OBJECTIVES
FOR A
CLINICAL EXPERIENCE
IN
OBSTETRICS AND GYNECOLOGY
6th Edition

A compendium of learning objectives and information designed for medical students and residents caring for female patients.

Written as a joint effort by the faculty of the Department of Obstetrics, Gynecology and Reproductive Biology at Michigan State University
The information contained in this document pursuant to patient care should not be considered as exclusive medical treatment and should not be interpreted as excluding other acceptable management plans. Considerations of individual patient needs and institutional and/or practice resources and limitations may necessitate other appropriate methods of practice.

The word "resident" may be substituted for "student" in each objective as deemed appropriate by residency program directors.
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<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit I – General Medical Issues</strong></td>
</tr>
<tr>
<td>Ethics</td>
</tr>
<tr>
<td>Informed Consent</td>
</tr>
<tr>
<td>Medical Economics</td>
</tr>
<tr>
<td><strong>Unit II – History and Physical</strong></td>
</tr>
<tr>
<td>Preconceptual Counseling</td>
</tr>
<tr>
<td><strong>Unit III – Normal Obstetrics</strong></td>
</tr>
<tr>
<td>Diagnosis of Pregnancy</td>
</tr>
<tr>
<td>Maternal Physiology</td>
</tr>
<tr>
<td>Endocrinology of Pregnancy</td>
</tr>
<tr>
<td>Immunology</td>
</tr>
<tr>
<td>Fetoplacental Physiology</td>
</tr>
<tr>
<td>Antepartum Care</td>
</tr>
<tr>
<td>Fetal Well-Being</td>
</tr>
<tr>
<td>Fetal Maturity</td>
</tr>
<tr>
<td>Labor and Delivery</td>
</tr>
<tr>
<td>Obstetric Analgesia and Anesthesia</td>
</tr>
<tr>
<td>Assessment and Immediate Care of the Newborn</td>
</tr>
<tr>
<td>The Puerperium</td>
</tr>
<tr>
<td><strong>Unit IV – Abnormal Obstetrics</strong></td>
</tr>
<tr>
<td>Prenatal Diagnosis</td>
</tr>
<tr>
<td>Adolescent Pregnancy</td>
</tr>
<tr>
<td>First and Second Trimester Bleeding</td>
</tr>
<tr>
<td>Intrauterine Fetal Demise</td>
</tr>
<tr>
<td>Third Trimester Bleeding</td>
</tr>
<tr>
<td>Dystocia</td>
</tr>
<tr>
<td>Breech Presentation</td>
</tr>
<tr>
<td>Cesarean Delivery and VBAC</td>
</tr>
<tr>
<td>Hypertensive Disorders of Pregnancy</td>
</tr>
<tr>
<td>Rh Isoimmunization</td>
</tr>
<tr>
<td>Medical and Surgical Complications of Pregnancy</td>
</tr>
<tr>
<td>Anemia</td>
</tr>
<tr>
<td>Cardiac Disease</td>
</tr>
<tr>
<td>Gestational Diabetes/Diabetes Mellitus</td>
</tr>
<tr>
<td>Infectious Diseases of Pregnancy</td>
</tr>
<tr>
<td>Rubella</td>
</tr>
<tr>
<td>Urinary Tract Infections</td>
</tr>
<tr>
<td>Other Medical and Surgical Complications</td>
</tr>
<tr>
<td>Multiple Gestation</td>
</tr>
<tr>
<td>Intrauterine Growth Retardation</td>
</tr>
<tr>
<td>Premature Rupture of Membranes</td>
</tr>
<tr>
<td>Preterm Labor</td>
</tr>
<tr>
<td>Postpartum Hemorrhage</td>
</tr>
<tr>
<td>Puerperal Fever</td>
</tr>
<tr>
<td>Maternal and Perinatal Morbidity and Mortality</td>
</tr>
<tr>
<td><strong>Unit V – Gynecology</strong></td>
</tr>
<tr>
<td>Adolescent Gynecology</td>
</tr>
<tr>
<td>Genetics</td>
</tr>
<tr>
<td>Infections</td>
</tr>
</tbody>
</table>
Human Immunodeficiency Virus V-87
Sexually Transmitted Disease V-89
Pelvic Inflammatory Disease V-94
Urethritis V-96
Toxic Shock Syndrome V-98
Infectious Diseases of the Breast V-99
Vulvar Disease V-100
Premenstrual Syndrome V-102
Pelvic Relaxation V-105
Pelvic Pain V-107
Dysmenorrhea V-108
Endometriosis V-110
Adenomyosis V-111
Neoplasms V-112
Early Cancer Detection V-112
Breast V-112
Cervix V-114
Gestational Trophoblastic Neoplasms V-117
Ovary V-118
Uterine Corpus V-121
Vagina V-122
Vulva V-123
Terminal Disease V-125
Violence Against Women V-126
Domestic Violence V-126
Sexual Assault V-129
Unit VI – Endocrinology and Infertility VI-133
Puberty VI-133
Menstrual Cycle VI-134
Prostaglandins VI-137
Abnormal Uterine Bleeding VI-137
Amenorrhea VI-140
Hirsutism VI-143
Infertility VI-147
Menopause VI-151
Unit VII – Obstetrical and Gynecologic Procedures VII-155
Obstetric VII-155
Gynecologic VII-158
Unit VIII – Control of Reproduction VIII-161
Contraception VIII-161
Sterilization VIII-167
Induced Abortion VIII-169
Unit IX – Sexuality IX-173
Sexual Abuse IX-178
Unit I

GENERAL MEDICAL ISSUES

Ethics

NOTE: As in all areas of medicine, ethical issues and dilemmas will arise during the obstetrics and gynecology clerkship. Students will be expected to utilize the skills and concepts of medical ethics while on this clerkship. The development of these skills, as well as self-evaluation to understand how one’s own value system influences decisions, should be a continuous process employed throughout the clerkship.

1. Given actual or simulated cases, the student will apply basic principles of ethics to develop a systematic approach in order to help resolve moral conflict.

(The following is to be considered a guide and is not all inclusive.)

A. Autonomy – may be defined as respect for self-determination
   (1) Who is the decision maker?
   (2) What are the patient’s values?
   (3) Has the patient been adequately informed?
   (4) What does the patient want?
B. Beneficence – may be defined as the duty to promote the good of the patient
   (1) Medical information gathering
   (2) What is the "best" medical plan?
   (3) What are alternative treatment options?
C. Non-Maleficence – may be defined as the duty not to inflict harm
   (1) What are the possible outcomes of the proposed treatment?
   (2) What are the possible outcomes of other options?
   (3) What is the quality of life expected?
D. Justice – may be defined as the right of the patient to be treated fairly and to a fair distribution of burdens and benefits
   (1) What does society want?
   (2) What are the socioeconomic issues?
   (3) What are the legal issues?

Informed Consent

2. The student will be knowledgeable about the necessary information to be given to patients in order to obtain informed consent for obstetric and gynecologic care.

A. Informed consent is a primary responsibility of the physician in educating the patient. This is both a legal and ethical responsibility to fulfill prior to initiation of any treatment plan.
   (1) It is important to assess the patient's ability to give informed consent
   (2) Informed consent implies that the patient be informed about:
      a) The nature and extent of the problem
      b) The nature and extent of the contemplated treatment
      c) Anticipated benefits (including estimate of successful outcome)
      d) Anticipated risks and potential complications
      e) Alternative methods of therapy and their possible outcomes
      f) What the treatment will not accomplish
      g) In the case of surgery, the possibility of unanticipated pathology
B. Failure to disclose the above information to patients can be considered negligence
C. The option for informed refusal should also be given
Medical Economics

3. The student will be aware of the medical, as well as non-medical factors related to the cost of health care and access to services in the United States and how these affect patient welfare and medical decision-making.

A. Cost of health care
   (1) Total expenditures for health care have dramatically increased over the last 30+ years
      a) 1960 – $26 billion or 5.4% of Gross National Product (GNP)
      b) 1990 – $110 billion or 12.3% of Gross Domestic Product (GDP)
      c) 1994 – $949 billion or 13.7% of GDP
      d) 1997 – $1.1 trillion or 13.2% of GDP
      e) 2000 – $1.6 trillion or 18.1% of GDP
      f) 2010 projections -- $2.6 trillion or 15.9% of GDP
         a. In this projection, health spending as a percent of GDP increases over the decade due to faster health spending growth and slightly slower GDP growth, relative to the most recent historical period
         b. The projected growth in health spending over the next decade is fueled in part by rapid increases in spending for prescription drugs. The conditions that propelled prescription drugs expenditures since 1995 are projected to persist over the next decade, although the impact of these conditions in the latter period of the projection is assumed to be smaller than in the initial period. These conditions include an increasing number of health plans with low-cost copays for drug coverage, direct-to-consumer advertising, and newer, better therapies requiring high-cost branded products. Other factors contributing to the projected faster health spending growth include rising provider costs, insurers’ inability to negotiate increasing price discounts as obtained in the recent historical periods, and greater income growth.
      
   (2) Distribution of costs
      a) Medicare in 2001 – 40 million enrollees and expenditures of $227 billion, yet this paid for less than 50% of health care costs of the elderly
      b) Seventy percent of health care expenditures occur in the last year of life
      c) Nineteen percent of health care expenditures are related to physician services
      d) Medicaid in 2001 – costs of $202 billion

B. Access to care – In spite of having a highly sophisticated and costly health care system, the U.S. faces problems with distribution of services and access to care
   (1) Patients most likely to have problems with access
      a) Poor (includes indigent, as well as working poor)
      b) Children
      c) Pregnant women
      d) Elderly
      e) Those 18-29 years of age
      f) Those of Latina origin, regardless of race
   (2) Uninsured – In 2000, 44 million or 16% of all Americans had no health insurance
      a) Seventy percent of these uninsured Americans are employed, mostly at low-paying service industry jobs
      b) Sixty percent have annual income above the poverty level
      c) Twenty-five percent have lost insurance because of a change in job, seasonal work or divorce
d) 2000 – 19-20% of all women aged 18-64 years had no health care coverage compared with 17% of all men in this age group.
e) Welfare reform resulted in higher rate of uninsured women (particularly low-income, single mothers).

C. Influence on patient welfare and medical decision-making
   (1) In the past medical decisions were made almost exclusively by physicians whose primary concern was for patient welfare.
   (2) Presently medical decision-making is a conjoint effort based upon considerations other than patient welfare including:
      a) Economic issues
      b) Political issues
      c) Technological issues
      d) Organizational issues
      e) Institutional issues

D. Emergence of managed care
   (1) Managed care includes many different kinds of health financing and delivery arrangements but generally all have the following objectives:
      a) To provide incentives to reduce costs
      b) To reduce costs by:
         (b. 1) Eliminating waste and inefficiency
         (b. 2) Eliminating ineffective medical care
         (b. 3) Preventing disease and illness
      c) To return savings to:
         (c. 1) Payers through decreased fees and premiums
         (c. 2) Investors in profits and dividends
         (c. 3) Patients in increased services, higher quality services and increased access
   (2) Common features include:
      a) Integration of finance and delivery
      b) Service commitment to a defined population
      c) Select panel of contracted providers
      d) Authorization system for medical services beyond "gatekeeper"
      e) Explicit and prospectively determined limits on expenditures
      f) Information management and analysis
   (3) Membership enrollment has skyrocketed until 1999:
      a) Health Management Organization (HMO) enrollment was 58 million in 1995
      b) HMO enrollment was 80 million in 1999 indicating the first decline in percent of enrollment since 1973 due to steeply rising premiums
      c) Preferred Provider Organization (PPO) enrollment was 91 million in 1995
      d) PPO enrollment in 1999 was 10.6 million
      e) Seventy-one percent of those obtaining health services through an employer were doing so through some form of managed care
      f) Nine percent of Medicare beneficiaries
      g) Thirty-two percent of Medicaid beneficiaries
      h) Seventy-six percent of insured American women under age 65 are in some type of managed care plan
   (4) Emphasis on primary care:
      a) Preventive and screening services
      b) Components of women's primary health and well-being include:
         (b. 1) Medical disease areas (e.g., cardiology, rheumatology)
         (b. 2) Reproductive care (e.g., general gyn, ob and oncology)
         (b. 3) Psychology and behavioral medicine (e.g., depression, alcohol and drug abuse, eating disorders, domestic violence)
         (b. 4) Preventive medicine (e.g., cancer screening)
      c) Barriers to women receiving preventive services:
         (c. 1) Lack of insurance benefits coverage
         (c. 2) Minority status
(c. 3) Age
(c. 4) Lack of information to women regarding seeking services or taking steps to reduce risk
(c. 5) Failure of health professionals to counsel about prevention or refer to screening
(c. 6) Transportation problems
(c. 7) Work and child care difficulties

(5) Managed care has significant implications for women
a) Primary care provider functions as gatekeeper to virtually all health care services but is it reasonable to expect one provider to adequately manage the full range of health needs of women across the age continuum?
b) Restrictive provider networks may disrupt women's access to women's health providers and to services outside the managed care framework
c) Managed care plans (particularly HMO's) have done a very credible job of providing preventive services for women
d) Quality vs. cost containment
   (d. 1) Incentives to underserve
   (d. 2) Substandard services; e.g., "pap mills"
   (d. 3) Suboptimal benefits; e.g., "drive through deliveries" and outpatient mastectomies
   (d. 4) Decreased benefits; e.g., mental health, chronic and long term care
   (d. 5) Putting care back into healthcare

(6) Financial problems of managed care organizations
a) Budgeted revenues vs. expenses
b) Number of insolvencies

E. Mid-level providers
(1) Use of midwives, nurse practitioners, physician assistants
(2) Impact on professional relationships
Unit II

HISTORY AND PHYSICAL

NOTE: At times there is variation as to what someone considers comprising a complete history and physical. In this unit, specific questions and physical findings are described, that are relevant to a number of problems encountered in obstetrics and gynecology. Most of the questions in the outline that follows should be asked. In addition, the breasts, abdomen, and pelvis should be thoroughly examined. The student, however, need only record positive findings and pertinent negatives, making it obvious to the instructor that the student did attempt to gather those cues which support or refute the most probable causes of the patient's problems.

4. Given a student-patient encounter, the student will demonstrate the ability to gain the patient's confidence and cooperation and will recognize and manage mutual, overt, and covert anxieties that arise from the examination.

A. Patient concerns
   (1) Modesty
   (2) Sexual implications (see objective 215)
   (3) Fear of disease
   (4) Feelings directed toward and received from both the examiner and assistant in the room
   (5) Concerns stemming from previous examination(s)
   (6) Fears connected to history of physical/sexual abuse

B. Examiner concerns
   (1) Invasion of privacy
   (2) Sexual connotations (see objective 215)
   (3) Fear
      a) Poor performance
      b) Patient discomfort

C. Rapport and cultural sensitive interactions
   (1) Effective interactions with women of diverse personalities, interests, socio-economic backgrounds, values and ethnicity
   (2) Non-judgmental behaviors concerning actions, plans, and values that are different from one's own (see objectives 1 and 193)

5. Given actual or simulated female patients, the student's history will include items in every medical history that would be helpful in providing appropriate gynecologic care.

A. Criteria for adequate history taking and recording include
   (1) Accuracy of information
   (2) Inclusion of all relevant components in the outline
   (3) Exclusion of unnecessary components
   (4) Completion of a medical history in 30 minutes for the usual patient; time efficiency should be developed before completion of the clerkship
   (5) Legibility, appropriate grammar, correct spelling and judicious use of abbreviations

B. The patient history and physical should be organized in such a way as to facilitate logical progression in patient evaluation. Information should be organized as follows, selecting items and utilizing a sequence appropriate to the individual problem.
   (1) Chief complaint (not necessarily in patient's words)
(2) Identifying data
   a) Age
   b) Race
   c) Gravidity/parity (see objective 21)
   d) Last menstrual period
(3) History of present illness
(4) Menstrual history
   a) Menarche
   b) Interval between menses
   c) Duration of menses
   d) Amount of menses
   e) Dysmenorrhea
      (e. 1) Timing and duration of pain
      (e. 2) Location of pain
      (e. 3) Severity of pain
   f) Premenstrual tension
      (f. 1) Weight gain, "bloating," edema, constipation
      (f. 2) Breast tenderness
      (f. 3) Emotional instability
   g) Menopause
      (g. 1) Age at last menses
      (g. 2) Postmenopausal bleeding and discharge
      (g. 3) Hot flushes, sweating, emotional changes, insomnia
      (g. 4) Medications including hormones
      (g. 5) Dyspareunia
(5) Past gynecologic disease
   a) Abnormal vaginal bleeding
      (a. 1) Change in menstrual interval, quantity, quality, duration
      (a. 2) Bleeding between periods
      (a. 3) Post-coital bleeding (contact bleeding)
   b) Abnormal vaginal discharge
      (b. 1) Duration
      (b. 2) Color
      (b. 3) Consistency
      (b. 4) Odor
      (b. 5) Pruritus, pain
      (b. 6) Past treatment
   c) History of pelvic infections/sexually transmitted diseases
      (c. 1) Symptoms and diagnosis
      (c. 2) A history of one STD always elicits a search for other STD's
      (c. 3) Treatment
      (c. 4) Follow-up
   d) Pelvic, abdominal and perineal discomfort
      (d. 1) Description and severity
      (d. 2) Duration
      (d. 3) Location
      (d. 4) Radiation
      (d. 5) Symptoms of pelvic relaxation
         (d.5.1) Heaviness
         (d.5.2) Protrusion of vaginal tissues
      (d. 6) Symptoms of pelvic or abdominal mass
(6) Contraceptive history
   a) Current method and duration of use
   b) Prior methods
   c) Untoward effects and failures
   d) Desire for future pregnancies
   e) Desire or need to change method
(7) Reproductive history
   a) Problems of conception
   b) Obstetric information
      (b. 1) Total number of pregnancies, number of abortions (spontaneous and induced), number of term deliveries, number of pre-term deliveries, and living children
      (b. 2) Methods of deliveries
      (b. 3) Dates, lengths of gestation, weights, anesthesia, outcomes, and condition of each infant at birth
      (b. 4) Complications of pregnancy and puerperium
      (b. 5) Details of perinatal deaths

(8) Sexual history (see objective 210)
   a) Sexual orientation
   b) Sexual desire
   c) Frequency of sexual interaction, including coitus, number of partners, recent new partners
   d) Orgasmic frequency and satisfaction
   e) Dyspareunia
   f) Medications and/or health problems contributing to sexual function
   g) Problems of partner (e.g., premature ejaculation, impotence)
   h) Impact on the relationship

(9) History of abuse – past and/or current
   a) Physical
   b) Emotional
   c) Sexual

(10) Past medical and surgical history
(11) System review – See system review in a standard text. The following is especially relevant to obstetrics and gynecology.
   a) Urinary tract
      (a. 1) Frequency, urgency and dysuria
      (a. 2) Incontinence
         (a.2.1) Associated with physical activity (stress)
         (a.2.2) Associated with strong desire to urinate (urgency)
      (a. 3) Post-coital symptoms
   b) Gastrointestinal tract
      (b. 1) Rectal pain or bleeding
      (b. 2) Rectal incontinence
      (b. 3) Hemorrhoids
   c) Breast symptoms and self-examination
      (c. 1) Age of thelarche
      (c. 2) Cyclic soreness and tenderness
      (c. 3) Recent changes
         (c.3.1) Masses
         (c.3.2) Recent nursing, sexual manipulation
         (c.3.3) Soreness, tenderness
         (c.3.4) Secretions, blood (unilateral or bilateral)
         (c.3.5) Skin or nipple lesion
         (c.3.6) Asymmetry
      (c. 4) Mammograms
      (c. 5) Self-examination
      (c. 6) Fear of disease

(12) Social history
(13) Family history
(14) Preventive health issues
   a) Smoking
   b) Alcohol
   c) Illicit drug use
d) Exercise  
e) Diet  
f) Seat belt use  
g) Sun protection  
h) Accident prevention information

6. Given an actual or simulated patient, the student will perform a complete gynecologic physical examination to include, but not be limited to, the items listed below.

A. Breasts  
   (1) Contour and size  
   (2) Symmetry  
   (3) Nipple retraction, deviation and/or secretion  
   (4) Skin lesions, retraction, "peau d'orange"  
   (5) Masses  
   (6) Tenderness  
   (7) Axillae and associated lymph node-bearing areas

B. Abdomen  
   (1) Contour  
   (2) Scars  
   (3) Hair distribution  
   (4) Bowel sounds  
   (5) Tympany  
   (6) Hernia  
   (7) Organomegaly  
   (8) Masses  
   (9) Ascites  
   (10) Tenderness  
   (11) Rigidity  
   (12) Guarding  
   (13) Inguinal lymphadenopathy  
   (14) Fetal heart tones if a mass is present and pregnancy is suspected

C. Pelvis  
   (1) External genitalia and perineum  
      a) Escutcheon  
      b) Lesions and inflammation  
      c) Clitoral size  
      d) Hymen  
      e) Skene and Bartholin glands  
   (2) Vagina  
      a) Mucosal appearance  
      b) Secretions  
      c) Lesions  
      d) Relaxation (urethrocele, cystocele, rectocele, enterocele)  
   (3) Cervix  
      a) Color  
      b) Lesions  
      c) Mucus  
      d) Consistency, size, shape  
      e) Bleeding  
      f) Dilation and ectropion  
      g) Position (anterior-posterior, lateral)  
   (4) Uterus  
      a) Size  
      b) Position – anteverted, retroverted, anteflexed, retroflexed, levo, dextrorotated
c) Shape
d) Consistency
e) Mobility
f) Tenderness

(5) Adnexa
a) Not palpable
b) Palpable
  (b. 1) Size
  (b. 2) Consistency
  (b. 3) Tenderness
  (b. 4) Mobility

(6) Rectum
a) Bleeding
b) Hemorrhoids
c) Fissure
d) Stricture
e) Fistula
f) Sphincter tone
g) Mass

(7) Rectovaginal region
a) Perineal body
b) Rectovaginal septum
c) Uterosacral ligaments
d) Cul-de-sac
  (d. 1) Nodularity
  (d. 2) Masses
  (d. 3) Tenderness
  (d. 4) Fullness

7. Given a woman who is sexually active or older than 18, the student should obtain a cervical cytologic smear for prevention of cervical cancer if one has not been obtained in the last 12 months.

A. Screening recommendations
   (1) Initial screen at age 18 or onset of sexual activity
   (2) Screening annually for 3 years, then 1-3 years depending on risk factors
   (3) High risk (multiple partners, adolescent, history of abnormal Pap, diethylstilbestrol (DES) exposure, history of condyloma, human immunodeficiency virus (HIV) positive, smoker)

B. Traditional method for obtaining a cervical smear
   (1) The cervix must be visualized in its entirety
   (2) Gently wipe away excess mucus
   (3) The smear must contain squamous and endocervical cells best obtained with a spatula (wooden or plastic) and endocervical brush
   (4) Place on 1 or 2 properly labeled glass slides
   (6) The smear must be fixed immediately

C. Thin preparation pap smears
   (1) The cervix must be visualized in its entirety
   (2) Gently wipe away excess mucus
   (3) Using a plastic spatula and endocervical brush, squamous and endocervical cells are obtained
   (4) Plastic spatula and endocervical brush are swirled into a liquid medium in designated container.
   (5) The container with cellular solution is transferred to a pathology facility for slide preparation and interpretation.
D. To decrease the incidence of false negative Pap smears
   (1) No douching within 72 hours of smear
   (2) No intercourse with 72 hours of smear
   (3) No tampon use within 72 hours of smear
   (4) Best done mid-cycle
   (5) If patient is menstruating, obtaining Pap smear must be weighed against risk of
       not returning for Pap smear

8. Given that the student has completed the written history and physical examination, the student will generate a problem list, differential diagnosis, assessment, and plan of management.

Preconceptual Counseling

9. Given a patient who expresses an interest in pregnancy, the student will discuss the benefits of good health prior to conception and list those conditions for which preconceptual counseling would be especially helpful.

A. Actively planning for pregnancy may optimize a patient's pregnancy outcome
   (1) Discussions regarding reproductive desires should be a part of each annual exam for women of childbearing age (see objective 5)
   (2) Preconceptual counseling gives the patient and, if appropriate, her partner the necessary information about which to make informed decisions
      a) To accept increased risks that pregnancy may pose to her and her child's health or to modify those risks
      b) To consider pregnancy-related issues such as restrictions on maternal activity, alterations in employment status, and ramifications of needed medical care for certain high risk conditions
      c) To consider potentially difficult decisions that might need to be made (e.g., in the event of fetal abnormalities) in an unhurried and less stressful manner
      d) To work through anxieties about future pregnancies and/or issues related to previous pregnancies
   (3) Preconceptual counseling underscores the shared responsibility for good outcome between the patient and her health care provider(s)
   (4) A physician's responsibility is to inform so that patients can make decisions; it is not to make reproductive decisions for women
   (5) A multidisciplinary effort may be most advantageous in dealing with complex issues or referrals to other health care providers may be warranted

B. Conditions that especially warrant preconceptual counseling
   (1) History
      a) Advanced maternal age (≥age 35 at delivery)
      b) Exposure to environmental risk factors
      c) Substance abuse (cigarette use, alcohol and drugs)
      d) Previous pregnancy losses
      e) Genetic and/or congenital abnormalities with prior pregnancies or within the family
      f) Sexually transmitted disease and hepatitis B
      g) No documentation of rubella immunity and varicella immunity
      h) Medication use
   (2) Medical problems
      a) Consideration of the impact that the disease and its current or prior therapies may have on the intrauterine environment and fetal development
      b) Consideration of the impact the pregnancy may have on the patient's disease process
c) Diseases include
   (c. 1) Diabetes mellitus
   (c. 2) Thyroid disorders
   (c. 3) Chronic hypertension and heart disease
   (c. 4) Renal disease
   (c. 5) Respiratory diseases including asthma
   (c. 6) Neurologic disturbances including epilepsy
   (c. 7) Systemic lupus erythematosus
   (c. 8) Deep venous thrombosis
   (c. 9) Hemoglobinopathies
   (c.10) Hyperphenylalaninemia
   (c.11) Cancer
   (c.12) Positive human immunodeficiency virus (HIV) serology or acquired immune deficiency syndrome (AIDS)

(3) Counseling
   a) Menstrual cycle and fertile times
   b) Stopping oral contraceptive pills (OCP) for at least 3 months prior to conception
   c) When to call back if not pregnant

(4) Prevention
   a) Prenatal vitamins
   b) Folic acid—0.4mg/day beginning 3 months before conception
   c) Avoidance of environmental hazards
   d) Laboratory tests
   e) Immunization (rubella, varicella)
   f) Minimize medication use
   g) Investigate substance abuse
Diagnosis of Pregnancy

10. Given a patient with amenorrhea or suspicion of pregnancy, the student will make a diagnosis of pregnancy.

A. Symptoms
   (1) Breast fullness and tenderness
   (2) Fatigue
   (3) Nausea and vomiting
   (4) Frequency of urination
   (5) Quickening

B. Signs
   (1) Bluish discoloration of vagina and cervix (Chadwick's Sign)
   (2) Changes in size, shape and consistency of the uterus and cervix
   (3) Breast changes
      a) Areolar darkening
      b) Development of Montgomery's tubercles
      c) Increase in size and firmness
   (4) Fetal heart tones
      a) Stethoscope
      b) Doppler

C. Tests
   (1) Tests for human chorionic gonadotropin (hCG)
      a) Beta subunit of hCG
         (a. 1) Types
            (a.1.1) Radioimmunoassay
            (a.1.2) Receptor assay
            (a.1.3) ELISA
         (a. 2) Very sensitive test for hCG
            (b. 3) Typically positive 5-7 days after ovulation
      b) Immune chemistry – primarily used in home pregnancy tests
         (b. 1) Minimum sensitivity level of the tests for hCG
         (b. 2) Greatest cross reactivity with luteinizing hormone (LH)
         (b. 3) Can detect hCG as early as 7 days after conception
   (2) Sonography
      a) Gestational sac first visible at 5-6 weeks
      b) Fetal pole usually seen at 7-8 weeks
      c) Vaginal probe enhances visibility earlier
   (3) Doppler – fetal heart tones usually can be heard by the 10-12th week

Maternal Physiology

11. The student will be able to list the major changes that occur during pregnancy in the uterus, cervix, and breast.

A. Uterus
   (1) Hypertrophy and hyperplasia of the myometrium
   (2) Increased vascularity
   (3) Increased myometrial contractile "activity"
(4) Formation of decidua
B. Cervix
   (1) Hypertrophy and hyperplasia of the endocervical glands
   (2) Increased vascularity
   (3) Development of the mucous plug
   (4) Softening
   (5) Effacement and slight dilation before the onset of labor

C. Breasts
   (1) Increased ductal and alveolar growth
   (2) Increased vascularity
   (3) Production of colostrum

12. The student will list the principal physiologic and structural changes in the major organ systems of the pregnant woman.

A. Cardiovascular and hematopoietic
   (1) Increased plasma volume
   (2) Increased red cell mass
   (3) Slightly decreased hematocrit
   (4) Increased total blood volume
   (5) Increased cardiac output
   (6) Decreased vascular resistance
   (7) Increased nutrient iron and folic acid demands
   (8) Moderate leukocytosis (up to 15,000/ml)
   (9) Increased fibrinogen and several other clotting factors

B. Respiratory
   (1) Unchanged-to-slightly increased vital capacity
   (2) Increased tidal volume
   (3) Unchanged respiratory rate
   (4) Increased minute volume of respiration
   (5) Decreased blood \( pCO_2 \) and serum bicarbonate
   (6) Unchanged arterial pH

C. Genitourinary
   (1) Increased glomerular filtration rate and renal plasma flow
   (2) Variable renal tubular reabsorption
   (3) Dilation of urinary collecting system
   (4) Extrinsic compression of the bladder by the uterus

D. Gastrointestinal
   (1) Decreased motility
   (2) Cholestasis
   (3) Delayed absorption
   (4) Altered hepatic function

E. Integumentary
   (1) Hyperpigmentation of areola, vulva, facial skin, and development of linea nigra
   (2) Striae
   (3) Gingival hypertrophy

F. Skeletal
   (1) Center of gravity displaced ventralward
   (2) Marked postural changes (lordosis of pregnancy)
   (3) Softening of pelvic ligaments

G. Psychologic
   (1) Emotional lability
   (2) Anxiety
   (3) Apprehension
   (4) Identity crises
   (5) Changes in libido
Endocrinology of Pregnancy

13. The student will list the general and specific physiologic changes that occur in the endocrine system during pregnancy.

A. General changes may be gradual or abrupt and vary according to the period of gestation
   (1) Secretory and excretory rates
   (2) Size of the peripheral pool
   (3) Interaction with other hormones
   (4) Activities and amounts of binding globulins
   (5) Metabolic conversion rates
   (6) Size and vascularity of all endocrine organs
B. Pituitary – hypertrophy
C. Ovary
   (1) Cessation of ovulation
   (2) Persistence of corpus luteum with increased and prolonged elaboration of progesterone until placental production supersedes it by 8-10 weeks gestation
D. Thyroid
   (1) Hypertrophy
   (2) Alteration in function tests
      a) Increase in thyroid-binding globulin (TBG)
      b) Increase in total thyroxine (T4)
      c) Decrease in triiodothyronine (T3) uptake
E. Pancreatic islet cells and placenta (carbohydrate metabolism)
   (1) Decreased fasting serum glucose
   (2) Increased fasting free fatty acids
   (3) Elevated serum glucose three hours after a standard meal
   (4) Increased peripheral resistance to insulin
   (5) Increased insulin response to a standard glucose load
   (6) Contrainsulin factors present or increased during pregnancy
      a) Human placental lactogen (hPL)
      b) Estrogen
      c) Progesterone
      d) Corticosteroids
F. Adrenal – increase in measurable corticoids

14. The student will be familiar with changes in blood levels of hCG, hPL, prolactin, estriol, progesterone, estradiol, and estrone during gestation.

A. Human chorionic gonadotropin
   (1) Early abrupt elevation until 8-10 weeks gestation
   (2) Second trimester decrease that plateaus until delivery
B. Human placental lactogen (human chorionic somatomammotropin)
   (1) Diabetogenic
   (2) Biologically and immunologically similar to human pituitary growth hormone
   (3) Gradual increase from 6-8 weeks until delivery
C. Prolactin – gradual increase from 6-8 weeks until delivery in a linear pattern of rise probably related causally to estrogen stimulation
D. Estriol – concentrations increase exponentially with advancing gestation
E. Progesterone – gradual increase during pregnancy until the 32nd or 34th week
F. Estradiol and estrone – progressive increase through pregnancy
15. The student will understand the differences in origin and metabolism of estrogen and progesterone during pregnancy.

   A. Estrogens
      (1) Estriol is quantitatively the major estrogen during pregnancy
      (2) Synthesis requires fetal and maternal adrenal and liver enzymes to convert maternal precursors that are further converted in the placenta to estriol
   B. Progesterone
      (1) Initially supplied by corpus luteum
      (2) After 8-10 weeks gestation progesterone is synthesized predominantly by placenta from maternal precursors

Immunology

16. The student will be familiar with the explanations currently employed in attempting to understand the maternal tolerance of antigenically dissimilar fetal tissue.

   A. The non-pregnant uterus is not a privileged site with respect to immunologic events
   B. The fetus is immunocompetent at a relatively early age
      (1) The cellular immune apparatus is definable by 10 weeks of gestation
      (2) Fetal lymphocytes are capable of transformation to potentially reactive cells by 22 weeks of gestation when challenged by phytohemagglutinin
      (3) The fetus shows humoral antibody responses by 20 weeks with elaboration of IgM
   C. Trophoblastic epithelium has antigenic capacity that does not appear to be expressed in the course of pregnancy
   D. Sialomucin, a fibrous acellular mucopolysaccharide, coats the trophoblastic epithelium and may, by virtue of its high charge density and polarity, serve as a barrier to immunogens
   E. The decidual cell transformation appears to block lymphatic channels in the endometrial stroma, therefore interfering with the afferent migration
   F. A generalized decrease in maternal immunoreactivity appears through the course of pregnancy. This is manifest through evidence of lymphopenia, thymic atrophy, prolonged graft rejection, and progressively weakened allograft rejection. This modulation in the intensity of immunoreactivity may result from high concentrations of progesterone, hCG and/or estrogens
   G. The production of maternal blocking antibodies may prevent the immune expression of immunogens
   H. Immunotherapy is sometimes used in treatment of recurrent pregnancy loss

Fetoplacental Physiology

17. The student will understand that the fetus is dependent on the placenta for its respiratory, nutritional and excretory functions.

18. The student will list reasons why the fetus, in spite of a relatively low partial pressure of oxygen ($pO_2$), does not normally suffer from lack of oxygen.

   A. Favorable oxygen dissociation curve of fetal hemoglobin resulting in a greater affinity for oxygen than adult hemoglobin
   B. High percentage of fetal hemoglobin
   C. High fetal cardiac output per unit body weight
   D. High fetal heart rate
19. The student will list the factors upon which placental transfer depends.

A. Mechanism of transfer can be in either direction and is active or passive, dependent on the substance being transferred
B. Transfer depends on
   (1) Placental blood flow
   (2) Molecular size
   (3) Molecular charge
   (4) Concentration gradients
   (5) Area and thickness of placental membrane
   (6) Lipid solubility
   (7) Hydrostatic gradients
   (8) Energy dependent (active transfer) and independent (facilitated diffusion) carrier systems
   (9) Pinocytosis

20. The student will understand the changes that are essential for the physiologic transition of the fetus from an intra- to extrauterine existence.

A. Lung expansion
   (1) Surfactant effects
   (2) Pulmonary capillary blood \( p_{O_2} \) increase
   (3) Pulmonary vasodilation
   (4) Ductus arteriosus constriction
B. Hemodynamic changes
   (1) Arterial blood pressure increase
   (2) Ductus venosus collapse
   (3) Foramen ovale closure
   (4) Cardiac output decrease accomplished in part by a decreased heart rate
   (5) Regional blood flow rate change with altered oxygen requirements

Antepartum Care

21. Given an obstetrical patient, the student will describe the initial and subsequent clinical assessments and list the laboratory determinations appropriate for initial and repeat prenatal visits.

A. Definitions
   (1) Gravida—number of times pregnant
   (2) Parity—number of pregnancies reaching viability and delivered
   (3) Currently used system of identification—GP\( _{TPAL} \) where
      a) \( G= \) number of times pregnant
      b) \( T= \) term pregnancies or deliveries at 37 weeks or greater
      c) \( P= \) preterm deliveries of number of deliveries between 20 and 36 completed weeks
      d) \( A = \) abortion or any pregnancy loss whether spontaneous or elective at <20 completed weeks
      e) \( L = \) living or number of living children
   (4) Other terms identifying pregnancy and delivery status
      a) Nulligravida—never been pregnant
      b) Primigravida—first pregnancy
      c) Primipara—completed one pregnancy and delivery
      d) Multipara—two or more pregnancies to viability
e) Multigravida – multiple pregnancies, not necessarily deliveries past a viable age
d) Parturient – a woman in labor
e) Puerpera – a woman who has just given birth

B. Duration and dating of pregnancy
(1) Assuming a 28 day cycle, calculated from last menstrual period = 280 days or 40 weeks
(2) Assuming a 28 day cycle, Nagele’s rule – add seven days and count back three months from last menstrual period
(3) Precise knowledge of gestational age is imperative and should be established at first visit
   a) Known last menstrual period
   b) Assessment of uterine size
   c) Ultrasound, if indicated

C. Initial assessment
(1) Accurate determination of gestational age at first visit is crucial (see B above)
(2) Complete history (see objectives 5 and 6) including risk assessment (see objective 23)
   a) Family history of congenital or chromosomal abnormality
   b) Medical problems that may impact pregnancy
   c) Previous obstetrical history, i.e. preterm labor/delivery, previous cesarean delivery, history of gestational diabetes mellitus, pregnancy-indicated hypertension, etc.
(3) Social history
   a) Diet/weight gain
   b) Adolescent or advanced maternal age
   c) Substance abuse/medication use in pregnancy
   d) Social supports
(4) Complete physical exam
   a) General physical exam including thyroid, breast, abdomen, cardiovascular and respiratory systems,
   b) Pelvic exam
      (b.1) Uterine size, shape, consistency
      (b.2) Adnexae
      (b.3) Pelvic measurements – clinical pelvimetry
         (b.3.1) Inlet – diagonal conjugate
         (b.3.2) Midplane – interspinous diameter and sacral curve
         (b.3.3) Outlet – intertuberous diameter and subpubic arch
(5) Laboratory
   a) Initial visit
      (a.1) Complete blood count (CBC)
      (a.2) Urinalysis
      (a.3) Urine culture or biochemical screen for bacteria
      (a.4) Blood type and Rh factor
      (a.5) Screen for atypical serum antibodies
      (a.6) Rubella titer
      (a.7) Screening test for syphilis
      (a.8) Hepatitis B surface antigen
      (a.9) Human immunodeficiency virus screening (pre- and post-counseling and informed consent required) Patient confidentiality is mandated.
         (a.10) Pap smear
         (a.11) Gonorrhea culture and Chlamydia screen, if appropriate
         (a.12) Sickle cell prep, if appropriate
         (a.13) Tuberculosis skin testing, if appropriate
   b) Subsequent visits
      (b.1) 15-18 weeks
      (b.2) 18-20 weeks
26 weeks – one-hour glucose tolerance test, complete blood count, blood type, antibody screen
(b. 4) 35-37 weeks – Group B strep screening

D. Repeat assessments
(1) Frequency of visits
   a) Monthly to 28 weeks
   b) Biweekly between 28-36 weeks
   c) Weekly after 36 weeks
(2) History
   a) Maternal concerns/questions
   b) Patient education
   c) Perception of fetal movement
(3) Physical Exam
   a) Fundal height
   b) Weight/blood pressure
   c) Urine dip for protein and glucose
   d) Edema
   e) Fetal heart tones
(4) Laboratory
   a) 15-21 weeks – Triple test
   b) 20 weeks – ultrasound for anomaly screen (if indicated)
   c) 26 weeks – one hour glucose tolerance test
   d) 28 weeks – repeat hemoglobin and hematocrit, antibody screen
   e) 35-37 weeks – Group B strep screen
   f) Repeat ultrasound, if indicated

22. When presented with an obstetrical patient, the student will discuss general health issues.

A. Diet
   (1) Nutritious daily menu
   (2) Normal weight gain of approximately 25 to 35 pounds
   (3) No attempt should be made to lose weight. A positive caloric balance should be maintained during pregnancy and the nursing period.
   (4) May recommend vitamin supplements in modest doses
   (5) Iron supplements appropriate in most pregnant patients
B. Hygiene
   (1) No restrictions on bathing
   (2) Good dental care
   (3) No coital restriction in low risk patient
   (4) No douching
C. Exercise
   (1) Normal activity desirable
   (2) No restriction of usual exercise short of exhaustion
D. Preparation for labor
   (1) Recommend childbirth education classes
   (2) Describe events of labor and delivery to patient
   (3) Discuss labor instructions
      a) Contact physician when regular uterine contractions and/or rupture of membranes occur
      b) Generally no ingestion of food after onset of labor
E. Family planning – discuss needs, desires, and attitudes about
   (1) Contraception
   (2) Sterilization
F. Instruct patient to call physician for
   (1) Vaginal bleeding
   (2) Abdominal pain
   (3) Rupture of membranes
   (4) Edema
   (5) Headache or visual disturbance
   (6) Decrease in or absence of fetal movements
   (7) Chills and fever
   (8) Dysuria

G. Use of drugs
   (1) Over the counter and prescription drugs should not be used without prior consultation with a nurse or physician
   (2) Alcohol, tobacco, and street drugs should be avoided

23. The student will list the factors used in the identification of the high-risk gravida and fetus.

   A. Social History
      (1) Age less than 16 years or more than 35 years
      (2) Poor social support system

   B. Maternal disease affecting pregnancy
      (1) Cardiovascular disease
      (2) Chronic renal or liver disease
      (3) Diabetes mellitus
      (4) Anemia or hemoglobinopathy
      (5) AIDS
      (6) Pelvic abnormality
      (7) Drug/substance abuse
      (8) Hypertension
      (9) Mental disorder
      (10) Seizure disorder
      (11) Thyroid disorder
      (12) Obesity or malnutrition

   C. Abnormal obstetric history
      (1) Premature labor
      (2) Prolonged labor
      (3) Macrosomic infant; shoulder dystocia
      (4) Midforceps delivery
      (5) Cesarean delivery or hysterotomy
      (6) Two or more consecutive abortions or neonatal deaths
      (7) Any previous antepartum, intrapartum, or neonatal death
      (8) Abnormal neonatal outcome
         a) Child with congenital abnormality
         b) Child with cerebral palsy or birth injury
      (9) Cervical incompetence
      (10) Eclampsia/pre-eclampsia
      (11) Gestational diabetes mellitus
      (12) Hemorrhage, 2° placenta previa
      (13) Rh isoimmunization

   D. Obstetric complications in current pregnancy
      (1) Abnormal screening tests
      (2) Gestational diabetes mellitus
      (3) Pre-eclampsia/eclampsia
      (4) Multiple gestation
      (5) Hemorrhage
      (6) Hyperemesis
      (7) Poor fetal growth/intrauterine growth retardation
24. The student will recognize and know how to manage the common complaints of pregnancy.

A. Nausea and vomiting
   (1) Diet
      a) Multiple small meals
      b) High carbohydrate intake
   (2) Drug therapy
   (3) Hospitalization and intravenous therapy for severe cases only
B. Fatigue – reassure and validate
C. Urinary frequency without dysuria – reassure only
D. Backache
   (1) Postural exercises
   (2) Supportive garments
E. Varicosities
   (1) Support stockings
   (2) Elevation of lower extremities
F. Lightheadedness (may be related to postural hypotension) – encourage left lateral decubitus position and fluid hydration
G. Dyspepsia – encourage small meals and antacid therapy
H. Constipation
   (1) Increase bulk in diet
   (2) Increase fluid intake
   (3) Stool softeners and milk of magnesia for refractory cases
I. Uterine contractility prior to term – mandates evaluation
   (1) Differentiate preterm labor (see objective 99) from Braxton-Hicks contractions
   (2) Observation and increased fluid intake
   (3) Short-term moderate restriction of activity

25. The student will demonstrate the capacity to deal with the wide range of common emotional concomitants of pregnancy.

A. Emotional lability – wide range of normal
   (1) Anxiety
   (2) Depression
   (3) Phobia-compulsion
   (4) Indecisiveness
B. Longitudinal changes during pregnancy
   (1) General
      a) Altered feminine identity
      b) Primigravidas often change sequentially from woman to mother
   (2) First trimester concerns – accepting the reality of pregnancy and dealing with its implications
      a) Ambivalence
      b) Anxiety – culturally or historically derived (prior pregnancy complication)
      c) Economic issues
      d) Altered sexual interest
      e) Sexual anxiety – fear of injury to the fetus
      f) Development of mothering identity
(3) Second trimester concerns – feeling the presence of the fetus (quickening)
   a) Outfitting the nursery
   b) Pleasant awareness of fetal movement (the internal presence of a separate person)
   c) Concern about fetal normalcy
   d) Search for a figure of strength – mate and mother
   e) Possible increased libido, sometimes exceeding pregnancy norms

(4) Third trimester concerns
   a) Embarrassment about protruding abdomen, trips to the hospital for false labor, postdatism, etc.
   b) Recapitulation of fears and demands of prior births
   c) Immediate baby preparations
      (c. 1) Naming
      (c. 2) Baby needs
   d) Altered sexual interest
   e) Fear of fetal deformity, fetal and maternal death

26. The student will discuss his/her understanding of the common emotional concomitants of a patient requesting pregnancy testing.

   A. Concerns when the pregnancy is wanted
      (1) Fear of disappointment
      (2) Partner/parent pressure
      (3) Concerns regarding partner relationship
         a) Should partner be told?
         b) Will partner care?
         c) Will partner assume responsibility?
      (4) Concerns regarding parental relationship
         a) Should they be told?
         b) Consequences
         c) Pressure for/against partner relationship
         d) Availability for support

   B. Concerns when the pregnancy is unwanted (see objective 204)

27. The student will demonstrate the capacity to develop professional interpersonal relationships with obstetrical patients and their families and to give emotional support during pregnancy, labor, delivery, and the puerperium.

   A. Patient and partner concerns
      (1) Loss of control in a highly structured environment (the hospital) where procedures may be perceived as meeting needs of hospital personnel, not of the patient
      (2) Loss of self-control during labor and delivery – failure to fulfill natural childbirth objectives
      (3) Reliance on strangers for personal safety and emotional security
      (4) Fear of unknown that may negatively influence labor

   B. As attention shifts from mother to baby, a depression may begin, lightened by the pleasures of neonatal care but intensified by anticipated hospital discharge

   C. Postpartum blues – transient mild depression lasting up to 10 days

   D. Useful tactics
      (1) A trusting relationship between parturient and attendant is the most potent single determinant of comfort
      (2) Prior orientation to labor and delivery unit and to admission and intrapartum procedures increases acceptance and generates trust
The parturient should have some overt measure of control over intrapartum decisions including analgesia and mobility during labor.

Evaluations and procedures in labor should be explained.

Encourage participation of the woman's support persons.

Fetal Well-Being

28. The student will list and interpret results of methods used in evaluating fetal well being prior to the onset of labor.

A. Fetal activity records – decrease in frequency or character may signal significant fetal compromise and indicate further investigation.

B. Non-stress testing – increase in fetal cardiac rate in response to fetal movement recorded on fetal heart rate monitor
   (1) Normal ("reactive")
      a) Increase in fetal heart rate of at least 15 beats per minute for 15 seconds associated with fetal movement occurring two to three times in a 20 minute period of monitoring.
      b) Implies fetal well-being.
   (2) Abnormal ("non-reactive")
      a) Absence of movement or failure to reach level of fetal heart rate response indicated above.
      b) Requires further testing with biophysical profile or contraction stress testing.

C. Biophysical profile testing – observation of physiologic functions of the fetus using ultrasound.
   (1) Fetal heart rate reactivity.
   (2) Fetal breathing movements – fetal breathing movements lasting for 30 seconds over a 30 minute period of observation.
   (3) Gross fetal body movement – at least three discrete episodes of limb and/or trunk movement over a 30 minute period of observation.
   (4) Fetal tone – with extremities/trunk in flexion, the fetus should show an episode of full extension and return to flexion.
   (5) Amniotic fluid – evidence of adequate amniotic fluid with at least one pocket of fluid ≥2 cm deep. (The estimate of total amount is not precise and requires some experience with what is adequate and what constitutes oligohydramnios.)

D. Contraction stress test
   (1) Observation of fetal heart rate response to uterine contractions; must have at least three contractions in 10 minutes lasting 40-60 seconds to be considered adequate contraction.
   (2) Initiated by nipple stimulation or IV pitocin infusion.
   (3) Recorded with a fetal/maternal monitor.
   (4) Results reported as positive, negative, or equivocal.
      a) Positive
         (a. 1) Late decelerations associated with half or more of the adequate contractions.
         (a. 2) Implies fetal compromise but is associated with a significant percentage of false positive results.
         (a. 3) Requires evaluation of the total clinical picture and other appropriate testing for clinical decision making.
      b) Negative
         (b. 1) Normal beat-to-beat variability and no deceleration patterns.
         (b. 2) Implies fetal well-being.
c) Equivocal
   (c. 1) Late decelerations associated with less than half of the contractions
   (c. 2) Hyperstimulation of the uterus
   (c. 3) Results are inconclusive and require consideration of repeat test or alternative test to assure fetal well-being

**Fetal Maturity**

29. The student will define the duration of normal pregnancy and prematurity and will understand the concept of fetal viability.

   A. Duration of pregnancy is approximately 40 weeks (280 days) from the first day of the last menstrual period (assuming a 28 day menstrual cycle) or 266 days from ovulation
   B. Prematurity is defined as gestational age less than 37 completed weeks or weight less than 2500 grams
   C. The potential for fetal survival begins around 24-25 weeks. However, fetal viability as a function of gestational age varies based on individual fetal biologic considerations and technological support capabilities.

30. The student will list the tests helpful in determining fetal maturity.

   A. Estimated fetal weight
      (1) Ultrasound determination of estimated fetal weight using multi-parameter evaluation including biparietal diameter, femur length, and abdominal circumference
      (2) Prognosis for survival <500 grams is poor
   B. Fetal pulmonary maturity
      (1) Analysis of amniotic fluid, either from amniocentesis or pooled vaginal specimen
      (2) Lecithin/Sphingomyelin ratio (L/S) >2.0 (less reliable in diabetic pregnancies)
      (3) Phosphatidylglycerol level (PG)
         a) Absent – may be immature
         b) Present – mature

**Labor and Delivery**

31. The student will define fetal lie, fetal presentation, cervical effacement, cervical dilation, fetal station, and fetal position.

   A. Fetal lie – the relation of the long axis of the fetus to that of the mother; is either longitudinal, transverse, or oblique
   B. Fetal presentation – that portion of the body of the fetus that is foremost within the birth canal or in closest proximity to it
   C. Cervical effacement – the length of the cervical canal compared to that of an uneffaced cervix. For example, when the length of the cervix is reduced by one half, it is 50% effaced.
   D. Cervical dilation – the estimate of the average diameter of the cervical opening
   E. Fetal station – the level of the presenting fetal part in the birth canal
   F. Fetal position – the orientation of the presenting part of the fetus within the maternal birth canal – reported as anterior, posterior or transverse and right or left
32. The student will describe the cardinal mechanisms of normal labor.
   A. Engagement
   B. Descent
   C. Flexion
   D. Internal rotation
   E. Extension
   F. External rotation
   G. Expulsion

33. The student will define the three stages of labor.
   A. Definitions
      (1) First stage – begins with uterine contractions resulting in cervical dilation, effacement and/or descent of the presenting part and ends with complete effacement and dilation of the cervix
      (2) Second stage – begins with complete dilation of the cervix and ends with delivery of the fetus
      (3) Third stage – begins with delivery of the fetus and ends with delivery of the placenta
   B. Progress of labor
      (1) The events of labor normally occur in an orderly sequence involving variable rates of cervical dilation
      (2) Any variation from this pattern may indicate impending abnormality. The plotting of a graph of cervical dilation and descent of the presenting part against time (Friedman curve) is advisable to monitor for such abnormalities.

34. Given a series of patients with evidence of uterine contractions, the student will determine those in labor who should be admitted to the obstetrical unit.
   A. Characteristics of labor
      (1) The first stage of labor is divided into three stages:
         a) Latent phase – the period of time between the onset of labor and a point at which a change in cervical effacement and dilatation is noted. This phase may be several hours in duration.
         b) Active phase – the period of time characterized by maximum cervical dilatation and is more rapid. Some descent of the presenting part also occurs.
         c) Deceleration phase – The short period of time following the active phase that ends with full dilatation.
      (2) The first stage of labor is characterized by uterine contractions overcoming cervical resistance
      (3) The descent of the presenting part occurs primarily during the second stage
   B. Uterine activity in labor
      (1) Contractile coordination with contractions originating in the fundus and ultimately involving the entire myometrium
      (2) Frequency (every 2-5 minutes)
      (3) Intensity (the uterus is indentable only with strong digital pressure – 50-90 mm/Hg with an internal pressure sensor)
      (4) Tonus (baseline tone between contractions – usually less than 20 mm/Hg)
35. Given a patient presenting in labor, the student will determine fetal lie, fetal presentation, cervical effacement, cervical dilation, fetal station, and fetal position.

36. Given a laboring patient, the student will monitor and judge the normalcy of her labor.

A. Assess progress of labor
   (1) Uterine activity – monitor frequency and intensity of contractions by manual or electronic techniques
   (2) Evaluate for progressive cervical dilation
   (3) Evaluate for descent of presenting part
B. Record findings of exams in graphic fashion (Friedman labor graph)
C. Identify abnormal labor patterns
   (1) Prolonged latent phase – no progress from latent to active phase of labor
      a) Nulligravidas >20 hours
      b) Multiparas >14 hours
   (2) Protraction disorders – prolonged active phase of labor
      a) Nulliparas – cervical dilatation >1.2 cm/hr
      b) Multiparas – cervical dilatation <1.5 cm/hr
   (3) Arrest disorders – secondary arrest of dilatation; no further progress in the active phase of labor
      a) No cervical dilatation in >2 hours in the active phase of labor (nulliparas and multiparas)
      b) Nulliparas – rate of descent of fetus is <1 cm/hr
      c) Multiparas – rate of descent is <2 cm/hr
      d) No descent of the presenting part in >1 hour

37. The student will understand the means by which fetal well-being can be determined after the onset of labor.

A. Meconium stained amniotic fluid may alert the physician to possible fetal compromise
B. Fetal/maternal monitoring – recording of fetal heart rate and uterine activity
   (1) External monitoring – acceptable but less precise because shifts in patient position can disturb contact and thus distort or not record actual pattern, may give “false” heart rate variability
      a) Fetal heart rate – ultrasound (Doppler)
      b) Uterine activity – external tocodynamometer
   (2) Internal monitoring – more accurate recordings; requires rupture of the membranes
      a) Electrode attached to the fetal presenting part (scalp, buttock)
      b) Intrauterine pressure catheter
   (3) Pattern interpretation
      a) Normal range of baseline fetal heart rate
         (a. 1) Rate: 120-160 beats/min
         (a. 2) Beat-to-beat variability: 10-15 beats/min
      b) Fetal heart rate patterns most commonly and accurately interpreted in conjunction with simultaneous uterine contraction patterns
   (4) Deceleration patterns
      a) Early deceleration – associated with head compression; normally no treatment necessary. Associated with head compression, vagal stimulation are uniform in shape, begin near the onset of a uterine contraction, and are benign.
b) Late deceleration – associated with uteroplacental insufficiency, are uniform in shape, and are severe when the FHR decreases by >45 beats below baseline. When severe, associated with fetal acidosis and may signal significant fetal distress. Management decisions should be based on the total clinical picture and biochemical evaluation (fetal scalp blood pH) if appropriate.

c) Variable deceleration – associated with umbilical cord compression, are non-uniform in shape, abrupt in onset and cessation, severe if the FHR is <70 beats per minute and of duration 760 seconds. They usually do not reflect fetal acidosis. Interpretation depends on continued observation, evaluation of clinical picture, and fetal scalp blood sampling if indicated. Rule out cord prolapse. Treatment options include
   (c. 1) Alter maternal position – lateral recumbent position
   (c. 2) Administer oxygen to mother
   (c. 3) Administer a bolus of intravenous fluid
   (c. 4) Amnio infusion (introduction of saline through intrauterine pressure catheter)
   (c. 5) If uncorrected and clinical picture warrants, may require expeditious delivery

(5) Drug effects – decreased beat-to-beat variability may be associated with the use of medications such as narcotics, atropine, diazepam, magnesium sulfate, and barbiturates

(6) Complications
   a) Amniotomy may lead to
      (a. 1) Prolapse of the umbilical cord with resultant fetal heart rate abnormalities
      (a. 2) Abnormal heart rate patterns secondary to decreased amniotic fluid
   b) Trauma
      (b. 1) Scalp injuries and infection from the electrode (very low incidence and injury slight)
      (b. 2) Uterine or placental trauma from intrauterine catheter
   c) Infection – incidence of intrauterine infection increases notably if intrauterine catheter is in place >8 hours

(7) Efficacy – clinical studies have shown that continuous electronic fetal monitoring has not lowered perinatal morbidity and mortality rates in low risk pregnancies

C. Fetal scalp blood sampling
   (1) pH 7.25 or higher – normal
   (2) pH 7.20 to 7.24 – borderline
   (3) pH less than 7.20 – abnormal and commonly associated with significant fetal acidemia and possible fetal distress

38. Following a vaginal delivery, the student will demonstrate the ability to describe and manage the third stage of labor.

A. The third stage of labor involves the separation and expulsion of the placenta
   (1) Depends primarily on further uterine activity
   (2) Uterine bleeding after expulsion is limited by occlusion of uterine blood vessels at the placental site through sustained uterine contractions

B. Following delivery of the placenta
   (1) Inspect placenta for intactness
   (2) Inspect umbilical cord and vessels
   (3) Inspect cervix, vagina and vulva for lacerations and possible hematomas
   (4) Monitor uterine tone and maternal vital signs postpartum
Obstetric Analgesia and Anesthesia

39. The student will define anesthesia and analgesia and differentiate between local (regional) and general anesthesia.

A. Anesthesia – general term for all techniques involving the induced loss of feeling or sensation
   (1) General – loss of feeling or sensation accompanied by loss of consciousness
   (2) Regional – loss of pain sensation with maintenance of consciousness

B. Analgesia – decrease in awareness of intensity of pain

C. Conscious sedation – decreased awareness and activity of pain with diminished consciousness

40. The student will list several physiologic changes of pregnancy and understand how they affect obstetric anesthesia.

A. Aortocaval compression (supine hypotensive syndrome)
   (1) Is exacerbated with the use of spinal or epidural block
   (2) Decreases preload which reduces maternal cardiac output, thereby decreasing uterine blood flow
   (3) Causes dilatation of peridural veins which decreases the epidural and subarachnoid spaces, therefore decreasing drug dosage needs

B. Delayed gastric emptying, decreased pH, functional hiatal hernia
   (1) Places the parturient at increased risk of aspiration pneumonia (Mendelson’s syndrome) when upper airway reflexes are distended (e.g., general anesthesia)
   (2) Laboring patients may be allowed some clear fluids/ice chips unless cesarean section likely
   (3) Laboring patients with likelihood of cesarean section should be kept NPO
   (4) Pregnant patients should receive aspiration prophylaxis prior to receiving any anesthetic

C. Increased oxygen consumption and minute ventilation; decreased functional residual capacity
   (1) Produces a compensated respiratory alkalosis
   (2) Increases the likelihood of maternal hypoxia
   (3) Hastens the onset of inhaled anesthetic agents

41. The student will identify four categories of pharmacologic techniques to relieve pain in parturition and will give examples of each.

A. Systemic medications (IV or IM)
   (1) Narcotics
      a) Major disadvantage is maternal and neonatal respiratory depression
      b) Effects are reversible with naloxone (Narcan®)
   (2) Tranquilizers
   (3) Barbiturates

B. Inhalation analgesia – nitrous oxide/oxygen mixture

C. General anesthesia – halothane, enflurane, isoflurane
   (1) Rarely used
   (2) All depress uterine activity

D. Regional anesthesia
   (1) Paracervical block – chloroprocaine is safest. High fetal concentration of local anesthetic may cause fetal bradycardia.
   (2) Pudendal block – nerve block that decreases perineal sensation
   (3) Peridural (epidural or caudal) block – bupivacaine, chloroprocaine and lidocaine safest
   (4) Spinal (saddle) block – bupivacaine or tetracaine
42. The student will understand the pain pathways of labor and list regional anesthetic techniques to block pain.

A. Stage I: T-10, T-11, T-12, L-1
   (1) Paracervical
   (2) Peridural (epidural or caudal)
B. Stage II: S-2, S-3, S-4
   (1) Pudendal
   (2) Spinal (saddle) block
   (3) Peridural (epidural or caudal)
   (3) Local infiltration

43. The student will list the complications of epidural anesthesia and their management.

A. Hypotension – most common
   (1) Intravenous fluid bolus
   (2) Uterine displacement
   (3) Vasopressors (epheedrine), if necessary
   (4) Maternal O2 administration
B. Inadvertent dural puncture (wet tap) – epidural blood patch may be used if patient complains of headache
C. Prolongation of first stage of labor – offering epidural in active phase only may prevent this problem
D. Prolongation of second stage of labor – may result in increased use of forceps or vacuum assisted delivery

Assessment and Immediate Care of the Newborn

44. Given a newborn infant, the student will determine and interpret the Apgar score.

A. Determination

<table>
<thead>
<tr>
<th>Elements</th>
<th>Score</th>
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<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Heart rate</td>
<td>Absent</td>
</tr>
<tr>
<td>Respirations</td>
<td>Absent</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Limp</td>
</tr>
<tr>
<td>Reflex irritability (response to stimulation of sole of foot)</td>
<td>No response</td>
</tr>
<tr>
<td>Color</td>
<td>Blue or pale</td>
</tr>
</tbody>
</table>
B. Interpretation
   (1) Understand that the Apgar score should not be used to determine the need for resuscitation (one should not wait a full minute to begin, if needed)
   (2) Low 5 minute Apgar scores (L6) indicate need for further resuscitative efforts
   (3) Prolonged depressed Apgar (0-3) for 5-10 minutes may be associated with developmental delay

45. The student should know the measures to be taken with all newborns immediately after birth.
   A. Place infant under pre-warmed radiant warmer (or directly on mother’s abdomen)
   B. Dry infant and remove wet blankets
   C. Position infant to open airway – on back with neck slightly extended (sniffing position)
   D. Remove secretions from first mouth, then nares with bulb syringe

46. The student will have a basic understanding of the proper steps for resuscitating a newborn.
   A. The three parameters to monitor in the following order are
      (1) Respiratory effort
      (2) Heart rate
      (3) Color
   B. Respiratory support – if after the steps in Objective 45 an infant is apneic or has gasping respirations
      (1) Briefly stimulate the infant by flicking toes or rubbing back
      (2) If no improvement after approximately 10 seconds of stimulation, begin ventilation with 100% oxygen via bag and mask.
         a) Rate = 40-60 breaths/second
         b) Pressure for first few breaths may need to be higher than normal (30 cm H₂O) to clear pulmonary fluid and open alveoli
      (3) After 30-60 seconds of bag and mask ventilation (with good chest rise), assess heart rate
   C. Chest compressions – If heart rate <60 or 60-80 and not increasing, begin chest compressions and continue ventilation
      (1) Coordinate chest compressions with ventilations – three compressions to one ventilation for 90 compressions and 30 breaths per minute
   D. Medications
      (1) If heart rate = 0, begin mediations immediately, simultaneously with ventilation and chest compressions
      (2) If heart rate <80 after 30 seconds of chest compressions and ventilation, give epinephrine
         a) Action – increases contractility, increases rate, increases peripheral vascular resistance
         b) Route – ETT or IV (umbilical venous catheter)
         c) Dose – 1:10,000 concentration >0.1 ml/kg
         d) Frequency – every five minutes
      (3) Volume expander – LR, N.S., 5% albumen, whole blood
         a) Indication – evidence of acute bleeding, signs of hypovolemia, infant not improving with ventilation and chest compressions
         b) Route – IV, give slowly over 10 minutes
         c) Dose – 10 cc/kg
(5) Narcan  
   a) Action – narcotic antagonist  
   b) Indication – respiratory suppression and history of narcotics given to mother  
   c) Route – ETT, IV or IM  
   d) Caution – can cause seizures in infants of narcotic addicted mothers  

(6) Sodium bicarbonate  
   a) Action – correct metabolic acidosis  
   b) Indication – prolonged resuscitation and adequately ventilated patient  
   c) Route - IV  
   d) Dose – 2 mEq/kg  
   e) Caution – can worsen central acidosis in an inadequately ventilated patient  

E. Call experienced personnel (if not already present) immediately when it is apparent that resuscitation is required  

F. Transfer the infant to a neonatal intensive care unit  

The Puerperium  

47. The student will observe or manage the care of an uncomplicated postpartum patient while in the hospital.  

   A. Daily history of progress  
   B. Physical examination  
      (1) Vital signs – watch for fevers, hypertension, tachycardia, temperature <100°F normal with breast engorgement  
      (2) Breasts – exam for erythema, nipple trauma, engorgement  
      (3) Fundal height in response to involution – should be between umbilicus and halfway above symphysis  
      (4) Perineum and vulva (episiotomy) – observe for erythema, purulence, integrity, and increasing discomfort/pain  
      (5) Amount and character of lochia  
      (6) Lower extremities (thrombophlebitis)  
   C. Laboratory studies – CBC on day 1 or 2 postpartum (as indicated)  
   D. Immunization  
      (1) Rh-D immune globulin – Rhogam®, if indicated (see objective 66)  
      (2) Rubella vaccination, if indicated (see objective 88)  

48. The student will understand the physiology of lactation, will be supportive of breast feeding and will provide helpful information to those patients who breast-feed.  

   A. Physiology  
      (1) Colostrum present at delivery  
      (2) Milk production does not occur until approximately 3 days after delivery – following parturition, rapid fall in estrogens allows mammary glands to respond to lactogenic hormones  
      (3) Colostrum and milk contain a number of anti-infection factors including macrophages, IgA, lactoferrin and lysozymes that help protect infant from infection; especially beneficial in families with strong history of allergy  
   B. Breast-feeding  
      (1) Encourage additional maternal fluid intake  
      (2) Good infant attachment and suckling is essential to the continued production of milk ("demand creates supply")  
      (3) Reassure new mother to be patient with process and with her infant's response. It is a learning process and will take time.  
      (4) Do not nurse for excessive periods of time; 12-15 minutes on a breast every 2-4 hours is sufficient; shorter times prior to engorgement
Certain maternal illnesses (e.g., hepatitis, HIV) and some drugs and medications (e.g., cocaine) can be transmitted by nursing and would be contraindications to breast-feeding.

Nutritional requirements – an additional 500 K calories per day is recommended and should include iron and folate supplements.

Readily refer patients to lactation support services.

49. The student will describe a regimen for lactation suppression or for dealing with engorgement in non-nursing patients.

A. Without medication
   (1) Discuss the limited time breast firmness and discomfort will last (usually 2-3 days)
   (2) Provide adequate support for breasts, e.g., a firm supportive bra
   (3) Avoid stimulation or pumping
   (4) Avoid heat to breasts; run cool water over breasts at end of shower
   (5) Use ice packs
   (6) Prescribe appropriate analgesic medications

B. No approved pharmacologic agent available for lactation suppression

50. The student will list the common and/or potentially dangerous complications of the puerperium and outline a plan of management appropriate to each.

A. Common
   (1) Endometritis (see objective 102)
   (2) Abnormal postpartum bleeding (see objective 100)
   (3) Genitourinary problems
      a) Postpartum inability to void (urinary retention)
         (a. 1) Most common with epidural anesthesia and/or extensive repair
         (a. 2) Treated by using urinary catheter for up to 24 hours
      b) Lower or upper tract infections – appropriate antibiotic therapy
   (4) Thrombophlebitis (superficial) – moist heat, analgesics and rest of affected extremity
   (5) Mastitis (see objective 103)
   (6) Emotional changes
      a) Mild depression ("postpartum blues")
         (a. 1) 50-80% of mothers may experience a transient period of mild depression or mood instability ("postpartum blues"). Symptoms usually begin between 2-4 days postpartum and generally abate by 10 days.
         (a. 2) Generally emotional and familial support is sufficient to help patient
      b) Postpartum depression
         (b. 1) Occurs in approximately 10% of women
         (b. 2) Symptoms may include sleeplessness, loss of self-esteem, irritability, and mood swings and sometimes estrangement from the newborn
      c) Severe postpartum psychoses
         (c. 1) 3-10% of mothers may experience severe postpartum depression
         (c. 2) 20-30% of women with prior affective disorders may suffer postpartum depression
         (c. 3) Once a patient has experienced postpartum depression, there is a 30-50% risk of recurrence with subsequent pregnancies
         (c. 4) Symptoms may include anorexia, obsessive behavior, panic, delusions, and estrangement from the newborn
         (c. 5) Suicide ideation occurs in approximately 1 in 2,000 deliveries
(c. 6) Refer patient for psychiatric management
B. More serious disorders
   (1) Puerperal sepsis (see objective 102)
   (2) Deep venous thrombophlebitis with potential for pulmonary embolus –
   anti-coagulation therapy and hospitalization, when appropriate
   (3) Delayed postpartum hemorrhage (see objective 100)
   (4) Necrotizing fasciitis (perineal) – aggressive antibiotic and surgical management

51. At the time of hospital discharge, the student will list instructions for a postpartum patient.

A. Maintain good nutrition
   (1) If nursing, increase caloric intake appropriately and continue prenatal vitamin,
   calcium and iron supplements
   (2) Take oral iron for limited time if hemoglobin low
B. Limit activity for first two weeks with adequate rest and then gradually increase as
   tolerated. Modify, as appropriate, if cesarean delivery
C. Discuss and instruct in appropriate exercises
D. Initiation of coitus based on patient comfort and surgical condition, particularly if
   patient has episiotomy or cesarean delivery
E. Discuss contraception (see objectives 195 and 196)
F. Discuss analgesia
G. Discuss changes in appearance and amount of lochia
H. Arrange for postpartum office visit exam at six weeks if vaginal delivery or at three
   and six weeks if cesarean delivery
I. Patient to call physician with any questions or problems

52. The student will describe the elements of a 6-week postpartum office visit.

A. Interval history
   (1) General well-being of patient and infant
   (2) Character of lochia/menses
   (3) Breast-feeding
B. Physical examination
   (1) Vital signs
   (2) Breasts
   (3) Abdomen, including incision check if delivery was by cesarean
   (4) Pelvis
      a) Perineum (episiotomy)
      b) Vagina and cervix
      c) Uterine size and consistency
      d) Adnexal structures
      e) Rectal exam, if indicated
C. Laboratory studies
   (1) CBC – if patient anemic after delivery
   (2) Pap smear
   (3) Other studies as indicated
D. Family planning counseling and instruction (see objectives 195 and 196)
Unit IV
ABNORMAL OBSTETRICS

Prenatal Diagnosis

53. The student will list the diagnostic techniques available for the prenatal diagnosis of fetal disorders (genetic, metabolic, or structural) before and after viability and will understand the information that can be determined by each technique.

A. Amniocentesis – usually done at 14-18 weeks after LMP under ultrasound guidance. Counseling regarding procedures, risks, and results is an integral part of the procedure
   (1) Aneuploidies (see objective 107) – amniotic fluid cultured and a karyotype obtained, e.g., Down syndrome, Trisomy 13 and Trisomy 18
   (2) Sex-linked disorders – amniotic fluid cultured and a karyotype obtained
      a) If the biochemical defect can be identified in utero and if the fetus is male, the cells are analyzed for the specific defect (e.g., Fabry's disease, Hunter's disease, Lesch-Nyhan syndrome, hemophilia)
      b) If the biochemical defect cannot be identified in utero and if the fetus is male, there is a 50% chance that he will be affected (e.g., X-linked mental retardation, X-linked hydrocephaly)
   (3) Inborn errors of metabolism
      a) A substantial number can be diagnosed in utero
      b) A biochemical evaluation is performed either directly on the fluid, on cells from the amniotic fluid, or on cell cultures from the amniotic fluid cells
      c) Specific tests available only in a limited number of centers
      d) Examples
         (d. 1) Tay-Sachs disease
         (d. 2) Pompei disease
         (d. 3) Mucopolysaccharidosis
   (4) Open neural tube defects (NTD) – spina bifida, anencephaly
      a) Associated with elevated levels of maternal serum and amniotic fluid alpha-fetoprotein
      b) Presence of spectrophotometric-specific acetylcholinesterase in amniotic fluid establishes chemical evidence of defect
      c) Diagnosis confirmed by ultrasound
   (5) Ventral (abdominal) wall defects (VWD) – gastroschisis, omphalocele
      a) Associated with elevated levels of maternal serum and amniotic fluid alpha-fetoprotein
      b) Presence of spectrophotometric-specific acetylcholinesterase in amniotic fluid establishes chemical evidence of defect
      c) Diagnosis confirmed by ultrasound
   (6) Isoimmunization – spectrophotometric analysis of amniotic fluid allows for determination of severity of the disease (see objective 67)

B. Chorionic villus sampling (CVS) – optimally done at 9-12 weeks after LMP. Utilized for diagnosis of genetic problems. Counseling regarding procedure, risks, and results is an integral part of the process. Technique involves transcervical or transabdominal approach to chorion frondosum. Ultrasound guidance is essential to procedure
   (1) Diagnosis made earlier in gestation than with amniocentesis
   (2) Essentially same diagnostic capability as amniocentesis regarding genetic problems
   (3) Not applicable to diagnosis of neural tube or ventral wall defects or other problems detected by maternal serum screening or ultrasound
(4) Fetal loss risk variable, dependent on expertise and experience of the operator. Generally higher than amniocentesis. There is a question at this time of limb deformities being associated with this procedure.

(5) Maternal morbidity small but higher than with amniocentesis.

C. DNA analysis – evaluation done on blood or cell culture material
   (1) Requires examination of family members to determine inheritance pattern
      a) X-linked recessive
      b) Autosomal recessive
      c) Autosomal dominant
   (2) Establishes evidence of condition by utilizing DNA probes or markers
      a) Direct probes
         (a. 1) Deletion process can detect Duchenne's muscular dystrophy (70%), Alpha Thalassemia
         (a. 2) Substitution site process can detect sickle cell anemia
      b) Indirect evidence of linkage can detect
         (b. 1) Huntington's chorea
         (b. 2) Duchenne's muscular dystrophy (30%)
   (3) Currently only performed in a few select laboratory centers

D. Screens for carrier status
   (1) Test parents for carrier state. If both parents are carriers, proceed to test the fetus.
   (2) Examples include
      a) Tay-Sachs disease
      b) Thalassemia
      c) Sickle cell disease
      d) Cystic fibrosis

E. Ultrasound
   (1) Can primarily detect fetal abnormalities with history of increased risk or in association with work-up of abnormal signs or symptoms during gestational period
   (2) Essential to the diagnosis of
      a) Neural tube and ventral wall defects
      b) Central nervous system (CNS) abnormalities
      c) Abnormalities associated with oligohydramnios, e.g., renal agenesis, renal dysplasias
      d) Abnormalities associated with polyhydramnios, e.g., tracheo-esophageal fistulas, anencephaly
      e) Polycystic kidneys or posterior urethral valve obstruction
      f) Cystic hygroma
      g) Fetal hydrops
      h) Cardiac abnormalities
   (3) Is an essential component of amniocentesis, CVS, and percutaneous umbilical blood sampling (PUBS) procedures

F. Maternal serum screening for AFP, beta hCG and/or estriol (double or triple screen) – optimally done at 15-18 weeks gestation. Calculations require established local laboratory standards for gestational age and appropriate adjustments for weight, race, and diabetes mellitus, if present.
   (1) Elevated levels of AFP
      a) Detects 85-95% of neural tube or ventral wall defects
      b) In the United States 1-2/1,000 live born infants have a neural tube defect
   (2) Low levels of AFP
      a) Detects 40% of Down syndrome and other trisomies
      b) Interpretation requires calculating risk for maternal age
      c) Double or triple screening may increase accuracy
(3) Useful in detecting
   a) Multiple pregnancies
   b) Impending or recent fetal demise
   c) Errors in gestational dating

(4) If MSAFP level elevated and amniotic fluid alpha-fetoprotein (AFAFP) level is normal, there is an increased risk for perinatal morbidity/mortality secondary to premature labor, premature rupture of membranes, preeclampsia, and intrauterine growth retardation

G. Percutaneous umbilical blood sampling (PUBS) (cordocentesis) – direct sampling of fetal blood in utero via needle aspiration of blood from the umbilical vein under ultrasound guidance
   (1) Must establish evidence of fetal vs. maternal blood in specimen
   (2) Applications
      a) Rapid fetal karyotyping
      b) Fetal hemoglobin and hematocrit determinations
      c) Determination of fetal platelet disorders, e.g., immune thrombocytopenia (ITP)
      d) Detection of fetal infections in utero

H. Psychosocial issues – there may be serious medical, psychological and ethical implications to be faced subsequent to having prenatal diagnosis. Multiple gestation exacerbates the situation.
   (1) Emotional response
      a) Prior to diagnostic procedure
         (a. 1) Fear of procedure
         (a. 2) Fear of pregnancy loss
         (a. 3) Fear of test results
      b) After diagnostic procedure
         (b. 1) The time between the procedure and knowledge of the test results can be very unsettling for the patient/couple
         (b. 2) Patients may exhibit a wide range of emotions, dependent upon test result information
            (b.2.1) Relief
            (b.2.2) Frustration
            (b.2.3) Anger
            (b.2.4) Blame
            (b.2.5) Guilt
            (b.2.6) Grief
            (b.2.7) Depression
            (b.2.8) Ambivalence
            (b.2.9) Conflict
         (b. 3) Patients and their partners who are found to be "carriers" for certain conditions also may feel a great deal of conflict over the need to inform relatives that they may also be at risk vs protecting the patient's/couple's privacy
   (2) Counseling should be an integral component of prenatal diagnostic services
      a) Counseling should be given in a non-directive manner, providing information to the patient/couple so that they may make their own personal decisions
      b) Psychological support needs to continue regardless of the patient's decision to continue or terminate the pregnancy (see objective 203)
      c) Follow-up counseling is recommended for patient education and emotional support either after a pregnancy termination or the birth of an affected baby

I. Human Genome Project will increased applicability of prenatal diagnosis, but has raised numerous ethical issues.
Adolescent Pregnancy

54. The student will list some of the predisposing factors for adolescent pregnancy, discuss some obstetric problems for which the adolescent pregnant patient is at increased risk, and describe interventions that may be particularly helpful to pregnant adolescents.

A. Predisposing factors
   (1) Peer pressure combined with a lack of internal controls
      a) Vulnerable period of life, with great need to be accepted and loved
      b) Physical maturity but lagging emotional maturity
   (2) Poverty/disrupted family structure
      a) Parents as role models and educators may be absent
      b) Pregnancy seen as possible escape mechanism from abusive environment
   (3) Inadequate education/absent long term goals
      a) Poor understanding of one’s own sexual development
      b) Poor understanding of risks to the child
      c) Pregnancy may seem to fill a void when there are no real future goals to work toward
   (4) Glamorization of sexual promiscuity in the media may influence behaviors

B. Potential adverse consequences
   (1) Maternal
      a) A greater likelihood of not completing her education, and therefore a greater chance of remaining in poverty
      b) Risks entailed in pregnancy, particularly if she requires tocolytic therapy for premature labor, induction and/or operative delivery for hypertensive disorders, intrauterine growth retardation (IUGR), etc.
      c) Risks entailed if she chooses induced abortion
   (2) Neonatal
      a) Increased risk of psychomotor retardation and other consequences (visual, pulmonary) of premature delivery and/or intrauterine growth retardation
      b) Increased risk of sudden infant death syndrome (SIDS)
      c) Increased likelihood of being raised in an inadequate environment

C. Possible interventions to minimize the chances of adverse outcomes
   (1) Comprehensive programs stressing early intervention, medical and psychosocial support, and education of the adolescent, her partner and family
      a) Professional resources
         (a. 1) Obstetrician/gynecologist, family practitioner and/or pediatrician
         (a. 2) Social worker/counselors
         (a. 3) Health educator
      b) Federal or state-funded resources such as nutritional services
      c) High school equivalency program
      d) Accessible and affordable day care centers
   (2) Benefits of comprehensive care
      a) Decreased incidence of pregnancy-related problems
      b) Greater success in completing education
      c) Fewer repeat teenage pregnancies
   (3) Early recognition and prevention of specific problems
      a) Patient education regarding signs and symptoms of preterm labor, as well as education about smoking, drugs, and sexually transmitted diseases
      b) Frequent telephone contact, as needed, to answer questions and to follow up for missed appointments
      c) Education regarding risk factors for intrauterine growth retardation (IUGR) and careful obstetric surveillance for this problem (see objective 97)
D. Other considerations
   (1) The problems frequently associated with teenage pregnancy are often more
       related to the socioeconomic status of the mother rather than to her age or
       medical condition. A comprehensive treatment program can not only reduce the
       risks involved in the current pregnancy, but help reduce the incidence of
       repeated pregnancies during the teenage years.
   (2) Teenage coitus entails other risks in addition to pregnancy – e.g., sexually
       transmitted diseases, including AIDS.
   (3) A teenage pregnancy does not guarantee a poor outcome any more than a
       pregnancy in a well educated, married, wealthy woman guarantees a good
       outcome. With a comprehensive program of prenatal and postnatal care, the
       outcome of a teenage pregnancy is often good.

First and Second Trimester Bleeding

55. Given a patient with vaginal bleeding in the first trimester of pregnancy, the student
will develop a differential diagnosis and an appropriate plan of management.

A. Abortion – termination of pregnancy before fetal viability
   (1) Spontaneous
      a) Spontaneous implies that no attempt has been made by the patient, a
         physician, or anyone else to cause termination of the pregnancy.
      b) An abortion occurs spontaneously in at least 10-15% of pregnancies.
         This figure is much higher if one includes pregnancies that end before the
         woman realizes that she has missed a period.
      c) Etiology
         (c. 1) Fetal genetic abnormality – most common cause is chromosomal
              abnormality.
         (c. 2) Systemic maternal disorder (chronic disease)
         (c. 3) Infection
         (c. 4) Uterine anomaly
         (c. 5) Cervical incompetence
         (c. 6) Endocrinopathy
         (c. 7) Trauma
         (c. 8) Immunologic abnormality
         (c. 9) Nutritional deficiency
      d) Types
         (d. 1) Threatened abortion
            (d.1.1) Vaginal bleeding with or without pain
            (d.1.2) Cervix not dilated
            (d.1.3) Management
               (d.1.3.1) Ultrasound to confirm fetal viability
               (d.1.3.2) Expectant management
            (d.1.4) About 50% progress to spontaneous abortion
         (d. 2) Inevitable abortion
            (d.2.1) Cervix dilated
            (d.2.2) Membranes rupture
            (d.2.3) Fetal death confirmed by ultrasound
            (d.2.4) Management – suction curettage
         (d. 3) Incomplete abortion
            (d.3.1) Incomplete passage of products of conception
            (d.3.2) Placental tissue visible
            (d.3.3) Heavy vaginal bleeding
(d.3.4) Management
(d.3.4.1) Start intravenous infusion
(d.3.4.2) Complete the abortion by suction curettage
(d.3.5) Complications of untreated incomplete abortion
(d.3.5.1) Infection, possibly leading to sepsis
(d.3.5.2) Hemorrhage, possibly leading to shock

(d. 4) Complete abortion
(d.4.1) Passage of entire products of conception
(d.4.2) Usually does not require suction curettage
(d.4.3) Management – follow with ultrasound or B-hCG levels

(d. 5) Missed abortion
(d.5.1) Retention of the products of conception for two months or more after death of the fetus (classic definition)
(d.5.2) Usually uterus small for dates
(d.5.3) Often terminates spontaneously
(d.5.4) Management options
(d.5.4.1) Suction curettage
(d.5.4.2) Prostaglandin suppositories
(d.5.4.3) Dilation and evacuation (D&E) for second trimester loss

e) Psychosocial issues
(e. 1) Spontaneous abortion is usually a great loss for patients but may not be appreciated as such by family or health care providers
(e. 2) Feelings that women report
(e.2.1) Helplessness/powerlessness
(e.2.2) Grief
(e.2.3) Guilt
(e.2.4) Uncertainty
(e.2.5) Anger
(e.2.6) Disbelief
(e.2.7) Frustration
(e.2.8) Blame
(e.2.9) Disappointment
(e.2.10) Betrayal by body
(e. 3) Important aspects of care from the health provider
(e.3.1) Explain clearly what is happening to patient including possible treatment options
(e.3.2) Be sympathetic – saying you're sorry this is happening is always helpful
(e.3.3) Explain and acknowledge that this is a significant loss and that it might be helpful for patient to take on the role of a grieving person
(e.3.4) Acknowledge that other family members may feel loss as well – the father of the baby may be experiencing the loss differently in that his primary concern may be for the significant other or he may feel the need to be "strong" for her and not show his feelings of loss
(e.3.5) Facilitate emotional expression
(e.3.6) Look for unresolved or abnormal grief reactions
(e.3.6.1) Continued vivid memories
(e.3.6.2) Frequent flashbacks
(e.3.6.3) Overwhelming emotion at the time of crisis or on anniversary of spontaneous abortion
(e.3.7) Encourage patient to delay pregnancy for physical and psychologic reasons until recovered from bereavement – may be up to 6-12 months, dependent on individual patient situations

(2) Induced – implies medical or surgical intervention (see objective 204)
   a) Medically indicated
   b) Voluntary or elective
   c) Illegal

(3) General considerations
   a) Blood type and antibody screen (see objective 66)
   b) Rh immune globulin, if indicated (see objectives 66 and 67)

(4) Appropriate follow-up and counseling of all patients

B. Bleeding may be associated with an otherwise normal pregnancy and may be due to
   (1) Implantation (placental sign)
   (2) Cervical lesions – benign or malignant
   (3) Laceration
   (4) Extranatal sources (urinary or gastrointestinal)

C. Hydatidiform mole (see objective 145)

D. Vanishing twin

E. Ectopic pregnancy
   (1) Results from implantation of the blastocyst in tissue other than the endometrium
   (2) Most common type of ectopic pregnancy is tubal
   (3) To be considered in any patient of reproductive age with pain and bleeding
   (4) Incidence of tubal pregnancy is higher with history of
      a) Previous pelvic infection, particularly gonorrheal or chlamydial
      b) Endometriosis
      c) Previous tubal surgery
      d) Previous ectopic pregnancy
      e) Intrauterine device (IUD) use
      f) In utero diethylstilbestrol (DES) exposure
   (5) Causes of a tubal pregnancy include all tubal factors that retard transport of ovum; however, etiology cannot always be determined
   (6) Symptoms and signs of ectopic pregnancy may include
      a) Pelvic pain
      b) Menstrual irregularity (vaginal bleeding during pregnancy)
      c) Uterine changes including enlargement and softening
      d) Tender adnexal mass
   (7) Diagnosis of ectopic pregnancy
      a) Confirmation of pregnancy
         (a. 1) B-hCG positive
         (a. 2) Serial quantitative B-hCG – may see an abnormal rise in B-hCG level
         (b) Hemoperitoneum (rupture of tube) may be confirmed by culdocentesis and is often accompanied by tachycardia, a drop in hematocrit, or hemorrhagic shock
      c) Ultrasound
      d) Diagnostic laparoscopy
   (8) Management
      a) Start intravenous infusion; blood loss is often disproportionate to the amount of external bleeding
      b) Type and crossmatch; Rh immune globulin, if indicated
      c) Surgical – laparotomy or laparoscopy
         (c. 1) Conservation of the affected tube should be considered
         (c. 2) Salpingectomy where indicated
      d) Medical – methotrexate has been used for unruptured ectopic tubal pregnancies
56. The student will describe the role of ultrasound in the diagnosis of first and second trimester bleeding.

A. A gestational sac is detectable early in pregnancy
   (1) After 5-6 weeks with transabdominal scan
   (2) After 3-4 weeks with transvaginal scan
B. A gestational sac may be distorted when the pregnancy is not viable
C. A "true" gestational sac is absent in cases of tubal pregnancy. An adnexal mass and/or "fluid" in the cul-de-sac may be identified.
D. Correlation of ultrasound findings and B-hCG levels may aid in the diagnosis of unruptured ectopic pregnancy

Intrauterine Fetal Demise (IUFD)

57. Given a patient whose fetus has died in utero, the student will make a diagnosis, write out an appropriate plan of management, and list the potential complications.

A. History
   (1) Reduction in or loss of the signs and symptoms of pregnancy
   (2) Absence of fetal movement after it had been appreciated previously
   (3) Absence of expected weight gain
B. Physical signs
   (1) Absence of fetal heart tones when they had been heard previously
   (2) Absence of uterine growth and later a decrease in uterine size
C. Ultrasound – failure to observe cardiac motion using real-time ultrasound
D. Complications – consumptive coagulopathy (rare)
   (1) Generally when fetal death has occurred after the 20th week of gestation
   (2) Risk increases with length of time the fetus is retained in utero
E. Management
   (1) The diagnosis must be confirmed by ultrasound
   (2) Parent participation in labor and delivery planning helps to establish the reality of the baby's death, allows parents some control of an otherwise uncontrollable situation, and facilitates grieving
   (3) Options
      (a) Expectant management
         (a. 1) Majority of women with IUFD will deliver within two weeks of fetal death
         (a. 2) Immediate termination of the pregnancy may increase risk to patient
         (a. 3) Patients, however, may have strong emotional or psychologic need to rid themselves of the dead fetus. Although patients desire for termination may be legitimate, it must be carefully weighed against her medical situation.
         (a. 4) If expectant management is undertaken, coagulation profile needs to be monitored weekly
      (b) Dilation and evacuation (D&E) may be used prior to 20 weeks
      (c) Prostaglandin E2 vaginal suppositories to induce labor
      (d) Oxytocin induction
      (e) Laminaria – may be used in conjunction with D&E, prostaglandin suppositories, or oxytocin induction
   (4) Referral to support group or mental health professional as appropriate
   (5) Encourage patient to delay pregnancy for physical and psychologic reasons until recovered from bereavement – may be up to 6-12 months, dependent on individual patient situations
(6) Studies for etiology of fetal demise and counseling regarding future pregnancies
   a) Screen patient for undiagnosed diabetes mellitus or other potential causes of fetal demise
   b) Fetal karyotype when appropriate
   c) Consider fetal autopsy if cause of death not apparent at delivery

F. Psychosocial issues
(1) Emotional response
   (a) Patient may feel depressed, anxious, guilty
   (b) Patients may need time in which to grieve
   (c) Patients may wish to consider
      (c. 1) Naming the baby
      (c. 2) Viewing and holding the baby
      (c. 3) Keeping remembrances of the baby (e.g., photographs, footprints, hospital bracelet, articles of clothing)
      (c. 4) Having the baby baptized
      (c. 5) Having a funeral/memorial service
   (d) Physicians should be aware of the difference between normal and pathologic grief syndrome and refer patient to mental health professionals as appropriate
      (d. 1) Normal grief response may include
         (d.1.1) Somatic distress
         (d.1.2) Flashbacks
         (d.1.3) Guilt
         (d.1.4) Hostility and anger directed at others
         (d.1.5) Breakdown in normal pattern of everyday living
      (d. 2) Symptoms of pathologic grief may include
         (d.2.1) Delayed or postponed grief
         (d.2.2) Hyperactivity without sense of loss
         (d.2.3) Changes in relationships
         (d.2.4) Furious hostility toward specific individuals
         (d.2.6) Lasting patterns of social isolation
         (d.2.7) Initial diagnosis or exacerbation of psychosomatic disease
         (d.2.8) Agitated depression
         (d.2.9) Damaging behaviors to personal, social and economic existence
   (e) Marital/consort relationship may be affected

Third Trimester Bleeding

58. Given a patient with third trimester bleeding, the student will list the various causes, outline the appropriate diagnostic and therapeutic approaches and list the potential complications of placenta previa and abruptio placentae.

A. Placenta previa – abnormal implantation of the placenta which covers all or part of the internal cervical os and is typically associated with painless bleeding in the third trimester
   (1) Classifications
      a) Total placenta previa – internal cervical os completely covered
      b) Partial placenta previa – internal cervical os partially covered
      c) Low-lying placenta – placenta barely touches internal os
   (2) Risk factors
      a) Age
      b) Parity
      c) Previous uterine incision
      d) History of placenta previa
(3) Diagnosis
   a) Ultrasound
      b) In certain cases cautiously inspect vagina and cervix to rule out other causes of bleeding. No digital rectal or vaginal examinations should be attempted unless in operating room with "double setup" (surgical suite is fully equipped and staffed for immediate cesarean delivery).

(4) Potential complications
   a) May threaten mother’s life because of severe bleeding
   b) May be associated with placenta accreta in 5%; this association increases with previous cesarean section

(5) Management
   a) Start intravenous infusion
   b) Type and crossmatch blood
   c) Support and transfuse as necessary
   d) With fetus of any size, persistent or massive hemorrhage precludes expectant treatment
   e) With few exceptions definitive treatment for total and partial placenta previa is cesarean delivery
   f) Expectant management in the face of fetal immaturity and a stable maternal condition may require hospitalization

B. Abruptio placentae – premature separation of the normally implanted placenta

(1) Risk factors
   a) Multiparity
   b) Maternal hypertension
   c) Advanced maternal age
   d) Cocaine use
   e) Smoking
   f) Previous abruptio placentae
   g) Trauma

(2) Diagnosis
   a) Hypertonic, painful uterine contractions with vaginal bleeding (classic definition)
   b) Pain may be, but rarely is, absent
   c) Bleeding may be concealed (20%)
   d) Placenta previa must be ruled out by ultrasound
   e) Ultrasound exam does not rule out abruption

(3) Complications
   a) Premature labor
   b) Fetal death
   c) Maternal shock
   d) Consumptive coagulopathy
   e) Maternal renal failure

(4) Management
   a) Most patients with abruptio placentae require prompt delivery
   b) Fluid replacement is usually required and may include blood products
   c) Delivery of fetus and placenta is primary treatment when coagulopathy occurs

(5) Prognosis
   a) Fetal prognosis depends on fetal age and the extent of the placental abruption
   b) Maternal prognosis depends on the severity of the abruption and the promptness of appropriate management

C. Other causes of third trimester bleeding

(1) Bloody show
(2) Bleeding from cervix – postcoital spotting, neoplasia
(3) Trauma
(4) Infection
(5) Hematuria secondary to urinary tract disorders
(6) Hemorrhoids
(7) Vulvar varicosities

**Dystocia**

59. **Given a patient experiencing a difficult labor, the student will be able to recognize the principal cause and write an appropriate plan of management.**

A. Definition – difficult labor (abnormally slow progress of labor)
B. Etiology – may be associated with the following factor(s)
   1. The "POWERS" – abnormalities of uterine contractions (uterine dysfunction)
      a) Increased incidence with early conduction anesthesia
      b) Suboptimal contractions (hypotonic dysfunction)
         b. 1) Weak or infrequent contractions
         b. 2) Usually responds to IV oxytocin
      c) Abnormal contractions, hypertonic, or incoordinate uterine function – may respond to resting the patient with morphine sulfate
      d) Inadequate voluntary effort during the second stage
   2. The "PASSENGER" – abnormalities of size and presentation of the fetus
      a) Presenting part too large to pass through pelvis – ultrasound may be useful in determining fetal weight
      b) Malpresentation
         b. 1) Breech (see objective 60)
         b. 2) Transverse lie – if patient is in labor, must be delivered by cesarean section
         b. 3) Face and brow
      c) Malposition – occiput transverse or posterior
      d) Fetal anomalies
   3. The "PASSAGE" – abnormalities of size and architecture of the pelvis
      a) Contraction of pelvis may prevent vaginal delivery of normal-sized infant
         a. 1) Contracted inlet
            a.1.1) AP inlet <10 cm
            a.1.2) Greatest diameter <12 cm
         a. 2) Contracted mid-pelvis – interspinous diameter <9.5 cm (definition varies)
         a. 3) Contracted outlet – less common
      b) Xray pelvimetry is seldom used
      c) Unusual pelvic configuration without absolute contraction may necessitate cesarean section
      d) Obstructing soft tissue mass, e.g. fibroids – unusual
C. Management
   1. Progress in labor must be carefully monitored with respect to uterine contractions, cervical dilation, and descent of presenting part
      a) Fetal status must be continuously assessed
      b) Continuous uterine activities should be monitored
         b. 1) Toco-dynamometer – useful in determining frequency and duration of contractions
         b. 2) Intrauterine pressure measurement
            b.2.1) Demonstrates resting tone, frequency, duration and intensity
            b.2.2) Membranes must be ruptured and presenting part within the pelvis
      c) Proper management is more likely if cervical dilation and descent of presenting part are plotted (Friedman curve)
      d) Uterine dysfunction (hypotonic contractions) may be corrected through oxytocin augmentation
(2) Contraindications to IV oxytocin use
   a) Fetal
      (a. 1) Distress
      (a. 2) Abnormal lie/presentation
      (a. 3) Multigestation (relative contraindication)
      (a. 4) Suspected fetopelvic disproportion
   b) Maternal
      (b. 1) Normal uterine activity
      (b. 2) Contracted pelvis
      (b. 3) Obstructing tumors
      (b. 4) Increased risk of uterine rupture
         (b.4.1) High parity
         (b.4.2) Overdistention
         (b.4.3) Prior uterine surgery
            (b.4.3.1) Transmural myomectomy
            (b.4.3.2) Metroplasty
            (b.4.3.3) Properly administered and monitored oxytocin stimulation may be used in selected patients with a previous cesarean section not involving the uterine active segment (classical cesarean section)
      (b.4.4) Prolonged labor

Breech Presentation

60. The student will define the types of breech presentation, list the more likely complications, list the indications for cesarean delivery, and define the three methods of vaginal delivery.

A. Incidence
   (1) 3-4% of term pregnancies
   (2) Higher incidence with preterm labor
B. Classifications
   (1) Frank breech – lower extremities are flexed at the hips and extended at the knees (most common presentation)
   (2) Complete breech – lower extremities are flexed at the hips and one or both are flexed at the knees
   (3) Incomplete breech
      a) Single footling – one extremity is extended at the hip and lies below the breech
      b) Double footling – both extremities are extended at the hip and lie below the breech
C. Complications and frequently observed associated conditions
   (1) Increased perinatal morbidity and mortality
   (2) Increased incidence of prolapsed cord – most likely to occur with incomplete breech presentations
   (3) Placenta previa
   (4) Prematurity
   (5) Fetal anomalies
   (6) Uterine anomalies
D. External cephalic version
   (1) Technique to convert a mature fetus from a breech to cephalic presentation by transabdominal manipulation to facilitate vaginal delivery
   (2) Contraindications
      a) Placenta previa
      b) Premature rupture of membranes
c) Uterine activity
d) Contracted pelvis
(3) May be carried out with or without use of tocolytic drugs
(4) Should be done with ultrasound guidance and fetal heart rate monitoring

E. Vaginal delivery
(1) General indications
   a) Since largest and less compressible part of the fetus (head) passes through
      the pelvis last, at which time it is too late to consider cesarean section, the
      route of safe delivery must be decided upon early
   b) Due to umbilical cord compression, once the fetus has delivered to the
      umbilicus, it should be delivered within 4-8 minutes

(2) Methods
   a) Spontaneous breech – infant delivered spontaneously without any traction or
      manipulation
   b) Partial breech extraction – infant delivers spontaneously as far as the
      umbilicus. Chest and after-coming head are extracted by the obstetrician.
   c) Total breech extraction – the entire fetus is delivered by the obstetrician

F. Cesarean delivery
(1) Cesarean section (C/S) is preferred if the adequacy of the pelvis has never been
    proven (the primigravid breech)
(2) Indications
   a) A contracted pelvis
   b) Uterine dysfunction
   c) A large fetus
   d) A premature fetus
   e) A hyperextended head, as detected by ultrasound or xray
   f) History of a previous difficult delivery

Cesarean Delivery and Vaginal Birth After Cesarean (VBAC)

61. The student will be able to describe the relative risks of cesarean delivery and of
    vaginal delivery after cesarean and will understand the difference between a
    "classical" uterine incision and a "low cervical incision of the uterus" (transverse
    and vertical) and the implications of each.

A. Cesarean delivery
(1) Classical – incision is vertical and midline extending from the lower uterine
    segment to the uterine fundus
   a) Most commonly done to avoid trauma to the very premature fetus, for
      abnormal fetal lie with an undeveloped lower uterine segment, or if a
      significant fetal abnormality is present
   b) Associated with increased risk of uterine rupture with a subsequent
      pregnancy
   c) Rupture may result in severe hemorrhage, expulsion of fetus into the
      maternal abdomen with possible fetal death, significant maternal morbidity,
      and possible maternal death
   d) Constitutes an absolute contraindication to VBAC
(2) Low cervical – incision is in the lower uterine segment, entirely below the
    vesicouterine fold of peritoneum
   a) Transverse – low incidence of scar disruption (<1%)
      (a. 1) Dehiscence
      (a.1.1) Due to diminished blood supply to the uterine scar
      (a.1.2) Associated with little bleeding
Fetus remains in the uterus
May be occult and occur before labor (observed at cesarean section)
Rupture – associated with greater likelihood of significant bleeding and may be catastrophic
b) Vertical
   (b. 1) Incision frequently extends into uterine corpus and when it does, it is associated with the same risks as a classical incision
   (b. 2) The majority opinion is that this constitutes a contraindication to VBAC
B. VBAC
   (1) Advantages
      a) Can be safely accomplished in 60-70% of cases where the indication for the original cesarean delivery was obstetric and nonrecurrent
      b) Reduces morbidity and mortality associated with C/S
      c) Decreases the cost of obstetric care
      d) Allows normal participation in labor for the patient
      e) Shorter and easier postpartum course
   (2) Risks – possibility of uterine rupture with associated fetal and maternal morbidity/mortality
   (3) Prerequisites
      a) Antepartum
         (a. 1) Adequate maternal pelvis
         (a. 2) Cephalic presentation
         (a. 3) Documentation of previous low cervical transverse cesarean section(s) with no history of previous classical C/S
         (a. 4) Fetal weight estimated <4000 gms
         (a. 5) Signed informed consent including the acknowledgment of the possible need for repeat cesarean delivery
      b) Intrapartum
         (b. 1) Type and hold blood
         (b. 2) Have venous access in place during active labor
         (b. 3) Monitor progress in labor – oxytocin augmentation/induction is acceptable
         (b. 4) Have capability to perform cesarean section within 30 minutes. A physician capable of evaluating labor and performing cesarean delivery should be readily available.
         (b. 5) Conduction anesthesia is not contraindicated
   (4) Labor arrest or other complications that preclude continuing labor are indications for repeat cesarean delivery (see objective 59)
   (5) Cervical “ripening” with prostaglandin medications increases the risk of uterine rupture

Hypertensive Disorders of Pregnancy

62. The student will define preeclampsia (pregnancy-induced hypertension), eclampsia, chronic hypertension, and chronic hypertension with superimposed preeclampsia (pregnancy aggravated hypertension).

A. Preeclampsia is a syndrome of hypertension, with or without proteinuria or edema, occurring in pregnancy after the 20th week of gestation
   (1) In obstetrics, the definition of hypertension in all situations is generally agreed to be
      a) Systolic pressure of at least 140 mm Hg or a rise of at least 30 mm Hg systolic
      b) Diastolic pressure at least 90 mm Hg or a rise of at least 15 mm Hg diastolic
The blood pressures as listed above must be elevated on at least two separate occasions at least 6 hours apart.

(2) Proteinuria is defined as:
   a) Concentration of ≥0.1 grams per dL in two random clean-catch specimens collected at least 6 hours apart or
   b) Greater than 0.3 grams in a clean-catch, complete 24-hour collection specimen

(3) There is no uniform definition of edema as it relates to preeclampsia but it is generally considered significant when it involves the hands and face. Dependent edema of the lower extremities appears to be universal in pregnancy.

(4) Preeclampsia is considered severe if any one of the following occurs:
   a) Blood pressure of ≥160 mm Hg systolic or ≥110 mm Hg diastolic
   b) Proteinuria of ≥5 g in 24 hours (3+ to 4+ on qualitative examination)
   c) Oliguria (≤400 ml in 24 hours)
   d) Thrombocytopenia
   e) Cerebral or visual disturbances
   f) Epigastric pain
   g) Pulmonary edema or cyanosis
   h) Evidence of HELLP syndrome
      (h. 1) Hemolysis
      (h. 2) Elevated liver enzymes
      (h. 3) Low platelet count

B. Eclampsia
   (1) A convulsive disorder not due to a coincidental neurologic disease in a woman who meets the criteria for preeclampsia
   (2) Convulsions may begin antepartum, intrapartum, or postpartum – usually within 24 hours of delivery

C. Chronic hypertension
   (1) Hypertension, as defined above, recorded before pregnancy or
   (2) Hypertension diagnosed before the 20th week of pregnancy in the absence of hydatidiform changes of the chorionic villi or
   (3) Hypertension persisting beyond 6 weeks postpartum

D. Chronic hypertension with superimposed preeclampsia – the development of preeclampsia (a rise of 30 mm Hg systolic or 15 mm Hg diastolic and the development of proteinuria or generalized edema) in a woman with chronic hypertension

63. The student will describe the pathophysiology of preeclampsia.

A. Etiology unknown – in general, pathophysiologic observations include
   (1) Vasospasm which, if extreme, leads to hemorrhage and necrosis
   (2) Increased vascular reactivity to pressor hormones such as angiotensin II

B. Uteroplacental alterations – decreased uteroplacental blood flow

C. Hematologic alterations
   (1) A smaller increase in plasma volume than is noted with normal pregnancies
   (2) Thrombocytopenia or disseminated intravascular coagulation may occur

D. Renal alterations
   (1) Decreased renal plasma flow (RPF)
   (2) Decreased glomerular filtration rate (GFR)
   (3) Elevated blood uric acid
   (4) Renal cortical necrosis can develop in severe cases
Given a gravid patient at 20 or more weeks of gestation, the student will diagnose preeclampsia and outline a plan of management.

A. Risk factors
   (1) Nulliparity
   (2) Prior history or family history of preeclampsia or eclampsia
   (3) Underlying vascular disease, e.g., diabetes, hypertension, renal disease
   (4) Multiple gestation
   (5) Molar pregnancy
   (6) Fetal hydrops
   (7) Different fetal paternity in a multiparous patient
   (8) Race or socioeconomic status – The increased incidence in African Americans probably reflects the increased incidence of underlying essential hypertension. Eclampsia, resulting from inadequately treated preeclampsia, may be related to low socioeconomic status, but the incidence of preeclampsia alone has not been proven to be related to socioeconomic status.

B. Clinical features
   (1) Hypertension (see objective 62)
   (2) Proteinuria (see objective 62)
   (3) Edema (see objective 62)
   (4) Hyperreflexia
   (5) Headache
   (6) Visual disturbances
      a) Blurring/scotomata
      b) Blindness – may be due to retinal detachment
      c) Presence of retinal hemorrhages and exudates suggests chronic hypertension
   (7) Epigastric or right upper quadrant pain – related to liver capsular distention secondary to edema/hemorrhage

C. Differential diagnosis
   (1) Chronic hypertension depends largely on knowledge of blood pressure prior to pregnancy
   (2) Acute glomerulonephritis
   (3) Systemic lupus erythematosus
   (4) Thrombotic thrombocytopenic purpura
   (5) Hemolytic uremic syndrome

D. Management
   (1) Bed rest – may necessitate hospitalization
   (2) Well-balanced diet
   (3) Magnesium sulfate to prevent convulsions
      a) Must be monitored closely
         (a. 1) Excreted by the kidney – higher, sometimes toxic levels occur with oliguria
         (a. 2) Signs of toxicity
            (a.2.1) Loss of deep tendon reflex with serum magnesium 10 mEq per liter or above
            (a.2.2) Decreased respirations with serum magnesium 15 mEq per liter or above
         (a. 3) High levels in the fetus associated with:
            (a.3.1) Loss of beat-to-beat variability of fetal heart rate
            (a.3.2) Cerebral depression
      b) Action reversed with calcium ion
      c) Usual dosage range of magnesium sulfate is 4-6 gm loading dose, followed by 2-3 gm/hr IV infusion
   (4) If patient seizes and does not respond to magnesium sulfate, may need to use other anti-convulsant agents
(5) Anti-hypertensive agents for extreme elevations of blood pressure
   a) Hydralazine – short onset
   b) Methyldopa – delayed onset
   c) Nifedipine (Procardia)

(6) Delivery is the definitive treatment of preeclampsia/eclampsia
   a) If the preeclampsia is mild and remains stable, expectant management with continued close maternal and fetal surveillance may be appropriate
   b) If the condition deteriorates (e.g., worsening hypertension or renal function) then, following maternal stabilization, delivery must be effected

   c) Method of delivery
      (c. 1) Induction of labor when appropriate
      (c. 2) Cesarean delivery when labor induction is not feasible or fails
   d) Prognosis
      (d. 1) Maternal prognosis depends largely on prevention or early termination of convulsions
      (d. 2) Fetal prognosis depends largely on maturity and condition at the time of delivery

E. Complications
   (1) Cerebral hemorrhage
   (2) Pulmonary edema
   (3) Congestive heart failure
   (4) Renal failure
   (5) Disseminated intravascular coagulopathy

Rh Isoimmunization

65. The student will describe Rh isoimmunization and its associated disorder erythroblastosis fetalis, list its predisposing factors, and describe a direct and indirect Coombs' test.

   A. For Rh isoimmunization (sensitization) to occur, three prerequisite factors must be present.
      (1) The mother must be Rh negative and the fetus Rh positive
      (2) There must be fetal erythrocytes exposed to the maternal circulation
      (3) There must be a maternal immune response productive of antibodies directed against the Rh antigens

   B. Erythroblastosis fetalis due to Rh incompatibility occurs when a sensitized mother manufactures anti-Rh antibodies (IgG class) which cross the placenta and lead to the hemolysis of Rh-positive fetal red blood cells. This hemolysis leads to
      (1) Fetal anemia
      (2) Erythroid hyperplasia of the fetal bone marrow as well as extramedullary hematopoiesis (with resultant hepatosplenomegaly) to compensate for any anemia
      (3) Hydrops fetalis in severe fetal anemia occurs because of hypoproteinemia

   C. Rh isoimmunization can follow
      (1) Transfusion of incompatible blood
      (2) Fetomaternal hemorrhage – predisposing factors for such hemorrhage include
         a) Abortion (spontaneous or elective)
         b) Ectopic gestation
         c) Amniocentesis or chorionic villus sampling (CVS)
         d) Trauma
         e) Abruptio placentae
         f) Delivery
      (3) A maternal-fetal bleed from heterozygous mother to an Rh negative fetus (so-called "grandmother theory")
D. Maternal blood testing to detect sensitization
   (1) Direct Coombs’ – a test to measure antibodies adsorbed to red blood cells
   (2) Indirect Coombs’ – a test to measure antibodies in serum in a previously unsensitized gravid patient; an indirect Coombs’ of 1:16 or greater is indicative of potentially severe sensitization

66. Given an Rh-negative unsensitized pregnant patient, the student will outline a satisfactory course of management.
   A. At the first prenatal visit, laboratory testing should include ABO blood type determination, Rh type, and atypical antibody screen (indirect Coombs’ test)
      (1) If Rh antibody (anti-D) is found, then manage as a sensitized pregnancy
      (2) If Rh antibody is not found, then repeat the indirect Coombs’ test at 28 weeks gestation
         (a) If a patient is Rh negative and has no demonstrable Rh antibody (anti-D), then she is a candidate and should receive Rh immune globulin (RhIg) prophylaxis at 28 weeks gestation
         (b) If anti-D is detected at 28 weeks gestation, then manage as a sensitized patient
   B. An Rh negative unsensitized mother should receive RhIg within 72 hours of an abortion, ectopic gestation, trauma, abruptio placenta, amniocentesis, chorionic villus sampling, or delivery if the infant is Rh positive or if the Rh status of the infant is unknown

67. Given an Rh-negative sensitized (isoimmunized) patient, the student will outline a satisfactory course of management.
   A. Ultrasonographic confirmation of gestational age is desirable
   B. In a first isoimmunized pregnancy, initial management should be determined by the level of anti-D antibodies in the maternal serum
      (1) As long as the titer is less than 1:16 in an initial isoimmunized pregnancy, the fetus is not severely affected
      (2) Follow antibody titer every month and as long as the titer is less than 1:16, fetus may be delivered at term
   C. If the antibody titer rises above 1:16 or if managing a subsequent isoimmunized pregnancy, spectrophotometric analysis of amniotic fluid unconjugated bilirubin concentration (as detected by measuring the $\Delta$OD 450) is necessary
      (1) Spectrophotometric analysis of amniotic fluid ($\Delta$OD 450) provides an indirect assessment of the severity of hemolysis and remains a useful and relatively safe procedure. Bilirubin content in amniotic fluid decreases as pregnancy advances.
      (2) Depending on the severity of hemolysis (as plotted on a Liley graph), repeat amniocentesis will be required at 1-3 week intervals
      (3) In some cases amniotic fluid ($\Delta$OD 450) may not correlate well with fetal hemolysis (and, therefore, fetal hematocrit) making percutaneous umbilical blood sampling (PUBS) a useful alternative for determining severity of disease
   D. Severity of disease
      (1) If the $\Delta$OD 450 value is in Liley zone 1, the disease is mild
      (2) Liley zone 2 or 3 indicate moderate to severe risk for the fetus
   E. Management – When using Liley curve, multiple values are obtained at 1-3 week intervals. It is important that $\Delta$OD 450 values show a falling trend, following the graph. A rise or plateau of the value may indicate worsening of the hemolysis.
      (1) Liley zone 1 – follow-up determinations should be made in 3 weeks. Since disease is mild, infant can be delivered at 38-39 weeks.
(2) Liley zone 2 – follow-up determinations are made at 1-3 week intervals. Since the infant may be more severely affected, delivery is accomplished when fetal lung maturity is demonstrated (as long as the OD 450 values are falling).
   a) Fetal lung immaturity – repeat amniocentesis
   b) Fetal lung maturity – deliver
(3) Liley zone 3 – consider intrauterine transfusion. When to perform an intrauterine transfusion or to deliver the fetus depends on risk of prematurity versus the risk of the therapy.
(4) In utero therapies consisting of either intra-abdominal or intra-vascular transfusion may be appropriate when fetal immaturity precludes delivery

F. Prognosis of the fetus is unrelated to
   (1) Degree of anemia
   (2) Development of hydrops fetalis
   (3) History of prior pregnancy outcome

Medical and Surgical Complications of Pregnancy

Anemia

68. The student will list the most common causes of anemia in pregnancy and the laboratory tests useful in making the differential diagnosis.

A. Causes
   (1) Iron deficiency
   (2) Folate deficiency
   (3) Hemoglobinopathies
   (4) Acute blood loss

B. Laboratory tests
   (1) Complete CBC including hemoglobin, hematocrit, and red blood cell indices
   (2) Serum iron
   (3) Total iron-binding capacity (TIBC)
   (4) Serum ferritin
   (5) Peripheral blood smear
   (6) Reticulocyte count
   (7) Serum folate
   (8) Sickle cell prep (hemoglobin electrophoresis, if result is positive)

69. The student will list the physiologic changes in pregnancy which contribute to iron deficiency anemia and describe a program for prevention and management.

A. Physiologic changes
   (1) Physiologic anemia due to the dilutional effect of the following changes
      a) Increased plasma volume which appears during the second trimester
      b) Increased maternal RBC mass, but to a lesser degree than the plasma volume
   (2) Iron requirements of pregnancy total approximately 800 to 1000 mg, 300 mg of which is required by the feto-placental unit
   (3) Under normal circumstances, approximately one half of the increased blood volume is lost at the time of delivery

B. Prevention
   (1) Many women have low iron stores due to some of the following factors
      a) Low socioeconomic status
      b) Poor nutrition
      c) Menorrhagia
      d) High gravidity
(2) The average male requires 1 mg of iron per day, the average female requires 2 mg of iron per day, and the average pregnant female requires 4 mg of iron a day.

(3) A supplement of 30-60 mg of elemental iron should be given to each pregnant, non-anemic patient.

C. Management
(1) The efficiency of iron absorption by the gastrointestinal tract increases during pregnancy.
(2) Oral iron supplementation for a total of 200 mg of elemental iron per day in divided doses:
   a) A 300 mg tablet of ferrous sulfate contains 60 mg of elemental iron.
   b) Absorption is decreased by 40-50%, if taken with meals.
   c) If taken on an empty stomach, iron can cause dyspepsia.
   d) Increase in reticulocyte count should be expected in 5-10 days.

70. The student will define megaloblastic anemia and list its common laboratory findings, contributing factors and management.

A. Definition – megaloblastic anemia, a rare cause of anemia in pregnancy, is an arrest in red blood cell (RBC) development. In pregnancy it almost always is due to folate deficiency.

B. Laboratory findings in folate deficiency anemia. (Please note, iron and folate deficiency can coexist.)
   (1) Low serum folate
   (2) Hypersegmented neutrophils
   (3) Macrocytic, hyperchromic RBC indices

C. Contributing factors
   (1) Increased maternal and fetal folic acid demands
      a) Folic acid is both heat labile and water soluble and, therefore, not adequately stored in the body.
      b) Prenatal vitamins contain 1 mg of folic acid and when taken daily, prevent folic deficiency anemia.
   (2) Dietary deficiency which more commonly presents in teenagers and women from low socioeconomic backgrounds.

D. Management
   (1) Folic acid, 1 mg per day.
   (2) Oral iron.
   (3) Attention to predisposing factors – improve nutritional status when appropriate.

71. The student will list the two most common hemoglobinopathies and discuss the salient features of sickle cell disorders.

A. Hemoglobinopathies
   (1) Sickle cell anemia
   (2) Thalassemias

B. Sickle cell disorders
   (1) General considerations
      a) Restricted to African Americans.
      b) Inheritance is Mendelian with heterozygous (sickle cell trait) and homozygous (sickle cell disease) expression.
      c) Women with sickle cell disease have decreased fertility.
      d) Pregnancy is thought to increase the incidence of vaso-occlusive crises, especially during labor and the puerperium.
      e) Pregnancy also increases risk for urinary tract infections, congestive heart failure and thrombotic pulmonary events.
      f) As a consequence of this disorder, maternal and perinatal mortality is increased.
(2) Pathophysiology
   a) Caused by defective synthesis in beta chains resulting in abnormal hemoglobin known as hemoglobin S
   b) Microvascular occlusion leading to thrombosis (crisis) is precipitated by low oxygen tension that distorts hemoglobin S causing RBC sickling
   c) Vaso-occlusive crises can be precipitated by dehydration, infection, and/or acidosis

(3) Diagnosis
   a) Severe anemia and sickled cells on a blood smear
   b) Increased reticulocyte count
   c) Confirmed by hemoglobin electrophoresis

(4) Pregnancy management
   a) Sickle cell trait patients are treated like non-affected parturients
   b) Sickle cell disease parturients require
      (b. 1) Individualized attentive care
      (b. 2) Antenatal iron and folic acid supplementation
      (b. 3) Careful surveillance for urinary tract infections
      (b. 4) Treatment of vaso-occlusive crises
         (b.4.1) Hydration
         (b.4.2) Analgesia
         (b.4.3) Transfusion
         (b.4.4) Oxygen
      (b. 5) Evaluation of fetal well being by ultrasound and NST’s
      (b. 6) Prophylactic antenatal transfusions remain controversial
      (b. 7) Labor in lateral decubitus position with oxygen supplementation
      (b. 8) Cesarean delivery for obstetrical, not hematologic, reasons

Cardiac Disease

72. The student will list the physiological changes in normal pregnancy that may make the diagnosis of heart disease difficult.
   A. Increased cardiac output and blood volume
   B. Fatigue
   C. Chest discomfort
   D. Dyspnea
   E. Orthopnea
   F. Palpitations
   G. Peripheral edema
   H. Syncope
   I. Sinus tachycardia
   J. Systolic murmur
   K. Left axis deviation as seen on EKG

73. The student will list the signs and symptoms suggestive of heart disease in pregnancy.
   A. Dyspnea severe enough to limit activity
   B. Progressive orthopnea
   C. Paroxysmal nocturnal dyspnea
   D. Hemoptysis
   E. Syncope during or immediately following exertion
   F. Chest pain with activity and relief with rest, typical of myocardial ischemia
   G. Systolic murmur, Grade III or worse
H. Diastolic murmur
I. Cyanosis
J. Pulmonary rales that do not clear with deep inspiration
K. Arrhythmias
L. Unequivocal heart enlargement

74. The student will describe the New York Heart Association classification of cardiac disease.

A. Class I – no limitation of physical activity, asymptomatic
B. Class II – slight limitation of physical activity, comfortable at rest; discomfort with ordinary activity. Discomfort is defined as
   (1) Undue fatigue
   (2) Palpitation or dyspnea
   (3) Anginal pain
C. Class III – marked limitation of physical activity, comfortable at rest; less than ordinary activity associated with discomfort
D. Class IV – inability to perform any physical activity without discomfort; symptomatic at rest
E. General considerations
   (1) Pregnancy may alter the classification of an individual patient
   (2) 44% of women with cardiac disease may develop pulmonary edema for the first time during the third trimester of pregnancy. Pulmonary edema may present rapidly and unexpectedly.

75. The student will be knowledgeable about the maternal mortality rates associated with cardiac disease and pregnancy.

A. Group I – Mortality <1%
   (1) Atrial septal defect
   (2) Ventricular septal defect
   (3) Patent ductus arteriosus
   (4) Pulmonic/tricuspid disease
   (5) Tetralogy of Fallot, corrected
   (6) Bioprosthetic valve
   (7) Mitral stenosis, NYHA class I and II
B. Group II – Mortality 5-15%
   (1) Mitral stenosis, NYHA class III and IV
   (2) Aortic stenosis
   (3) Coarctation of aorta, without valvular involvement
   (4) Uncorrected Tetralogy of Fallot
   (5) Previous myocardial infarction
   (6) Marfan syndrome with normal aorta
   (7) Mitral stenosis with atrial fibrillation
   (8) Artificial valve
C. Group 3 – Mortality 25-50%
   (1) Pulmonary hypertension
   (2) Coarctation of aorta, with valvular involvement
   (3) Marfan syndrome with aortic involvement
76. The student will list the obstetrical complications (maternal and fetal) associated with cardiac disease.

A. Maternal mortality and morbidity (see objective 77)
B. Intrauterine growth retardation
C. Prematurity
D. Intrauterine death

77. The student will outline antepartum, intrapartum, and postpartum management of the pregnant patient with cardiac disease.

A. Preconceptional counseling which includes discussion of maternal risks and possible inheritance of congenital heart defects (see objective 8)
B. Antepartum
   (1) Class I and II patients can generally be managed as outpatients
   (2) Class III and IV require hospitalization, bed rest, and intensive care throughout gestation.
   (3) Mortality risks should be discussed with the patient so that if abortion is an alternative for her, it can be considered (see objectives 204 and 206)
   (4) Care includes
      a) Careful questioning of the patient for symptomatology at each visit
      b) Satisfactory fetal growth and well-being
      c) Physical examination of lung fields, heart rate and pulse at each visit
      d) The prevention and correction of
         (d. 1) Anemia
         (d. 2) Infection
         (d. 3) Excessive weight gain
         (d. 4) Hypertension
         (d. 5) Edema
      e) Consultation with patient’s cardiologist for careful follow-up and echocardiography as needed
      f) Predelivery consultation with anesthesia to plan for the delivery
C. Intrapartum – Each patient must be managed individually, depending on her cardiac disease. Certain generalizations, however, can be made.
   (1) Management of delivery includes well-controlled analgesia, shortening of second stage, and antibiotics to prevent subacute bacterial endocarditis
   (2) Decompensation is more likely to occur suddenly in the third stage of labor and early postpartum
   (3) Cardiac decompensation requires aggressive medical management
   (4) Cesarean delivery is generally reserved for obstetrical indications
D. Postpartum
   (1) Additional bed rest may be warranted
   (2) Infection, thromboembolism, and hemorrhage are particularly serious
   (3) Contraception should be discussed with the patient
   (4) Postpartum sterilization procedures are best performed as an interval procedure after complete stabilization

Gestational Diabetes/Diabetes Mellitus

78. The student will define gestational diabetes and be knowledgeable about predisposing factors and screening tests.

A. Definition – carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy
B. Predisposing factors in patient history
   (1) Family history of diabetes
   (2) Previous delivery of
      a) Large infant weighing 4000-4500 gm or greater (macrosomia)
      b) Unexplained stillbirth
   (3) Age >30 years old

C. Physical examination
   (1) Obesity
   (2) Hypertension
   (3) Polyhydramnios

D. Laboratory testing
   (1) All pregnant women should be screened for glucose intolerance during pregnancy since selective screening based on clinical attributes or past obstetric history has been shown to be inadequate. Students should be aware that in 1999, the American Diabetes Association recommended that pregnant women be screened based on risk factors. Many physicians feel all patients should be screened.

   (2) Screening is performed by a one-hour post glucola (50 mg glucose), between the 24th and 28th week of gestation. Serum plasma glucose should be <140 mg/dl. If the screen is abnormal, a 3-hour glucose tolerance test (GTT) should be performed. An abnormal 1-hour screen is not diagnostic of gestational diabetes. Screening is performed earlier in pregnancy with presence of risk factors.

   (3) 3 hour GTT (100 gm glucose) – the following plasma glucose levels should be obtained; two or more levels must be abnormal to be considered diagnostic for gestational diabetes mellitus
      a) Fasting = 105 mg/dl
      b) One hour = 190 mg/dl
      c) Two hour = 165 mg/dl
      d) Three hour = 145 mg/dl

79. The student will recognize that there are two methods of classification of diabetics, an older version and a more current one.

A. Priscilla White classification (1978) (older)

<table>
<thead>
<tr>
<th>Class</th>
<th>Progestational Diabetes*</th>
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<tbody>
<tr>
<td></td>
<td>Age of Onset (year)</td>
</tr>
<tr>
<td>A</td>
<td>Any</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 20</td>
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<tr>
<td>C</td>
<td>10-19</td>
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<td>D</td>
<td>&gt; 20</td>
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<table>
<thead>
<tr>
<th>Class</th>
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<tbody>
<tr>
<td></td>
<td>Fasting Glucose Level</td>
</tr>
<tr>
<td>A-1</td>
<td>&lt; 105 mg/dl</td>
</tr>
<tr>
<td>A-2</td>
<td>≥ 105 mg/dl</td>
</tr>
</tbody>
</table>

B. National Diabetes Group classification (more current)
   (1) Type I insulin-dependent diabetes mellitus formerly known as juvenile diabetes, juvenile onset diabetes, ketosis-prone diabetes and brittle diabetes
   (2) Type II non-insulin dependent diabetes formerly known as adult-onset diabetes, maturity onset diabetes, ketosis resistant diabetes, stable diabetes and maturity onset diabetes of youth
   (3) Gestational diabetes

80. The student will outline the management of a pregnant patient with diabetes mellitus.

A. Diabetes education
B. Dietary counseling
   (1) Approximately 300 Kcal per day over non-pregnant needs (1800-2400 cal per day)
   (2) American Diabetic Association diet based on 35 Kcal/kg ideal body weight – needs to be adjusted in the obese patient
C. Blood glucose monitoring utilizing laboratory and/or home glucose monitoring
   (1) Target glucose levels
      a) In general, maintain plasma glucose in the normal range at 70-140 mg/dl
      b) Fasting glucose should be 70-95 mg/dl
   (2) Insulin requirements fluctuate
      a) Increase in second and third trimesters
      b) Decrease precipitously after delivery
      c) Urine glucose determinations do not reflect serum glucose due to changes in
         (c. 1) Glomerular filtration rate
         (c. 2) Renal tubular reabsorption
   (3) Oral hypoglycemic agents are contraindicated
   (4) Poor glucose control may lead to maternal ketoacidosis that is
      a) A consequence of inadequate exogenous insulin
      b) Associated with fetal death in utero
      c) Associated with maternal infection
   (5) Glycosylated hemoglobin (HbA1c) levels reflect the average glucose levels over time and should be periodically checked during pregnancy
D. Maternal serum alpha-fetoprotein measurement at 16 weeks
E. Urine cultures initially, then as needed
   (1) Increased incidence of bacteriuria
   (2) Pyelonephritis may precipitate maternal ketoacidosis
F. Ultrasound studies to rule out fetal anomalies and to follow fetal growth
G. Fetal well-being assessment (see objective 29) should be performed twice weekly beginning approximately in the early to mid-third trimester. Clinical indicators of deterioration include
   (1) Decrease in fetal movement
   (2) Decrease in fetal growth
   (3) Decrease in insulin needs
   (4) Obstetrical complications such as preeclampsia or polyhydramnios
   (5) Ketoacidosis
H. Delivery
   (1) Timing of delivery is based upon
      a) Past obstetrical history
      b) Gestational age and documented fetal lung maturity (see objective 30)
   (2) Mode of delivery
      a) Labor induction is undertaken if no labor by 38-40 weeks
      b) Vaginal delivery is the preferred method of delivery
c) Cesarean delivery is indicated for obstetrical reasons
d) Macrosomia is associated with significant fetal morbidity at time of vaginal delivery. If the estimated fetal weight is >4250 grams, consider cesarean delivery.

81. The student will list the maternal obstetric complications associated with diabetes mellitus.

A. Preeclampsia
B. Infections
C. Hydramnios
D. Dystocia and cesarean delivery

82. The student will list the effects of diabetes mellitus on fetal/neonatal outcome.

A. Spontaneous abortions
B. Large infants/fetal macrosomia
C. Fetal and neonatal deaths
D. Fetal anomalies
   (1) Cardiovascular system
   (2) Central nervous system
   (3) Caudal regression syndrome
   (4) Renal anomalies
E. Respiratory distress syndrome (hyaline membrane disease)
F. Neonatal metabolic disorders
   (1) Hypoglycemia
   (2) Hyperbilirubinemia
   (3) Hypocalcemia

Infectious Diseases in Pregnancy

83. The student will list maternal infections that could affect the fetus and newborn infant.

A. Group B Streptococcus (GBS)
   (1) Leading cause of life threatening perinatal infection in the United States.
   Spectrum of disease includes maternal chorioamnionitis and endomyometritis as well as neonatal sepsis, pneumonia, and meningitis
   (2) Epidemiology
      a) Fifteen to 40% of all women are colonized and have positive vaginal or anal cultures
      b) Half of the babies born to colonized women become colonized with GBS
      c) One to 2% of colonized babies develop disease
         (c. 1) Early-onset infection occurs within 6 hours of birth, is manifested by bacteremia, pneumonia, or meningitis. Mortality rate is 15% or higher.
         (c. 2) Late-onset disease occurs after several days of life. Meningitis is the predominant part of the syndrome
      d) Symptomatic maternal infection due to GBS includes chorioamnionitis, endomyometritis, cystitis, pyelonephritis, and preterm labor
   (3) Screening – culture performed of the lower 1/3 of the vagina and anal area near term (35-37 weeks). If positive culture, treat intrapartum.
(4) Chemoprophylaxis – Penicillin is drug of choice. If patient is penicillin-allergic, Clindamycin is an alternative. (Ampicillin may be used).

a) Intrapartum intravenous antibiotics have been shown to prevent mother-to-baby vertical transmission
b) Risk factors have been identified for selection of patients who are most likely to benefit from chemoprophylaxis
   (b. 1) Preterm labor (<37 weeks) or
   (b. 2) Premature rupture of membranes (<37 weeks)
   (b. 3) Prolonged rupture of membranes (>18 hours)
   (b. 4) Prior sibling affected by GBS
   (b. 5) Maternal fever during labor (38°C or 100.4°F)
   (b. 6) Antepartum GBS urinary tract infection

B. *Chlamydia trachomatis* is seen in 4-25% of pregnant women
   (1) Pregnancies among infected women are more likely to end in premature delivery
   (2) Children born to mothers with *Chlamydia trachomatis* infection carry a 40-50% risk of developing conjunctivitis
   (3) Neonatal pneumonia caused by chlamydia has a peak incidence at six weeks of age
   (4) Management – see current Centers for Disease Control (CDC) recommendations

C. Human papilloma virus (HPV)
   (1) Clinically this wart virus may grow in moist areas around the introitus, rectum, vagina, urethra and cervix
   (2) Condyloma may be transmitted in the neonate during childbirth, but the incidence is very low
   (3) Antepartum treatment may include cauter y, trichloroacetic acid, or laser. Podophyllin is contraindicated in pregnancy.
   (4) Management – see current Centers for Disease Control (CDC) recommendations

D. Gonorrhea
   (1) Acute gonococcal salpingitis is rarely a problem after the third month
   (2) The patient may have local lower tract infection throughout pregnancy
      a) Active infection at the time of delivery may lead to gonorrheal ophthalmia neonatorum (GON)
      b) May progress to disseminated neonatal disease if not treated
      c) Antepartum treatment is highly successful with appropriate antibiotic
      d) Ophthalmic erythromycin is administered at birth to protect the neonate against GON
      e) Management – see current Centers for Disease Control (CDC) recommendations

E. Herpes simplex
   (1) Usually Type II herpes hominis
   (2) Rarely transmitted across the placenta or the intact chorioamnion to the fetus
      a) Most frequently transmitted as the fetus passes through the vagina during labor
      b) Ascending infection after rupture of the membranes is also possible
   (3) Cesarean section preferred method of delivery if the mother has active genital herpes or prodromal symptoms
   (5) Neonatal infection may be disseminated, localized, or asymptomatic but mortality rate is high. Survivors likely to have CNS or ocular damage.
   (6) Management – see current Centers for Disease Control (CDC) recommendations

F. Syphilis
   (1) Primary lesion (chancre) is variable in size, while secondary lesions such as condyloma latum may not be obvious
   (2) Serologic tests are not positive for four to six weeks after inoculation
(3) May cause mid-trimester or late abortion
(4) Congenital syphilis
   a) May be responsible for fetal death in utero, premature labor or hydrops fetales
   b) Infection may cause interstitial lesions in lungs, liver, spleen, and long bones
(5) Management – see current Centers for Disease Control (CDC) recommendations
G. HIV (see objective 109)
H. Rubella (see objectives 84-88)
I. Cytomegalovirus (CMV)
   (1) CMV is the leading cause of congenital viral infection, with an incidence of 1% of all live births. This infection is largely unapparent during the neonatal period. Five to 10% of infected babies have severe infection, which may range from fatal illness to moderate hepatosplenomegaly, jaundice and petechiae. Another 10% with subclinical infection will have varying degrees of neurologic, psychomotor, or behavioral complications. Risk of intrauterine transmission, if the mother acquires the infection while pregnant, is 47-75%
   (2) Risk of intrauterine infection by vertical transmission is approximately 1%
   (3) The risk of the neonate acquiring CMV if the mother has an active infection at the time of birth is 30-50%
   (5) Recurrent congenital CMV infection with subsequent pregnancies, while rare, may occur
   (6) Management – see current Centers for Disease Control (CDC) recommendations
J. Toxoplasmosis
   (1) Toxoplasmosis is very uncommon in the United States. Congenital toxoplasmosis occurs only if the mother acquires the infection during pregnancy. The earlier the maternal infection in pregnancy, the more severe the potential fetal anomalies.
   (2) Acquired by eating undercooked infected meat or through contact with infected cat feces
   (3) Diagnosis is by serum indirect fluorescent antibody tests for toxoplasma IgG and IgM
   (4) Treatment of acute maternal infection appears to reduce the risk of fetal wastage and congenital infection. Currently, the medications for treating toxoplasmosis are only available through the Centers for Disease Control in Atlanta.
   (5) Management – see current Centers for Disease Control (CDC) recommendations
K. Parvovirus – a small, single stranded DNA virus discovered in the mid-1970’s, which is known to be the cause of transient aplastic crisis in patients with chronic hemolytic anemias and of erythema infectiosum (Fifth disease)
   (1) Human parvovirus usually is associated with an asymptomatic or mild non-specific illness
      a) Children – usually present with a rash (slapped cheek appearance)
      b) Adults – usually do not present with rash but develop arthralgia
   (2) In the fetus, due to a predilection for rapidly growing cells, parvovirus can attack the fetal bone marrow, causing an aplastic crisis in the fetus. The result can be fetal hydrops and death.
      a) When fetal hydrops is found, a history of possible exposure to parvovirus should be elicited.
      b) A pregnant woman who has been exposed to parvovirus should have ultrasounds to screen for fetal hydrops
      c) Fetal loss may be 5-10%
      d) If hydrops is diagnosed and the fetus is found to be anemic, an intrauterine fetal transfusion can be performed
Lyme disease

1. Most commonly reported Vector-borne disease
2. A tick-borne infection by spirochete *Borrelia burgdorferi*
   a) Leads to multi-system illness characterized by distinct lesion - erythema chronicum migrans (ECM)
   b) Headaches, neurologic symptoms dominate
3. Most common vector is deer tick – *Ixodes dammini*
4. Transplacental passage has been documented
5. No congenital malformation reported but some possible increase loss noted
6. Diagnose by ELISA and confirmed by IgG and IgM Western blot
7. Treatment in pregnancy includes Amoxicillin, Ceftriaxone, azithromycin for 2-3 weeks, longer with disseminated disease
8. Management – see current Centers for Disease Control (CDC) recommendations

Rubella

84. The student will identify the pregnant patient at risk for rubella.
   A. No immunity – hemagglutination-inhibition (HAI) titer <1:8
   B. Immunity – HAI ≥1:8

85. The student will diagnose rubella infection occurring in pregnancy using paired acute and convalescent sera.
   A. Clinical diagnosis of rubella is often inaccurate
   B. Suspected rubella infection in pregnant women should be confirmed serologically
      1. A fourfold rise in specific antibody titer between acute and convalescent phase serum specimens
         a) Initial serum specimen should be drawn as soon as possible (within 7-10 days) after onset of illness
         b) Repeat serology 2-3 weeks later (no sooner than 7 days)
      2. Alternatively, the presence of rubella-specific IgM indicates recent infection

86. The student will list the consequences of rubella in pregnancy.
   A. First trimester – infection of mother during fetal organogenesis may result in congenital anomalies
   B. Second and third trimesters
      1. Congenital anomalies occur if infection during first trimester from 50% (first month) to 10% (third month)
      2. Congenital rubella syndrome – intrauterine growth retardation, deafness, mental retardation, cataracts

87. The student will outline the management of rubella during pregnancy.
   A. With exposure during pregnancy, patient counseling is indicated regarding risks, diagnostic measures (see objective 85), and outcomes
   B. Therapeutic abortion may be offered (see objectives 204 and 206)
   C. Immune serum globulin (ISG) does not protect the fetus against disease, but may modify the disease manifestations in the mother
D. Infected infants should be isolated because they shed the virus for a long period of time post-delivery
E. Management – see current Centers for Disease Control (CDC) recommendations

88. The student will outline a program of prophylaxis against rubella in women of childbearing age.
   A. Immunization of mother with vaccines containing live viruses should be avoided during pregnancy
   B. Seronegative pregnant patients should be counseled regarding the availability of vaccination postpartum and counseled regarding exposure avoidance during pregnancy
   C. Provide reliable contraception so as to avoid pregnancy for two to three months after vaccination
   D. If patient inadvertently becomes pregnant within 3 months after vaccination, available data shows no increased risk of malformation
   E. Management – see current Centers for Disease Control (CDC) recommendations

**Urinary Tract Infections**

89. The student will list common factors predisposing to urinary tract infection in pregnancy.
   A. Urinary stasis
   B. Increased incidence of bacteriuria – symptomatic and asymptomatic

90. The student will indicate the significance of asymptomatic bacteriuria noted during pregnancy.
   A. Bacteriuria defined as the presence of greater than 100,000 organisms per ml in a clean-voided urine
   B. Present in approximately 5% of the prenatal population at the time of the first visit
      (1) Higher incidence in low socioeconomic gravidas
      (2) Higher incidence in women with a past history of urinary tract infection
      (3) Higher incidence in patients with sickle cell disease
   C. If not treated, 25% of these women will develop symptomatic urinary tract infections

91. The student will list the signs and symptoms of symptomatic urinary tract infections (cystitis and pyelonephritis).
   A. Cystitis
      (1) Urgency, frequency, dysuria
      (2) Suprapubic tenderness
      (3) Pyuria
      (4) Hematuria
   B. Pyelonephritis
      (1) Urgency, frequency, dysuria
      (2) Nausea, often with emesis
      (3) Anorexia
      (4) Fever and/or chills
      (5) CVA tenderness – unilateral or bilateral
(6) Urinary findings
   a) Bacteriuria
   b) WBC's
   c) RBC's
   d) Possibly proteinuria
   e) Casts
   f) Antibody-coated bacteria test

92. The student will be able to list complications of pyelonephritis.
   A. Preterm labor
   B. Anemia
   C. Septicemia
   D. Adult respiratory distress syndrome (ARDS)

93. The student will outline a plan of management for urinary tract infections complicating pregnancy.
   A. Identify organism and determine sensitivity to antibiotics
   B. Treat with appropriate antibiotic
      (1) All antibiotics have the potential to adversely affect both mother and fetus
         a) Ampicillin – hypersensitivity or idiosyncratic maternal reaction
         b) Sulfonamides – rare cause of hyperbilirubinemia in newborn; best avoided
            near term
         c) Nitrofurantoin – hemolytic anemia in mother if she has glucose 6-PD
            deficiency
         d) Tetracycline – should not be used during pregnancy
            (d. 1) Discolored deciduous teeth in newborn
            (d. 2) Depressed normal skeletal growth
         e) Bactrim/Septra® – trimethoprim interferes with folic acid metabolism. In rats,
            congenital anomalies have been reported
         f) Aminoglycosides – neonatal and maternal renal and otic toxicity if not
            properly dosed
   C. If cystitis only, obtain post-treatment culture to verify adequacy of therapy
      (1) One during or soon after completion of therapy
      (2) A second several weeks later
   D. If pyelonephritis, two options available
      (1) Consider suppressive antibiotic therapy throughout pregnancy if
         a) Bacteriuria returns
         b) History of recurrent UTI
         c) Underlying renal disease
         d) Sickle cell disease, diabetes
      (2) Serial cultures throughout pregnancy

Other Medical and Surgical Complications

94. The student will be knowledgeable about other coincidental diseases that have special significance during pregnancy and will identify the particular diagnostic or management problem that each entity poses.
   A. Gastrointestinal diseases
      (1) Hyperemesis gravidarum
         a) Vomiting severe enough to cause dehydration, weight loss, and ketosis
         b) Management usually requires hospitalization
(b. 1) Intravenous correction of caloric and electrolyte deficiencies
(b. 2) Hyperalimentation may be required
(b. 3) Attention to psychosocial problems

(2) Acute appendicitis
a) Diagnostic dilemma
(a. 1) Anorexia, nausea, emesis associated both with appendicitis and early pregnancy
(a. 2) Pain secondary to appendicitis may localize in the right upper quadrant as the uterus grows
(a. 3) Mild leukocytosis is a normal finding during pregnancy and may complicate the diagnosis
(a. 4) Peritoneal signs appear late
b) Management – appendectomy

(c) Complications
(c. 1) Due to the difficulty in diagnosis, appendiceal rupture with generalized peritonitis may be more common
(c. 2) May be a cause of premature labor
d) Prognosis – excellent with prompt diagnosis and therapy

(3) Cholestasis of pregnancy (also called cholestatic hepatitis, icterus gravidarum, recurrent jaundice of pregnancy)
a) The mechanism is uncertain
b) Diagnosis
(b. 1) Severe pruritus appearing in the second or third trimester of pregnancy
(b. 2) Elevated serum bile acids, SGOT, and occasionally bilirubin. Viral hepatitis, mechanical biliary tract obstruction and underlying liver disease must be ruled out.
c) Management
(c. 1) Cholestyramine, administered orally, can reduce the pruritus. Cholestyramine binds the bile salts in the GI tract and lowers their reabsorption into the bloodstream, lowering serum levels
(c. 2) The pregnancy should be followed carefully as increased risk of prematurity and fetal death have been reported in several studies

(4) Viral hepatitis – may be caused by a variety of viruses, including CMV and Epstein-Barr virus. The classic hepatitis is caused by hepatitis viruses A, B, and C (formerly known as non-A, non-B)
a) Hepatitis A
(a. 1) Transmitted almost exclusively by the fecal-oral route
(a. 2) Usually a self-limiting disease, although fulminant hepatitis may occur
(a. 3) There is no evidence that Hepatitis A causes birth defects
(a. 4) Immune serum globulin may be administered to the neonate to prevent the disease
b) Hepatitis B
(b. 1) Transmitted by parenteral exposure or sexual contact
(b. 2) Congenital infection may occur but the risk is decreased by the neonatal administration of Hepatitis B Immune Globulin (HBlg)
(b. 3) Vertical transmission (at the time of birth) may occur
(b. 4) Risk of transmission is higher (85% vs 15%) if the mother is HBeAg antigen positive
c) Hepatitis C
(c. 1) Responsible for 80% of infections caused by blood borne non-A, non-B infections
(c. 2) Approximately 40% of transfusion-related Hepatitis C have chronic hepatitis within five years
(c. 3) Transmission identical to Hepatitis B
(c. 4) After acute infection antibody is not detected for an average of 15 weeks, sometimes for one year
Hepatitis C is transmitted vertically at birth. Although data not conclusive, administration of immunoglobin to newborn of mother with antiC antibody may prevent disease acquisition.

5. Management
   a. All pregnant women should be screened for HBBAg status
   b. If a woman is antigen positive
      (b. 1) Serologic determination of acute vs. chronic infection is necessary
      (b. 2) Her newborn infant should receive both HBIG and hepatitis B vaccine. Current recommendations are for all infants to receive Hepatitis B vaccination.

B. Endocrine disorders
   (1) Hyperthyroidism
      a. Diagnosis in pregnancy may be more difficult because
         (a. 1) Elevated serum estrogen increases thyroid binding globulin and complicates interpretation of serum T4 and T3 resin uptake values
         (a. 2) Hyperthyroidism diagnosed by low TSH and high free T4
         (a. 3) Radioiodide uptake test contraindicated
         (a. 4) Thyroid gland normally diffusely enlarged during pregnancy
         (a. 5) Tachycardia, weight loss, and heat intolerance may be normal in pregnancy
      b. Management
         (b. 1) Medical – antithyroid drugs such as propylthiouracil
            (b.1.1) Cross the placenta
            (b.1.2) Are secreted in breast milk
            (b.1.3) Should be administered in amounts that will keep the mother slightly hyperthyroid rather than hypothyroid
            (b.1.4) May cause fetal goiter
            (b.1.5) May cause agranulocytosis
            (b.1.6) Fetal heart rate is a good monitor of fetal status
         (b. 2) Surgical
            (b.2.1) May be considered once mother is euthyroid on antithyroid drugs
            (b.2.2) Most safely performed during the second trimester
      c. Neonatal complication – neonate may exhibit hyper or hypothyroidism due to passage of maternal thyroid stimulating and/or inhibiting antibodies

   (2) Hypothyroidism
      a. Usually associated with infertility or spontaneous abortion
      b. If not adequately treated, may lead to severe physical impairment and/or retardation
      c. Management
         (c. 1) Thyroid hormone replacement
         (c. 2) Monitor TSH level each trimester

C. Renal diseases
   (1) An individual may lose approximately 50% of renal function, and her BUN and creatinine will still be <20 and 1.5 mg/dl, respectively. Most individuals with renal disease remain symptom-free until their GFR falls to 25% of less of its original level.
   (2) Normal pregnancy is rare when BUN and serum creatinine exceed 30 and 3 mg/dl, respectively
   (3) All chronic renal diseases can coexist with pregnancy, including, but not limited to, glomerulonephritis, collagen diseases, diabetic nephropathy, nephrotic syndrome and polycystic disease
   (4) Increased risk of superimposed preeclampsia, IUGR and preterm delivery
(5) Management
a) Surveillance of maternal well-being (labs including BUN, serum creatinine, 24-hour urine for protein and creatinine clearance, and frequent blood pressure checks)
b) Assessment of fetal well-being (see objective 28) including serial ultrasounds for fetal growth

D. Pulmonary diseases
(1) Asthma
a) Disease can be exacerbated during pregnancy. This may be associated with increased perinatal mortality rates.
b) May be triggered by a respiratory infection or emotional stress
c) Management – same as in the nonpregnant patient
   (c. 1) Blood gas measurement
   (c. 2) Pulse oximetry alone can be misleading
   (c. 3) Pulmonary function testing
   (c. 4) Oxygen
   (c. 5) Corticosteroids
   (c. 6) Bronchodilators
   (c. 7) Antibiotics in cases of superimposed infection
   (c. 8) Terbutaline/Aminophylline — not currently used as frequently
   (c. 9) Epinephrine
   (c.10) Fetal well-being assessment

E. Substance abuse
(1) Heroin
a) Associated maternal problems may include coincidental infection, hepatitis, HIV infection, SBE, inadequate care
b) Fetal problems – small for gestational age, intrauterine growth retardation secondary to dietary factors
c) Majority of neonates develop withdrawal symptoms within a few days to a week post-delivery. If not recognized, death may occur.
d) Patients are best managed in specialized programs
e) Withdrawal during pregnancy should be avoided to prevent the highly associated incidence of intrauterine fetal demise

(2) Methadone
a) Less deleterious to the fetus than heroin in utero
b) Neonatal withdrawal may be worse than heroin and not occur for a week or more post-delivery

(3) Cocaine – central and peripheral nervous system stimulant which acts as vasoconstrictor by interfering with norepinephrine uptake
a) Taken by snorting through the nostrils, injected when dissolved in water, or smoked in a “free-base” form. Beginning in the 1980’s, crack cocaine became a drug of choice, easily accessible and affordable.
b) Causes an intense “high” after administration
c) Usual physiologic effects include tachycardia, hypertension, dilated pupils, and muscle twitching
d) May cause convulsions, arrhythmias, respiratory arrest, or myocardial infarction
e) Frequently associated with abruptio placentae, premature labor, spontaneous abortion, intrauterine growth retardation
f) In utero exposure may lead to fetal vascular infarcts/vascular disruption-type anomalies and long-term behavioral problem
g) Management
   (g. 1) Identification of the pregnant woman as a cocaine abuser – drug screen, history
   (g. 2) Counseling, treatment at drug rehabilitation center, support services
   (g. 3) Close observation of pregnancy with attention to fetal growth and fetal well-being
(4) Alcohol
a) Completely safe levels of alcohol consumption have not been established
b) Approximately six drinks per day (3 oz. absolute alcohol) or more are associated with fetal alcohol syndrome
c) Features of fetal alcohol syndrome include
   (c. 1) Prenatal and postnatal growth retardation
   (c. 2) Craniofacial anomalies
   (c. 3) Limb abnormalities
   (c. 4) Cardiac abnormalities
   (c. 5) Mental retardation
d) Management
   (d. 1) Inform the patient of the risk of potential fetal side effects and recommend that she stop her alcohol intake during pregnancy
   (d. 2) Close observation of pregnancy with attention to fetal growth and well-being and maternal nutrition

(5) Tobacco – cigarette smoking plays a major role in the cause of lung cancer and chronic obstructive pulmonary diseases. As a public health hazard and because of potential effects on pregnancy, all pregnant and non-pregnant women should be counseled to stop smoking.
a) Perinatal mortality is greater in women who smoke than in women who do not. Unfortunately, smoking is usually associated with other maternal characteristics that are also associated with increased fetal mortality such as low socio-economic status, race, age, parity, and anemia, making a clear-cut cause-and-effect association difficult.
b) Nicotine is known to cross the placenta and lead to an increase in blood pressure and respiratory heart rate in the fetus. Nicotine may decrease uterine and placental blood flow.
c) Smoking greater than one half pack per day is associated with vaginal bleeding during pregnancy, abruptio placentae, and premature rupture of membranes

Multiple Gestation

95. Given a patient with a uterus large for gestational dates, the student will list the differential diagnosis.
   A. Inaccurate menstrual history
   B. Multiple gestation
   C. Uterine myoma
   D. Gestational trophoblastic disease
   E. Hydramnios
   F. Enlarged adnexal mass

96. Given a patient with multiple gestation, the student will describe the embryonic characteristics and contributing factors associated with this condition and list and describe factors responsible for increased perinatal morbidity and mortality.
   A. Embryonic types
      (1) Monozygotic – results from the fertilization of one ovum, which then divides into two embryos. The twinning rate is constant at a rate of 4 per 1000 births and is not influenced by race, environmental factors, physical characteristics or fertility.
      (2) Dizygotic – results from multiple ovulation and subsequent fertilization of two ova by two different sperm. The dizygotic twinning rate ranges from 4 to 50 per 1000 births and is affected by familial tendency, maternal age, parity, ovulation-inducing drugs, race and in vitro fertilization procedures.
B. Diagnosis
   (1) Uterine fundal height measuring three or more centimeters greater than would be 
       expected for gestational age
   (2) Multiple fetal parts
   (3) Ultrasound examination
C. Significance – multiple gestations are associated with increased morbidity and 
   mortality for both mother and baby
   (1) Maternal
      a) Anemia
      b) Hydramnios
      c) Premature labor
      d) Preeclampsia/eclampsia
      e) Abnormal fetal presentation (breech/transverse lie)
      f) Dysfunctional labor
      g) Placental abruption and previa
      h) Postpartum hemorrhage
   (2) Fetal
      a) Increased risk of spontaneous abortion
      b) Increased risk of congenital malformations, especially with monozygotic 
         twins
      c) Prematurity
      d) Intrauterine growth retardation
      e) Twin-twin transfusion syndrome
      f) Cord complications, especially with monoamniotic twins (cord entanglement)
      g) Complications at the time of delivery including "locked twins"
D. Management
   (1) Early diagnosis
   (2) Proper nutrition and vitamins
   (3) Rest
   (4) Ultrasound to rule out fetal anomalies and to determine chorionicity
   (5) Frequent ultrasounds for fetal growth and fetal presentation
   (6) Fetal surveillance in the third trimester – non-stress testing
   (7) Frequent monitoring of blood pressure and urinary protein excretion
   (8) Education of the patient to the signs and symptoms of preterm labor
   (9) Delivery – the route of delivery (vaginal versus cesarean delivery) is currently 
       determined by obstetric factors

Intrauterine Growth Retardation

97. The student will define intrauterine growth retardation (IUGR), the methods available 
    for its diagnosis, management principles, and its impact on the neonate.

A. A newborn infant is classified as growth-retarded if its birth weight falls below the 
    10th percentile for its particular gestational age. Intrauterine growth retardation is 
    diagnosed when the estimated fetal weight of a fetus, plotted for its gestational age 
    on a normal weight curve appropriate for the region, falls at or below the 10th 
    percentile. The incidence is 3-6% of all pregnancies.
B. Classification and etiology – IUGR is divided into two broad categories, each 
    associated with numerous potential etiologies
   (1) Symmetric – decreased growth potential
      a) Fetal infection
      b) Congenital anomalies
      c) Genetic factors
      d) Starvation
(2) Asymmetric – restricted growth
   a) Uteroplacental insufficiency, e.g. maternal medical disorders such as hypertension, severe diabetes, connective tissues diseases
   b) Poor nutrition
   c) Smoking, ETOH, illicit drug use
C. Diagnosis
   (1) Clinical diagnosis of IUGR should be suspected when uterine fundal height measurement does not keep pace with gestational age. After 20 weeks, the fundal height should equal the weeks gestation +/- 3 centimeters.
   (2) Ultrasonic evidence of IUGR
      a) Estimated fetal weight <10th percentile
      b) Head/abdominal circumference ratio helps determine symmetric vs. asymmetrical IUGR
      c) Measurements of BPD, AC, and femur length may lag behind measurements based on gestational age. Lagging AC early sign if IUGR.
      d) Decreased amniotic fluid may be seen
      e) Premature aging of the placenta (calcification) – Grade III
      e) Investigational studies suggest doppler flow studies increased S/D ratio, absent end-diastolic flow, or reverse flow may be seen with umbilical artery doppler flow studies
D. Management
   (1) Assessment of fetal well-being
   (2) Serial ultrasounds, growth curve, and to rule out abnormalities of fetus
   (3) Amniotic fluid evaluation for karyotype or fetal lung maturity as appropriate
   (4) Early delivery may be necessary
E. Neonates delivered from pregnancies in which IUGR has occurred are more likely to be subject to the following abnormalities than are normal neonates
   (1) Increased risk of death
   (2) Hypoxia, acidosis and hypercarbia
   (3) Meconium aspiration
   (4) Hypoglycemia
   (5) Hypothermia
   (6) Hypocalcemia

Premature Rupture of Membranes

98. Given a patient in the third trimester, the student will be able to define premature rupture of the membranes (PROM), make the diagnosis, and develop a plan of management.
A. Description
   (1) Rupture of the membranes prior to the onset of labor
      a) At or >37 weeks gestation (near term) – PROM
      b) Prior to 37 weeks gestation (pre-term) – PPROM
   (2) Etiology is unknown in the majority of cases
   (3) It is a major cause of premature labor and is, therefore, a major factor in increased maternal and perinatal morbidity and mortality
   (4) Overall incidence is approximately 8-12% of all pregnancies
   (5) Near term labor begins within 24 hours in 80% of patients with PROM. The latent period between PROM and the onset of labor is longer in preterm gestations.
   (6) In addition to premature labor, chorioamnionitis, abnormal presentations, and prolapse of the umbilical cord are common and significant complications
   (7) Low socio-economic groups are more likely to develop chorioamnionitis
B. Diagnosis – made by sterile speculum examination, testing of the fluid "pool" in the vaginal vault
   (1) pH is alkaline
   (2) "Fern" pattern when dried fluid is examined microscopically
   (3) Confirmed by ultrasound (oligohydramnios)
C. Management – depends upon gestational age
   (1) Term PROM – induce immediately or wait 24 hours to see if spontaneous labor occurs
   (2) Preterm PROM
      a) No digital cervical exams until patient in active labor
      b) Ultrasound – to ascertain gestational age, determine fetal presentation, presence of fetal anomalies, and amniotic fluid volume
      c) Fetal assessment – biophysical profile and NST
      d) Using sterile speculum, obtain cultures for Group B strep, GC, and chlamydia
      e) Fetal lung maturity determination
         (e. 1) May be possible to collect a vaginal pool sample of amniotic fluid
         (e. 2) Amniocentesis is optional for the culture of amniotic fluid and biochemical determination of fetal pulmonary maturity
            (e.2.1) If the fetal lungs are mature, induction of labor should be considered
            (e.2.2) If the fetal lungs are immature, treat expectantly encouraging adequate hydration, reduced physical activity, abstinence from intercourse, and observation for possible infection and consider steroids for fetal lung maturity
      f) Start antibiotics until Group B strep cultures are reported negative. If cultures are positive, complete treatment. In patients with Penicillin allergy – Cleocin.
      g) Prior to labor the patient should be watched carefully for signs of infection – fever, uterine tenderness, maternal leukocytosis, maternal and/or fetal tachycardia, and malodorous amniotic fluid
      h) In the event of infection, delivery should be expedited by the most appropriate manner. Antibiotic therapy should be instituted and continued postpartum in both mother and infant as indicated. Vaginal delivery appropriate; cesarean for obstetrical indications.
      i) Normal handling appropriate to gestational age and fetal presentation should occur once labor begins. Intrapartum antibiotics may be indicated.

Preterm Labor (PTL)

99. Given a patient complaining of painful uterine contractions prior to 37 weeks, the student will list the diagnostic procedures to ascertain whether the patient is in preterm labor, list the causes, and prepare a plan of management.
   A. Diagnosis based on evidence of sustained, rhythmic uterine activity and cervical change (effacement and/or dilation)
   B. Onset after 20 weeks gestation and before assumed fetal maturity (37 weeks)
   C. Causes
      (1) Usually unknown
      (2) May be associated with
         a) Genitourinary tract infection
         b) Chorioamnionitis
         c) Premature rupture of the membranes
         d) Maternal systemic disorders
         e) Uterine anomalies
         f) History of induced abortion
g) Uterine over-distention (e.g., multiple gestation, polyhydramnios)
h) Fetal death in utero
i) Congenital anomalies
j) Abruptio placentae
k) Intrauterine growth retardation

D. Prevention
(1) The cornerstone of prevention centers around risk assessment by providers with resultant educational efforts directed towards patient self-recognition of the signs and symptoms of PTL
(2) Patient identified with signs and symptoms of PTL should have frequent, perhaps daily, contact with resource persons
   a) Provider
   b) Outside monitoring agency
(3) Home uterine monitoring remains controversial relative to efficacy
(4) Experimental measures may prove efficacious, e.g. oncogenic fetal fibronectin

E. Management
(1) Maternal evaluation consisting of history, physical examination, vital signs and appropriate laboratory studies to determine possible etiology for the PTL. Treat etiology when indicated (example pyelonephritis).
(2) Fetal evaluation consisting of ultrasound and fetal heart rate monitoring
(3) Bed rest and hydration
(4) Tocolytic therapy should only be administered in the absence of contraindications
   a) Strong contraindications
      (a. 1) Chorioamnionitis
      (a. 2) Severe placental abruption
      (a. 3) Fetal distress
   b) Relative contraindications
      (b. 1) Fetal growth retardation
      (b. 2) Premature rupture of membranes
      (b. 3) Vaginal bleeding of undetermined etiology
      (b. 4) Other serious maternal disease
   c) Tocolytic agents
      (c. 1) Magnesium sulfate – few side effects. Respiratory depression may occur with overdose.
      (c. 2) Beta-agonists – side effects include hyperglycemia, tachycardia, hypotension and hypokalemia
         (c.2.1) Ritodrine – currently the only tocolytic approved by the FDC for tocolysis
         (c.2.2) Terbutaline
      (c. 3) Prostaglandin inhibitors (indomethacin) – fetal side effects may include premature close of ductus; neonatal complication, intraventricular hemorrhage
      (c. 4) Calcium channel blockers (nifedipine)

E. Delivery
(1) Delivery should occur in a hospital equipped to handle the preterm infant, usually a Level 2 or 3 hospital
(2) Minimize exposure to medications
(3) Cesarean section for obstetrical indications
(4) Immediate expert neonatal care

F. Prognosis for the infant depends on
(1) Gestational age at the time of delivery
(2) The presence or absence of birth trauma
(3) The presence of congenital anomalies
Postpartum Hemorrhage

100. The student will define postpartum hemorrhage and list the most common causes, including predisposing factors.

A. Definition
   (1) Early – loss of more than 500 cc of blood in first 24 hours after delivery
   (2) Delayed – loss of more than 500 cc of blood after 24 hours following delivery and prior to completion of the puerperium

B. Common causes
   (1) Uterine atony – predisposing factors include
      a) Overdistention of uterus
         (a. 1) Multiple pregnancy
         (a. 2) Hydramnios
         (a. 3) Fetal macrosomia
      b) Prolonged labor
      c) Precipitous labor
      d) Oxytocin stimulation
      e) High parity
   (2) Retained placenta
   (3) Lacerations of the uterus, cervix, vagina or perineum
   (4) Coagulation disorders – acute and chronic

101. The student will be able to write a management algorithm for postpartum hemorrhage.

A. General therapeutic measures
   (1) Establish baseline vital signs
   (2) Start intravenous line, 18 gauge or larger
   (3) Type and screen for possible blood product replacement
   (4) Evaluate uterine tone
   (5) Inspect the birth canal for lacerations
   (6) Manually explore the uterus for
      a) Placental fragments
      b) Lacerations
   (7) Replace blood volume – crystalloid, blood products

B. Specific therapeutic measures
   (1) Restore uterine tone
      a) Vigorous bimanual uterine compression (uterine massage)
      b) Administer uterotonics such as oxytocin, ergotamines, prostaglandins analogues (15-methyl-...\( \text{PGF}_{2a} = \text{carboprost} = \text{Prostin}/15\text{M}^{R} = \text{Hemabate}^{R} \)
         etc., 16, 16-dimethyl.\( \text{PGE}_{1} \) methylester = gemeprost = \text{Cervagem}^{R} \) etc.,
         sulprostone = \text{Nalador}^{R} \text{etc.}, and misoprostol = \text{Cytotec}^{R})
   (2) Repair lacerations
   (3) Remove placental fragments – uterine curettage
   (4) Consider surgical measures
      a) Hypogastric and/or uterine artery ligation in stable patients
      b) Hysterectomy
      c) Arterial embolization
Puerperal Fever

102. The student will be able to define puerperal fever, be knowledgeable about its causes and outline a plan of management.

A. Definition – temperature of 100.4 F (38.0 C) or higher, excluding first 24 hours, on at least two occasions occurring within the first 10 postpartum days

B. Causes
   (1) Endometritis – most common cause
      a) Etiologic factors
         (a. 1) Trauma to birth canal
         (a. 2) Chorioamnionitis
         (a. 3) Excessive number of digital exams
         (a. 4) Prolonged labor
         (a. 5) Cesarean delivery
         (a. 6) Poor nutrition
      b) Many organisms have been implicated in endometritis
         (b. 1) Klebsiella, bacteroides, group B streptococcus, peptococcus are common organisms associated with postpartum endometritis
         (b. 2) Tissue damage within the vagina, uterine cavity, or cesarean section scar form an excellent nidus for infection
      c) Signs or symptoms
         (c. 1) Fever
         (c. 2) Abdominal and uterine tenderness
         (c. 3) Foul lochia
         (c. 4) Leukocytosis
         (c. 5) Mass(es)
      d) Differential diagnosis
         (d. 1) PID/salpingitis
         (d. 2) Retained infected secundines
         (d. 3) Pelvic abscess
         (d. 4) Appendicitis
         (d. 5) Crohn’s disease
         (d. 6) Diverticulitis – rare
      e) Diagnostic studies
         (e. 1) CBC, blood cultures
         (e. 2) Cervical cultures – has little clinical value
         (e. 3) Endometrial cultures – unnecessary
      f) Management
         (f. 1) High dosage antibiotics, sometimes triple antibiotic therapy, is frequently needed for cure
            (f. 1. 1) Response to therapy should be carefully monitored and parenteral antibiotic therapy continued for 24-48 hours after patient has become afebrile
            (f. 1. 2) Progression of infectious process may lead to
               (f. 1.2.1) Pelvic cellulitis
               (f. 1.2.2) Thrombophlebitis
                  (f.1.2.2.1) Septic pelvic thrombophlebitis should be suspected if temperature continues to spike despite antibiotics
                  (f.1.2.2.2) Abscess or thrombophlebitis occurs in 2-4% of infections
            (f. 2) Ultrasound to rule out pelvic abscess if patient unresponsive to medical management
            (f. 3) Curettage if outflow obstruction or retained (infected) secundines are suspected
   (2) Urinary tract infection
Infected episiotomy or an infected laceration involving the perineum, vulva, or vagina
(4) Atelectasis
(5) Mastitis (see objective 104)
C. Management
(1) Appropriate culture and sensitivity – urine, wound, endometrium
(2) Appropriate antibiotics – obstetric infections tend to be of mixed flora, both aerobic and anaerobic bacteria require broad spectrum antibiotic coverage
(3) D&C if retained products of conception are suspected; ultrasound may be helpful
(4) Surgical drainage of abscesses when they are present and refractory to medical management
(5) Septic pelvic thrombophlebitis is generally a diagnosis of exclusion and is treated with IV heparin with or without antibiotic therapy

103. The student will describe a patient likely to develop puerperal mastitis.

A. More likely in a primiparous patient
B. Usually nursing
C. Usually 2-3 weeks postpartum
D. May have an increased incidence with weaning

104. Given a patient with mastitis, the student will list the signs and symptoms, name the usual etiologic organisms, and outline a plan of management.

A. Signs and symptoms
   (1) Localized tenderness
   (2) Localized erythema and induration
   (3) Localized hyperthermia
   (4) Often fissuring of nipple
   (5) Usually has systemic fever
B. Causative organism usually coagulase-positive Staphylococcus aureus or occasionally streptococcus
C. Management
   (1) In the majority of instances, encourage the continuation of breast-feeding unless the infectious process is suppurative
   (2) Apply moist heat and prescribe an analgesic
   (3) Begin appropriate antibiotic therapy (usually a penicillinase resistant penicillin)
   (4) Observe frequently to detect abscess formation
   (5) If abscess present, incise and drain in addition to obtaining a culture and initiating antibiotics

Maternal and Perinatal Morbidity and Mortality

105. The student will define fetal, neonatal, post-neonatal, infant and maternal death, and perinatal death rate and list the causes of infant mortality.

A. Fetal death
   (1) Abortion – death of a fetus at earlier than 20 weeks gestation and/or weighing less than 500 grams
   (2) Stillbirth – death of a fetus of 20 or more weeks gestation and/or weighing more than 500 grams
   (3) Fetal death rate is the number of fetal deaths per 1,000 births
B. Neonatal death
   (1) Death of a live-born infant within the first 28 days of life
   (2) The neonatal death rate is the number of neonatal deaths per 1,000 live births
C. Perinatal death rate – the sum of stillbirths and neonatal deaths per 1,000 total births
D. Post-neonatal death – death of a live-born infant from 29 days to 1 year of age
E. Infant death
   (1) Death of a live-born infant during the first year of life. In Michigan, an infant is considered live-born if it has any of the following, regardless of weight, length, or gestational age
      a) A heartbeat
      b) Respirations
      c) Voluntary muscle activity
      d) Cord pulsation
   (2) Infant mortality rate – number of infant deaths per 1,000 live births
      a) In U.S. in 1998 – 7.3 infant deaths per 1,000 births – 22nd among industrial countries
      b) In Michigan in 1998 – 8.2 infant deaths per 1,000 live births
      c) U.S. Caucasian infant mortality rate in 1998 – 6.0/1,000 live births
      d) U.S. African American infant mortality rate in 1998 – 13.8/1,000 live births
      e) Although both the black and white infant mortality rates in the U.S. have dropped dramatically, the African American infant mortality rate has consistently remained more than twice that of Caucasians
   (3) Causes of infant deaths
      a) Major causes – account for approximately 90% of infant deaths
         (a. 1) Pre-term labor and delivery and/or low birth weight infants
         (a. 2) Congenital anomalies
         (a. 3) Sudden infant death syndrome (SIDS)
      b) Other causes – account for approximately 10% of infant deaths
         (b. 1) Hypoxia, anoxia
         (b. 2) Infections
         (b. 3) Trauma (e.g., accident, fire, poisoning, child abuse)
         (b. 4) Miscellaneous
   (4) Risk factors associated with high infant mortality rates
      a) Low birth weight (<2500 gm)
         (a. 1) A low birth weight infant is 40 times more likely to die in the first four weeks of life than a normal birth weight infant
         (a. 2) Low birth weight infants that survive face greater risks of birth defects, developmental disabilities, mental retardation, cerebral palsy, seizure disorders, vision and hearing impairment, and autism
      b) Race
      c) Socioeconomic status — poverty is strongly related to high infant mortality rates
      d) Marital status – single mothers are 2.6 times more likely to have an infant death than married women
      e) Substance abuse – tobacco, alcohol, cocaine and heroin use all contribute to low birth weight infants and increase infant mortality rates
      f) Sexually transmitted disease – related to chorioamnionitis, pre-term labor and low birth weight infants
      g) Inadequate prenatal care – 6% of all pregnant women and 11% of African American pregnant women receive little or no prenatal care
F. Maternal death
   (1) Death of a woman during pregnancy, childbirth, or in the 42 days of puerperium, irrespective of the duration or site of the pregnancy (includes ectopic pregnancy), from any cause related to or aggravated by the pregnancy or its management
   (2) Direct maternal death – due to a direct complication of the pregnancy itself
(3) Indirect maternal death – due to a complication not specific to pregnancy but aggravated by the physiologic changes associated with pregnancy
(4) Non-maternal death – death from accidental or incidental causes unrelated to the pregnancy (e.g., automobile accident)

106. The student will list the major causes of obstetrically-related maternal deaths and indicate why there has been a decrease in incidence.

A. Hemorrhage
   (1) The availability of blood transfusion
   (2) Hospital delivery
   (3) Anticipation of and preparation for excessive blood loss in those conditions related to pregnancy that predispose to this problem are of vital importance in reducing morbidity and mortality

B. Hypertensive disorders of pregnancy
   (1) Improved prenatal care
   (2) Hospitalization with appropriate evaluation and therapy
   (3) Early delivery

C. Infection
   (1) Aseptic technique
   (2) Antibiotics
   (3) Hospital delivery

D. Anesthesia
   (1) Reduction in the use of general anesthesia in vaginal deliveries and cesarean sections
   (2) Careful attention to the effects of anesthetic agents and procedures on the pregnant woman with complications requiring operative procedures for delivery
Unit V

GYNECOLOGY

Adolescent Gynecology

107. The student will be aware of the special problems affecting adolescents and the role of the obstetrician/gynecologist in their care.

A. Physiologic changes (see objectives 161 and 162)
B. Psychosocial development
   (1) Often times asynchronous intellectual, physiologic and emotional development
   (2) Major issues
      a) Individual identity
      b) Social and physical intimacy with others
      c) Future plans and life choices
   (3) Peers become the primary social influence
   (4) Adolescents often engage in risk taking, limit testing and experimentation that may jeopardize their well-being
C. The doctor-patient relationship
   (1) Adolescents often have increased needs for privacy, confidentiality and involvement in decision-making
      a) Although adolescents may be encouraged to involve their parents in their health care, it should be understood by the doctor, adolescent and parents that the same confidentiality afforded adult patients will be afforded the adolescent patient
      b) There needs to be a clear understanding, however, between the doctor and patient as to what circumstances (e.g., a life-threatening emergency) may warrant a breach in confidentiality
   (2) Doctors should be aware of state laws regarding age of majority, emancipation, and parental consent to certain types of medical care (e.g., voluntary abortion, contraception, obstetric care)
D. Preventive health care
   (1) Annual pelvic exams and Pap smears in sexually active adolescents and those age 18 or older
      a) Adolescents may be reluctant to have pelvic exams because of fear or modesty concerns (see objective 4)
         (a. 1) A thorough explanation of the exam with opportunity to have a companion present may lessen anxiety
         (a. 2) Use of comfortable equipment, especially specula, is recommended
         (a. 3) For those who refuse an exam or who are uncooperative, other strategies may be used (e.g., ultrasound, patient participation in the exam process)
   (2) Screening for immunity to rubella and immunization updates of all adolescents are recommended as well as screening for STD's in sexually active teens
   (3) Education should be a key component of adolescent health care
      a) Reading material geared to adolescents at easily understood reading level
      b) Audio-visual material may be a better source of information
E. Common problems
   (1) Menstrual problems
   (2) Vaginal discharge
   (3) Physiologic development
   (4) Nutritional problems
F. Major health issues

(1) STD's
   a) Adolescents are ten times more likely to develop PID than adult population and many will develop tubo-ovarian abscesses
   b) The incidence of *C. trachomatis*, *N. gonorrhoeae*, and most STD's is rising in adolescents

(2) Contraception
   a) Choice of contraceptive method should take into consideration patient understanding and compliance, as well as possibility of providing protection from other problems (e.g., STD's, HIV)
   b) Patient fears about effects of contraceptives and future fertility should be discussed

(3) Pregnancy (see objective 54)

(4) Sexual abuse and assault (see objectives 159 and 216)
   a) Women under the age of 24 are at greatest risk of involuntary sexual activity (e.g., incest and sexual assault, including date rape)
   b) Signs of possible sexual abuse
      (b. 1) Recurrent abortions or pregnancies, especially in very young adolescents
      (b. 2) Sexual "acting out"
      (b. 3) Frequent STD's
      (b. 4) Substance abuse
      (b. 5) Skipping school or fear of going home
      (b. 6) Runaways
      (b. 7) Recurrent urinary tract infections
      (b. 8) Genital or rectal itching
      (b. 9) Perineal warts
      (b. 10) Appetite or sleep disorders and/or other psychosomatic symptoms
      (b. 11) Multiple somatic complaints out of proportion to physical findings

Genetics

108. For each of the following categories of chromosomal abnormalities, the student will list each typical syndrome by designating its karyotype, phenotypic characteristics, and associated diagnostic tests.

A. Sex-chromosomal aneuploidy – older data appears unduly pessimistic, particularly in reference to intellectual and social functioning
   (1) Turner syndrome
      a) Phenotypic characteristics
         (a. 1) Short stature
         (a. 2) Short or webbed neck
         (a. 3) Broad chest with widely separated nipples
         (a. 4) Failure of normal secondary sexual development
         (a. 5) Amenorrhea
         (a. 6) High arched palate
         (a. 7) Low birth weight
         (a. 8) Puffy hands and feet at birth
         (a. 9) Cubitus valgus
         (a. 10) Lymphedema, congenital
         (a. 11) Cystic hygroma
         (a. 12) Low posterior hairline
         (a. 13) Increased number of pigmented nevi
         (a. 14) Hypertension, diabetes mellitus, and osteoporosis are common in persons with this disorder
b) Laboratory tests
   (b. 1) Karyotype – 45,XO
   (b. 2) Estrogen deficiency
   (b. 3) Elevated pituitary gonadotropins

(2) Klinefelter syndrome
a) Phenotypic characteristics may include
   (a. 1) Tall, eunichoid appearance
   (a. 2) Testicular dysgenesis (small testes)
   (a. 3) Gynecomastia
   (a. 4) Mental retardation – rare
   (a. 5) Behavioral changes
b) Laboratory tests
   (a. 1) Karyotype – 47,XXY
   (a. 2) Azospermia or oligospermia
   (a. 3) Elevated pituitary gonadotropins

(3) Triple X (XXX) syndrome
a) Phenotypic characteristics may include
   (a. 1) Normal stature
   (a. 2) Mild mental handicap
   (a. 3) Normal reproductive capacity
   (a. 4) Premature menopause
b) Laboratory tests – karyotype – 47,XXX

(4) XYY syndrome
a) Phenotypic characteristics may include
   (a. 1) Tall stature
   (a. 2) Behavioral changes
   (a. 3) Normal reproductive capacity
b) Laboratory test – karyotype – 47,XYY

B. Autosomal aneuploidy – the risk of giving birth to an infant with an autosomal aneuploidy, except trisomy 16, increases with advancing maternal age; 1/46 over 45 years of age

(1) Trisomy 21 (Down syndrome)
  a) Phenotypic characteristics
     (a. 1) Varying degrees of mental retardation
     (a. 2) Habitually open mouth with protruding tongue
     (a. 3) Oblique palpebral fissures with inner epicanthic folds
     (a. 4) Flat nasal bridge
     (a. 5) Simian palmar creases
     (a. 6) Low set ears
     (a. 7) Hypotonia and lack of moro reflex
     (a. 8) Clinodactyly of 5th finger
     (a. 9) Epicanthal folds
     (a. 10) Brushfield spots
  b) Laboratory tests
     (b. 1) Karyotype – 47 + 21. 5% of Down syndrome is due to translocation of a segment of chromosome 21 and another chromosome; in these cases parental karyotyping is necessary
     (b. 2) In a significant number of cases, the extra chromosome is of paternal origin
     (b. 3) Low MSAFP – increased association, should not be used as a substitute for amniocentesis
     (b. 4) Ultrasound assessment, under optimal circumstances, may identify up to 70% of affected fetuses, some of which may show a nuchal fold

(2) Trisomy 13 (Patau syndrome), 1/8000 live births
  a) Phenotypic characteristics
     (a. 1) Low birth weight
     (a. 2) Cleft lip and palate
109. The student will be familiar with the genetic abnormalities that affect the genitalia and will designate the karyotype, phenotype, and diagnostic characteristics of each.

A. Androgen insensitivity (testicular feminization)
   (1) Karyotype – 46,XY
   (2) Syndrome due to partial or complete lack of testosterone receptors
      a) Syndrome due to partial or complete lack of intracellular androgen receptors
      b) X-linked recessive disorder
   (3) Phenotype – female
      a) Scant axillary and pubic hair
      b) Absent uterus, foreshortened vaginal pouch
      c) Testes are intra-abdominal or inguinal – should be removed due to potential for malignant transformation
      d) Normal female external genitalia
      e) Pale areolae of breast
   (4) Primary amenorrhea

B. Gonadal dysgenesis with normal karyotype
   (1) Karyotype – 46,XX or 46,XY
   (2) Inheritance – variable
   (3) Phenotype – female
      a) Delayed secondary sexual development
      b) Normal internal and external genitalia except for streak ovaries
   (4) Primary amenorrhea

C. Adrenogenital syndrome in female
   (1) Karyotype – 46,XX
   (2) Autosomal recessive inheritance
   (3) Phenotype – female (may appear to be male or genitalia may be ambiguous at birth)
      a) Due to one of several enzymatic defects of adrenal cortex resulting in decreased cortisol production, increased ACTH, adrenal cortical hyperplasia, and excess androgen production
      b) Clitoral hypertrophy
   (4) Depending upon the specific enzyme deficiency there is an elevation of the corresponding metabolite and/or substrate
   (5) Corrected by adrenocorticoid steroid replacement
Infections

Human Immunodeficiency Virus Infections

110. Given a patient with an HIV infection, the student will understand the clinical implications of the disease and its impact on the patient's reproductive health.

A. Pathophysiology – HIV is a retrovirus (RNA virus) that infects cells with the CD4+ antigen, macrophages, cell of the central nervous system, and cells of the placenta. Infection leads to progressive debilitation of the immune system and renders the infected individual susceptible to opportunistic infections and neoplasias.
(1) Between initial infection and development of acute immune response (3-12 weeks) is called "Acute Retroviral Syndrome" with symptoms occurring in 30-50% of infected patients
(2) Latent period with decline in viremia from sequestration of HIV to lymph nodes may last 6-8 years. Later, with depletion of CD4 lymphocytes, HIV-1 infection starts and later progresses to AIDS
(3) After seroconversion, the time period until the diagnosis of AIDS may range from 3 years to greater than 10 years. Younger persons develop AIDS at a slower rate.
(4) Once AIDS develops, median survival rate is 12.5 months with a 5 year survival rate of 3.4%
(5) Plasma viremia persists regardless of the stage of diseases
(6) Pathogenesis and natural history of HIV-1 infection is closely linked to viral load. Increase of plasma HIV-1 RNA is believed to be a strong predictor of rapid progression to AIDS.
(7) Monocytes/macrophages are important as reservoir of infection and widespread of HIV-1 to CNS, gut, etc.

B. Diagnosis
(1) HIV – ELISA testing followed by Western blot confirmation
(2) AIDS
a) An HIV-infected individual with one of several specific opportunistic infections
   (a. 1) Disseminated coccidiomycosis
   (a. 2) Histoplasmosis
   (a. 3) Any disseminated mycobacterial disease other than M. tuberculosis
   (a. 4) Pulmonary or extra pulmonary M. tuberculosis infarction
   (a. 5) Neoplasia
      (a.5.1) Kaposi sarcoma
      (a.5.2) Lymphoma of the brain
      (a.5.3) Other non-Hodgkin lymphoma of B-cell subtype
   (a. 6) Dementia encephalopathy or wasting syndrome
b) Without laboratory evidence of HIV infection, in the absence of immune deficiency, the following indicate AIDS
   (b. 1) Candidiasis of the esophagus, trachea, bronchi or lungs
   (b. 2) Extrapulmonary cryptococcus
   (b. 3) Cryptosporidiosis with diarrhea >1 month
   (b. 4) Herpes simplex infections affecting a patient >1 month
   (b. 5) CMV infection for >1 month
   (b. 6) Kaposi sarcoma in a patient <60 years old
   (b. 7) Pneumocystis carinii pneumonia
   (b. 8) Progressive multifocal leukoencephalopathy (PML)
   (b. 9) Toxoplasmosis of brain
C. Transmission
(1) Sexual activity
   a) Homosexual
   b) Heterosexual – roughly 33% of women with AIDS have contracted the disease by this route

(2) Parenteral exposure to blood
   a) Intravenous drug use – roughly 52% of women with AIDS have contracted it by this route
   b) Blood transfusion – currently the risk of contracting AIDS from a single unit of blood is 1/225,000, risk continues to decrease
   c) Occupational exposure
   d) There is no evidence of transmission through casual contact, water, food or environmental surfaces
   e) Perinatal transmission

D. HIV and Pregnancy
(1) Pregnancy may influence the course of HIV-1 infection resulting in marked postpartum morbidity
(2) No difference has been observed in the rates of clinical and immunologic deterioration between pregnant and non-pregnant HIV-infected patients
(3) Low CD4 cell counts and increasing viral load are predictive of the development of serious infections during pregnancy (as in non-pregnant patients)
(4) Rates of preterm birth, low birth weight and pregnancy complications in asymptomatic HIV-infected women are not different from non-HIV-infected pregnant women
(5) The rate of perinatal transmission
   a) 15-30% in Europe and USA
   b) 25-40% in developing countries
   c) Research use of zidovudine (AZT) has reduced perinatal transmission by two-thirds in select patient groups

(6) Management
   a) Informed reproductive choice
   b) Psychosocial support
   c) Screening for other sexually transmitted diseases such as syphilis, gonorrhea, chlamydia, and hepatitis B. Screen also for TB.
   d) Hepatitis B, pneumococcal, and influenza vaccines
   e) Administer zidovudine (AZT) prenatally, at time of delivery, and to infant for first six weeks according to CDC protocol, if patient consents to treatment
   f) Monitor CD4 cell counts
      (f. 1) If count <500/mm3, antiviral therapy should be initiated
      (f. 2) If count <200/mm3, P. carinii prophylaxis should be instituted
      (f. 3) If AZT prophylaxis is being used to prevent perinatal transmission, CD4 counts should be done per protocol

(7) Delivery – fetal scalp electrodes and sampling are to be avoided in order to minimize contact between fetal blood and infected maternal vaginal secretions

E. HIV and Gynecology
(1) Contraception
   a) Estrogen and progesterone can affect immune function
   b) Use of condoms still needs to be addressed as a barrier to transmission of HIV
   c) IUD – patients with decreased immune function may be at risk for IUD-associated infections

(2) Vaginal moniliasis – recurrent vaginal moniliasis is common. If topical anti-fungal therapy fails, parenteral therapy should be used.
(3) Immunocompromise may justify inpatient management of pelvic inflammatory disease
F. Physician behavior
   (1) Treat every patient as infected, infective
   (2) Take precautionary steps in handling needles, blood and other bodily fluids
   (3) Observe universal precautions – use of gloves, masks and goggles and other protective garb

G. Changing concepts in the management of HIV disease
   (1) Viral load levels correlate well with disease progress, response to treatment better than CD4 lymphocyte count. This is done by quantification of HIV-1 RNA.
   (2) Combination treatment using two reverse transcriptase inhibitor with or without protease inhibitor is the current method of treating patients with progressive illness. There is the ability to suppress virus to very low levels using combination therapy.
   (3) Ability to reduce maternal-fetal transmission

Sexually Transmitted (Venereal) Disease (STD's)

111. The student will be able to list the classic venereal diseases and will be knowledgeable about other sexually transmitted diseases other than HIV.

A. Classic venereal diseases (reportable by law to the local health department)
   (1) Chlamydial infections
   (2) Gonococcal disease
   (3) Syphilis
   (4) Chancroid
   (5) Granuloma inguinale
   (6) Lymphogranuloma venereum

B. Other sexually transmitted diseases
   (1) Trichomoniasis
   (2) Candidiasis
   (3) Bacterial vaginosis (formerly Gardnerella vaginalis vaginitis)
   (4) Human papillomavirus infection – condyloma acuminata
   (5) Herpes simplex virus infection
   (6) Hepatitis B, Hepatitis C
   (7) AIDS
   (8) Molluscum contagiosum
   (9) Mycoplasma and ureaplasma infections
   (10) Cytomegalovirus infections
   (11) Group B streptococcus infection
   (12) Scabies
   (13) Phthirus pubis (pubic lice)

112. Given a patient with a chlamydial infection, the student will discuss the epidemiology, clinical presentation, diagnosis and treatment.

   A. Epidemiology – the agent is Chlamydia trachomatis (obligate intracellular gram negative organism)
   B. Clinical presentation – the endocervix is the primary site of infection in women
      (1) The majority of cases of mucopurulent cervicitis are caused by chlamydia
      (2) Approximately one in five cases of acute PID is associated with C. trachomatis
      (3) Chronic asymptomatic chlamydial may lead to salpingitis, infertility, ectopic pregnancy, chronic pelvic pain, and acute urethral syndrome
      (4) Vertical transmission leading to conjunctivitis and/or pneumonia in the newborn is possible
C. Diagnosis
(1) The use of tissue culture is the most sensitive method of diagnosis
(2) Indirect immunofluorescent staining is also used
(3) Antigen detection by enzyme-linked immunoassay, direct fluorescent antibody staining, nucleic acid hybridization, and nucleic acid amplification are other tests

D. Treatment
(1) Annual screening of high risk women is warranted
(2) Chlamydia control programs have included presumptive treatment of individuals at high risk for infection, active screening and partner notification
(3) Doxycycline, erythromycin, and Azithromycin dihydrate are commonly used medications. Ofloxacin and Sulfisoxazole are alternative agents.
(4) Azithromycin may be used as 2 gram single dose

113. Given a patient with gonorrheal cervicitis or vulvovaginitis, the student should be able to make the diagnosis, outline a differential diagnosis, and be knowledgeable about appropriate treatment.

A. Clinical presentation – Neisseria gonorrhoea is a gram negative diplococcus that may be detected as intracellular on gram stain
(1) Transmission of gonorrhea occurs almost exclusively by sexual contact (there is vertical transmission of mother to infant)
(2) Gonorrhea usually presents as a mucosal disease; pharyngitis, cervicitis, urethritis, gonococcal ophthalmia. Common symptoms include mild dysuria, pelvic pain, abnormal bleeding
(3) There may be local extension, endometritis, salpingitis, peritonitis, oophoritis, or distant infections dermatitis, enteritis, endocarditis, meningitis, perihepatitis, tenosynovitis

B. Diagnosis
(1) The gram stain is an inexpensive rapid test but not sensitive
(2) Chocolate agar media is a common formulation for obtaining a culture
(3) Genetic probe techniques based on DNA hybridization are used successfully in many clinics

C. Treatment
(1) The guidelines for treatment are updated regularly by the CDC
(2) Increasing frequency of resistant strains to penicillin and tetracyclines has led to the need for constant surveillance
(3) Single dose therapy has a high demonstrated cure rate
   a) Ceftriaxone 125 mg IM
   b) Ciprofloxacin 500 mg PO
   c) Cefixime 25 mg IM
   d) Ofloxacin 400 mg PO
   e) Treatment of Chlamydia trachomatis should be done concomitantly
   f) Patients with gonorrhea should be screened for syphilis
   g) Quinolones and tetracycline should not be used in pregnancy
   h) Test of cure is no longer recommended for patients with uncomplicated GC who received CDC recommended regimens
   i) Ceftriaxone is the drug of choice for disseminated gonococcal infections

114. Given a patient with syphilis, the student will describe the stages of the disease, the means of diagnosis, and the significance of treponemal and non-treponemal tests.

A. Stages of syphilis
(1) Primary syphilis – two weeks to three months after exposure a painless chancre with a raised firm edge usually appears at the site of entry of the spirochete
The student will list the causative agent, a diagnostic test and treatment for each of the following three venereal diseases:

A. Chancroid is caused by *Hemophilus ducreyi*
   1. Clinically it presents as an ulcerative lesion with lymphadenopathy (Bubo)
   2. The painful, tender bubo develops approximately one week after the initial lesion
   3. The diagnosis is made by Gram's stain culture and clinical presentation
   4. Treatment is Azithromycin 1 gram single dose or Ceftriaxone 250 mg IM or Erythromycin 500 mg qid x 1 week

B. Granuloma inguinale (Donovanosis) caused by *Calymmatobacterium granulomatis*. It presents as a subcutaneous papule on the labia minora, fourchette or labia majora.
   1. The lesions are usually beefy, red and spread by extension
   2. Demonstration of the characteristic Donovan bodies in smears prepared from active lesions provide the simplest method of diagnosis
   3. Treatment for Donovanosis includes tetracycline 500 mg qid, doxycycline 100 mg bid, or Bactrim® DS twice daily

C. Lymphogranuloma venereum is caused by *Chlamydia trachomatis* (L-1, L-2, L-3 serovars)
The disease progresses through three stages including ulcer, regional lymphadenopathy, and systemic symptoms including fever, headache and myalgia.

The long-term sequelae includes multiple draining fistulae, rectal stricture, chronic ulceration and elephantiasis of external genitalia.

Tetracycline is treatment of choice.

116. The student will describe the causative agent, the signs and symptoms, a diagnostic test, and therapy for each of the following sexually transmitted diseases.

A. Trichomoniasis
   (1) Agent – *Trichomonas vaginalis*
   (2) Signs and symptoms – thin, frothy, malodorous green discharge associated with pruritus, burning, or dyspareunia. A "strawberry cervix" is highly suggestive.
   (3) Test – flagellated protozoans on saline wet mount
   (4) Management
      a) Metronidazole
      b) Evaluate and treat partner(s) as indicated – 60% recurrence if partner untreated

B. Candidiasis
   (1) Agent – *Candida albicans*
   (2) Signs and symptoms – cottage cheese like, thick discharge, typically with associated pruritus and/or dyspareunia
   (3) Test – mycelia and spores on KOH wet mounts; to culture use Nickerson or Sabaroud's media
   (4) Management – triazoles, imidazoles or nystatin or other anti-fungal agents

C. Bacterial vaginosis
   (1) Agents – *Gardnerella vaginalis; Mobiluncus* species (mixed bacterial organisms)
   (2) Signs and symptoms – gray, malodorous, homogenous discharge
   (3) Tests
      a) "Clue cells" or epithelial cells with embedded bacteria along the epithelial borders noted on saline wet mount
      b) "Whiff test" – release of amines (fishy) odor when KOH applied to sample of vaginal discharge
   (4) Management
      a) Antibiotics such as metronidazole, clindamycin, or augmentin are used orally or intravaginally
      b) Treatment of partner(s) in recurrent cases might be considered

D. Herpes simplex viral infection
   (1) Agent – *Herpes virus hominis*, type II (type I in 15%)
   (2) Signs and symptoms – vesicles (usually vulvar) which tend to ulcerate, resulting in acute pain, edema, and often urinary retention
      a) Infection of vagina and cervix may coexist and cause fewer symptoms
      b) Primary infection tends to cause fever, severe local reaction, and inguinal lymphadenopathy
      c) Recurrent infection takes place at sites of primary lesions and is less intense and prolonged
      d) Herpes infection in pregnancy (see objective 83)
   (3) Tests
      a) Herpes virus culture
      b) Tzanck smear – multinucleated giant cells and epithelial cells with intranuclear inclusion bodies (non-specific)
      c) Monoclonal antibodies
   (4) Management
      a) Symptomatic treatment of pain and urinary retention
      b) Antiviral agents (e.g., acyclovir)
c) Treat secondary infection with antibiotics

d) No curative therapy is currently available

E. Human papillomavirus infection

(1) Agent – Human Papilloma Virus (over 80 types)

(2) Signs and symptoms
   a) Warty growths on the genital or non-genital tissue. Many patients are asymptomatic
   b) Types 6 and 11 are associated with condyloma
   c) Types 16, 18, 31 and 33 are associated with neoplasia

(3) Management includes podophyllin, cryotherapy, trichloroacetic acid, laser surgery, cautery, or intralesional interferon

F. Hepatitis B

(1) Agent – Hepatitis B, a DNA virus

(2) The virus is transmitted almost exclusively through contact with body fluids that contain the virus. This includes health care workers’ exposure, sexual contact, infants of mothers with hepatitis B.

(3) Clinical presentation – weakness, malaise, nausea, vomiting, anorexia, jaundice

(4) Management
   a) No specific therapy is available for the acute hepatitis patient
   b) Interferon may be beneficial in chronic hepatitis patients
   c) All pregnant women should be screened for hepatitis B
   d) All high risk individuals should have hepatitis B virus vaccine

G. Molluscum contagiosum

(1) Agent – Pox virus

(2) Clinical presentation – firm papules singly or in groups, pink, dome shaped, and umbilicated; usually painless

(3) Molluscum contagiosum in children is usually spread by non-sexual contact. However, sexual abuse should be considered.

(4) Management – excision of nodule with sharp dermal curette under local anesthetic followed by treatment of base with chemical or thermal ablation

H. Mycoplasma/ureaplasma infections

(1) Agent – Ureaplasma urealyticum; Mycoplasma hominis

(2) Clinical presentation – mycoplasmas and ureaplasmas have been associated with spontaneous abortion, premature births, premature rupture of membranes, and chorioamnionitis

(3) Management
   a) There is weak evidence to support the treatment of patients with habitual abortion, premature labor, and infertility. More investigation is needed.
   b) Tetracycline, or a derivative, is the drug of choice for both M. hominis and ureaplasma
   c) Erythromycin is not active against M. hominis
   d) Clindamycin is moderately active against ureaplasmas

I. Scabies

(1) Agent – Sarcoptes scabies, a mite

(2) Clinical presentation
   a) Itching, rash usually involving elbows, axillae, buttocks, genitals
   b) The organism burrows under the skin

(3) Management
   a) Scabicides are applied to all areas of the body. Family members and sexual contact(s) should also be treated.
   b) Lindane should not be used in pregnancy

J. Pediculosis pubis

(1) Agent – Phthirus pubis, a crab louse

(2) Clinical presentation
   a) Intense itching is believed to be due to allergic sensitization
   b) Visualization of lice nits with a magnifying glass is diagnostic
(3) Treatment
   a) Lindane shampoo
   b) Permethrin
   c) Clothing or bedding should be washed or dry-cleaned
   d) All contacts must be treated simultaneously

Pelvic Inflammatory Disease

117. The student will contrast the several varieties of pelvic inflammatory disease (PID) by listing the organism(s) usually responsible, the primary site, and the mode of spread of the infection.

A. Pelvic inflammatory disease refers to the clinical syndrome among women resulting from infection involving the uterus, fallopian tubes, ovaries, peritoneal surfaces and/or contiguous structures.

B. Although any pelvic infection may be associated with pregnancy, the presence or absence of a recent pregnancy determines important considerations about the infectious process

C. Non-pregnancy associated PID
   (1) Gonorrheal
      a) Organism – *Neisseria gonorrhoeae*
      b) Primary site of infection usually cervical glands but may be Bartholin or Skene's glands, anus and/or pharynx
      c) Spread is via mucous membranes, *i.e.*, endometrium (transient), salpinges, ovaries, and pelvic peritoneum
      d) Infection passes from lower to upper reproductive tract causing tubal and tubo-ovarian infection which may, in turn, result in pelvic abscess

   (2) Chlamydia
      a) Organism – *Chlamydia trachomatis*
      b) Primary site – cervical glands and urethra. Also pharynx and rectum in women engaging in oral or anal sex.
      c) Spread to salpinges is common, but vaginal and endometrial infection rare

   (3) Non-gonorrheal – other
      a) Organism – polymicrobial
         (a. 1) Anaerobes (especially bacteroides, peptostreptococci)
         (a. 2) Aerobes (especially enterobacteria, streptococci, mycoplasma/ureaplasma)
      b) Mode of spread through interstitial connective tissue, resulting in parametritis, peri-salpingitis. Infection may be associated with IUD use.
      c) This infection tends to be associated with abscess formation and infertility.

   (4) Tuberculous
      a) Organism – *Mycobacterium tuberculosis*
      b) Primary site almost always extra-genital, usually pulmonary. Accounts for less than 5% of PID in U.S.
      c) Mode of spread is rarely ascending – usually hematogenous to fallopian tubes, then endometrium, ovaries, and peritoneum
      d) Usually chronic – sometimes an unexpected finding on infertility evaluation, particularly in certain immigrant populations
      e) Diagnosis by evidence of pulmonary tuberculosis and positive culture of endometrial tissue obtained by biopsy or curettage

D. Post-abortal and puerperal PID (see objective 102)
   (1) Organism – polymicrobial
      a) Anaerobes (especially bacteroides, peptostreptococci, and clostridia)
      b) Aerobes (especially enterobacteria, streptococci, chlamydia, mycoplasma/ureaplasma)
   (2) Mode of spread is hematogenous and lymphogenous from nidus of infection in endometrium to parametrium and peritoneum
118. Given a patient with acute PID, the student will list the signs and symptoms, establish a differential diagnosis, and be knowledgeable about the diagnostic tests associated with this disorder.

A. Signs and symptoms – onset often occurs during or immediately following menses
   (1) Lower abdominal (usually bilateral) pain that increases with movement
   (2) Dyspareunia
   (3) Dysuria
   (4) Few gastrointestinal symptoms
   (5) Vaginal discharge
   (6) Fever, chills, tachycardia
   (7) Lower abdominal tenderness and guarding
   (8) Pelvic tenderness on bimanual examination and cervical deflection

B. Differential diagnosis
   (1) Appendicitis
   (2) Ruptured tubal pregnancy
   (3) Urinary tract infection (cystitis, urethritis, pyelonephritis)
   (4) Ruptured ovarian cyst or adnexal torsion
   (5) Endometriosis (ruptured endometrioma)
   (6) Hemorrhagic follicular cyst or corpus luteum
   (7) Diverticulitis
   (8) Intestinal obstruction

C. Diagnostic tests
   (1) Smear and culture of cervical discharge and anus for gonorrhea, chlamydia, aeroebes, and anaerobes
   (2) Complete blood count
   (3) Erythrocyte sedimentation rate
   (4) Blood culture, if severely ill
   (5) Pelvic ultrasound if abscess suspected
   (6) Laparoscopy may be necessary to establish the diagnosis
   (7) Additional tests for post-abortal and puerperal infections
      a) Serum electrolytes, BUN, creatinine
      b) Coagulation studies
      c) Chest xray

119. Given a patient with acute PID, the student will outline a plan of management and be knowledgeable about the possible sequelae of this disorder.

A. Management
   (1) Antibiotics
      a) Initially treat with the antibiotic known to be effective against the likely organism (Refer to CDC treatment guidelines)
      b) Subsequent therapy depends upon the response obtained and the culture and sensitivity results
      c) Outpatient management for selected cases necessitates appropriate follow-up
   (2) Bed rest
   (3) Surgery is indicated under the following circumstances:
      a) To remove an intrauterine device if unable to do so in an ambulatory setting
      b) Post-abortal or puerperal
         (b. 1) Remove nidus of infection by D&C
         (b. 2) If infection is severe, hysterectomy may be necessary
      c) Pelvic abscess
         (c. 1) Acute rupture necessitates patient stabilization, initiation of antibiotic therapy, then prompt exploration and drainage
         (c. 2) If unruptured and unsatisfactory response to antibiotic therapy
(c.2.1) Drainage by CT guided needle
(c.2.2) Drainage by posterior colpotomy if abscess is fluctuant and pointing in cul-de-sac
(c.2.3) If patient is acutely ill and abscess cannot be drained from below, then laparotomy and surgical drainage are indicated. Total abdominal hysterectomy and bilateral salpingo-oophorectomy may be needed.

(4) Treat partner(s)

B. Sequelae
(1) Acute salpingitis and/or oophoritis (recurrent episode)
(2) Parametritis (post-abortal and puerperal)
(3) Peri-salpingitis
(4) Hydrosalpinx/pyosalpinx
(5) Pelvic adhesions
(6) Tubo-ovarian abscess
(7) Septicemia
   a) Gonorrheal – arthritis
   b) Post-abortal and puerperal infection
      (b. 1) Septic (endotoxin) shock
      (b. 2) Disseminated intravascular coagulation
      (b. 3) Sterile or septic thrombophlebitis or thromboemboli
      (b. 4) Acute renal failure
(8) Chronic PID – repeated or persistent infection which significantly damages the tubes, ovaries, and support structures of the uterus with resulting adhesions
   a) Associated conditions
      (a. 1) Recurrent acute PID
      (a. 2) Infertility
      (a. 3) Ectopic pregnancy
   b) Signs and symptoms – same as acute PID with addition of
      (b. 1) Recurrent fever
      (b. 2) Persistent pelvic mass or abscess formation
      (b. 3) Intestinal obstruction
   c) Diagnostic tests – same as with acute PID with emphasis on diagnostic ultrasound and diagnostic laparoscopy
   d) Differential diagnosis – same as acute PID
   e) Management – surgically oriented, bearing in mind patients desire for future childbearing

Urethritis

120. The student will define infectious urethritis and distinguish it from urethral syndrome.

A. Infectious urethritis is inflammation of the urethra secondary to a bacterial or viral etiology
(1) Bacterial causes
   a) Neisseria gonorrhoeae – tend to have suprapubic pain and hematuria with rapid onset
   b) Chlamydia trachomatis – lack urgency, hematuria, or suprapubic pain and have gradual onset of symptoms over 7-21 days
   c) Coliforms
   d) Treponema pallidum – the urethra is an uncommon but possible site of a syphilitic chancre
   e) Ureaplasma urealyticum – suspected but unproven etiologic agent
   f) Mycoplasma hominis – suspected but unproven etiologic agent
(2) Viral causes  
   a) Herpes simplex virus I and II  
   b) Human papilloma virus

B. Urethral syndrome – there is no universally accepted definition of this disorder and its diagnosis is felt to be one of exclusion. Characteristics may include

   (1) Symptoms
      a) Frequency  
      b) Urgency  
      c) Dysuria  
      d) Suprapubic pain  
      e) Urethral pain  
      f) Dyspareunia

   (2) Physical abnormalities of the bladder and urethra are generally absent

   (3) Urine culture may be sterile or contain less than 100,000 bacteria/mL

   (4) Negative leukocyte esterase test

121. The student will list the hypothesized etiologies of urethral syndrome and be knowledgeable about the diagnostic evaluation and management approach.

A. Etiologies
   (1) Infection of periurethral glands
   (2) Urethral obstruction – distally
   (3) Urethral spasm
   (4) Hypoestrogenism and atrophic changes
   (5) Psychogenic
   (6) Neurologic
   (7) Trauma from instrumentation, intercourse, diaphragms, etc.
   (8) Anatomic abnormalities
   (9) Allergy and chemical sensitivity

B. Diagnostic approach
   (1) A general physical and neurologic examination to exclude neurologic etiology
   (2) Exclude infectious etiology
      a) Urine culture with bacterial growth greater than 100 organisms/mL should be treated with an appropriate antibiotic agent
      b) Vaginitis should be ruled out with a pelvic examination and if present, treated appropriately
      c) Urethral cultures to screen for *N. gonorrhea* and *C. trachomatis* with specific antibiotic therapy if positive
         (c. 1) In some studies *C. trachomatis* was recovered in 25% of women with urethral syndrome
         (c. 2) *C. trachomatis* cannot be recovered from urine so urethral cultures are necessary
   (3) Pelvic examination to rule out other causes such as
      a) Urinary diverticulum
      b) Periurethral cyst or abscess
      c) Urethral or vaginal neoplasm
   (4) Cystourethroscopy (with biopsy as needed) to rule out
      a) Urinary tract malignancy
      b) Interstitial cystitis
      c) Inflammation suggested by erythema and exudate
      d) Hypoestrogenism suggested by atrophy and pallor
C. Management
   (1) Specific approaches
      a) Infection – specific antibiotic therapy directed at known infectious agent
      b) Anatomic abnormality – specific surgical correction or urethral dilation
      c) Estrogen deficiency – local vaginal cream with or without oral estrogen replacement
   (2) Empiric approaches
      a) Broad spectrum antibiotics – tetracycline or erythromycin
      b) Urethral dilation
      c) Diazepam if urethral spasms are suspected or Minipress (alpha-adrenergic blocker)
      d) Observation with reassurance and psychological support

Toxic Shock Syndrome

122. Given an 18 year old patient with a probable diagnosis of toxic shock syndrome (TSS), the student will discuss the epidemiology, etiology, clinical presentation, diagnosis and treatment of the disease process.

A. Epidemiology
   (1) The peak number of reported cases occurred in the early 1980's
   (2) The majority of cases occurred in women who were menstruating
   (3) Approximately 95% of women with TSS wore tampons
   (4) Use of the (Rely®) tampon with its super absorbent materials may have resulted in the sudden increase in TSS in the 1980's
   (5) The incidence was estimated to range from 4-6 cases per 100,000 menstruating women

B. Etiology – a staphylococcal toxin was identified as being Toxic Shock Syndrome, Toxin-1 (TSST-1)
   (1) The bacterial toxin either alone or synergistically with other factors was responsible for TSS
   (2) The TSST-1 enhanced susceptibility to lethal endotoxin shock and may explain the manifestations of gram negative septic shock
   (3) *Staphylococcus aureus* was discovered in nearly 100% of TSS cases

C. Clinical presentation – TSS is an acute and severe multisystem illness
   (1) Characterized by high fever, hypotension, nausea and vomiting, diarrhea, rash, and multiple organ involvement
   (2) A life threatening condition
   (3) Now recognized as being associated with a wide variety of conditions unrelated to menses or tampon use
      a) Surgical wound infections
      b) Soft tissue infections
      c) Postpartum period
      d) Female genital tract cases
      e) Vaginal sponge (removed from the US market)
   (4) Signs and symptoms
      a) Sudden onset of chills and fever
      b) Myalgias
      c) Vomiting
      d) Diarrhea
      e) Hypotension
      f) Palmar erythema
      g) The rash begins to desquamate after several days (for up to five weeks) and involves the palms of the hands and the soles of the feet
      h) Hyperemia of the mucous membranes
D. Differential diagnosis – there are no definitive diagnostic or confirmatory laboratory tests
   (1) Strep scarlet fever
   (2) Mucocutaneous lymph node syndrome (Kawasaki's disease)
   (3) Leptospirosis
   (4) Rubella
   (5) Rocky Mountain Spotted Fever

E. Management
   (1) Prompt and aggressive treatment
   (2) Thorough physical exam
   (3) Removal of any tampon, sponge, cervical cap, or diaphragm
   (4) Culture for *Staphylococcus aureus* from vagina, rectum, conjunctiva and oropharynx. Antistaphylococcal antibiotics are recommended.
   (5) Culture blood and urine
   (6) Obtain serum for serologic studies
   (7) Provide supportive fluid therapy – massive amounts of fluids are needed (8-12 liters per day)
   (8) Employ aggressive monitoring – may require use of Swan-Ganz catheter and/or arterial line
   (9) Employ strict monitoring of input/output using Foley catheter
   (10) Provide oxygen supplementation
   (11) Monitor arterial blood gases
   (12) Intubate as necessary
   (13) The major objective should be to prevent Adult Respiratory Distress Syndrome (ARDS) which is the leading cause of death in patients with TSS. ARDS is associated with very high mortality rates when it is complicated by septic shock

**Infectious Diseases of the Breast**

123. The student will discuss the diagnosis and management of infectious diseases of the breast.

A. Breast cellulitis
   (1) Etiology
      a) Generally occurs in lactating women (see objective 103)
      b) Organisms usually originate from the skin – *Staphylococcus aureus* or streptococcus
   (2) Physical findings
      a) Erythema
      b) Induration
      c) Tenderness
      d) Fever (often >102°F)
   (3) Differential diagnosis
      a) Breast abscess
      b) Neoplasia – especially in non-lactating women
   (4) Diagnostic studies
      a) None indicated in lactating women
      b) In non-lactating women
         b. 1) Mammography
         b. 2) Ultrasound
   (5) Management
      a) Oral antibiotics – Amoxicillin, Cephalexin, Dicloxacillin
      b) Lactating women should be encouraged to continue breast feeding on affected side
B. Breast abscess
(1) Etiology
   a) A consequence of untreated or inadequately treated breast cellulitis
   b) May occur in non-lactating women
(2) Physical findings
   a) Erythema
   b) Induration – in non-lactating women commonly located in subareolar or periareolar area
   c) Possible palpable mass
   d) Tenderness
   e) Fever
(3) Differential diagnosis
   a) Breast cellulitis
   b) Neoplasia
(4) Diagnostic studies
   a) CBC
   b) Ultrasound
   c) Serial blood cultures for persistent or recurrent fever elevations greater than 101°F
   d) Culture of any draining abscess contents
   e) Culture of abscess contents if obtained by needle aspiration
(5) Management
   a) In lactating women
      (a. 1) Early infection can usually be successfully treated with antibiotics
      (a. 2) If the mass is localized and becomes fluctuant, then it should be incised and drained
   b) In non-lactating women any persistent induration or recurrent abscess in the breast must be explored, drained, and biopsied because malignant changes may be present (see objective 138)

Vulvar Disease

124. The student will describe the common benign diseases of the vulva and outline their management.

A. Inflammatory lesions
(1) Contact dermatitis
   a) Diffuse erythema and edema
   b) Irritants, *e.g.* feminine hygiene products, perfumes, shampoos, salivary enzymes – usually painful
   c) Allergens – usually pruritic
   d) Treat by removing offending substance and applying mild topical steroids
(2) Intertrigo
   a) An inflammatory, edematous, and exudative dermatitis that occurs between opposing skin surfaces
   b) There may be a secondary fungal dermatitis in areas of moisture retention
   b) Common with diabetes and obesity
   c) Treat by keeping area dry and applying mild topical steroids and antifungal agents
(3) Seborrheic dermatitis
   a) Pale erythema and fine scale
   b) Often found on postauricular folds and scalp in addition to vulva
   c) Treat by keeping dry; anti-pruritic, anti-dandruff agents, or mild steroids may be helpful
(4) Psoriasis
   a) Sharply marginated appearance with erythema and an overlying scale
   b) In skin folds it has a moist, shiny appearance
   c) More easily identified if typical lesions appear elsewhere; confirm with biopsy
(5) Trichomoniasis (see objective 116)
(6) Candidiasis (see objective 116)
(7) Tinea cruris
   a) Sharply marginated annular patches with a scaling border
   b) Responds to clotrimazole, miconazole, tolnaftate, and ketoconazole
(8) Bartholinitis
   a) Inflammation, tenderness, and fluctuance of Bartholin’s duct
   b) May respond to warm soaks, antibiotics, and analgesics in early stages
   c) Requires incision and drainage when fluctuant; Word catheter is usually helpful
   d) Marsupialization may be necessary if recurrent
(9) Lichen simplex chronicus
   a) End-effect of chronic mechanical irritation (usually scratching)
   b) Leads to epidermal hyperplasia and hyperesthesia
   c) Treatment must break itch-scratch-itch cycle; remove offending agent;
      responds to topical steroids; diphenhydramine and hydroxyzine can eliminate
      nighttime scratching
(10) Lichen planus
    a) Lacy white bands of keratosis and occasionally shallow ulcers
    b) More common in vagina; may be found in mouth
    c) Produces chronic burning and/or pruritus; often recurrent
    d) Responds to topical steroids
B. Ulcerative lesions
(1) Herpes simplex (see objective 116)
(2) Syphilitic chancre (see objective 114)
(3) Chancroid (see objective 115)
(4) Granuloma inguinale (see objective 115)
(5) Aphthous ulcers
   a) White-yellow shallow ulcers; unknown etiology
   b) Treat with good hygiene and analgesics
(6) Behcet's syndrome
   a) Painful, shallow ulcers associated with oral lesions and iritis
   b) Treat with systemic steroids
(7) Crohn’s disease
   a) May produce abscesses and draining sinuses
   b) Treat with systemic steroids and metronidazole; azothiaprine may be
      necessary
C. White lesions
(1) Vulvar dystrophies (biopsy is important in diagnosis)
   a) Lichen sclerosus
      (a. 1) Diffuse thin white epithelial areas; may extend around anus to
          produce “hour glass” pattern
      (a. 2) May lead to obliteration of vulvar architecture and/or introital stenosis
      (a. 3) Usually pruritic; may occur at any age
      (a. 4) Characteristic microscopic appearance is atrophic squamous
          epithelium with associated hyperkeratosis, blunting of the rete pegs
          and homogenization of the dermis
      (a. 5) Treat with clobetasol 0.05% ointment bid, then taper to less potent
          steroids; testosterone propionate 2% in aquaphor is sometimes
          efficacious
b) Squamous cell hyperplasia  
   (a. 1) May be with or without atypia  
   (a. 2) Often intensely pruritic  
   (a. 3) White, thickened, hyperkeratotic skin, often with excoriations  
   (a. 4) Lesions without atypia usually respond to topical halogenated corticosteroids  

(2) Vitiligo  
   a) Depigmented areas; relatively common on the vulva  
   b) Often also found elsewhere on the body  
   c) Cause is unknown; often familial  

(3) Postinflammatory hypopigmentation  
   a) Depigmented areas; more prominent in more darkly pigmented individuals  
   b) Arises in areas of pre-existing dermatitis  

D. Pigmented lesions  
(1) Most are intradermal, junctional, or compound nevi  
(2) Pigmented vulvar lesions should be excised if enlarging, inflamed, blue-black, or if there are irregular borders or irregular intensity of pigmentation  

(3) Wide local excision is necessary for diagnosis and staging  

E. Solid tumors include condylomata, fibroepitheliomas, hemangiomas, and lipomas  
F. Cysts include epidermal inclusion cysts, Bartholin duct cysts, mucous cysts, cysts of the canal of Nuck  

G. Vulvar pain syndromes  
(1) Vestibulitis  
   a) Main symptom is introital dyspareunia  
   b) Findings limited to erythema and hyperesthesia  
   c) Etiology is unknown; may be due to inflammation of minor vestibular glands with reflex pelvic floor muscle spasm and reflex vasodilatation  
   d) No treatment is uniformly successful; treatments include topical analgesics, and steroids, biofeedback, low oxalate diets, tricyclic agents (e.g., amitriptyline), and surgical excision of the minor vestibular glands  

(2) Dysesthetic vulvodynia  
   a) Chronic unrelenting vulvar pain  
   b) Only finding is vulvar hyperesthesia  
   c) Treated with tricyclic agents, anticonvulsants, biofeedback, nerve blocks, and analgesics  

Premenstrual Syndrome  

125. Given a patient with premenstrual syndrome, the student will evaluate the symptoms, differentiate premenstrual syndrome from other disorders, and recommend an appropriate management plan.  

A. Definition  
   (1) The signs and symptoms must occur cyclically and recur in the luteal phase  
   (2) Symptom questionnaires are helpful in diagnosis  
   (3) There must be at least seven symptom-free days each cycle during the follicular phase  
   (4) There must be a 30% increase in symptoms in the luteal phase to diagnose  
   (5) The symptoms must be severe enough to significantly alter the lifestyle of the patient  

B. Signs and symptoms – over one hundred physical, psychologic and behavioral symptoms and signs are associated with premenstrual syndrome. The more common are  
(1) Physical  
   a) Fatigue 92%  
   b) Abdominal bloating 90%  
   c) Breast tenderness 85%
d) Peripheral edema 67%
e) Headache 60%
f) G.I. upset 48%
g) Other symptoms include abdominal cramps, palpitations, dizziness, faintness, generalized achiness, and weight gain

(2) Psychologic
a) Irritability 91%
b) Mood swings 81%
c) Depression 80%
d) Crying 65%
e) Oversensitivity 69%
f) Social withdrawal 65%
g) Forgetfulness 56%
h) Reduced concentration 47%
i) Other symptoms include insomnia or somnolence, confusion, distractibility

(3) Behavioral
a) Increased appetite and food cravings 70%
b) Avoidance of social or work activities 65%
c) Increased alcohol consumption
d) Increased or decreased libido

C. Diagnosis
(1) No symptoms are unique to, and diagnostic of, premenstrual syndrome
(2) Diagnosis is made through daily reporting in a menstrual symptom diary

D. Etiology and pathophysiology
(1) Unknown – most likely a complex interaction between ovarian steroid hormones, endogenous opiate peptides, central neurotransmitters, and prostaglandins in the peripheral autonomic and endocrine systems
(2) Associated with ovulatory cycles
(3) Many theories
   a) Prostaglandins – evidence of decreased synthesis of PGE1 and arachidonic acid
   b) Endogenous opiates – evidence of decreased endogenous opiate peptides during luteal phase; could be an opiate withdrawal syndrome
   c) Steroid hormone imbalance
      (c. 1) No measurable abnormalities in serum progesterone, estradiol, FSH, LH, SHBG, DHEAS, dihydrotestosterone, prolactin or cortisol
      (c. 2) Possible abnormal levels in central nervous system
   d) Thyroid – association of abnormal thyroid function tests and premenstrual syndrome, but no luteal phase changes
   e) Nutritional deficiency – no evidence of decreased nutrients or vitamins in women with premenstrual syndrome
   f) Hypoglycemia – symptoms of hypoglycemia are common and often respond to a hypoglycemia diet, but hypoglycemia cannot be documented
   g) Fluid retention
      (g. 1) Total body water and sodium do not change
      (g. 2) Fluid shifts between body compartments may be responsible for bloated sensation and soft tissue swelling
      (g. 3) Many improve with diuretics
   h) Psychogenic – strong association with anxiety and depressive disorders
   i) Serotonin deficiency
   j) Endogenous hormone allergy
   k) Increased tissue sensitivity to prolactin

E. Management
(1) Completely empiric – must be directed at individual's symptom complex
(2) Education and support groups
(3) Stress reduction techniques
(4) Well balanced diet with adequate protein, fiber and complex carbohydrates – avoiding increased sugar, salt, caffeine, alcohol and fat help many women. No changes in glucose metabolism have been documented.

(5) Exercise may decrease breast symptoms, fluid retention and anxiety – possible via induction of endogenous opiates, although this has not been documented in controlled studies.

(6) Vitamins
   a) No evidence of efficacy
   b) Beware of toxicity of pyridoxine, vitamin A, and tryptophan

(7) Progesterone (vaginal suppositories or oral) – no evidence of efficacy greater than placebo

(8) Diuretics
   a) May improve weight gain, bloatedness, breast tenderness and mood changes
   b) Spironolactone
      (b. 1) Has proven efficacy
      (b. 2) May alleviate bloating and mood symptoms
      (b. 3) May affect mood through its anti-androgen properties

(9) Anti-anxiety agents
   a) May decrease anxiety and irritability and improve depression
   b) Alprazolam has been shown effective in some studies
   c) May be addictive

(10) Selective serotonin re-uptake inhibitors
    a) Fluoxetine has been effective for dysphoric symptoms in all studies
    b) Fluoxetine is less effective for physical symptoms

(11) Bromocriptine – may sometimes decrease breast tenderness

(12) Prostaglandin synthetase inhibitors – sometimes improve headache, breast tenderness, abdominal cramps, generalized aching, anxiety of depression

(13) Evening primrose oil
    a) A prostaglandin precursor, but mechanism of action is unknown
    b) May improve breast tenderness, fluid retention, bloatedness, anxiety or depression

(14) Oral contraceptives – may relieve symptoms by inhibiting ovulation

(15) GnRH agonists
    a) May relieve symptoms by creating pseudo-menopause
    b) Should not be used for longer than six months because of high incidence of osteopenia
    c) Protocols with add-back of estrogen for long-term therapy are under investigation
    d) Could be used before considering oophorectomy (a last resort)

(16) Danazol
    a) 100 mg per day may relieve mastalgia, fluid retention, bloatedness, anxiety and depression without completely inducing amenorrhea – must use contraception
    b) 400 mg per day will inhibit ovulation

(17) Clonidine and verapamil
    a) Used in treatment of mania and opiate withdrawal
    b) May improve anxiety, irritability and "hot flushes"
Pelvic Relaxation

126. The student will define the following terms that may or may not coexist with one another and when given an actual patient or photographic representation, identify these anatomic defects.

A. Cystocele – protrusion of the urinary bladder to create a downward bulging of the anterior vaginal wall due to a weakness or break in the endopelvic fascia
B. Urethrocele – protrusion of the urethra through the supporting structures of the anterior vaginal wall forming a bulge of the wall
C. Rectocele – protrusion of the rectum through the supporting structures of the posterior vaginal wall forming a bulge of the wall
D. Enterocele – herniation of the posterior cul-de-sac peritoneum into the vagina due to a weakness or defect in the endopelvic fascia of the vaginal apex or posterior segment; may contain a segment of small bowel
E. Uterine descensus – relaxation or prolapse of the uterus from its normal position high in the vagina down through the vagina

127. The student will list the common symptoms of pelvic relaxation.

A. Non-specific symptoms – please note pelvic relaxation may be asymptomatic
   (1) Bearing down sensation, heaviness or pelvic pressure, a sense of pelvic fullness and/or backache
   (2) Protrusion of the cervix or a segment of vaginal wall through the introitus
   (3) Uncomfortable or unsatisfactory intercourse
B. Urinary symptoms
   (1) Urinary incontinence (see objective 129)
   (2) Urinary hesitancy or incomplete voiding
   (3) Urinary frequency and/or urgency
   (4) Recurrent cystitis
C. Gastrointestinal symptoms
   (1) Difficult or incomplete defecation
   (2) Constipation
   (3) Fecal urgency or incontinence

128. The student will list the structures important in maintaining pelvic support.

A. Endopelvic fascia
B. Levator ani muscles
C. Cardinal and uterosacral ligament complex
D. Perineum

129. The student will define the different types of urinary incontinence and list some associated causes.

A. Stress urinary incontinence – involuntary urine loss due to bladder pressure exceeding urethral pressure coincident with exertion (a rise in intra-abdominal pressure)
   (1) The most common type of urinary incontinence in women
   (2) Usually due to poor pelvic support at the bladder neck
B. Urge incontinence (“overactive bladder”) – involuntary urine loss associated with a sudden strong desire to void and concomitant fear of leakage (urgency)
May be associated with uninhibited detrusor (bladder) contractions – motor urgency (detrusor instability)

May be associated with hypersensitivity to bladder filling – sensory urgency

(3) Idiopathic 90% of time

(4) Identifiable causes may include
  a) Infection
  b) Neoplasm
  c) Urinary stone
  d) Radiation cystitis
  e) Interstitial cystitis
  f) Foreign body

C. Overflow incontinence – involuntary urine loss due to bladder filling exceeding physical bladder capacity (overdistention)

(1) Usually occurs in the absence of normal sensation, as may be seen with
  a) Multiple sclerosis
  b) Advanced diabetes mellitus

(2) May be secondary to an obstructive uropathy

(3) May or may not be associated with a detrusor contraction

D. Reflex incontinence – involuntary urine loss due to disruption of the upper central nervous system control over micturition. Seen in spinal cord I injured patients.

E. Extraurethral incontinence – involuntary urine loss by channels other than the urethra. Seen with urinary fistulae, such as
  (1) Vesicovaginal
  (2) Ureterovaginal

F. Functional incontinence – involuntary urine loss due to transient physical or psychological impairment. Examples include
  (1) Elderly patient with restricted mobility
  (2) Severe depression
  (3) Stool impaction

130. The student will list the procedures available to evaluate a patient with urinary incontinence.

A. Complete general and urologic history
  (1) This may suggest the possible etiology, e.g., the use of a medication that adversely affects bladder function
  (2) Characterizes the type of incontinence

B. Physical examination
  (1) Abdominal examination
    a) Assess for suprapubic tenderness
    b) Assess for masses or bladder distention
  (2) Neurologic screening, with emphasis on the sensory and motor function of the perineum and lower extremities
  (3) Pelvic examination
    a) Assess for presence of cystocele, urethrocele, rectocele, enterocele, uterine descensus, and perineal support
    b) Assess for presence of hypoestrogenism, fistula and/or diverticulum
    c) Q-tip test – to assess urethral mobility, an indirect marker of urethral support

C. Urinalysis and culture
D. Cystometry
E. Cystourethroscopy
F. Other urodynamic studies (urethral profilometry, urinary flow rate and pattern)
G. Electromyographic studies
H. Intravenous pyelogram or other radiologic studies as indicated
   (1) Used when a fistula or urinary stone is suspected
   (2) Intravenous injection of indigo carmine to diagnose a ureterovaginal fistula
   (3) Intravesical injection of indigo carmine to diagnose vesicovaginal fistula

131. The student will outline a plan of management for pelvic relaxation or conditions associated with pelvic relaxation.

A. Urinary tract infection (see objective 120)
   (1) Appropriate antibiotics
   (2) Estrogen therapy for postmenopausal women in whom urogenital atrophy is considered etiologic
   (3) If infections are recurrent in the face of reproducibly large residual urines and a cystocele, then cystocele repair
B. Urge incontinence (“overactive bladder”)
   (1) Anticholinergics, smooth muscle relaxants, or combined-effect agents
   (2) Estrogen therapy for postmenopausal women in whom atrophy is considered etiologic
   (3) Bladder training drills develop urge inhibition and decrease voiding frequency
   (4) Biofeedback
   (4) Functional electrical stimulation
C. Stress incontinence
   (1) Pelvic muscle exercises (Kegel exercises), vaginal cones
   (2) Estrogen therapy if urogenital atrophy coexists
   (3) Surgical repair not indicated if woman is minimally symptomatic or if she has an asymptomatic anatomic support defect
   (4) Surgical therapy
      a) When non-surgical therapy fails
      b) Anterior colporrhaphy, retropubic urethropexy, or pubovaginal sling, depending on composite findings
      c) Periurethral collagen injection for select situations
      d) Usually not considered until patient has completed her family
D. Rectocele – posterior colporrhaphy if significantly symptomatic
E. Uterine descensus
   (1) Vaginal hysterectomy with anterior and posterior colporrhaphy or vaginal vault suspension as needed
   (2) Pessary in patients who are very poor surgical risks or decline surgery
   (3) Colpopoiesis
F. Enterocele – vaginal or abdominal surgical correction

Pelvic Pain

132. The student will list the genital and extragenital causes of chronic pelvic pain and describe an appropriate diagnostic evaluation.

A. Causes – Genital
   (1) Extrauterine
      a) Adhesions
      b) Chronic ectopic gestation
      c) Chronic pelvic infection (see objective 118)
      d) Endometriosis (see objective 134)
      e) Adnexal tumor
      f) Primary or metastatic tumor
(2) Uterine
   a) Adenomyosis (see objective 136)
   b) Chronic endometritis
   c) Pelvic support defects (see objective 127)
   d) Intrauterine contraception device (IUD) use

B. Causes – Extragenital
   (1) Urologic
      a) Chronic urinary tract infection
      b) Urinary calculi
      c) Interstitial cystitis
   (2) Gastrointestinal
      a) Diverticulitis
      b) Chronic appendicitis
      c) Constipation
      d) Inflammatory bowel disease
      e) Irritable bowel syndrome
      f) Neoplasia
   (3) Musculoskeletal
      a) Hernias
      b) Myofascial pain
      c) Orthopedic condition
   (4) Other causes
      a) Abuse
      b) Psychiatric disorders
      c) Psychosocial stress
      d) Somatiform disorders

C. Diagnostic evaluation
   (1) Detailed history
   (2) General physical and pelvic examinations
   (3) Laboratory
      a) Complete blood count
      b) Urinalysis
      c) Serum beta hCG
      d) Cervical cultures – chlamydia and gonorrhea
   (4) Imaging – selective, focused
      a) Ultrasonography
      b) X-ray assessment – intravenous pyelogram (IVP)
   (5) Endoscopic assessment – selective
      a) Colonoscopy
      b) Diagnostic laparoscopy
      c) Hysteroscopy

D. Management
   (1) Targeted toward specific etiology
   (2) Multidisciplinary approach is advantageous
   (3) Pharmacologic
      a) Analgesics
      b) Non-steroidal anti-inflammatory drugs
   (4) Surgical – specified and directed

Dysmenorrhea

133. Given a patient with dysmenorrhea, the student will evaluate the symptoms, differentiate the cause, and plan appropriate management.

   A. Definition – significant pain during menstruation
   B. Primary dysmenorrhea – dysmenorrhea not due to organic cause
(1) Symptom complex
   a) Pain
      (a. 1) Intermittent, sharp, colicky
      (a. 2) Localized at suprapubic area with radiation to back and thighs
   b) Gastrointestinal
      (b. 1) Nausea and vomiting
      (b. 2) Diarrhea
   c) Cardiovascular
      (c. 1) Dizziness
      (c. 2) Palpitations
      (c. 3) Flushing
      (c. 4) Headache
   d) The patient may have any combination of the above
(2) Clinical course
   a) Onset soon after menarche
   b) Associated with the menstrual cycle
   c) Prior to or first day of menses is most severe
   d) Usually improves with advancing age
   e) Usually improved with vaginal delivery
(3) Pathophysiology – related to prostaglandins effects
   a) Related to increased amounts of \( \text{PGF}_{2\alpha} \) at time of menstruation
   b) Initiates myometrial contractility and hypertonicity
(4) Management
   a) Prostaglandin inhibitors
      (a. 1) Administer with the onset of menses or onset of symptoms, whichever occurs first
      (a. 2) Use only in first part of cycle, when symptoms are severe
      (a. 3) Indomethacin, naproxen, ibuprofen, suprofen, and mefenamic acid inhibit prostaglandin synthetase enzyme system
      (a. 4) The fenamates (mefenamic acid) also have an antagonistic action on the PG receptors
   b) Oral contraceptive agents
      (b. 1) Decreases endometrial prostaglandin content
      (b. 2) Useful if patient also desires contraception
      (b. 3) May be used in combination with prostaglandin inhibitors
   c) Cyclo-oxygenase 2 (COX-2) inhibitors
      (c. 1) Similar level of pain relief to prostaglandin inhibitors (NSAIDs)
      (c. 2) Similar duration of effect to NSAIDs
      (c. 3) Not yet FDA approved for this indication
   d) Mild analgesics or antispasmodics
      (d. 1) Do not use stronger analgesics or narcotics because of chronicity of problem
      (d. 2) Avoid addictive drugs
   e) Laparoscopic uterosacral nerve ablation
      (e. 1) Rarely indicated
      (e. 2) If performed, it is usually in association with conservative endometriosis surgery
   f) Presacral neurectomy
      (f. 1) Rarely indicated
      (f. 2) If performed, it is usually in association with conservative endometriosis surgery
C. Secondary dysmenorrhea – dysmenorrhea associated with a demonstrable pathologic lesion or process
(1) Most common lesions
   a) Endometriosis
   b) Adenomyosis
   c) Chronic salpingitis
d) Leiomyomata – submucous or intramural
e) Cervical stenosis
f) Endometrial polyps
(2) Onset – usually in adult life with previous symptom-free menses
(3) Diagnosis
a) Suspected by history and/or palpable abnormalities on pelvic examination
b) Confirmed by
   (b. 1) Ultrasound
   (b. 2) Laparoscopy
   (b. 3) Hysteroscopy
(4) Therapy – directed toward specific cause

**Endometriosis**

134. Given a patient with endometriosis, the student will describe the condition, list the signs and symptoms and generate a differential diagnosis.

A. Description
   (1) A condition in which endometrial glands and usually stroma are found in various extrouterine locations, most commonly on the ovary or on the peritoneal surface of pelvic structures (particularly the posterior cul-de-sac and uterosacral ligaments)
   (2) Most commonly found in patients of low parity
   (3) Endometriosis is stimulated by endogenous cyclic hormone secretion
B. Symptoms – severity of symptoms often does not correlate with the extent of disease
   (1) Secondary dysmenorrhea
   (2) Dyspareunia
   (3) Dysuria
   (4) Dyschezia
   (5) Pelvic pain – acute and chronic
   (6) Infertility
   (7) Pre- and postmenopausal spotting
   (8) Cyclic, vicarious menstruation (hemoptysis, hematochezia, hematuria)
C. Signs associated with endometriosis
   (1) Adnexal mass
      a) Ovarian endometrioma
      b) Adhesive complex
   (2) Intrapertitoneal hemorrhage (ruptured cyst)
   (3) Fixed, retroverted uterus
   (4) Tender nodularity in the cul-de-sac
   (5) Diffuse abdominal tenderness
D. Differential diagnosis
   (1) Recurrent pelvic inflammatory disease (salpingo-oophoritis)
   (2) Torsion or rupture of adnexal masses
   (3) Ovarian carcinoma
   (4) Appendicitis
   (5) Diverticulitis
   (6) Ectopic pregnancy
   (7) Carcinoma of bladder, rectum, or colon
   (8) Intestinal and/or ureteral colic
135. Given a patient with endometriosis, the student will be knowledgeable about the diagnostic evaluation and outline both the medical and surgical methods to management.

A. Diagnosis – visualization of implants by laparoscopy or laparotomy
B. Management – must be individualized according to patient's age, reproductive desires, and extent of disease
   (1) Medical – suppression of ovarian function to cause atrophy of endometrial implants
      a) Progestogens or oral contraceptives
      b) Gonadotropin releasing hormone analogs
         (b. 1) Antagonistic action toward gonadotropin secretion
         (b. 2) Creates a "pseudo menopause"
      c) Danazol
         (c. 1) Mildly androgenic
         (c. 2) Suppresses ovulatory gonadotropin peak
         (c. 3) Rarely used in contemporary gynecology
   (2) Surgical – ranges from resection or fulguration of implants to total hysterectomy and bilateral salpingo-oophorectomy and may include presacral neurectomy

Adenomyosis

136. Given a patient with adenomyosis, the student will describe this condition, list the signs and symptoms, list the differential diagnosis, and outline its management.

A. Description
   (1) Adenomyosis is characterized by the presence of normal endometrial glands and stroma within the myometrium. There are no connections between this ectopic tissue and the endometrial cavity.
   (2) Condition sometimes called internal endometriosis to differentiate it from external endometriosis
   (3) May exceed 60% in parous women during their fifth decade
   (4) The diagnosis can be suspected but cannot be confirmed until the pathologist has examined the hysterectomy specimen
B. Symptoms
   (1) Dysmenorrhea
   (2) Menorrhagia
C. Signs – diffuse enlargement of uterus is seen occasionally
D. Differential diagnosis
   (1) Pregnancy
   (2) Uterine leiomyomata, especially intramural
   (3) Endometrial polyp
   (4) Endometrial hyperplasia
   (5) Endometrial adenocarcinoma
   (6) Uterine sarcoma
E. Management
   (1) Dysmenorrhea
      a) Minor – mild analgesics, prostaglandin inhibitors
      b) Severe – hysterectomy with possible oophorectomy depending on age
   (2) Menorrhagia
      a) Endometrial pathology must be excluded by endometrial sampling
      b) If associated with anemia, hysterectomy is indicated, with possible oophorectomy, depending on age
Neoplasms

Early Cancer Detection

137. The student will list the community resources, methods and techniques available to women for early cancer detection.

A. Community resources
   (1) Public health clinics
   (2) Free-standing clinics for women
   (3) Hospital ambulatory services
   (4) Offices of private practitioners
   (5) Mobile health screening units

B. Diagnostic studies
   (1) Papanicolaou smear
   (2) Colposcopy
   (3) Endometrial sampling
   (4) Hysteroscopy
   (5) Screening mammography
   (6) Self-breast examination
   (7) Needle or open biopsy of suspicious lesions
   (8) Flexible sigmoidoscopy
   (9) Stool testing for occult blood

Breast

138. Given a patient with a breast mass, the student will recognize clinically significant historical factors and/or physical findings which increase the risk for malignancy and outline a diagnostic approach.

A. Historically significant information
   (1) History of breast cancer in the contralateral breast
   (2) Family history of breast cancer in a first-degree relative
   (3) Age at birth of first child
   (4) Current age

B. Findings present on breast examination which are indications for additional evaluation or consultation
   (1) A discrete mass, especially if fixed to the skin or chest wall
   (2) Bloody nipple discharge
   (3) Skin retraction
   (4) "Peau d'orange" skin change
   (5) Erythema with or without a palpable mass
   (6) Suspicious axillary lymph nodes
   (7) Breast pain

C. Diagnostic studies
   (1) Mammography
   (2) Ultrasound – delineates solid from cystic mass
   (3) Needle aspiration, direct needle biopsy, or mammographically guided needle biopsy
   (4) Excisional biopsy with or without wire guidance

139. Given a patient with a breast mass, the student will list the benign conditions which may account for the mass.

A. Fibrocystic change – most common
B. Fibroadenoma – all ages – more common in ages 15-35
C. Ductal ectasia
D. Mastitis – gestational or non-gestational
E. Lipoma
F. Fat necrosis
G. Chronic periareolar abscess
H. Superficial thrombophlebitis
I. Phylloides tumor
J. Intraductal papilloma
K. Galactocele

140. Given a patient with fibrocystic change of the breast, the student will recognize the symptoms and be knowledgeable about diagnostic options and management.

A. Symptoms
   (1) Pain
   (2) Tenderness – commonly premenstrual
   (3) Swelling
   (4) Nipple discharge
B. Findings present on examination
   (1) Bilateral nodular thickening – commonly upper outer quadrant
   (2) Discrete masses may or may not be present
   (2) Blackish-green nipple discharge – occasional
C. Diagnostic studies
   (1) Cyst aspiration – fluid
   (2) Needle aspiration – cells from solid masses
   (3) Ultrasonography – differentiate solid from cystic masses
   (4) Mammography – particularly after age 35
   (5) Excisional or needle biopsy – for masses undiagnosed by other methods or recurrent masses
D. Management
   (1) Decaffeination – 60% response rate
   (2) Oral contraceptives – should the patient also need contraception
   (3) Danocrine – rarely used, expensive, androgenic side effects, symptoms recur after discontinuing medication
   (4) Oil of Evening Primrose
   (5) Vitamin E
   (6) Analgesic

141. Given a patient with a premalignant-malignant breast mass, the student will provide a differential diagnosis and be knowledgeable about the staging of breast cancer.

A. Malignant conditions
   (1) Invasive ductal carcinoma – 80% of breast malignancies
   (2) Lobular carcinoma in situ or infiltrating – 8%
   (3) Ductal carcinoma in situ – 10%
   (4) Inflammatory carcinoma – 1%
   (5) Paget's disease – 1%
B. Breast cancer staging
   (1) T – primary tumor
      a) T0 – no evidence of primary tumor
      b) Tis – preinvasive carcinoma, non-infiltrating ductal carcinoma, Paget's disease of nipple with no demonstrable tumor
      c) T1 – a tumor 2 cm or less in greatest diameter
         (b. 1) T1a – no fixation to the pectoral fascia or muscle
         (b. 2) T1b – fixation to the pectoral fascia, muscle, or both
d) T2 – a tumor more than 2 cm but not more than 5 cm in greatest diameter
   (c. 1) T2a – no fixation to the pectoral fascia or muscle
   (c. 2) T2b – fixation to the pectoral fascia, muscle, or both

e) T3 – a tumor more than 5 cm in diameter
   (d. 1) T3a – no fixation to the pectoral fascia or muscle
   (d. 2) T3b – fixation to the pectoral fascia, muscle, or both

f) T4 – a tumor of any size with direct extension to the chest wall or skin
   (e. 1) T4a – fixation to chest wall
   (e. 2) T4b – edema, infiltration, ulceration, satellite skin nodules confined to the breast

(2) N – nodal involvement
   a) N0 – no palpable homolateral axillary nodes
   b) N1 – movable homolateral axillary nodes
   c) N2 – fixed homolateral axillary nodes considered to contain growth

d) N3 – homolateral supra or infraclavicular nodes thought to contain growth or edema of arm

(3) M – distant metastasis
   a) M0 – no distant metastasis
   b) M1 – distant metastasis

Cervix

142. The student will differentiate cytologic and histologic assessment of cervical abnormalities and describe their respective reporting systems and the appropriate use of each.

A. Cytologic abnormalities (Papanicolaou smear)
   (1) Examination of cells taken from the cervix and endocervix and used as a screening test for cervical dysplasia or cervical cancer
   (2) Specimens are obtained from the endocervical canal and the area of the transformation zone of the cervix
   (3) An abnormal Papanicolaou smear requires further evaluation including re-examination, colposcopically-directed punch biopsies combined with endocervical curettage, cone biopsy, or loop electrosurgical excision procedure (LEEP)
   (4) Pap smear descriptive terminology
      a) Cervical intraepithelial neoplasia (CIN)
         (a. 1) Normal
         (a. 2) Inflammatory
         (a. 3) CIN I, II, III – premalignant
      b) Bethesda system – introduced in 1988
         (b. 1) Normal
         (b. 2) Inflammatory – with or without atypia
         (b. 3) Low grade squamous intraepithelial lesion
         (b. 4) High grade squamous intraepithelial lesion
         (b. 5) Squamous cell cancer

B. Histologic abnormalities
   (1) Several subtypes of HPV (e.g., 16, 18, 32) have significant oncogenic potential and are histologically characterized by koilocytopic change
   (2) CIN I or II
      a) Undifferentiated immature cells (indistinguishable from cancer cells) replace the lower layers of the epithelium
      b) Frequent mitosis
      c) Abnormal maturation throughout the epithelium
      d) May progress to malignancy or may spontaneously regress
143. Given a patient with invasive cervical carcinoma, the student will understand the common histologic types, recognize the signs and symptoms, and be knowledgeable about the diagnostic evaluation.

A. Histologic types
   (1) Squamous cell carcinoma – 85-90% occurrence
   (2) Adenocarcinoma – 10-15% occurrence

B. Signs and symptoms
   (1) Irregular vaginal bleeding or staining, especially contact bleeding (post-coital)
   (2) Cervix may appear normal (occult lesion), eroded, ulcerated, or fungating on exam
   (3) Pelvic pain is a late symptom

C. Diagnosis
   (1) Colposcopic examination – allows magnification of the cervical epithelium for more accurate selection of biopsy sites
   (2) Biopsy of the cervix – a Pap smear may be negative despite the presence of carcinoma, therefore, all suspicious lesions should be biopsied
   (3) LEEP – will obtain a flat disc-like portion of the distal cervix and endocervical canal, which includes the entire squamocolumnar junction
   (4) Cone biopsy – cold knife or laser
      a) Excision of a conical mass of cervical tissue including the cervical lesion and a portion of the endocervical canal
      b) Should not be done prior to biopsy of a gross cervical lesion or if a tissue diagnosis of invasive carcinoma has already been made
      c) Especially useful when a lesion is located solely within the endocervical canal

144. Given a patient with invasive cervical carcinoma, the student will understand the staging of the disease including the staging system and be knowledgeable about management.

A. General staging information
   (1) Definition – the clinical estimate of the extent of the disease process that is made prior to treatment
   (2) Purposes
      a) To study the natural history of the disease
      b) To measure the effectiveness of treatment program
      c) To compare competence of the individual, department or institution with others
   (3) Mode of spread – by direct invasion and via lymphatics and infrequently hematologically

B. Staging evaluation
   (1) Physical examination
   (2) Chest xray
   (3) Intravenous pyelogram
   (4) Complete blood count, chemistries
Cystoscopy – optional, based on stage estimate
Sigmoidoscopy – optional, based on stage estimate
CT scan with contrast can be useful adjunct


(1) Stage 0 – carcinoma in situ, intraepithelial carcinoma; cases of Stage 0 should not be included in any therapeutic statistics for invasive carcinoma

(2) Stage I – carcinoma strictly confined to the cervix (extension to the corpus should be disregarded)
   a) Stage IA – invasive cancer identified microscopically. All gross lesions, even with superficial invasion, are stage IB cancers. Invasion limited to measured stromal invasion with a maximum depth of 5 mm and no wider than 7 mm. (The depth of invasion should not be more than 5 mm taken from the base of the epithelium, either surface or glandular, from which it originates. Vascular space involvement, either venous or lymphatic, should not alter the staging).
      (a. 1) Stage IA1 – measured invasion of stroma no greater than 3 mm in depth and no wider than 7 mm
      (a. 2) Stage IA2 – measured invasion of stroma greater than 3 mm and no greater than 5 mm in depth and no wider than 7 mm
   b) Stage IB – clinical lesions confined to the cervix or preclinical lesions greater than IA
      (b. 1) Stage IB1 – clinical lesions no greater than 4 cm
      (b. 2) Stage IB2 – clinical lesions greater than 4 cm

(3) Stage II – the carcinoma extends beyond the cervix, but has not extended onto the pelvic wall; the carcinoma involves the vagina, but not as far as the lower third
   a) Stage IIA – no obvious parametrial involvement
   b) Stage IIB – obvious parametrial involvement

(4) Stage III – the carcinoma has extended onto the pelvic wall; on rectal examination there is no cancer-free space between the tumor and the pelvic wall; the tumor involves the lower third of the vagina; all cases with a hydronephrosis or non-functioning kidney should be included, unless they are known to be due to other causes
   a) Stage IIIA – no extension onto the pelvic wall, but involvement of the lower third of the vagina
   b) Stage IIIB – extension to the pelvic wall or hydronephrosis or non-functioning kidney

(5) Stage IV – the carcinoma has extended beyond the true pelvis or has clinically involved the mucosa of the bladder or rectum
   a) Stage IVA – spread of the growth to adjacent organs
   b) Stage IVB – spread to distant organs

D. Management
(1) Stage 0 – extent of treatment is influenced by the age of the patient and her desire for further reproductive capability
   a) Laser ablation surgery
   b) Cryocauterization
   c) LEEP
   d) Therapeutic conization
   e) Hysterectomy

(2) Stage Ia1
   a) Hysterectomy
   b) Therapeutic conization may be considered in young patients who understand the risks of conservative management and who strongly desire a pregnancy
Stage Ia2 – irradiation and surgery give the same long-term survival results in Stages Ia2 and Ib, when conducted by experienced oncologists
   a) Modified radical hysterectomy (with retention of normal ovaries in women under age 40) with pelvic lymphadenectomy
   b) Irradiation therapy

Stage Ib and Ila – radical hysterectomy, an alternative to irradiation, (with retention of normal ovaries in women under age 40) with pelvic lymphadenectomy and sampling of para-aortic lymph nodes as indicated

Stages IIb-IIIa-IIIb – are treated by concurrent radiation therapy and platinum-based chemotherapy. The use of computerized axial tomography may be useful in planning the size and extent of the therapy ports

Stage IVa and IVb – irradiation therapy combined with platinum-based chemotherapy

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**Gestational Trophoblastic Neoplasm (GTN)**

145. The student will list the signs, symptoms, and abnormal laboratory test results associated with trophoblastic disease.

A. Benign – hydatidiform mole
   1) Patient usually aborts by 4th month
   2) Signs and symptoms
      a) May be associated with preeclampsia prior to the 24th week of gestation
      b) Vaginal bleeding and anemia
      c) Hyperemesis
      d) Abnormal uterine size in relationship to suspected gestational age
      e) No fetal parts, movements, or heart tones
      f) Vaginal passage of molar vesicles
   3) Diagnosis may be confirmed by ultrasound
   4) Management
      a) May evacuate vaginally by suction curettage
      b) Consider hysterectomy for women who no longer wish to retain reproductive capacity
      c) Follow-up required
         (c. 1) Serial B-subunit hCG titers
         (c. 2) Chest xray

B. Malignant – choriocarcinoma or invasive mole; non-metastatic or metastatic
   1) 50% of malignant disease stems from co- or pre-existing hydatidiform mole
   2) High risk factors
      a) Disease present more than four months
      b) Pretreatment ßhCG level greater than 40,000 mIU/ml
      c) Brain or liver metastases
      d) Failure of prior chemotherapy
      e) Following term pregnancy
   3) Management
      a) Usually responds to chemotherapy – methotrexate, actinomycin, or etoposide
      b) Small role for hysterectomy in treating persistent, non-metastatic disease
146. Given a patient with an ovarian mass, the student will list the associated signs and symptoms.

A. Symptoms
   (1) Irregular vaginal bleeding
   (2) Increasing abdominal girth
   (3) Pelvic pain or heaviness
   (4) Alteration in the functioning of the urinary, gastrointestinal, or endocrine systems
   (5) Weight loss
   (6) Often there are no symptoms of early disease

B. Signs
   (1) Abdominal or pelvic mass or enlarged adnexa
   (2) Cul-de-sac masses or nodularity
   (3) Ascites
   (4) Vaginal bleeding

147. The student will describe the management of solid ovarian neoplasms, of cystic ovarian tumors less than 6 cm in size, and of those cystic tumors greater than 6 cm in size.

A. Solid adnexal tumors – immediate exploration for diagnosis regardless of patient's age

B. Cystic ovarian masses
   (1) Less than 6 cm in size
      a) May be reassessed for change after one menstrual period preferably with ovarian suppression, i.e., after one or more cycles with an oral contraceptive agent
      b) Evaluate with ultrasonography
      c) If bilateral, diagnosis is required
      d) If patient premenarchal or postmenopausal, surgical exploration is required
   (2) Greater than 6 cm in size – diagnosis is required

C. Frozen section frequently necessary at laparotomy to differentiate benign from malignant

148. The student will describe non-neoplastic cysts and benign neoplastic ovarian tumors and outline a plan of management.

A. Non-neoplastic cysts
   (1) Follicular
   (2) Corpus luteum

B. Benign neoplastic tumors
   (1) Epithelial
      a) Mucinous cystadenoma
         (a. 1) Usually unilateral
         (a. 2) May become very large (>10 cm)
         (a. 3) Rarely associated with pseudomyxoma peritonei
      b) Serous cystadenoma
         (b. 1) Commonly bilateral and multicystic tumors
         (b. 2) Potentially premalignant
      c) Endometrioid – adenomas and cystadenomas
Germ cell benign cystic teratomas
- Contents include mature derivatives of all three germ layers
- Bilateral in approximately 15% of cases
- May be associated with torsion of the pedicle – patient presents with an acute abdomen

Stromal
- Fibroma
  - Most common benign solid tumor
  - Low malignant potential
  - Can be associated with ascites and hydrothorax (Miegs syndrome)
- Thecoma

Management
- Exploration
- Excision of the neoplasm – conserve as much ovarian tissue as possible
- Exclude bilaterality by inspection, palpation, and excision of suspicious lesions

149. The student will describe the common malignant ovarian tumors.

A. Epithelial tumors
   (1) Serous cystadenocarcinoma – most common malignant tumor of the ovary
      - Usually presents as multilocular or papillary tumor
      - Often bilateral
      - Commonly associated with ascites
      - Metaplastic implants may be found throughout the peritoneal cavity
      - May be associated with CA-125 elevation – 80%
   (2) Mucinous cystadenocarcinoma
      - Often large
      - Usually unilateral
      - Multilocular tumor with multiple areas of hemorrhage
      - May be associated with CA-125 elevation – 60%
   (3) Endometrioid – adenocarcinoma may arise in endometriosis

B. Epithelial tumors of low malignant potential – ovarian tumors with biologic and histologic features between those which are benign and those which are malignant
   (1) General information
      - Account for approximately 15% of all epithelial ovarian cancers
      - 10-year survival rate approximates 90-95%
      - Recurrent disease and death may occur as late as 20 years following treatment
   (2) Histologic features
      - Nuclear hyperchromatism
      - Epithelial tufting and palisading
      - No stromal invasion

C. Gonadal or sex cord stromal tumors
   (1) Granulosa – thecal cell
      - Often associated with elevations of ovarian steroids
      - Most are of low malignant potential
        - 5 year survival – 90%
        - 20 year survival – 50%
   (2) Masculinizing ovarian stromal tumor (arrhenoblastoma)
      - Uncommon
      - Most often seen in third decade of life
      - Clinical course
        - First, defeminization
          - Amenorrhea
        - Regression of breast tumor
        - Changes in body contour
      - Later, masculinization
Hirsutism
Change in voice
Temporal balding
Hypertrophy of clitoris
d) Usually of low malignant potential – 5-year survival is 70-90%

D. Germ cell tumor
(1) Dysgerminoma
   a) Germ cell tumor equivalent to the testicular seminoma
   b) Most common malignant germ cell tumor
   c) Usually found in young adults
   d) May be bilateral in up to 10-15% of cases
   e) Highly radiosensitive but usually treated surgically
(2) Choriocarcinoma – ovarian origin
(3) Endodermal sinus tumor
(4) Embryonal carcinoma
(5) Mature teratoma
   a) May be cystic (95%) or solid (5%)
   b) Most common ovarian tumor in women in the second and third decades of life
   c) Contain tissue elements from all three germ layers
(6) Solid immature teratoma
   a) Includes immature derivatives of all three germ layers
   b) Usually found in young adults

E. Secondary or metastatic tumors
(1) Uterus – most common site of origin
(2) Breast
(2) G.I. tract

150. Given a patient with an ovarian malignancy, the student will be familiar with the staging system and management.

A. Surgical staging – according to the Oncology Committee of the International Federation of Gynecology and Obstetrics (FIGO), 19th annual report, 1985
(1) Stage I – growth limited to the ovaries
   a) Stage Ia – growth limited to one ovary; no ascites; no tumor on the external surface; capsule intact
   b) Stage Ib – growth limited to both ovaries; no ascites; no tumor on the external surface; capsule intact
   c) Stage Ic – tumor either Stage Ia or Ib, but with tumor on the surface of one or both ovaries; or with capsule ruptured; or with ascites present containing malignant cells or with positive peritoneal washings
(2) Stage II – growth involving one or both ovaries with pelvic extension
   a) Stage IIa – extension and/or metastases to the uterus and/or tubes
   b) Stage IIb – extension to other pelvic tissues
   c) Stage IIc – tumor either Stage IIa or Stage IIb, but with tumor on surface of one or both ovaries; or with capsule(s) ruptured; or with ascites present containing malignant cells or with positive peritoneal washings
(3) Stage III – tumor involving one or both ovaries with peritoneal implants outside the pelvis and/or positive retropertitoneal or inguinal nodes; superficial liver metastasis equals Stage III; tumor is limited to the true pelvis but with histologically proven malignant extension to small bowel or omentum.
   a) Stage IIIa – tumor grossly limited to the true pelvis with negative nodes but with histologically confirmed microscopic seeding of abdominal peritoneal surfaces
b) Stage IIIb – tumor of one or both ovaries with histologically confirmed implants of abdominal peritoneal surfaces none exceeding 2 cm in diameter. Nodes are negative.
c) Stage IIIc – abdominal implants greater than 2 cm in diameter and/or positive retroperitoneal or inguinal nodes

(4) Stage IV – growth involving one or both ovaries with distant metastases. If pleural effusion is present, there must be positive cytology to assign a case to Stage IV; parenchymal liver metastasis equals Stage IV

G. Management

(1) Tumors of low malignant potential
a) Total abdominal hysterectomy and bilateral oophorectomy in most cases
b) If patient desires maintaining reproductive capacity and is aware of risks involved, then unilateral oophorectomy providing that
   (b. 1) Tumor is small
   (b. 2) Tumor is confined to one ovary and
   (b. 3) No malignant cells are found in peritoneal "washings"

(2) Frankly malignant tumors – primary therapy is surgical with a staging laparotomy and maximal debulking effort
a) Peritoneal washings for cytology
b) Total abdominal hysterectomy, bilateral salpingo-oophorectomy
c) Omentectomy
d) Peritoneal biopsies or maximum possible debulking
e) Exploration of the entire abdomen
f) Selected para-aortic lymph node biopsy as indicated

(3) Adjuvant therapy may include
a) Chemotherapy
b) Irradiation
c) Immunotherapy

Uterine Corpus

151. Given a patient with a uterine neoplasm, the student will list the signs and symptoms of uterine leiomyomata, endometrial polyps, adenomyosis, and endometrial hyperplasia and will describe the diagnostic test(s) and treatment appropriate for each lesion.

A. Leiomyomata – tumors of smooth muscle cells usually of the uterus
(1) Symptoms and signs
a) Abnormal vaginal bleeding
b) Pelvic pressure symptoms
c) Pelvic pain
d) Irregularity in uterine size and shape
   (d. 1) Submucosal
   (d. 2) Intramural
   (d. 3) Subserosal
e) Pelvic mass of unknown origin – may be difficult to differentiate from an ovarian neoplasm
f) May enlarge if patient received exogenous estrogen. Likewise, may regress postmenopausally.

(2) Diagnostic studies
a) Pelvic examination
b) Ultrasound
c) Hysteroscopy or laparoscopic evaluation in doubtful cases

(3) Management
a) Indicated when symptomatic
b) Myomectomy when preserving reproductive capability; may be preceded by preoperative gonadotropin releasing hormone analog treatment.

c) Hysterectomy

(4) Malignant transformation is rare – leiomyosarcoma 0.3-0.7%

B. Endometrial polyps – finger-like projections of endometrial tissue

(1) This is a gross description. Microscopic evaluation is necessary to make a definitive diagnosis.

(2) Associated with irregular bleeding

(3) Diagnosis and treatment require curettage or excisional hysteroscopic biopsy

C. Endometrial hyperplasia

(1) Associated with prolonged estrogen activity unopposed by cyclic progestins

(2) Types

a) Cystic glandular hyperplasia – may progress or be associated with adenomatous hyperplasia

b) Adenomatous hyperplasia

c) Atypical adenomatous hyperplasia – premalignant

(3) Diagnosis is by endometrial sampling via office biopsy or curettage

(4) Management

a) Curettage is often therapeutic

b) The anovulatory patient may benefit from progestin therapy

c) Hysterectomy is indicated in the woman near menopause who has adenomatous hyperplasia, especially if there are atypical changes or failure of the hyperplasia to revert to normal with progestin therapy

(5) Prevention – patients receiving estrogen replacement therapy with the uterus in situ should also be given cyclic or continuous progestin therapy

D. Adenomyosis (see objective 136)

152. The student will describe the typical patient with endometrial adenocarcinoma and will list the signs, symptoms, and diagnostic techniques for endometrial carcinoma.

A. Common clinical history

(1) Patient is peri- or postmenopausal

(2) Anovulation

(3) Infertility

(4) Obesity

(5) Exogenous estrogen use without progestins

B. Signs and symptoms

(1) Abnormal uterine bleeding – postmenopausal uterine bleeding should be presumed to be due to malignancy until proven otherwise

(2) The uterus may be enlarged in advanced cases

C. Diagnosis

(1) Cancer cells may be identified on Pap smear – less than 40% of cases

(2) Endometrial biopsy – 90% accuracy

(3) Adenocarcinoma can be ruled out only by fractional D&C

153. Given a patient with endometrial adenocarcinoma, the student will be knowledgeable about its staging and management.

A. Surgical staging – according to the Oncology Committee of the International Federation of Gynecology and Obstetrics (FIGO), April 1989. FIGO Grades 1, 2 and 3 apply to all surgical staging.

(1) Stage Ia: tumor growth limited to endometrium

(2) Stage Ib: myometrial invasion of less than 1/2 full thickness

(3) Stage Ic: myometrial invasion of greater than 1/2 full thickness

(4) Stage IIa: involvement of endocervical glands
Stage IIb: cervical stromal involvement
Stage IIIa: involvement of the uterine serosa, adnexa, and/or positive cytology
Stage IIIb: extension to the vagina
Stage IIIc: metastases to the pelvic or para-aortic lymph nodes
Stage IVa: bladder or rectosigmoid involvement
Stage IVb: distant metastasis

B. Management
(1) Surgery – total abdominal hysterectomy, bilateral salpingo-oophorectomy, and peritoneal fluid for cytologic examination. Pelvic and para-aortic lymph node dissection may be indicated.
(2) Irradiation
(3) A combination of surgery and irradiation is the most common mode of treatment

Vagina

154. The student will describe the woman likely to develop squamous cell carcinoma of the vagina, indicate its most common mechanism of spread, and outline its management.

A. Demographics
(1) Most often develops in woman over age 50
(2) Many women have pre-existing HPV infection
(3) Uncommon malignancy
(4) 95% of vaginal malignancies are squamous cell type

B. Spreads by direct invasion and via the lymphatics to pelvic lymph nodes

C. Management – irradiation

155. Given a patient with a history of in utero diethylstilbesterol (DES) exposure, the student will list those problems the patient is at particular risk to develop and describe a program of surveillance.

A. Problems associated with DES exposed daughters when exposure occurred prior to the fourth month of gestation
   (1) Vaginal adenosis
      a) The presence of islands of columnar epithelium in the vagina
      b) No evidence that this lesion has malignant potential
   (2) Minor congenital malformations
      a) Cervical hood
      b) Uterine and tubal
         (b. 1) T-shaped uterus – diagnosis with hysterosalpingogram
         (b. 2) Uterine and tubal abnormalities are associated with an increased incidence of spontaneous abortions, tubal pregnancies, and infertility
   (3) Clear cell adenocarcinoma of the vagina
      a) Peak incidence in the second half of the second decade of life
      b) The risk is less than 1/1,000 DES-exposed women

B. Management of DES-exposed patients
   (1) Initial vaginal examination to include
      a) Inspection
      b) Palpation
      c) Pap smear
         (c. 1) Endocervix
         (c. 2) Cervix
         (c. 3) Vaginal fornices
      d) Colposcopy
(2) Suspicious lesions are evaluated by colposcopically-directed biopsies
(3) Follow-up with annual pelvic examination and Pap smear

Vulva

156. The student will describe the benign neoplasms of the vulva, outline the procedures required to diagnose them, and list the appropriate management for each.

A. Condyloma acuminatum
   (1) Tree-like structure with central core of connective tissue
      a) Characteristic appearance
      b) Usually multiple and scattered around the vulva and anus but may coalesce to form large cauliflower-like masses
   (2) Etiology – HPV
   (3) Often associated with vulvovaginitis
   (4) Management
      a) Trichloracetic acid
      b) Laser ablation
      c) Cryosurgery
      d) Cautery
      e) Excision
      f) 20% podophyllin in tincture of benzoin – contraindicated during pregnancy and becoming less commonly used
   (5) Sexual partner(s) should be evaluated for evidence of condyloma acuminatum

B. Vulvar dystrophies
   (1) Leukoplakia is a descriptive term meaning white patch. It has been used to describe different conditions, some benign, some with definite malignant potential. Its use is best avoided.
   (2) Types
      a) Lichen sclerosus (see objective 124)
      b) Hypertrophic – localized whitish or slightly elevated reddish areas most frequently on the hairless part of the vulva (see objective 124)
   (3) Diagnosis – histologic evaluation is necessary via punch biopsy of any suspicious lesion
   (4) Management – only after a tissue diagnosis
      a) General – try to decrease pruritus and scratching. Local fluorinated steroids can be helpful.
      b) Lichen sclerosus – testosterone 2% in aquaphor base
      c) Hypertrophic dystrophy
         (c. 1) Local excision
         (c. 2) Laser ablation of refractory keratoses

157. The student will describe the typical patient with vulvar carcinoma, outline an approach to vulvar lesions that will ensure the diagnosis, and be knowledgeable about its staging and management.

A. Common clinical history
   (1) Postmenopausal woman, often obese
   (2) Chronic vulvar lesion, often pruritic
      a) Patient may have delayed seeing physician
      b) Physician may treat with ointments without first obtaining biopsy

B. Diagnostic studies – consider all lesions as suspicious but especially raised white or red lesions, or ulcerated areas
   (1) Low power microscopy (colposcopy)
   (2) Biopsy
C. Clinical staging – according to the Oncology Committee of the International Federation of Gynecology and Obstetrics (FIGO), 1989
(1) Stage 0 – carcinoma in situ; intraepithelial carcinoma
(2) Stage I – lesions are confined to the vulva and/or perineum and are \( \leq 2 \) cm in diameter without suspicious groin nodes
(3) Stage II – tumor confined to the vulva and/or perineum and lesions exceed 2 cm in diameter without suspicious groin nodes
(4) Stage III – tumor of any size with spread to the urethra, vagina, and/or anus and/or associated with suspicious groin nodes
(5) Stage IVA – tumor invades the upper urethra, bladder mucosa, rectal mucosa, pelvic bone, and/or bilateral regional node metastases
(6) Stage IVB – any distant metastasis including pelvic lymph nodes

D. Management
(1) Carcinoma in situ
   a) Wide local excision
   b) Laser surgery
   c) Superficial (skinning) vulvectomy with or without skin graft
(2) Paget's disease
   a) Wide local excision
   b) Superficial (skinning vulvectomy) with or without skin graft
   c) 20% incidence of adenocarcinoma in underlying apocrine glands of the vulva
(3) Invasive squamous cell carcinoma of the vulva
   a) Radical vulvectomy and bilateral inguinal and femoral lymphadenectomy
   b) In selected early stage I cases, modified vulvectomy with ipsilateral inguinal lymph node dissection
(4) Basal cell carcinoma – wide local excision

(See Table of Gynecological Carcinomas at end of Chapter V.)

Terminal Disease

158. Given a patient with a terminal disease, the student will demonstrate sensitivity to the biopsychosocial dimensions of the patient's illness.

A. Patient concerns
(1) Patients frequently exhibit a wide range of emotions
   a) Anger
   b) Hopelessness
   c) Profound sadness and grief
   d) Fear
   e) Guilt
   f) Loss of individual integrity and dignity
   g) Helplessness – with little control over the disease itself, many patients welcome ability to take control through decision-making in areas such as
      (g. 1) Information sharing with others
      (g. 2) Treatment options
      (g. 3) Code status
      (g. 4) Life support
      (g. 5) Death issues
Mood swings are common, particularly as a result of shifts in patient expectations during illness ("good days" vs "bad days")

A woman's knowledge about the meaning of her illness combined with some sense of control over physiologic function may positively influence her response to the diagnosis

A woman's perception of her illness may be based upon her:
   a) Knowledge of human anatomy and physiology – body image/function concerns
   b) Age
   c) Culture
   d) Socioeconomic status
   e) Beliefs regarding available help and support from others

Coping mechanisms differ with each patient:
   a) Conscious or unconscious
   b) Effective or ineffective

Changes in family roles/responsibilities are inevitable and are usually dependent on patient's life cycle:
   a) The "nurturer" as the "nurtured"
   b) Desire to spare loved ones often results in increased isolation and loneliness even when patient feels greatest need for emotional support – patients may derive a great deal of benefit from educational classes and support groups

B. Family concerns – illness affects everyone
   (1) Loss of emotional and physical support previously provided by patient
   (2) Role reversals
   (3) Emotional and physical burnout
      a) Situational support from social agencies offering a mix of services such as medical, nutritional, palliative, personal custodial support and home maintenance can be very helpful
      b) Sharing care among family members and friends affords the patient caring contact with others with the added benefit of providing time for family members to emotionally rejuvenate
      c) Family members may not wish to add to patient's burden by discussing their fears and vulnerabilities
         (c. 1) Generally open, honest communication should be encouraged
         (c. 2) Support groups for families of the terminally ill and professional counseling (particularly for younger children) may be very helpful
   (4) The longer the illness, the greater likelihood that support systems will wane
   (5) Financial considerations
      a) Financial drain on patient and her family – often there are large out-of-pocket expenses even if patient has insurance
      b) Social agencies and third party payers often unresponsive to long term care needs
      c) The uninsured frequently suffer added indignities associated with poverty and bureaucratic processing

C. Physician considerations
   (1) Responsibility to clearly and accurately inform patients about the diagnosis, treatment options, and disease process and course in an appropriate setting when there is sufficient time to answer questions and concerns
      a) If patient desires that others share in the information exchange and/or decision-making, group meetings might be helpful
      b) More frequent, shorter meetings over the course of the illness may be more beneficial than infrequent longer meetings held only at the outset
      c) Frank and sensitive discussion of the issues of body image, sexuality and impact of treatment on the patient and others is essential
      d) Physicians need to continually reinforce information in light of patient mood swings and perceptions of improvement
(2) Must remain respectful of patient decisions, even when treatment choices or refusal are contrary to physician's recommendations
(3) Should remain mindful of patient's need for palliative care and emotional support as well as medical treatment

**Violence Against Women**

**Domestic Violence**

159. The student will be knowledgeable about the incidence and impact of domestic violence in women, screening and assessment, the physical, psychological and medico-legal issues related to domestic violence, and the role of the physician in intervention and referral.

A. General information
   (1) Definition – intentional and usually repeated physical or psychologic harm inflicted on a woman by a partner with whom she is or has been involved in an intimate relationship
   (2) Areas of most common injury in women are the head, neck, chest, abdomen, breasts, and upper extremities through beatings with clenched fists, kicking and use of weapons
   (3) In most violent relationships, mental abuse and intimidation are an integral component of the abuse syndrome
   (4) Domestic violence can often begin or escalate during pregnancy. This, plus the fact that many abused women do not seek health care until they are pregnant, puts the obstetrician in a front-line position for detection and intervention.

B. Types
   (1) Physical abuse
   (2) Emotional abuse (also called verbal or non-physical abuse)
   (3) Sexual abuse

C. Incidence
   (1) Difficult to ascertain due to probable severe underreporting
   (2) Studies on women of reproductive age report that between 11% and 23% have been physically assaulted, and 25% to 45% of all abused women are pregnant at the time of the beating
   (3) 57% of annual cases of family violence were committed by spouses or ex-spouses with the wife being the victim in more than 93% of cases (U.S. Department of Justice)
   (4) Over one-third of all female homicide victims are murdered by their male partners

D. Domestic violence occurs in all socioeconomic, racial, ethnic, religious and age groups. Although there are no clear-cut predictors of domestic violence, the following traits often characterize the men and women in abusive relationships.
   (1) "The abused" profile
      a) History
         (a. 1) Victim of child abuse, sexual assault or incest
         (a. 2) Raised in a single-parent home
         (a. 3) Married as a teenager
         (a. 4) Pregnant prior to marriage
         (a. 5) Frequent clinic/emergency room visits
      b) Psychological characteristics
         (b. 1) Low self-esteem and self-confidence
         (b. 2) Belief that she cannot function without the abuser
         (b. 3) Belief that she "causes" the abuse
         (b. 4) Belief that she can control the abuser
(2) "The abuser" profile
   a) History
      (a. 1) Deprived of nurturing as a child
      (a. 2) Exposure to domestic violence as a child
         (a.2.1) As an observer
         (a.2.2) As a victim
      (a. 3) Use of violence as a normal behavioral response
   b) Psychological characteristics
      (b. 1) Inability to resolve conflict in an appropriate way
      (b. 2) Rigid sexist attitudes and behaviors
      (b. 3) Blames the abused
      (b. 4) Needs to control victim
      (b. 5) Low self-esteem and self-confidence
      (b. 6) Low tolerance for stress

E. Recognition may depend on the physician's attitude about, and awareness of, the problem and his/her level of suspicion. Every patient should be assessed for abuse as part of her annual exam (see objective 5) or at every prenatal visit.

(1) Screening and assessment
   a) Screening of women for domestic violence should be done routinely and often, ideally at every prenatal visit and at each annual exam
   b) Ongoing screening is important since abuse may begin during pregnancy or the patient may not disclose abuse until later visits when trust is developed
   c) Screening and assessment should be accomplished using standardized instruments such as the "Abuse Assessment Screen" and "Danger Assessment." These instruments are brief but have comprehensive and effective wording.
   d) All women should be screened since screening on suspicion alone detects only a fraction of abused women

(2) Major physical complaints in abused women
   a) Headaches
   b) Insomnia
   c) Choking sensation
   d) Hyperventilation
   e) Gastrointestinal symptoms
   f) Chest, back and/or pelvic pain

(3) Other signs and symptoms
   a) Shyness
   b) Fright
   c) Embarrassment
   d) Evasiveness
   e) Jumpiness
   f) Passivity
   g) Frequent crying
   h) Often accompanied by male partner, who may control or speak for the patient
   i) Drug or alcohol abuse – often overdose
   j) Injuries – obstetrician/gynecologists are more likely to see injuries in healing stages than as acute wounds seen by ER personnel

F. Abuse cycle
   (1) Phase 1 – tension-building
   (2) Phase 2 – battering
   (3) Phase 3 – apologies or blame shifting
   (4) Repeated cycles often occur with an increase in the first phase, a decrease in the third phase, and a tendency for the violence to become more acute and dangerous
   (5) Victims often become so demoralized that they find it difficult to leave the situation, even with the means and opportunity
G. Medical issues
   (1) Physical examination
      a) Signs of abuse should be recognized upon physical exam and treated if necessary
      b) Detailed descriptions of abuse should be documented as part of the medical record. Use photographs if possible and document events using the patient's own words.
      c) Because abused pregnant women are often struck in the abdomen, patients who call following a beating should be seen immediately. Abused women may need to be scheduled for more frequent prenatal visits.
   (2) Counseling and intervention
      a) Physicians should attempt to identify that the problem of abuse may exist and then affirm that abuse is unacceptable
      b) Physicians can give "permission" to the patient to take some control over her life. Oftentimes, all a patient wants from her doctor is affirmation of her worth, permission to seek help, and information about options and resources available to her (e.g., shelters, financial help, legal assistance, and other community resources)
      c) Physicians may help abuse victims understand the dynamics of their relationship and the dangers faced by themselves and their children
      d) Physicians may help victims identify a safety plan for dealing with the abusive partner
      e) Refer for counseling (for victim, batterer, and/or children), as acceptable to the patient
      f) Remain non-judgmental, caring and supportive of the patient, even if she chooses not to leave the relationship
      g) Physician should be aware of community resources specific to domestic violence
   
H. Legal Issues
   (1) In some states, physicians are required to report to authorities any violent injuries inflicted on their patients
   (2) In some states, physicians may be liable if they fail to address and/or report the suicidal and/or homicidal intentions of their abused patients
   (3) Physician testimony may prove crucial to the outcome of a legal case
   (4) Most states have passed laws that protect the battered wife and allow arrest of the batterer
   (5) Police are being better trained to recognize domestic violence and may be empowered to take action against the batterer even if the victim refuses to press charges

Sexual Assault

160. The student will discuss the appropriate evaluation and treatment of a female who has been sexually assaulted.

A. Psychological concerns
   (1) Recognize the significant and often overwhelming fear, powerlessness, and helplessness which the victim experiences
   (2) Minimize further stress
      a) Use private examination room
      b) Have a patient advocate present; this can be a nurse
      c) A police officer should not be present during the interview and examination
   (3) Arrange for appropriate referral for emotional support for the patient and her significant other(s) as necessary
   (4) Understand the phases of response to rape and explain briefly to the patient that it may be several weeks or months before the experience and her feelings can be worked through
a) Phase I – acute reaction with signs of shock, disbelief, and a disruption of normal behavior
b) Phase II – outward adjustment with an apparent return to normal life which may be denial and suppression. There may be little interest into gaining insight through professional help
c) Phase III (integration and resolution) – patient needs to talk; feels depressed. May be triggered by courtroom experience or problems in relationship. Patient may feel need to seek psychological help.

B. Medico-legal concerns
(1) Consent must be obtained for evaluation, collection of evidence, release of evidence to authorities, and for any treatment rendered
(2) There needs to be meticulous attention to the medical record and recognition of the emotional state of the patient
   a) History
      (a. 1) Gravity and parity
      (a. 2) Last menstrual period
      (a. 3) Possibility of pregnancy (pre-existing or as a consequence of the assault)
         (a.3. 1) Current contraception
         (a.3. 2) Last voluntary intercourse
      (a. 4) History of STD’s
      (a. 5) Date, time and place of assault
      (a. 6) Threats of violence or reprisals
      (a. 7) Use of restraints
      (a. 8) Douching, bathing or change of clothes since assault
      (a. 9) Use of drugs or alcohol before or after assault
      (a.10) If ejaculation occurred
         (a.10.1) Site (i.e., vagina, anus, mouth, hair, etc.)
         (a.10.2) Condom use
   b) Physical examination (use of "rape kit," if available)
      (b. 1) General physical
      (b. 2) Inspect hair for foreign materials. If semen present, scrape and collect
      (b. 3) Inspect skin for bruises and scratches. Diagram or photo trauma
      (b. 4) Conduct breast exam for signs of maturity and trauma. Diagram or photograph
      (b. 5) Obtain fingernail scrapings
      (b. 6) Examine external genitalia (may use Woods light)
         (b.6. 1) Observe for signs of trauma – diagram or photograph
         (b.6. 2) Comb pubic hair
      (b. 7) Examine and describe the hymen
      (b. 8) Examine and describe the vagina and cervix
         (b.8. 1) Aspirate and pool secretions and place in sterile container
         (b.8. 2) Obtain cervical cultures
         (b.8. 3) Perform wet prep
      (b. 9) Complete bimanual exam
      (b.10) Inspect and describe anal area
      (b.11) Conduct oral exam and obtain cultures if indicated
   c) Other – photograph and collect clothing
(3) Protect chain of evidence for police. Evidence should be handed directly to the authorities and a receipt obtained

C. Laboratory studies
(1) Blood type
(2) Pap smear
(3) GC and Chlamydia cultures, hepatitis screen, HIV
(4) Serum pregnancy test
(5) Serological test for syphilis
(6) Urine drug and alcohol screen

D. Management
(1) Treat physical injuries
(2) Allow patient to use mouthwash and douche after all evidence has been collected
(3) Make recommendations for prevention of venereal disease – prophylaxis for GC and Chlamydia
(4) Make recommendations for prevention of pregnancy – Lo/Ovral or other form of "emergency contraception", if appropriate
(5) Provide reassurance that distress is normal in response to this crisis and that professional help is available. Consider giving the patient a sedative, if needed
(6) Arrange for appropriate referral and follow-up evaluation – 2 weeks and 6 weeks
### Table of Gynecological Carcinomas

<table>
<thead>
<tr>
<th>% of Gyn Cancers</th>
<th>Breast</th>
<th>Cervical</th>
<th>Endometrial</th>
<th>Gestational Trophoblastic Neoplasia</th>
<th>Ovarian</th>
<th>Vaginal</th>
<th>Vulvar</th>
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<tbody>
<tr>
<td>Not applicable</td>
<td>About 25%</td>
<td>About 40%</td>
<td>(1/2000 pregnancies)</td>
<td>About 30%</td>
<td>About 1%</td>
<td>About 4%</td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Usual Age Group</th>
<th>Mid 40's to 80. Incidence begins to rise rapidly in the 50's</th>
<th>Reproductive years</th>
<th>Menopausal and postmenopausal</th>
<th>Early or late reproductive years</th>
<th>Varying, often menopausal and postmenopausal</th>
<th>Postmenopausal, early lesions may occur in young women</th>
</tr>
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<tr>
<th>Common Symptoms and Signs</th>
<th>Palpable breast mass. Non cyclic persistent localized pain</th>
<th>Abnormal bleeding, postcoital spotting, or discharge. May be none</th>
<th>Abnormal uterine bleeding</th>
<th>Bleeding, uterine size discrepancy</th>
<th>Abdominal pain, increase in abdominal girth, ascites pelvic mass. May be none</th>
<th>Bleeding or discharge</th>
<th>Persistent pruritus or erythema</th>
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<tr>
<th>Correlates</th>
<th>Family history-mother, sister. Previous breast biopsy-atypical ductal hyperplasia</th>
<th>First coitus in early teen years, multiple male sexual partners, sexually transmitted genital viral infections (warts, herpes)</th>
<th>Obesity, history of anovulation, unopposed estrogen therapy, decreased with OC history</th>
<th>Poor nutrition, previous hydatidiform mole</th>
<th>Low parity, decreased with OC history</th>
<th>DES exposure history - young women</th>
<th>Atypical hypertrophic dystrophy, history of HPV infection</th>
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<tr>
<th>In Situ Form</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>No</th>
<th>Low malignancy potential</th>
<th>Yes</th>
<th>Yes</th>
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<tr>
<th>Spread</th>
<th>Lymphatic, local, systemic</th>
<th>Local and lymphatic</th>
<th>Local, lymphatic and vascular</th>
<th>Direct extension vascular</th>
<th>Peritoneal, lymphatic and vascular</th>
<th>Local and lymphatic</th>
<th>Local and lymphatic</th>
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<thead>
<tr>
<th>Diagnosis</th>
<th>Mammogram, excisional biopsy, needle biopsy</th>
<th>Pap smear, colposcopy, biopsy (punch or cone)</th>
<th>Fractional curettage</th>
<th>Ultrasonography</th>
<th>Laparotomy</th>
<th>Colposcopy, biopsy</th>
<th>Colposcopy, biopsy</th>
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<tr>
<th>Therapy*</th>
<th>Lumpectomy, axillary sampling, radiation therapy, modified radical mastectomy</th>
<th>Irradiation or radical surgery</th>
<th>Surgery and irradiation (Progestins for recurrent or metastatic disease)</th>
<th>Uterine evacuation, chemotherapy</th>
<th>1) Surgery 2) Chemotherapy 3) Irradiation (rarely)</th>
<th>Irradiation or radical surgery</th>
<th>Radical surgery</th>
</tr>
</thead>
</table>

*Diagnostic workup of a patient who may require radiotherapy or a major surgical procedure usually includes: biopsy for histological identification of the lesion, chest xray, CBC, tests for renal and hepatic function, intravenous pyelogram and cystoscopy, barium enema, and sigmoidoscopy.
UNIT VI
ENDOCRINOLOGY AND INFERTILITY

Puberty

161. The student will define puberty, precocious puberty and delayed puberty.

A. Puberty – the period of transition between the juvenile state and adulthood
   (1) Secondary sexual characteristics appear and mature
   (2) The adolescent growth spurt occurs, fertility is achieved, and profound
       psychological effects are observed
   (3) These changes result from maturation of the hypothalamus-pituitary unit,
       secretion of sex steroids, and stimulation of the reproductive organs
B. Precocious puberty – the appearance of any sign of secondary sexual maturation at
   an age more than 2.5 standard deviations below the mean. In North America, the
   age of 8 years in girls sets the limit.
   (1) True precocious puberty – gonadotropin-mediated event including sex hormone
       secretion by maturing glands. This is also known as GnRH-dependent
       precocious puberty
       a) CNS and pituitary tumors (7.0%)
       b) Idiopathic (74.0%)
   (2) Pseudo-precocious puberty – sex hormone-mediated events. This is also known
       as GnRH-independent precocious puberty
       a) Ovarian neoplasms (11%)
       b) McCune-Albright syndrome (5.0%)
       c) Adrenal feminizing neoplasms (1.0%)
       d) Adrenal masculinizing neoplasms (1.0%)
       e) Ectopic gonadotropin production (0.5%)
       f) Primary hypothyroidism
       g) Exogenous steroids (<1.0%)
C. Delayed puberty – no secondary sexual characteristics by 13 years of age; causes
   include
   (1) Hypergonadotropic hypogonadism
       a) Primary ovarian failure, abnormal karyotype
       b) Primary ovarian failure, normal karyotype
   (2) Hypogonadotropic hypogonadism
       a) Functional hypothalamic amenorrhea (e.g., stress, strenuous exercise,
          weight loss)
       b) Irreversible causes (e.g., tumors, congenital CNS defects, hypopituitarism)
   (3) Physiologic delay – diagnosis by exclusion

162. The student will list the sequence and tempo in which the stage of development of
      secondary sex characteristics occur.

A. Thelarche – breast development which begins at approximately 9.8 years of age
   (range: 8-13 years)
B. Pubarche – appearance of pubic hair that starts at approximately 10.5 years of age
   (range: 9-13 years)
C. Peak growth spurt that occurs at approximately 11.5 years of age
   (range: 9.5-13.5 years)
D. Menarche – the first menses that begins, on average, at 12.8 years of age
   (range: 10-16 years)
Menstrual Cycle

163. The student will list and describe the hypothalamic factors important to the normalcy of the adult female menstrual cycle.

A. Gonadotropin releasing hormone (GnRH)
   (1) Decapeptide
   (2) Pulsatile administration of GnRH increases the number of its own receptors (up-regulation)
   (3) Continuous infusion of GnRH reduces the number of receptors (down-regulation)
   (4) Pulsatile secretion into hypothalamic-hypophyseal portal circulation. This pulsatile secretion must be within a critical range for frequency and concentration (amplitude).
   (5) Stimulates both synthesis and release of FSH and LH from the anterior pituitary gonadotrophs
   (6) The GnRH receptor is on the external cell membrane. The GnRH receptor is calcium dependent and activation involves the utilization of inositol 1, 4, 5 – triphosphate (IP$_3$) and 1, 2 diacylglycerol (1, 2 – DG) as second messengers to stimulate protein kinase activity. These responses require a G-protein receptor and are associated with cyclical release of calcium ions.
   (7) Feedback
      a) Long feedback (from ovary)
         (a. 1) Estrogen
            (a.1.1) Low levels of estrogen enhance FSH and LH synthesis and storage, have little effect on LH secretion, and inhibit FSH secretion
            (a.1.2) High levels of estrogen induce the LH surge at midcycle, and high steady levels of estrogen lead to sustained elevated LH secretion
         (a. 2) Progesterone
            (a.2.1) Low levels of progesterone acting at the level of the pituitary gland enhance the LH response to GnRH and are responsible for the FSH surge at midcycle
            (a.2.2) High levels of progesterone inhibit pituitary secretion of gonadotropins by inhibiting GnRH pulses at the level of the hypothalamus. In addition, high levels of progesterone antagonize pituitary response to GnRH by interfering with estrogen action.
      b) Short feedback (from anterior pituitary) – gonadotropins inhibit GnRH release
      c) Ultra-short feedback (within hypothalamus) – inhibition by GnRH of its own synthesis

B. Prolactin inhibiting factor (PIF)
   (1) Is assumed to be dopamine
   (2) Secreted by the hypothalamus into the hypothalamic-hypophyseal portal circulation
   (3) In its absence the anterior pituitary releases prolactin

164. The student will explain the interaction between glycoprotein hormones (FSH, LH, hCG, TSH) and their receptors and list the functions of pituitary FSH, LH, and prolactin.

A. Receptors
   (1) Specificity of the tropic hormones depends upon the presence of a receptor in the cell plasma membrane
The hormone unites with the receptor and activates the cell wall enzyme, adenylate cyclase, leading to conversion of ATP to intracellular cyclic AMP. (3) Cyclic AMP leads to a physiologic event by activation of protein kinase that carries out phosphorylation of specific enzymes.

B. Follicle stimulating hormone (FSH)
   (1) Responsible for ovarian follicular growth
   (2) Induces aromatase enzymes in the granulosa cells
   (3) Stimulates the formation of LH receptors on the granulosa cells

C. Luteinizing hormone (LH)
   (1) Stimulates sex steroidogenesis in the theca cells and luteinized granulosa cells
   (2) The LH surge is the trigger mechanism for
      a) Oocyte maturation
      b) Ovulation
      c) Luteinization of granulosa cells
      d) Progesterone production
      e) Corpus luteum formation

D. Prolactin
   (1) Structurally is closely related to growth hormone
   (2) Release inhibited by PIF
   (3) Release stimulated by thyrotropic releasing hormone (TRH)
   (4) Necessary for lactation
   (5) Antigonadotropin
   (6) Osmolality control, especially of amniotic fluid

165. The student will explain the interaction between steroids and their receptors.

   A. The specificity of the reactions of tissues to steroids is due to the presence of intracellular nuclear receptor proteins

   B. Mechanism of action
      (1) Diffusion across the cell membrane
      (2) Binding to the nuclear receptor
      (3) Binding of the hormone-receptor complex to nuclear DNA
      (4) Synthesis of messenger RNA
      (5) Transfer of messenger RNA to the ribosomes
      (6) Protein synthesis

166. The student will indicate the structure and describe the effects of the ovarian steroids listed below.

   A. Estrogens
      (1) Structure
         a) C-18 steroid
         b) Estrone
            (b. 1) Single hydroxyl group at the 3 position
            (b. 2) Metabolite of estradiol
            (b. 3) Less potent than estradiol
            (b. 4) Can be produced by the peripheral conversion of androstenedione by aromatization in adipose tissue
            (b. 5) Especially important source of estrogen in the postmenopausal woman
         c) Estradiol
            (c. 1) Hydroxyl groups at the 3 and 17 position
            (c. 2) Most biologically active form of the hormone
            (c. 3) Principal secretion by pre-ovulatory follicle
d) Estriol
   (d. 1) Hydroxyl groups at the 3, 16 and 17 position
   (d. 2) Predominant estrogen metabolite found in the urine
   (d. 3) Less potent than estradiol
   (d. 4) Found in circulation during pregnancy (see objectives 13-15)

(2) Effects
   a) Fat deposition
   b) Breast growth and development
   c) Selective growth effects upon all tissues derived from the paramesonephric
      (Müllerian) ducts
   d) Blood proteins and lipids
      (d. 1) Increases binding globulins
      (d. 2) Increases high density lipoprotein (HDL) cholesterol and triglycerides
   e) Protects vascular and skeletal systems
   f) Increases FSH receptors
   g) Induces specific progesterone receptor protein

B. Progesterone
   (1) Structure
      a) C-21 steroid
      b) Progesterone – active form of the hormone
      c) Pregnanediol – major metabolite in urine
   (2) Effects
      a) Prepares the endometrium for implantation
      b) Decreases the motility of uterine and tubal musculature
      c) Stimulates acinar bud development from breast ducts
      d) Induces a rise in the basal body temperature

167. The student will construct a graph with the 28 day cycle on the abscissa and
      hormone concentration on the ordinate. This graph will illustrate the fluctuations of
      and interactions between the anterior pituitary (FSH and LH) and ovarian (estradiol
      and progesterone) hormones.

168. The student will describe the basic histological characteristics of the endometrium.

A. Endometrial architecture
   (1) Surface – columnar epithelium
   (2) Zona functionalis
      a) Zona compacta – upper one third; stroma more plentiful than glands
      b) Zona spongiosa – lower two thirds; glands more plentiful than stroma
   (3) Zona basalis

B. Cell types
   (1) Glands – columnar cells with elongated nuclei
   (2) Stromal cells
   (3) Lymphocytes
   (4) Stromal granulocytes

C. Physiologic cyclic variation
   (1) Proliferation of glands and stroma with progressive glandular tortuosity
   (2) Secretory activity in glandular cells is initially seen as subnuclear vacuoles
   (3) Glands undergo elongation and coiling followed by secretion. The stroma
      decidualizes.
   (4) Arteriolar constriction and ischemia are associated with stromal granulocyte
      appearance, followed by necrosis, then hemorrhage (menses)
169. The student will list the methods for detecting ovulation.

A. Pregnancy – only definitive indicator
B. Basal body temperature (BBT) elevation
C. LH surge detection
D. Ultrasound
E. Visualization of corpus luteum/stigma
F. Progesterone assay
G. Endometrial biopsy

Prostaglandins

170. The student will describe the structure and metabolism of the prostaglandins (PG).

A. PG are 20-carbon fatty acids derived from essential fatty acids
B. PG are primarily intracellular mediators that are synthesized, act, and are catabolized within the cells
C. Precursor for PG is arachidonic acid found in phospholipids in cell membrane
D. Release of arachidonic acid from phospholipids is an important rate-limiting step that is controlled by phospholipase
E. Arachidonic acid is metabolized by cyclooxygenase pathways to produce PGE$_2$, PGF$_2$, PGD$_2$, PGI$_2$ (prostacyclin) and TXA$_2$ (thromboxane A$_2$)
F. Non-steroidal anti-inflammatory drugs, such as aspirin and indomethacin, inhibit PG production by inhibiting cyclooxygenase

![Prostaglandin Metabolism Diagram]

Abnormal Uterine Bleeding

171. The student will define menstruation, normal and abnormal menstrual bleeding, and the various terms used to describe abnormal menstrual patterns.

A. Menstruation – the cyclic shedding of secretory endometrium
B. Normal menses
C. Abnormal uterine bleeding – any bleeding which significantly deviates from the usual menstrual pattern
D. Dysfunctional uterine bleeding – abnormal uterine bleeding from which organic lesions of the uterus and systemic disorders have been excluded. It is usually anovulatory.
E. Abnormal menstrual patterns
   (1) Oligomenorrhea – infrequent, irregular episodes of bleeding, usually occurring at intervals greater than 40 days (alternate definition – 45 days)
Polymenorrhea – frequent but regular episodes of uterine bleeding usually occurring at intervals of 21 days or less (alternate definition – 18 days or less)

Hypermenorrhea or menorrhagia – uterine bleeding excessive in both amount and duration of flow, occurring at regular intervals

Metrorrhagia – uterine bleeding, usually not excessive, occurring at irregular intervals

Menometrorrhagia – uterine bleeding, usually excessive and prolonged, occurring at frequent and irregular intervals

Hypomenorrhea – uterine bleeding that occurs at regular intervals but is decreased in amount

Intermenstrual bleeding – episodes of uterine bleeding between regular menstrual periods

172. Given a patient with abnormal uterine bleeding occurring before, during, or after her reproductive years, the student will construct a differential diagnosis, indicate appropriate diagnostic tests, and be knowledgeable about proper management.

A. Childhood
   (1) Most bleeding in childhood is due to vaginal rather than uterine bleeding
      a) Trauma
      b) Abuse
      c) Infection
      d) Vaginal tumor
   (2) Ovarian tumors may stimulate uterine bleeding
   (3) Diagnosis – via careful pelvic and abdominal examination
   (4) Management – according to diagnosis

B. Peri-menarchal – usually anovulatory

C. Reproductive life (see objectives associated with each of these specific entities)
   (1) Bleeding associated with pregnancy
   (2) Tumors
      a) Benign
         (a. 1) Cervical or endometrial polyps
         (a. 2) Endometrial hyperplasia
         (a. 3) Myomata
      b) Malignant
         (b. 1) Adenocarcinoma of the endometrium
         (b. 2) Ovarian gonadal stromal tumors
   (3) Infection
      a) Salpingitis
      b) Endometritis
      c) Cervicitis
   (4) Blood dyscrasias
      a) Idiopathic thrombocytopenia
      b) Von Willebrand's disease – especially important in adolescents
      c) Leukemia
   (5) Iatrogenic
      a) Oral contraceptive agents
      b) Anticoagulants
      c) Intrauterine devices
   (6) Systemic disease
      a) Hypo- or hyperthyroidism
      b) Hyperprolactinemia
      c) Liver dysfunction
      d) Diabetes mellitus
      e) Renal insufficiency or dialysis
(7) Anovulatory
   a) Anovulatory bleeding most frequently occurs shortly after menarche or shortly before menopause. It either represents endogenous estrogen breakthrough bleeding or estrogen withdrawal bleeding.
   b) Prolonged unopposed estrogen may be associated with endometrial hyperplasia
   c) A manifestation of polycystic ovarian syndrome (PCOS)
   d) Diagnosis
      (d. 1) Suspected after history and physical examination
      (d. 2) Made by basal body temperature chart and carefully timed endometrial biopsy or D&C with hysteroscopy (perimenopausal)
      (d. 3) Sonohysterography
      (d. 4) Rule out hyperprolactinemia and thyroid disease
   e) Management
      (e. 1) Reasonable to treat a woman under 35 without first obtaining sample of endometrial tissue
      (e. 2) Estrogen-progestin therapy or progestin therapy
         (e.2.1) Especially useful in the adolescent patient
         (e.2.2) Periodic use may prevent endometrial hyperplasia
      (e. 3) Corticosteroid therapy may be beneficial if adrenal steroids are elevated (DHEA-S)
      (e. 4) D&C may be therapeutic as well as diagnostic
      (e. 5) Ovulation induction if patient desires pregnancy

(8) Ovulatory
   a) Ovulatory bleeding represents progesterone breakthrough bleeding or it may also be associated with an inadequate corpus luteum function
   b) Diagnosis by basal body temperature chart, serum progesterone, late luteal endometrial biopsy, and/or D&C
   c) Luteal phase defect (corpus luteum defect)
      (c. 1) Diagnosis by two late luteal endometrial biopsies in sequential cycles showing maturational lag by two days or more on histology
      (c. 2) Treatment – cyclic progestin therapy, clomiphene citrate, or human menopausal gonadotropins
   d) Management
      (d. 1) D&C
      (d.1.1) Not indicated before reproductive age
      (d.1.2) Sometimes indicated during reproductive age
      (d.1.3) Virtually always indicated after reproductive years, potentially with hysteroscopy
      (d. 2) Progestin therapy or combination estrogen and progestin therapy

D. Perimenopausal
   (1) Usually anovulatory
   (2) Pathology must be ruled out

E. Postmenopausal
   (1) All postmenopausal bleeding must be considered adenocarcinoma of the endometrium until it is proven otherwise. Fractional endocervical and endometrial sampling is mandatory to rule out carcinoma. Hysteroscopy may be beneficial to aid in diagnosis.
   (2) Exogenous estrogen is associated with a four to eight times increased risk of adenocarcinoma of the endometrium when given alone
   (3) Ovarian tumor
   (4) Atrophic vaginitis
      a) Responds to topical estrogen
      b) Topical estrogen is absorbed into the systemic circulation
Amenorrhea

173. The student will define amenorrhea.

A. Primary amenorrhea
   (1) No period by age 14 in the absence of growth or development of secondary sexual characteristics
   (2) No period by age 16 regardless of the presence of normal growth and development with the appearance of secondary sexual characteristics

B. Secondary amenorrhea – in a woman who has been menstruating, the absence of periods for a length of time equivalent to a total of at least three of her previous cycle intervals or six months without a menstrual flow

174. Given a case of amenorrhea, the student will derive a differential diagnosis and outline an approach to diagnosis and management.

A. The diagnosis can be reached by meticulous attention to history and physical findings combined with a sequential approach to the ordering of diagnostic tests. Further, the organization of problems capable of causing amenorrhea into groups according to the expected diagnostic test results is useful.
   (1) Pregnancy test
      a) If positive, appropriate follow-up
      b) If negative, proceed to next step
   (2) Prolactin assay
      a) If elevated, see below
      b) If normal, proceed to next step
   (3) TSH and T₄ assay
      a) If low T₄ and elevated TSH, patient has hypothyroidism and should be evaluated and managed accordingly
      b) If both normal, proceed to next step
   (4) Progestin withdrawal – after negative pregnancy test
      a) Usually given as medroxyprogesterone acetate 10 mg PO for 10 days
      b) If vaginal bleeding follows, the hypothalamic-pituitary-ovarian axis is intact, but the cycling mechanism is not functioning
      c) If no withdrawal bleeding occurs, proceed with estrogen-progestin withdrawal test
   (5) Estrogen-progestin withdrawal test
      a) Failure to bleed following test
         (a. 1) Imperforate hymen
         (a. 2) Müllerian anomalies and agenesis
            (a.2.1) G.U. anomalies and skeletal anomalies, especially vertebral anomalies, should be ruled out
            (a.2.2) Ovarian function is normal
            (a.2.3) Many are surgically correctable
            (a.2.4) Treatment of Müllerian agenesis includes dilation of vaginal pouch or construction of an artificial vagina
         (a. 3) Endometrial sclerosis (Asherman's syndrome)
            (a.3.1) Partial to complete obliteration of the endometrial cavity following vigorous puerperal or post-abortal curettage or tuberculosis infection
            (a.3.2) Treatment involves lysis of adhesions hysteroscopically or by dilation and curettage plus high dose estrogen therapy for several months
Androgen insensitivity syndrome (testicular feminization)
(a.4.1) Male pseudohermaphrodite
(a.4.2) Due to lack of intracellular androgen receptors
(a.4.3) Transmitted by X-linked recessive gene
(a.4.4) Diagnostic test – 46,XY karyotype in female phenotype
(a.4.5) Clinical manifestations
(a.4.5.1) Primary amenorrhea
(a.4.5.2) Blind vaginal canal and absent uterus
(a.4.5.3) Possible presence of inguinal hernias
(a.4.5.4) Normal growth and development
(a.4.5.5) Scant body hair
(a.4.6) Management
(a.4.6.1) Bilateral gonadectomy after puberty – incidence of neoplasia about 10%
(a.4.6.2) After surgery, estrogen replacement

b) Estrogen-progestin test provokes vaginal bleeding – proceed to next step

(6) Serum FSH, LH
a) Elevated FSH (>40 mIU/ml)
   (a.1) This is pathognomonic of ovarian failure (menopause)
   (a.2) In women under 35, a karyotype should be performed
b) Abnormal karyotype – Turner syndrome
   (b.1) Abnormal or absent X (i.e. 45,X; 45,X/46,XY; 46,XX; 45X/46,XX)
   (b.2) Short stature and somatic anomalies
   (b.3) Rule out renal and cardiovascular anomalies
   (b.4) Provide estrogen-progestin replacement therapy
   (b.5) With the presence of a Y chromosome line, the patient should undergo immediate gonadectomy. Unlike the testicular feminization syndrome, androgens in these patients will cause masculinization. There is a high incidence of malignant gonadal neoplasms in women under age 30.
c) Normal karyotype in a woman under 35
   (c.1) 46,XX or 46,XY
   (c.2) Normal or tall stature
   (c.3) No somatic, renal, or cardiovascular anomalies
   (c.4) Provide estrogen-progestin replacement therapy
   (c.5) With the presence of a Y chromosome line, the patient should undergo immediate gonadectomy. Unlike the androgen insensitivity syndrome, androgens in these patients will cause masculinization. There is a high incidence of malignant gonadal neoplasms.
d) Normal or low levels of FSH, LH
   (d.1) Pituitary causes
      (d.1.1) Pituitary tumors or necrosis
      (d.1.2) Prolactin-secreting adenomas
         (d.1.2.1) Less than 1 cm in size – microadenomas
         (d.1.2.2) 1 cm or greater in size – macroadenomas
         (d.1.2.3) Diagnosis confirmed by high elevated levels of serum prolactin and an abnormal CT scan or MRI
         (d.1.2.4) Treatment is medical, surgical, or by irradiation; dopamine agonists (bromocriptine, cabergoline) can cause the adenoma to regress temporarily
         (d.1.2.5) Extension may affect other pituitary hormones and impair vision
      (d.1.3) Other causes of prolactin elevation – lactation, amenorrhea
         (d.1.3.1) Hypothyroidism – treatment: exogenous thyroid hormone
         (d.1.3.2) Excessive estrogen
(d.1.3.3) Drugs that cause suppression of hypothalamic dopamine (phenothiazine derivatives, tricyclic antidepressants, alpha-methyldopa, etc.)
(d.1.3.4) Intensive suckling
(d.1.3.5) Stress
(d.1.3.6) Hypothalamic lesions

(d.2) Hypothalamic causes

(d.2.1) Anorexia nervosa
(d.2.1.1) General information
  (d.2.1.1.1) Estimates of prevalence are as high as 1 in every 200 high school women
  (d.2.1.1.2) Generally occurs between age 10 and 30, but most commonly less than age 25
  (d.2.1.1.3) Patients typically seen as “perfect” children; are often overachievers with rigid value system, frequently resulting in social isolation

(d.2.1.2) Diagnosis
  (d.2.1.2.1) Weight loss of 25% or weight 15% below normal for age and height
  (d.2.1.2.2) Amenorrhea
  (d.2.1.2.3) No known medical illness
  (d.2.1.2.4) No other psychiatric disorder
  (d.2.1.2.5) Associated with constipation, low blood pressure, hypercarotenemia, diabetes insipidus, electrolyte abnormalities
  (d.2.1.2.6) Patients frequently deny loss of weight, have distorted body image and/or unusual handling of food

(d.2.1.3) Laboratory studies
  (d.2.1.3.1) Decrease in FSH, LH
  (d.2.1.3.2) Increase in cortisol
  (d.2.1.3.3) T4, TSH and prolactin within normal limits but T3 is low and reverse T3 is Increased
  (d.2.1.3.4) With weight gain all values revert to normal though 30% of patients may remain amenorrheic
  (d.2.1.3.5) Response to GnRH tends to recur at 15% below ideal body weight

(d.2.1.4) Management
  (d.2.1.4.1) The patient's recognition of the association between the amenorrhea and low body weight is sometimes all that is necessary
  (d.2.1.4.2) Patient should keep a daily calorie diary
  (d.2.1.4.3) Frequent visits for weight checks and diary check
  (d.2.1.4.4) If progress is slow, hormone replacement may be necessary to prevent osteoporosis
  (d.2.1.4.5) In an adult weighing less than 100 pounds, continued weight loss requires psychiatric consultation
Prognosis – poor when associated with
- Long duration of illness
- Older age at onset
- Presence of bulimia
  - Definition – a syndrome of intermittent secretive binge eating. Binges are followed by self-induced vomiting, fasting or use of laxatives and diuretics.
- Seen in about half of women with anorexia nervosa
- Bulimic/anorexic patients have wider fluctuations in body weight but less severe weight loss than other anorexics
- Protein calorie malnutrition often occurs and contributes to anovulation
- Low socioeconomic status
- Poor parental relationship

Hypothalamic amenorrhea
- Usually due to stress, weight loss, or exercise
- Usually self-limited
- Should have annual re-evaluation
- May wish to stimulate endometrium periodically with progestin or estrogen-progestin combination

Other endocrine causes of amenorrhea
1. Adrenal dysfunction
2. Diabetes mellitus

Hirsutism

The student will define hirsutism, virilization, defeminization, and hypertrichosis.

A. Hirsutism – excessive growth of hair in abnormal position of the body, usually on the upper lip, chin, chest, abdomen, and anterior thighs
B. Virilization – regression of female characteristics associated with acquisition of male characteristics, e.g., clitoral hypertrophy, hirsutism, deepening voice, increased muscle mass, and temporal balding. By definition, virilization mandates the presence of clitoromegaly – the other symptoms listed may also be found.
C. Defeminization – diminished breast tissue and female fat deposits; decreased or absent menses; growth of hair in abnormal position of the body
D. Hypertrichosis – excessive growth of fine downy hair in the absence of an abnormality of androgen metabolism
176. Given a patient with hirsutism, the student will list the screening tests that can be used to differentiate adrenal from ovarian disease, list the possible causes, and indicate the associated diagnostic laboratory findings and the proper management for each abnormal condition.

A. Laboratory tests
   (1) DHEA-S – adrenal source
   (2) Testosterone – ovarian source

B. Causes
   (1) Physiologic
      a) Puberty
      b) Pregnancy
      c) Postmenopausal – probably related to continued secretion of testosterone from the ovary and adrenal gland plus a decrease in binding globulin; net effect is increased circulating free hormone
   (2) Pathologic
      a) Adrenal
         (a.1) Congenital adrenal hyperplasia
            (a.1.1) This problem arises from an enzymatic deficiency, generally 21-alpha-hydroxylase, and is usually diagnosed in earlychildhood
            (a.1.2) Late onset congenital adrenal hyperplasia (LOCAH) may mimic polycystic ovarian syndrome (PCOS) in up to 5% of women given the diagnosis of PCOS
               (a.1.3) Diagnosis
                  (a.1.3.1) Elevated 17 alpha-OH progesterone in the plasma which decreases markedly following dexamethasone suppression
                  (a.1.3.2) Normal to slightly elevated serum testosterone
                  (a.1.3.3) LOCAH is diagnosed with IV ACTH stimulation testing
               (a.1.4) Management – corticosteroids
         (a.2) Adrenal adenoma or carcinoma
            (a.2.1) Diagnosis
               (a.2.1.1) Markedly increased DHEA-S (usually >700 mg/dl) which decreases minimally following dexamethasone suppression
               (a.2.1.2) Normal to slightly elevated serum testosterone
               (a.2.1.3) Tumor visualization
                  (a.2.1.3.1) CT scan
                  (a.2.1.3.2) Magnetic resonance imaging (MRI)
            (a.2.2) Management
               (a.2.2.1) Surgical – adrenalectomy
               (a.2.2.2) Mitotane in selective cases
         (a.3) Cushing's syndrome
            (a.3.1) Manifestations in addition to hirsutism which are often noted
               (a.3.1.1) Centripetal obesity
               (a.3.1.2) "Buffalo hump"
               (a.3.1.3) Hypertension
               (a.3.1.4) Purple striae
            (a.3.2) Diagnosis
               (a.3.2.1) Elevated morning serum cortisol
               (a.3.2.2) Must differentiate tumor site
                  (a.3.2.2.1) Adrenal
                  (a.3.2.2.2) Pituitary
            (a.3.3) Management – surgical
b) Ovarian
   (b. 1) Polycystic ovarian syndrome (PCOS)
      (b.1.1) Classic form is also known as Stein-Leventhal syndrome
      (b.1.2) Common findings – patients will exhibit some or all of these
         (b.1.2.1) Hirsutism
         (b.1.2.2) Obesity
         (b.1.2.3) Amenorrhea or abnormal uterine bleeding
         (b.1.2.4) Infertility secondary to anovulation or oligo-ovulation
      (b.1.2.5) Bilateral ovarian enlargement – usual pathologic features
         (b.1.2.5.1) Thickened tunica albuginea
         (b.1.2.5.2) Theca cell luteinization
         (b.1.2.5.3) Numerous follicles arrested in early development
         (b.1.2.5.4) Absence of corpora lutea
      (b.1.2.6) Insulin resistance
      (b.1.3) Diagnostic tests
         (b.1.3.1) Testosterone – upper normal to slightly elevated
         (b.1.3.2) DHEA-S – upper normal to slightly elevated
         (b.1.3.3) LH usually elevated (increased LH:FSH ratio)
      (b.1.4) Management
         (b.1.4.1) Infertility – ovulation induction
            (b.1.4.1.1) Usually with clomiphene citrate (see objective 177)
            (b.1.4.1.2) Human menopausal gonadotropins are used if clomiphene citrate fails
            (b.1.4.1.3) Metformin may be effective as an adjuvant
            (b.1.4.1.4) Ovarian wedge resection is rarely indicated
         (b.1.4.2) Abnormal uterine bleeding
            (b.1.4.2.1) These patients are more likely to develop endometrial hyperplasia and malignancy, so an endometrial biopsy or a fractional D&C may be indicated prior to therapy
            (b.1.4.2.2) Periodic withdrawal bleeding induced with progestin to prevent the development of endometrial hyperplasia. An oral contraceptive is warranted instead if the woman also desires contraception.
            (b.1.4.2.3) Metformin may correct underlying insulin resistance, leading to more frequent and/or regular cycles
         (b.1.4.3) Hirsutism
            (b.1.4.3.1) Eflornithine hydrocholoride 13.9% cream applied topically b.i.d. blocks the enzyme ornithine decarboxylase, vital for terminal hair growth.
(b.1.4.3.2) Oral contraceptive agent
  (b.1.4.3.2.1) Preferably a strong estrogen combined with a weak non-androgenic progestin
  (b.1.4.3.2.2) May arrest growth of new hair after six months to one year although not all authorities agree
  (b.1.4.3.2.3) Previously established hair growth may not disappear

(b.1.4.3.3) Spironolactone – long-term therapy, may be used in conjunction with an oral contraceptive

(d.1.4.3.4) Depilatories – need to be used repeatedly
(d.1.4.3.5) Bleach – needs to be used repeatedly
(d.1.4.3.6) Electrolysis – expensive and painful, more effective in conjunction with hormonal suppressive therapy
(d.1.4.3.7) In a few older patients who have been appropriately evaluated, bilateral oophorectomy might be considered.

(b. 2) Ovarian tumors
  (b.2.1) See Unit V – ovarian, gonadal stromal tumors
  (b.2.2) Ovary usually enlarged
  (b.2.3) Minimal or no suppression with oral contraceptives

C. Drugs
  (1) Anabolic steroids
  (2) Synthetic progestins (19 nor-testosterone derivatives)
  (3) Danocrine (Danazol®)
  (4) ACTH and corticosteroids
  (5) Diphenylhydantoin (Dilantin®)
  (6) Diazoxide

D. Genetic (see objective 108)
  (1) Incomplete androgen insensitivity syndrome (testicular feminization)
  (2) Mosaicism

E. Idiopathic (constitutional, familial)
  (1) Common with women of Mediterranean descent
  (2) Often present in other family members
  (3) Diagnosis – hormonal investigation is within normal limits; this is a diagnosis of exclusion
  (4) Management
    a) Spironolactone – long-term therapy
    b) Depilatories – need to be used repeatedly
    c) Bleach – needs to be used repeatedly
    d) Electrolysis – expensive and painful
Infertility

177. The student will define infertility and be knowledgeable about counseling regarding options and the psychosocial issues infertile couples may face.

A. Definition – failure to conceive after a period of 12 months of unprotected intercourse. Please note, however, that evaluation and treatment may be initiated after a shorter duration in the presence of obvious factors reducing fertility potential, including advancing age.

B. General issues
   (1) Infertility affects approximately 15% of couples
   (2) Given appropriate therapy, about 50% of couples will achieve pregnancy
   (3) In those cases where pregnancy has not been achieved in a reasonable length of time, where all corrective measures have failed, and where all appropriate diagnostic tests have been performed, the couple should be helped to accept this fact. Further options include
      a) Assisted reproductive technologies
         (a. 1) In vitro fertilization/embryo transfer (IVF/ET)
         (a. 2) Gamete intrafallopian transfer (GIFT)
         (a. 3) Zygote intrafallopian transfer (ZIFT)
         (a. 4) Tubal embryo transfer (TET)
         (a. 5) Micromanipulation, including intracytoplasmic sperm injection (ICSI) (see objective 178)
      b) Adoption
      c) Other alternative forms of parenting (where available)
         (c. 1) Oocyte donor
         (c. 2) Embryo donor
         (c. 3) Sperm donor
         (c. 4) Surrogate parent
         (c. 5) Womb donor
      d) Discontinuance of therapies and acceptance of non-parenthood
   C. Psychosocial issues
      (1) Patient feelings of isolation and powerlessness
      (2) Common feelings of both patient and partner
         a) Frustration
         b) Anger
         c) Depression
         d) Guilt
         e) Grief
         f) Anxiety
      (3) Infertility testing and therapy may precipitate and/or aggravate marital disharmony
      (4) Counseling and support groups may be helpful
      (5) Psychological evaluation may be required in some programs prior to initiation of certain advanced reproductive technologies or alternative parenting options
   D. Financial considerations
      (1) Diagnostic workup and infertility treatments are often quite costly, particularly over an extended period of time
      (2) Many third party payors will not pay all or some infertility costs. Patients need to be aware of possible copays and other out-of-pocket expenses.
      (3) Physicians and patients should consider the expense and yield of each procedure individually, particularly if limited resources (i.e., time and money) are to be optimally utilized
178. Given a couple who have been unable to conceive, the student will list the major factors which can cause infertility, indicate how each factor can be evaluated, and list the appropriate therapeutic intervention(s).

A. Ovary
   (1) Anovulation/oligo-ovulation
      a) Diagnostic aides
         (a. 1) Usually, but not always, a history of menstrual irregularity
         (a. 2) Basal body temperature (BBT) graph – monophasic
         (a. 3) Timed serum progesterone – mid-luteal
         (a. 4) Timed endometrial biopsy – premenstrual
         (a. 5) Early follicular LH, FSH, PRL, T4, TSH, DHEA-S, testosterone
         (a. 6) Ultrasound follicular studies
      b) Management
         (b.1) Clomiphene citrate
            (b.1.1) Given for 5 days near the beginning of the cycle (e.g., cycle days 5 through 9)
            (b.1.2) A weak estrogen that interferes with the replenishment of estrogen receptors in the hypothalamus
            (b.1.3) Dosage increased only if ovulation does not occur
            (b.1.4) 70% of properly selected patients will ovulate on this medication; ineffective in hypothalamic amenorrhea
            (b.1.5) Side effects
               (b.1.5.1) Ovarian hyperstimulation (unusual)
               (b.1.5.2) Increase in number of multiple gestations (8%)
               (b.1.5.3) Vasomotor symptoms
               (b.1.5.4) Visual symptoms – halos, scotomata
               (b.1.5.5) Headaches
               (b.1.5.6) Possible link to ovarian cancer when used for 12 cycles or more
         (b.2) Human menopausal gonadotropins (hMG) – Pergonal®, Humegen®, Repronex® = FSH + LH; Metrodin® and Fertinex® = FSH only; Gonal-F® and Follistim® = recombinant FSH only; indications may include
            (b.2.1) Hypothalamic amenorrhea
            (b.2.2) Hypopituitarism
            (b.2.3) Clomiphene failure
            (b.2.4) Superovulation for assisted reproductive technology (ART) cycles
         (b.3) Human chorionic gonadotropin (hCG)
            (b.3.1) Used as a substitute for LH (to mimic LH surge)
            (b.3.2) Often used as an adjunct to ovulation induction, especially with gonadotropin therapy
   (2) Luteal phase defect (LPD)
      a) Diagnosis
         (a. 1) Timed endometrial biopsies – developmental lag of two or more days in two different cycles
         (a. 2) Timed progesterone assays – suggestive, not diagnostic
      b) Management
         (b.1) Daily luteal phase intramuscular or vaginal progesterone
         (b.2) hCG at the time of ovulation or in divided doses every 2 to 3 days during the luteal phase
         (b.3) Clomiphene citrate
         (b.4) hMG, FSH
B. Fallopian tube occlusion, intraluminal/extratubal adhesions

(1) Predisposing historical factors
   a) Pelvic infections, sexually transmitted diseases
   b) Endometriosis – often unexpected and not diagnosed until endoscopy is performed
   c) Appendicitis, especially if ruptured
   d) Intrauterine device
   e) Peritonitis
   f) Tuberculosis
   f) Previous tubal sterilization

(2) Diagnosis
   a) Hysterosalpingogram, hysterosonogram
   b) Endoscopic visualization of tubes while injecting contrast medium through cervix and uterus
   c) Falloposcopy is controversial

(3) Management
   a) Tuboplasty
      (a. 1) With extensive disease, prognosis is poor and surgery should not be attempted
      (a. 2) Best results achieved using microsurgical techniques, especially microreanastomoses (post-sterilization)
      (a. 3) Laparoscopic tubal surgery, e.g., salpingolysis, fimbrioplasty, salpingostomy, and salpingectomy in selected cases
   b) IVF and related technologies

C. Uterus and Cervix

(1) Uterine problems are more frequently associated with spontaneous abortion and should not be considered a factor until all other problems have been ruled out
   a) Diagnosis
      (a. 1) Physical
      (a. 2) Hysterogram
      (a. 3) Ultrasound
      (a. 4) Laparoscopy
      (a. 5) Hysteroscopy
      (a. 6) Sonohysterography
   b) Management is surgical and is specific to abnormality

(2) Cervix – inadequate cervical mucus
   a) Etiology
      (a. 1) Infection
      (a. 2) Surgically-destroyed glands (conization)
      (a. 3) Clomiphene citrate – 15% of patients produce suboptimal or no mucus
   b) Diagnosis
      (b. 1) Careful examination of mucus in late follicular phase for amount, quality, Spinnbarkeit, ferning
      (b. 2) Sims-Hühner test (post-coital test)
      (b. 3) Cultures for chlamydia and GC; when appropriate
      (b. 4) Immune factor problems
         (b.4.1) Local cervical anti-sperm antibodies – immuno-bead technique
         (b.4.2) Anti-sperm antibodies in semen – mixed agglutination test
         (b.4.3) Circulating antibodies – immuno-bead technique
   c) Management
      (c. 1) Antibiotics to treat infection
      (c. 2) Human menopausal gonadotropin treatment to improve quantity or quality of mucus
      (c. 3) Low dose estrogen from 8 to 9 days preceding ovulation remains controversial
(c. 4) Steroids (potentially dangerous) and/or condoms (controversial) in immune factor
(c. 5) Intrauterine insemination with washed sperm
(c. 6) Assisted reproductive technology, possibly with ICSI

D. Male
(1) Abnormal or inadequate sperm or semen
   a) Semen analysis includes evaluation of
      (a. 1) Volume
      (a. 2) Motility
      (a. 3) Count
      (a. 4) Morphology
      (a. 5) pH
      (a. 6) liquefaction
      (a. 7) Presence of infection
   b) Management
      (b. 1) Medical therapy usually is not successful
         (b.1.1) Antibiotic therapy for infection
         (b.1.2) Empirical hormone therapy is not successful and therefore not used unless there is a specific endocrine disorder, e.g., Kallmann syndrome
      (b. 2) Surgical
         (b.2.1) Attempts at vas reconstruction
         (b.2.2) Ligation of the internal spermatic vein in cases of varicoceles associated with abnormal semen analysis
      (b. 3) Insemination
         (b.3.1) Sperm separation techniques
         (b.3.2) Donor insemination
      (b. 4) Intracytoplasmic sperm injection (ICSI) in ART cycle (see objective 177)
         (b.4.1) Excellent new technology for severe male factor infertility
         (b.4.2) Involves injecting a single sperm into an oocyte via micro-manipulation
         (b.4.3) Testicular sperm aspiration (vas ligation, absence) for ICSI

(2) Abnormal ejaculation
   a) Premature ejaculation
   b) Retrograde ejaculation

179. The student will list the diagnostic screening tests that need to be performed during the course of evaluating an infertile couple.

A. Male
(1) CBC
(2) Urinalysis
(3) Semen analysis
(4) Semen culture
(5) Testicular exam to rule out anatomic disease

B. Female
(1) CBC
(2) Urinalysis
(3) Pap smear
(4) G.C. culture
(5) Chlamydia and ureaplasma screen/culture
(6) Rubella titer
(7) BBT
(8) Mid-luteal serum progesterone
(9) Endometrial biopsy and timed progesterone assay
Menopause

180. The student will define menopause and describe the physiological and emotional changes associated with it.

A. Definition – the woman’s final menstrual period, a diagnosis made in retrospect after amenorrhea of six months or more, caused by ovarian failure

B. Findings and physiologic disturbances
   (1) Normally occurs between ages 45-55 – the mean age in U.S. is 51.4 years
   (2) Frequently preceded by anovulatory bleeding and irregular cycles
      a) Shortening of the follicular phase
      b) Reduced fertility
      c) Hypo- or hypermenorrhea
      d) Inadequate luteal phase
   (3) Frequently accompanied by climacteric symptoms
      a) Hot flushes
      b) Excessive perspiration
      c) Depression or agitation
      d) Insomnia

C. Frequently followed by physical and metabolic changes which occur gradually over a period of many years (see objective 182)
   (1) Genital and breast atrophy
   (2) Osteoporosis
   (3) Degenerative cardiovascular changes

D. Psychosocial issues
   (1) The impact of the menopause on a woman’s psyche depends upon a variety of cultural, educational and personal beliefs
      a) Menopause may be perceived as a relief from
         (a. 1) Fear of pregnancy
         (a. 2) Hassle of menstruation
         (a. 3) Inconveniences of contraception
      b) In Western culture, which values youth and which denies the elderly status, menopause is frequently associated with negative connotations rather than as an empowering or status-elevating rite of passage
         (b. 1) Menopause may be a symbol of loss of
            (b.1.1) Childbearing potential
            (b.1.2) Attractiveness/femininity/sexual desirability
            (b.1.3) Physical ability
            (b.1.4) Energy
         (b. 2) Depression may be inevitable and the normal reaction; severe depression, however, may require psychologic referral
      c) Sexuality
         (c. 1) Social acceptability
         (c. 2) Dyspareunia secondary to atrophy and decreased lubrication
         (c. 3) Availability and health of partner
      d) Memory – diminished effect of short-term and long-term
(2) Mid-life stressors may aggravate or overwhelm a woman trying to cope with menopause
   a) Dealing with teenage or older offspring
   b) Having children leave home
   c) Helping aging parents
   d) Becoming divorced or widowed
   e) Grieving for friends and family who are ill or dying
   f) Helping spouse cope with own mid-life crisis
(3) Physicians should provide education and support underscoring the normalcy of this stage of a woman's life cycle

181. The student will describe the changes in FSH, LH, estradiol, and estrone that take place during the perimenopausal period.

A. FSH
   (1) Elevated during the cycles prior to menopause
   (2) Reaches maximum levels 1 to 3 years after the last menstrual period
   (3) Most reliable test for verifying the presence of menopause. A serum FSH of more than 40 mIU/ml is diagnostic – mid-cycle surge values are generally lower than this
   (4) Ratio of FSH:LH usually greater than one
   (5) Testing is indicated for amenorrhea in women prior to menopausal age range

B. LH
   (1) Elevated
   (2) Elevation usually lags behind FSH
   (3) A woman with premenopausal elevations of FSH:LH may have a spontaneous ovulatory cycle after having had several anovulatory cycles

C. Estradiol
   (1) For the 6-8 years preceding the menopause, serum estradiol is low, especially during follicular phase
   (2) Levels are less than 40 pg/ml in peri-menopausal women and approach normal in the obese female

D. Estrone
   (1) A weak estrogen
   (2) Most abundant estrogen in the postmenopausal female
   (3) Source – primarily peripheral conversion of androstenedione
   (4) Levels are usually less than 30 pg/ml but may be normal in the obese female

E. Lipid profile
   (1) Increased LDL
   (2) Decreased HDL

182. The student will list conditions for which postmenopausal estrogen replacement therapy (ERT) might be indicated.

A. Treatment of menopausal symptoms
   (1) Hot flushes
   (2) Genital atrophy
   (3) Senile urethritis
   (4) Urinary incontinence

B. Prophylactic
   (1) Prevention of osteoporosis
      a) Theoretically estrogen therapy impedes the development of osteoporosis. Consequently, its prolonged use should diminish the incidence of osteoporotic fractures
         (a. 1) To be effective, estrogen should be started at menopause and must be given for years
(a. 2) 50% of untreated women have vertebral fractures by age 75
(a. 3) 15% of women with osteoporotic hip fractures will die within three months, and another 25% will develop nonfatal complications
(a. 4) 20% of women have fractures of the hip by age 90. Of these, 20% will die within six months of the fracture

b) Osteoporosis facts
(b. 1) Progressive loss of bone mass without loss of bone structure, eventually leading to increased fracture risk
(b. 2) Symptoms present only after 25-50% of bone mineral contents lost
(b. 3) Principal types of fracture
(b.3.1) Vertebral compression fracture
(b.3.2) Distal forearm fracture
(b.3.3) Hip fracture

c) Risk factors for developing osteoporosis
(c. 1) Being female
(c. 2) A small, thin frame
(c. 3) Advanced age
(c. 4) A family history of osteoporosis
(c. 5) Early menopause
(c. 6) Abnormal absence of menstrual periods (amenorrhea)
(c. 7) Anorexia nervosa or bulimia
(c. 8) A diet low in calcium
(c. 9) Use of certain medications (steroids, heparin, anticonvulsants, excessive thyroid hormones, certain cancer treatments, prolonged GnRH analog use)
(c.10) A sedentary lifestyle
(c.11) Cigarette smoking
(c.12) Excessive alcohol intake
(c.13) Malabsorption problems
d) 30% of women undergoing a spontaneous menopause do not develop osteoporosis
e) Estrogen, through its interaction with parathyroid hormone, initially inhibits bone resorption; it may also eventually inhibit bone formation
f) Other prophylactic measures include
(f. 1) Adequate dietary calcium and protein
(f. 2) Weight-bearing exercise
(f. 3) Fluoride
(f. 4) Cessation of smoking
(f. 5) Limiting alcohol consumption
g) Bone density tests
(g. 1) Detects the amount of bone mineral content (BMC) and bone mineral density (BMD)
(g.1.1) BMD is compared to two norms – aged matched (what is expected in someone of same age and body size) and young normal (estimated peak bone density of a healthy young adult)
(g. 2) Useful for
(g.2.1) Detecting low bone density before a fracture occurs
(g.2.2) Predicting chances of fracturing in the future
(g.2.3) Confirming a diagnosis of osteoporosis if patient already has suffered a fracture
(g.2.4) Distinguishing between spinal osteoporosis and other spinal abnormalities
(g.2.5) Determining rate of bone loss (interval testing)
(g.2.6) Monitoring effects of treatment (interval testing)
(g. 3) May be particularly helpful to patients who
(g.3.1) Are considering long-term estrogen replacement therapy
(g.3.2) Are taking steroid medications
(g.3.3) Have primary hyperparathyroidism
(g.3.4) Have recently suffered a fracture suggestive of osteoporosis
(g.3.5) Want to monitor the progress of osteoporosis treatment
(g.3.6) Have multiple risk factors

h) Management of osteoporosis
(h. 1) Prevention of osteoporosis is most important
(h. 2) Aminobisphosphonate acts as a specific inhibitor of osteoclast-mediated bone resorption (Fosamax® [alendronate sodium])
(h. 3) Calcitonin is given parenterally or intranasally (Miacalcin®) and may only be effective for a short term of therapy, as antibodies may form

(2) Decrease in incidence of cardiovascular disease

183. The student will list the principles of postmenopausal hormone replacement therapy, and also be able to list other types of medications that are useful in the perimenopausal and early postmenopausal period.

A. Estrogen
   (1) Give the lowest dose possible to relieve symptoms and to prevent osteoporosis
   (2) Oral contraceptives should not be used
   (3) It may be advisable to periodically sample the endometrium of patients on estrogen (with progestin), especially in the presence of acyclic bleeding
   (4) Annual examination and re-evaluation is recommended

B. Progestins – in the presence of a uterus, progestins should be used to prevent endometrial hyperplasia – can be given as cyclic or continuous therapy

C. Androgens – controversial
   (1) May enhance psychotropic effect of estrogen
   (2) May be associated with an increase in libido
   (3) May induce hirsutism

184. The student will list the contraindications to postmenopausal estrogen replacement therapy.

A. Major contraindications
   (1) Cerebrovascular disease
   (2) Deep venous thrombosis and embolism
   (3) Myocardial infarction
   (4) Estrogen-dependent malignancies of the breast or uterus
   (5) Unexplained uterine bleeding
   (6) Undiagnosed postmenopausal bleeding
   (7) Liver disease

B. Cases in which caution should be observed
   (1) Strong family history of carcinoma of the uterus or breast
   (2) Smokers
   (3) Diabetics
   (4) Obese, hypertensive women
   (5) Hyperlipidemia
   (6) Uterine fibroids
UNIT VII
OBSTETRICAL AND GYNECOLOGICAL PROCEDURES

Obstetric

185. The student will define induction of labor and differentiate it from augmentation of labor.

A. Induction – labor is initiated with a therapeutic intervention
B. Augmentation – labor is improved with a therapeutic intervention; the objective is to increase the frequency and/or amplitude of contractions
C. Induction/augmentation of labor should only be undertaken with continuous fetal and maternal monitoring.

186. Given a patient in whom induction of labor is being considered, the student will list the indications, the absolute and relative contraindications, the complications, and the methods of induction.

A. Indications may include
   (1) Hypertensive disorder
   (2) Diabetes mellitus
   (3) Rh isoimmunization
   (4) Chorioamnionitis
   (5) Premature rupture of the membranes near term
   (6) Postmaturity
   (7) IUGR
   (8) Fetal demise
   (9) Elective
B. Absolute contraindications
   (1) "Absolute" cephalopelvic disproportion
   (2) Transverse lie
   (3) Complete placenta previa
   (4) Classical uterine scar – previous myomectomy
C. Relative contraindications
   (1) Malpresentation such as breech
   (2) Grand multiparity
   (3) Multiple pregnancy
   (4) Prematurity
   (5) Fetal distress
   (6) Inability to monitor fetus
D. Complications
   (1) Hypertonic uterus with associated fetal distress and hypoxia
   (2) Uterine rupture
   (3) Amniotic fluid embolism
   (4) Cervical lacerations
   (5) Postpartum hemorrhage
   (6) Water intoxication (secondary to incorrect use of oxytocin)
E. Methods of induction
   (1) Oxytocin infusion
   (2) Amniotomy
   (3) Prostaglandins (gel, suppositories or oral) for cervical "ripening"
   (4) Mechanical – foley catheter
187. Given any one of the following obstetric procedures, the student will describe the procedure, list the indications for its use, and list the significant associated complications.

A. Cerclage
   (1) The surgical placement of an encircling suture in the cervix
   (2) Indication – documented history of an incompetent cervix
   (3) Complications
      a) Premature rupture of membranes
      b) Infection
      c) Hemorrhage
      d) Premature labor

B. Amniocentesis
   (1) The aspiration of amniotic fluid, usually transabdominally, under ultrasound guidance, for diagnostic or therapeutic purposes
   (2) Indications
      a) Prenatal genetic diagnosis
      b) Rh isoimmunization management
      c) To assess fetal lung maturity
      d) To exclude chorioamnionitis
      e) Assist in management of emergent cerclage placement
   (3) Complications
      a) Premature rupture of membranes
      b) Premature labor
      c) Fetal injury
      d) Infection
      e) Hemorrhage
      f) Fetal death or abortion

C. Version
   (1) A procedure in which the presentation of the fetus is artificially altered
   (2) Types
      a) External version – the manipulations are transabdominal in an unanesthetized patient usually with use of a tocolytic agent
      b) Internal version – the manipulations are performed by introducing entire hand into uterine cavity. The uterus needs to be relaxed.
      c) Cephalic version – the vertex is made the presenting part
      d) Podalic version – breech is made the presenting part
   (3) Indications
      a) External cephalic version
         (a. 1) Transverse lie
         (a. 2) Breech presentation
      b) Internal podalic version – second twin
   (3) Complications
      a) Uterine rupture
      b) Infection
      c) Maternal trauma
      d) Fetal trauma
      e) Intrauterine bleeding
      f) Fetal distress/abruption

D. Forceps delivery
   (1) Delivery of the fetal head through application of obstetric forceps
   (2) Classification
      a) Outlet
      b) Low
      c) Mid
(3) Indication – to facilitate delivery of the fetus
   a) Maternal
      (a. 1) Exhaustion
      (a. 2) Heart disease
      (a. 3) Acute pulmonary edema
      (a. 4) History of spontaneous pneumothorax, detached retina
   b) Fetal
      (b. 1) Abruptio placentae
      (b. 2) Fetal distress
      (b. 3) After-coming head (breech)

(4) Complications
   a) Lacerations of birth canal
   b) Fetal trauma

E. Vacuum extractor delivery
   (1) Application of a suction cup to the fetal scalp for traction to facilitate delivery
   (2) Indications and complications similar to those for forceps delivery

F. Cesarean section
   (1) Absolute indications
      a) Transverse lie in labor
      b) Prolapse of the umbilical cord
      c) Complete placenta previa
      d) Previous classical cesarean section or myomectomy
   (2) Relative indications
      a) Cephalopelvic disproportion
      b) Partial placenta previa
      c) Fetal distress
      d) Breech presentation
      e) Previous cesarean section in which scar is in upper uterine segment
      f) Macrosomia (fetal weight greater than 4500 gm)
      g) Multi-fetal gestation (triplet or more)
   (3) Complications
      a) Maternal mortality secondary to
         (a. 1) Sepsis
         (a. 2) Hemorrhage
         (a. 3) Anesthesia – e.g. aspiration, cardiac arrest
      b) Maternal morbidity secondary to
         (b. 1) Infection
         (b. 2) Hemorrhage
         (b. 3) Thromboembolic disease
         (b. 4) Urinary tract injury
         (b. 5) Uterine scar separation with subsequent pregnancies
      c) Fetal
         (c. 1) Prematurity
         (c. 2) Hypoxia
         (c. 3) Trauma

G. Episiotomy
   (1) Incision of the perineum to prevent soft tissue damage and/or to facilitate delivery
       of the fetus
   (2) Types
      a) Median
      b) Mediolateral
   (3) Complications
      a) Hemorrhage
      b) Hematoma
      c) Infection
      d) Rectovaginal fistula
      e) Anal incontinence
Gynecologic

188. The student will describe a cervical biopsy and an endometrial biopsy.

A. Cervical biopsy
   (1) A biopsy forcep is used to remove single or multiple pieces of a visible lesion for histological evaluation
   (2) The lesion may be grossly visible or revealed by colposcopic evaluation
   (3) Usually does not require anesthesia
   (4) An office procedure

B. Endometrial biopsy
   (1) Usually an office procedure
   (2) Accomplished with a small curette or plastic disposable suction device
   (3) Useful primarily when small samples of endometrium may be diagnostic to detect
       a) Presence or absence of ovulation
       b) Endometrial dating
       c) Presence of endometrial cancer or precursors; however, negative endometrial biopsy does not always exclude the possibility of endometrial cancer

189. The student will describe the indications for and performance of a culdocentesis.

A. To grossly identify cul-de-sac fluid type (clear fluid, pus, or blood) and to submit fluid for cytologic examination or culture
B. A needle is passed transvaginally into the posterior cul-de-sac and the fluid is aspirated
C. Useful in evaluating patients with abdominal pain to differentiate
   (1) Hemoperitoneum (blood)
   (2) Infectious peritonitis (pus)
   (3) Ruptured ovarian cyst (clear fluid) – to serosanguineous

190. The student will state the appropriate procedures for the evaluation of some common gynecologic problems.

A. Abnormal Pap smear
   (1) Colposcopic examination after application of 3% acetic acid
   (2) Directed punch biopsy and endocervical curettage
   (3) Schiller's test – a useful adjunct prior to biopsy
      a) Staining of cervix and vagina with iodine-containing solution
      b) Non-staining areas of squamous epithelium are glycogen-poor and demarcate potential areas of dysplasia or neoplasm. These areas warrant biopsy.

B. Abnormal uterine bleeding
   (1) Endometrial biopsy
   (2) Hysteroscopy and directed biopsy
   (3) Dilation and curettage (D&C)
      a) Employed for both diagnosis and therapy
         (a. 1) A bimanual pelvic examination should precede instrumentation of the uterus
         (a. 2) When cancer is suspected, collect endocervical tissue separately from endometrial tissue (fractional curettage)
         (a. 3) The uterus should be sounded to ascertain the size and configuration of uterine cavity
         (a. 4) Dilate cervix
         (a. 5) Remove tissue specimens with a curette
b) Complications may include cervical laceration, uterine perforation, hemorrhage, and infection

(4) Ultrasound examination of endometrial cavity
   a) Hysterosonogram
C. Postmenopausal bleeding – fractional D&C
D. Possible intra-abdominal hemorrhage – culdocentesis
E. Possible ruptured ovarian cyst or tumor
   (1) Culdocentesis
   (2) Pelvic ultrasound
F. Urinary incontinence
   (1) Urodynamic studies
   (2) Cystourethroscopy

191. During the clerkship, the student will observe and then describe common gynecological operative procedures.

A. Laparoscopy
   (1) Allows visualization of the peritoneal cavity and pelvic organs
   (2) Frequently used to assess the tubes and ovaries for
      a) Infertility evaluation
      b) Diagnosis and treatment of ectopic pregnancy
      c) Tubal sterilization
      d) Evaluation of pelvic pain
   (3) Operative laparoscopy allows intervention with laparoscopic instruments, cauter and laser
B. Dilation and curettage of the uterus
C. Colposcopy and endocervical curettage
D. Conization of the cervix
   (1) Cold cone
   (2) Loop electrosurgical excision procedure (LEEP)
   (3) Laser cone
E. Cryocauterization
F. Laser treatment of the cervix, vulva, or vagina
G. Hysterectomy
   (1) Abdominal
   (2) Vaginal
   (3) Laparoscopic assisted vaginal hysterectomy (LAVH)
H. Adnexal surgery
I. Surgery for urinary incontinence
J. Hysteroscopy, including operative hysteroscopy

192. The student will display sensitivity regarding the psychosocial issues that patients contemplating obstetric and gynecologic procedures may face.

A. Issues of trust between the patient and her physician
B. Patient may be fearful of
   (1) The procedure itself
   (2) Anesthesia
   (3) Surgical complications
   (4) Her death or death of fetus, if pregnant
   (5) Diagnostic results
C. Loss of control issues
D. Changes in self-image, particularly in regard to breast surgery, hysterectomy and vulvectomy
   (1) Loss of femininity/attractiveness/sexual desirability
   (2) There may be greater psychologic morbidity in patients undergoing surgery for benign disease than cancer surgery, in which the disposed organ is viewed as life threatening
   (3) Risk factors for post-hysterectomy depression
      a) Pre-surgical depression
      b) Prior psychiatric disturbances
      c) Age less than 35
      d) Nulliparity
      e) Less than 12 years of formal education
      f) Abuse survivor
   (4) Physician support and counseling of patient and her partner prior to surgery regarding reproductive anatomy and sexual function may minimize post-operative somatic and psychologic complaints

E. Other patient concerns
   (1) Care for children or others during hospitalization and recuperative period
   (2) Convalescent care
   (3) Financial considerations
   (4) Work-related issues
UNIT VIII

CONTROL OF REPRODUCTION

193. The student will demonstrate to the faculty, residents, and nurses an attitude empathetic to the needs of patients who wish to control their reproduction. If the provision of this care would be contrary to personal values, the student should refer patients wishing to control reproduction, without demonstrating negativism or behaving judgmentally, to another health professional.

Contraception

194. The student will define birth rate and fertility rate, and explain what is meant by theoretical effectiveness and use effectiveness of contraceptive methods. The student should understand the following terms.

A. Birth rate – the number of births per 1,000 population
B. Fertility rate – the number of live births per 1,000 female populations aged 15 through 44 years
C. Theoretical effectiveness – lowest expected failure rate
D. Use effectiveness – this figure takes into consideration all users of the contraceptive method, independent of compliance

*Number of pregnancies during the first year of use per 100 non-sterile women initiating the method

195. Given a woman in the reproductive age group, the student will obtain the appropriate history and physical and provide sufficient information and counseling to enable the woman to choose a satisfactory method of reversible contraception. If selected, a method should not be contraindicated and the couple's motivation should be such that the method will likely prevent pregnancy. The student should be familiar with the following methods of contraception.

A. Coitus interruptus (withdrawal)
   (1) Mechanism of action – seminal fluid theoretically is not deposited in vagina
   (2) Use effectiveness – 18 pregnancies/100 users per year
   (3) Advantages
      a) No cost
      b) No preparation, e.g., purchases
      c) No devices or chemicals
   (4) Disadvantages
      a) Extremely variable effectiveness, depending upon male control and pre-ejaculatory discharge
      b) Frequently frustrating to one or both partners

B. Rhythm (natural family planning)
   (1) Mechanism of action – abstinence during the fertile time of the cycle
   (2) Use effectiveness – 20 pregnancies/100 users per year
   (3) Advantages
      a) Allows compliance with religious beliefs of some patients
      b) Safe and inexpensive
      c) To be recommended only when pregnancy is acceptable
(4) Disadvantages  
a) Only effective with regular menses  
b) Efficacy requires strong motivation of couple plus use of basal body temperature and/or examination of cervical mucus, and previous menstrual cycle data  
c) Couple must understand detailed instructions  
d) Avoidance of coitus and the need to calculate accurately the fertile period may be frustrating to one or both members of the couple  

C. Spermicidal jellies and creams, foams, suppositories and tablets, and film  
(1) Mechanism of action – form mechanical barrier and are spermicidal  
(2) Use effectiveness – 21 pregnancies/100 users per year  
(3) Advantages  
a) May be used with convenience by women who have infrequent intercourse  
b) May be used with other contraceptives such as condom or diaphragm  
c) May be used as a backup to the pill or IUD  
d) May be used for several months after stopping the pill before attempting pregnancy  
e) Does not require physician’s prescription  
f) Decrease risk of STD’s  
(4) Disadvantages  
a) Variable effectiveness  
b) Unaesthetic for some  
c) Must be used shortly before coitus (effective approximately 30 minutes) with reapplication for each coital episode  
d) Adequate time must elapse between insertion and intercourse for suppositories (10-15 minutes) and film (5 minutes) to allow spermicide to dispense  

D. Diaphragm with spermicidal jelly  
(1) Mechanism of action – mechanical barrier to sperm and spermicidal effect of jelly  
(2) Use effectiveness – 18 pregnancies/100 users per year  
(3) Advantages  
a) May decrease likelihood of STD’s  
b) Coitus more aesthetic during menses  
(4) Disadvantages  
a) Requires pre-coital planning, competent fitting and instruction, and considerable motivation  
b) May not be feasible with pelvic relaxation  
c) Unaesthetic to some couples  
d) Should remain in place 8 hours post-coitum  
e) Periodic refitting by physician advisable, especially following childbirth  
f) Increased risk of urinary tract infection  
g) Possibly an increased risk of toxic shock syndrome (TSS), especially if used during menses  

D. Condom  
(1) Mechanism of action – mechanical barrier to insemination; effectiveness increased if used with foam (spermicidal agent)  
(2) Use effectiveness – 12 pregnancies/100 users per year (age dependent)  
(3) Advantages  
a) Prevention of STD’s and cervical neoplasia  
b) Protective against human immunodeficiency virus transmission if condom is latex  
c) Convenience  
d) Available without physician’s prescription  
(4) Disadvantages  
a) Unaesthetic to many couples  
b) May rupture or leak
c) May come off
d) Male motivation must be high
e) Diminished lubrication
f) Diminished penile sensitivity
g) Contraindicated in couples where latex allergy is a factor

E. Female condom
(1) Mechanism of action – mechanical barrier to insemination
(2) Use effectiveness – lack of studies available
(3) Advantages
   a) Prevention of STD’s
   b) Not coital related in some designs
(4) Disadvantages
   a) Female motivation must be high
   b) Expensive
c) May rupture or leak
d) Unaesthetic to some couples
e) Contraindicated in couples where latex allergy is a factor

F. Intrauterine devices (IUD)
(1) Mechanism of action is uncertain
   a) Increased motility of ovum in fallopian tube
   b) Local foreign body inflammatory response
c) Immobilization of sperm
d) Increased local production of prostaglandins
e) Biochemical effects of copper (for copper-containing IUD’s)
f) Mechanical dislodging of the implanted blastocyst
(2) Use effectiveness – 3 pregnancies/100 users per year
(3) Advantages
   a) Requires motivation only once
   b) No skills required of user
c) No pre-coital planning required
(4) Disadvantages
   a) Special training required for insertion by medical professional
   b) History of medicolegal difficulties make obtaining an explicit and detailed informed consent advisable or mandatory
c) Careful screening of prospective intrauterine device users is important
d) Occasional severe pain and vasovagal reaction encountered during insertion
e) Uterine perforation primarily at time of insertion
f) Menometrorrhagia may occur in many patients especially during first few menses. 15% of women have the IUD removed because of bleeding problems.
g) Persistent pain and cramping experienced in some women
h) Incidence of pelvic inflammatory disease is usually higher in IUD users but probably due to acquired STD’s
   (h. 1) Cause of subsequent infertility
   (h. 2) Removal in pregnancy is recommended prior to 8-10 weeks gestation
   (h. 3) Has been associated with silent unilateral abscesses. Remove IUD and begin treatment promptly when PID is suspected
i) Spontaneous expulsion may not be recognized
j) Removal may be difficult
k) Re-examination desirable to ensure continued intrauterine location, especially after a missed period
G. Hormonal (combined oral contraceptives and progestin only contraceptives)

1. Mechanisms of action are dependent on dose and type of compound
   a) Ovulation inhibition (most compounds)
   b) Change in cervical mucus (diminished sperm penetration with combined preparation)
   c) Change in endometrium (most marked with combination preparations)

2. Use effectiveness – 3 pregnancies/100 users per year

3. Advantages
   a) Contraceptive – taken orally; no pre-coital preparation
   b) Noncontraceptive
      b. 1) Less dysmenorrhea
      b. 2) Regular and diminished menstrual flow
      b. 3) Less anemia
      b. 4) May have less acne (depends on composition of pill and on the patient)
      b. 5) Reduced incidence of ovarian and endometrial cancer
      b. 6) Decreased incidence of fibrocystic breast disease
      b. 7) Reduced incidence of functional ovarian cysts
      b. 8) Less rheumatoid arthritis

4. Disadvantages
   a) Woman must remember to take pill
   b) Headaches
   c) Nausea
   d) Development of estrogen-dependent cholelithiasis
   e) Hypertension
   f) Metrorrhagia (break through bleeding) or missed periods
   g) Aggravation of acne (depends on composition of pill and on the patient), asthma, epilepsy, leiomyomata
   h) Depression
   i) Altered libido
   j) Increased incidence of candidal vaginitis
   k) Chloasma
   l) Weight gain due to fluid retention or increased appetite

H. Long-acting steroid methods

1. Mechanism of action – sustained release of progestin to cause similar effects as minipill
   a) Norplant – silastic tubes inserted under skin of arm – levonorgestrel (progestin) released over 5 years
   b) Depo-Provera – injectable medroxyprogesterone acetate – effective 3-6 months
   c) Progestasert – IUD releases hormone up to 1 year
   d) Trial studies for patches, pellets and vaginal rings

2. Use effectiveness
   a) Norplant – decreases over five year period from .04 to 1.1 pregnancies/100 users per year. Therefore, the capsules should be removed at the end of the fifth year. (Currently withdrawn for US market)
   b) Depo-Provera – < 1.0 pregnancies/100 users per year
   c) Progestasert – 2.0 pregnancies/100 users per year

3. Advantages
   a) Requires less patient motivation
   b) Not related to coitus
   c) Can be used by women who have contraindications to use of estrogens in oral contraceptives
(4) Disadvantages
   a) Irregular bleeding
   b) Cost
   c) Norplant and Progestasert require insertion and removal by skilled medical personnel or physician
   d) No protection against STD's

196. In obtaining an appropriate data base from a potential contraceptive user, the student will recognize all the absolute and relative contraindications for each method. If hormonal contraception is considered, the student will list the metabolic effects of this form of contraception.

A. Contraindications
   (1) Coitus interruptus – lack of ejaculatory control
   (2) Rhythm – irregular cycles
   (3) Jellies and foams – allergy or sensitivity on contact
   (4) Diaphragm
      a) Allergy to latex or spermicide
      b) Inability to achieve satisfactory fitting
      c) Inability of patient or partner to learn correct insertion technique
      d) Recurrent urinary tract infections
   (5) Condom
      a) Allergy to latex in either partner (latex condoms only)
      b) Inability to retain erection
   (6) Female condom
      a) Expense
      b) Allergy to latex
   (7) Intrauterine device
      a) Absolute contraindications
         (a. 1) Active pelvic infection
         (a. 2) Pregnancy
         (a. 3) Abnormal uterine bleeding
         (a. 4) Suspected uterine malignancy
      b) Relative contraindications
         (b. 1) History of pelvic infections, recurrent or recent, especially if exposure to multiple partners
         (b. 2) Impaired response to infection – diabetes, steroid treatment
         (b. 3) History of ectopic pregnancy
         (b. 4) History of valvular heart disease
         (b. 5) Impaired coagulation response
         (b. 6) Suspected cervical malignancy or pre-malignancy
         (b. 7) Cervical stenosis
         (b. 8) Small uterus
         (b. 9) Bicornuate uterus or other uterine anomaly
         (b.10) Uterine leiomyomata
         (b.11) Past history of severe vasovagal reactivity
         (b.12) Allergy to copper – copper containing IUD only
   (8) Hormonal (estrogen containing preparations)
      a) Absolute contraindications
         (a. 1) Thromboembolic disorder, or history thereof
         (a. 2) Cerebrovascular accident, or history thereof
         (a. 3) Coronary artery disease, or history thereof
         (a. 4) Impaired liver function
         (a. 5) Hepatic adenoma
         (a. 6) Malignancy of breast or estrogen dependent neoplasia, or history, thereof
(a. 7) Pregnancy  
(a. 8) Undiagnosed abnormal uterine bleeding  
(a. 9) Smokers over age 35  
(a.10) Poorly controlled insulin dependent diabetes  

b) Relative contraindications  
(b. 1) Severe vascular or migraine headaches  
(b. 2) Hypertension with resting diastolic BP of 110 or greater  
(b. 3) Diabetes  
(b. 4) Active gallbladder disease  
(b. 5) Previous cholestasis during pregnancy  
(b. 6) Mononucleosis, acute phase  
(b.7) Sickle cell disease  
(b. 8) Elective surgery planned in next 4 weeks  
(b.9) Long-leg casts or major injury to lower leg  
(b.10) History of heavy smoking  
(b.11) Family history of hyperlipidemia or myocardial infarction before age 50  

c) Certain conditions may become worse when using estrogen-containing contraceptives. Oral contraception should be discontinued if these conditions become more severe  
(c. 1) Depression  
(c. 2) Hypertension with resting diastolic BP of 90-100  
(c. 3) Chloasma or hair loss related to pregnancy, or history thereof  
(c. 4) Asthma  
(c. 5) Epilepsy  
(c. 6) Uterine leiomyomata  
(c. 7) Acne  
(c. 8) Varicose veins  
(c. 9) History of hepatitis but now normal liver function tests  
(c.10) Headaches  

B. Metabolic effects of hormonal contraception  
(1) Hepatic function  
 a) Increased sulfobromophthalein retention  
 b) Alteration in other indices of hepatic function  

(2) Coagulation tests  
 a) Increase in prothrombin, Factors VII, VIII, IX, and X  
 b) Decrease in antithrombin III  
 c) Increase in norepinephrine-induced platelet aggregability  

(3) Thyroid function  
 a) Increase in thyroxine binding globulin  
 b) Decrease in T3 uptake values  

(4) Decreased pregnanediol  
(5) Decrease in glucose tolerance  
(6) Serum lipid values  
 a) Increase in triglycerides  
 b) Increase in phospholipids  
 c) Decrease in HDL  

(7) Decreased serum folate  

C. Oral contraceptives should be discontinued if the following conditions become more severe  
(1) Hypertension with resting diastolic blood pressure of 90-100  
(2) Chloasma or hair loss  
(3) Asthma  
(4) Epilepsy  
(5) Uterine leiomyomata  
(6) A change in liver function tests to abnormal values
D. Prior to discontinuation of oral contraceptives, other agents might be tried if these conditions become more severe:
   (1) Depression
   (2) Acne
   (3) Headaches

197. The student will list at least one method of post-coital contraception and explain its mechanism of action.
   A. Hormonal – interferes with the development of normal endometrium of pregnancy if used within 72 hours
   B. Intrauterine device – prevents implantation of the fertilized ovum

198. The student will list the community facilities available for assistance in family planning.
   A. Federal, state and/or county-sponsored family planning clinics
   B. School clinics
   C. Private health care facilities

199. The student will discuss the State regulations controlling the prescription of contraceptives to both adults and minors.
   A. A Michigan law which prohibited physicians from giving contraceptive advice without parental consent has been declared unconstitutional
   B. The choice of contraception is a decision between patient and/or partner with consultation from physician

**Sterilization (Permanent Contraception)**

200. Given a patient requesting permanent sterilization, the student will be able to list the components of the discussion with the patient about her request and about the sterilization procedure she may choose.
   A. Considerations
      (1) Medical indications or contraindications
      (2) Emotional and social stability
      (3) Ability to understand the consequences of the procedure (mental competence)
      (4) Realistic motives
   B. BRAIDED
      (1) Benefits
      (2) Risks
      (3) Alternatives – other contraceptive methods
      (4) Inquiries – patient’s questions should be encouraged and myths and misinformation should be corrected
      (5) Decision – advise patient that they may change their mind at any time prior to the procedure
      (6) Explanation of procedure
      (7) Documentation of discussion
201. The student will list methods of male or female sterilization, stating the failure rate (which includes ectopic pregnancies), the advantages and disadvantages, and indicate the complications and contraindications of each.

A. Mini-laparotomy with tubal ligation – postpartum or interval
   (1) Failure rate – 0.4% (4/1,000)
   (2) Advantages
      a) Patient already hospitalized if postpartum
      b) In interval procedure, do as outpatient
      c) 50-70% have patent tubes after reanastomosis with microsurgical technique
      d) Complications rare
   (3) Disadvantages
      a) Abdominal incision – postoperative pain, larger incision compared to laparoscopic approach
      b) If postpartum procedure, decision may be made hastily or neonate may not survive
      c) Usually requires general or regional anesthetic
   (4) Complications
      a) Wound infection
      b) Hematoma
      c) Bowel or bladder injury
      d) Adverse anesthetic reaction
   (5) Contraindications – poor surgical risk
   (6) Slower recovery compared to laparoscopic procedure

B. Laparoscopic tubal occlusion (cauterization, rings or clips)
   (1) Failure rate – 0.25% (2.5/1000) some recent studies suggest this may be somewhat higher
   (2) Advantages
      a) Outpatient (ambulatory) procedure
      b) Smaller incision
      c) Minimal patient disability
   (3) Disadvantages
      a) Usually requires general anesthesia
      b) Requires operator skilled in technique
      c) Even with microsurgical techniques, reanastomosis less likely than with mini-lap and tubal ligation because more of tube destroyed with cauterization which is the most common technique
   (4) Complications
      a) Bleeding at puncture site, site of tubal division, or in the mesosalpinx
      b) Burns of the skin, bowel
      c) Inadvertent puncture of pelvic or abdominal viscera or blood vessels
      d) Adverse effects of the CO2 insufflation such as hypercapnia, gas embolism, cardiac arrhythmia
      e) Adverse anesthetic reaction
      f) Operative failure
         (f. 1) Patient already pregnant
         (f. 2) Electrocauterization or clipping of the round ligament
   (5) Contraindications
      a) Advanced cardiovascular or respiratory disease
      b) Presence or history of generalized peritonitis
      c) Intestinal obstruction
      d) Malignancy involving anterior abdominal wall
      e) Abdominal, umbilical, inguinal or diaphragmatic hernias
C. Vasectomy
   (1) Failure rate – 0.4%
   (2) Advantages
      a) Office procedure
      b) Minimal morbidity
      c) Low cost
      d) Local anesthesia
      e) No physiological alteration of sexuality
      f) 70-90% of the time patency of the vas has been achieved using microsurgical techniques
      g) Can check if effective
   (3) Disadvantages
      a) Male fear of impotence
      b) One-half to one-third of males develop sperm antibodies
      c) Female partner may still conceive
      d) High reversal failure rate due to decreased sperm counts and sperm antibodies
   (4) Complications
      a) Hematoma
      b) Infection
      c) Epididymitis
      d) Granuloma
   (5) Contraindications – male ambivalence or sexual dysfunction

202. The student will be familiar with state and federal laws concerning sterilization.

   A. The patient must be mentally competent
   B. Spouse's consent is not necessary
   C. If reimbursed by Medicaid
      (1) The patient must be at least 21 years of age
      (2) A specified time interval must elapse between obtaining consent and performing the procedure (currently 30 days)

Induced (Voluntary) Abortion

203. The student will state the important aspects of the U.S. Supreme Court (Roe vs. Wade) decisions bearing on issues of induced abortion.

   A. An abortion decision during the first trimester must be left to the judgment of the pregnant woman and her physician
   B. Each state may regulate abortion decisions in ways that are reasonably related to the woman's health during the second trimester
   C. Subsequent to viability, the state may regulate and even prohibit abortion except where it is necessary for the preservation of the life or health of the pregnant woman
   D. The state cannot impose the requirements of consent by a third party (spouse or parent) on a woman's right to abortion. The state may pass legislation requiring parental consent if the pregnant teenager is not emancipated, however.
204. Given a patient at 9 weeks gestation who wishes to terminate her pregnancy, the student will be knowledgeable about the psychosocial issues and counsel the patient regarding her decision.

A. Patient concerns
   (1) Patients may experience a wide range of feelings including
       a) Ambivalence
       b) Guilt – short term and long term issues
       c) Anger toward themselves and/or partner
       d) Fear of
           (d. 1) Procedure
           (d. 2) Future compromised fertility
           (d. 3) Rejection of partner and/or family
       e) Depression – short term and long term issues
       f) Sense of isolation
   (2) Deciding whether to terminate a pregnancy is always a serious and difficult decision
   (3) The time before the termination is the time of greatest conflict
   (4) The patient needs to decide what is responsible, moral and best for her. The physician should be careful not to impose his/her values or recommendation on the patient.

B. Physician concerns
   (1) The physician needs to identify and come to terms with his/her own feelings regarding pregnancy termination. This is an area in which there is often conflict between personal conscience and professional responsibilities
   (2) Understand that women have the right to non-judgmental health care
   (3) If a physician is unable to counsel the patient about termination, then a referral to a non-biased counselor should be made
   (4) The physician should be knowledgeable about community resources available to women who desire pregnancy termination and the associated costs and preoperative and postoperative follow-up care

C. Counseling should entail both pre- and post-abortion assistance
   (1) Time and availability for more than one visit
   (2) Assistance to the patient in acknowledging problems, making sure she is aware of options, addressing concerns, weighing pros and cons, reviewing the reasons for her decision and then acting on her decision
   (3) Community resource availability for procedures (first and second trimester terminations), alternative options (pregnancy support, adoption), financial assistance, continued personal counseling, etc.
   (4) Information regarding sterilization and other contraceptive methods post-termination or pregnancy

D. Post-abortion sequelae
   (1) Most women feel relief
   (2) Grief is very common as many women process the experience as a loss (see objective 55)
   (3) Guilt and depression are also common
   (4) Long term or serious reaction to the abortion is rare – 5%

E. Predictors of post-abortion reaction
   (1) Ambivalence at time of decision. These women often undergo terminations at later gestation age.
   (2) Poor familial/social support
   (3) Outside coercion to have termination
   (4) Termination secondary to health problems
   (5) Second trimester termination
205. The student will list, corresponding to duration of gestation, safe techniques for inducing abortion and describe concisely the nature of those techniques and their complications.

A. Procedures to be employed in the first trimester of pregnancy (first 13 weeks)
   (1) Dilation and curettage or suction curettage
      a) Technique
         (a. 1) Preoperative use of hydrophilic cervical dilators – optional
         (a. 2) Empty uterus using
            (a. 2.1) Suction cannula – preferable
            (a. 2.2) Curette and ovum forceps
         (a. 3) Anesthesia – none, local, conduction, or general
      b) Advantages
         (b. 1) Ambulatory surgical procedure
         (b. 2) Low risk
         (b. 3) Minimal blood loss
         (b. 4) Rapid recovery (1-8 hours)
         (b. 5) Short procedure (5-15 minutes)
         (b. 6) Minimal anesthesia
      c) Disadvantages
         (c. 1) Possible cervical trauma
         (c. 2) Pregnant uterus easily perforated – related to uterine size and operator's experience
         (c. 3) Occasional infection and/or hemorrhage
         (c. 4) Retained products of conception
         (c. 5) Continuation of pregnancy
         (c. 6) Long term potential complications include Asherman's syndrome, cervical stenosis, and cervical incompetence
         (c. 7) Possible adverse psychological reactions
      d) Contraindications
         (d. 1) Uterus more than 13 weeks size
         (d. 2) Absence of nearby hospital facility
      e) Maternal mortality –1.0/100,000 abortions
   (2) Future medical methods are being researched
      a) RU486 – progesterone agonist
      b) Epostane – inhibitor of progesterone production
      c) Prostaglandins
      d) Combination protocols with methotrexate

B. Procedures to be employed in the second trimester of pregnancy (14-24 weeks)
   (1) Prostaglandin E₂
      a) Technique – insertion of vaginal suppository
      b) Advantages
         (b. 1) Ease of administration
         (b. 2) Removal of intact fetus for morphologic examination and genetic testing
         (b. 3) Induction to abortion interval is shorter than with amnio-infusion
         (b. 4) Safe for women when concomitant medical problems contraindicate anesthesia and dilation and evacuation
      c) Disadvantages
         (c. 1) High incidence of G.I. symptoms
         (c. 2) High incidence of fever due to effect on thermo-regulatory mechanism
      d) Contraindications – asthma
(2) Cytotec (misoprostol) PGE1
   a) Technique – vaginal or oral tablets
   b) Advantages – decreased G.I. side effects
   c) Disadvantages – process may take several days
   d) Contraindications - asthma

(3) Dilation and evacuation
   a) Technique
      (a. 1) Similar to D&C but should be done in a facility where blood and a surgical suite are available
      (a. 2) Involves greater dilation of the cervix
      (a. 3) May require use of crushing instruments
      (a. 4) Appropriate for a uterus the size of a 13-16 weeks gestation, and in more experienced hands it can be done up to 20-22 weeks gestation
      (a. 5) Ultrasonographic guidance may be a useful adjunct
   b) Advantages
      (b. 1) Can be done in the second trimester
      (b. 2) Quick procedure
      (b. 3) Rapid recovery
      (b. 4) Before 17 weeks gestation, this is the safest second trimester abortion method
   c) Disadvantages
      (c. 1) Must be done by experienced operator
      (c. 2) Same as for D&C
   d) Contraindications
      (d. 1) Inexperienced operator
      (d. 2) Lack of an accessible surgical suite including anesthesia and blood products
   e) Mortality – 7.7/100,000 abortions – figure may reflect incomplete reporting
   f) Potential legal limitations (variation by state)

(4) Intra-amniotic infusion of saline or prostaglandin
   a) Technique
      (a. 1) Transabdominal amniocentesis
      (a. 2) Removal of some amniotic fluid
      (a. 3) Slow injection of 20% NaCl (100-200 ml) or an appropriate dose of prostaglandin
      (a. 4) Await “spontaneous” abortion
      (a. 5) Do only on pregnancies of 17-24 weeks gestation
   b) Advantages – obviates laparotomy and uterine scar
   c) Disadvantages
      (c. 1) Saline
         (c.1.1) Hypernatremia
         (c.1.2) Cardiac arrest
         (c.1.3) Hemoglobinuria
         (c.1.4) Encephalopathy
         (c.1.5) Tissue necrosis
         (c.1.6) Infection
         (c.1.7) Hemorrhage
         (c.1.8) Retained placenta
         (c.1.9) Coagulopathy
         (c.1.10) Extravascular or peritoneal spill
      (c. 2) Prostaglandin
         (c.2.1) G.I. hypermotility
         (c.2.2) Retained placenta
         (c.2.3) Delivery of live fetus
         (c.2.4) Cervical lacerations or uterine rupture
         (c.2.5) Occasional need for second injection
Long induction to abortion interval (20-30 hour average)

Curettage is frequently required for retained placenta

d) Contraindications
   (d. 1) Asthma – prostaglandins
   (d. 2) Severe cardiovascular or renal disease – saline infusion
   (d. 3) Nonpalpable uterus (as in obesity)
   (d. 4) Ruptured membranes or severe oligohydramnios
   (d. 5) Hydatidiform mole

e) Mortality
   (e. 1) Saline – 13.9/100,000
   (e. 2) Prostaglandin and other agents – 9.0/100,000

(5) Hysterotomy – rarely performed; more common in developing countries
   a) Technique – laparotomy with uterine incision
   b) Advantages – concomitant sterilization possible
   c) Disadvantages
      (c. 1) Longer hospitalization
      (c. 2) Abdominal and uterine scars
      (c. 3) Future pregnancies probably delivered by cesarean section
      (c. 4) Increased morbidity and mortality (infection, hemorrhage)
   d) Contraindications – poor surgical risk
   e) Mortality – 58.9/100,000 abortions

206. The student will be able to recognize those aborted patients who are at risk for sensitization to D-antigen and prescribe Rh immune globulin (see objective 67).

207. The student will be knowledgeable about the risk of pregnancy in comparison to the risk of contraception, sterilization, and induced abortion.

   A. Pregnancy – maternal mortality is 7.7/100,000
   B. Contraception – overall oral contraceptive mortality risk is 1.5/100,000
   C. Sterilization – mortality risk is 3/100,000
   D. Induced abortion
      (1) First trimester – 1/100,000
      (2) Second trimester – 7.7-58.9/100,000 (depending on method)

UNIT IX
SEXUALITY

208. Given a patient or a group requesting information about sexuality, the student will provide an understandable explanation, answer questions appropriately, and make necessary referrals.

   A. The triphasic model
      (1) Female
         a) Desire phase
            (a. 1) Cannot be directly measured
            (a. 2) Fantasy about sexual activities
            (a. 3) Interest in initiating or responding to partner’s initiation of sexual activities
            (a. 4) Desires and looks forward to sexual activity
(a. 5) Pays attention to erotic material
(a. 6) Feelings of frustration if deprived of sex
(a. 7) Masturbation

b) Excitement phase
   (b. 1) Onset of erotic feelings
   (b. 2) Vaginal lubrication
   (b. 3) Generalized vasocongestion and myotonia
   (b. 4) Increased rate and depth of respirations
   (b. 5) Increased heart rate and blood pressure

c) Orgasm phase
   (c. 1) Rhythmic contractions of circumvagina and perineal muscles
   (c. 2) Rhythmic contractions of orgasmic platform
   (c. 3) Refractory period may not be present; may have repeated orgasms
   (c. 4) Rhythmic contractions of uterus

(2) Male
a) Desire phase
   (a. 1) Cannot be directly measured
   (a. 2) Fantasy about sexual activities
   (a. 3) Interest in initiating or responding to partner’s initiation of sexual activities
   (a. 4) Desires and looks forward to sexual activity
   (a. 5) Pays attention to erotic material
   (a. 6) Feelings of frustration if deprived of sex
   (a. 7) Masturbation during adolescence and young adulthood

b) Excitement phase
   (b. 1) Penile erection
   (b. 2) Scrotum thickens
   (b. 3) Testes begin to elevate
   (b. 4) Increased heart rate and blood pressure

c) Orgasm phase
   (c. 1) Contraction of seminal vesicles – “ejaculatory inevitability”
   (c. 2) Ejaculation
   (c. 3) Refractory period during which time another ejaculation cannot take place

B. The Masters and Johnson model
   (1) Excitement
   (2) Plateau
   (3) Orgasm
   (4) Resolution
209. Given a patient who presents for examination and requests information regarding sexual relations, the student will obtain information about the extent of the patient’s knowledge and her attitudes about sex, provide education and information, and make necessary referrals.

A. Take complete history including a sexual history and perform a complete physical examination, using special equipment where necessary (see objectives 5 and 6)
B. Laboratory evaluation
   (1) Screening for sexually transmitted diseases
   (2) Rubella titer
C. Ascertain the patient's knowledge and feelings about sexual relationships including her physical and psychological responses
D. Educate and counsel the patient concerning
   (1) The range of male and female behavior in sexual activity
   (2) Contraception
   (3) Pregnancy planning
E. Refer the patient to other specialists for further counseling and/or treatment, if necessary

210. Given a patient who is anorgasmic, the student will obtain a detailed sexual history, relate this and other information to the patient's problem, and make necessary referrals.

A. Demonstrate ability to allow every patient to express sexual concerns
B. Respond empathetically and non-judgmentally to the patient's feelings and problems (see objective 214)
C. Establish a “safe plane” of discussion as sexual history is obtained. The patient should be able to relate her menstrual and pregnancy history in a non-anxious manner and this should facilitate discussion of sexual problems. The patient's confidence and ease in discussing these topics should determine the extent of the sexual history that is obtained.
D. Demonstrate the ability to talk comfortably about sexual problems with patients by taking an extended sexual history
   (1) Lack of orgasm
      a) Primary
      b) Secondary
   (2) Sexual orientation
   (3) Technique
   (4) Sexual play
   (5) Intromission
   (6) Position
   (7) Frequency
   (8) Number of partners
   (9) Contraception
   (10) Age of onset of coital activity
   (11) Masturbation
   (12) Fantasies
   (13) Dyspareunia
   (14) Attitudes
   (15) Femininity and gender role
E. Causes and management of sexual dysfunction
   (1) Female
      a) General sexual dysfunction (frigidity) – treatment may include
         (a. 1) Integrating basic psychotherapeutic techniques with marital counseling and behavioral techniques
         (a. 2) Sensate focus exercises
(a. 3) Genital stimulation
(a. 4) Non-demand coitus
(a. 5) Evaluation of antidepressant medications as cause

b) Orgasmic dysfunction (preorgasmia or anorgasmia) – treatment is dependent on type of dysfunction
   (b. 1) Primary absolute – refer to psychiatrist
   (b. 2) Secondary to situational – refer for group therapy when available (private or couple therapy)

(c) Vaginismus – treatment options include
   (c. 1) Integrating basic psychotherapeutic techniques with counseling and behavioral techniques
   (c. 2) Vaginal dilator use

(2) Male
   a) Erectile dysfunction (impotence) – treatment may include
      (a. 1) Integrating basic psychotherapeutic techniques with counseling and behavioral techniques
      (a. 2) Non-demand pleasuring
      (a. 3) Dispel fear of failure
      (a. 4) Reduce or eliminate distracting obsessive thoughts
      (a. 5) Permission to be selfish
      (a. 6) Viagra® (sildenafil citrate)
   b) Premature ejaculation – treatment may include
      (b. 1) Integrating basic psychotherapeutic techniques with counseling and behavioral techniques
      (b. 2) Stop-start technique or squeeze technique
   c) Retarded ejaculation (ejaculatory incompetence)

(3) Female and male – inhibited sexual desire
   a) Primary – refer to appropriate therapist
   b) Secondary
      (b. 1) Assess relationship issues and treat if appropriate
      (b. 2) Assess intrapsychic issues including fear of pleasure, success, intimacy, and refer to appropriate therapist

211. Given a patient who expresses dissatisfaction or a lack of interest in sexual activities, the student will obtain relevant historic, emotional, and attitudinal information and determine if counseling is appropriate or if a referral is necessary.

   A. Determine any contributing etiologic factors, including alcohol and/or substance abuse
   B. Assess the level of commitment and communication in the relationship
   C. Demonstrate acceptance of the patient's discomfort, guilt, and/or anger regarding this problem
   D. Assist the patient and her partner in understanding how the low sexual desire may be reflective of other problems in the relationship

212. Given a patient who expresses guilt feelings regarding specific sexual activities, the student will obtain relevant historic, emotional, and attitudinal information and counsel the patient regarding her concern and its solution.

   A. Demonstrate acceptance of the attitude that "normal" sexuality is that which is acceptable to participating individuals
   B. Help the patient and her partner develop communication that allows growth and dissipation of fear and anxiety

213. Given a lesbian patient, the student will display sensitivity to the psychosocial issues and health concerns of women with this sexual preference.
A. Lesbians account for approximately 5% of the female population

B. Perceived risks to divulging sexual orientation to health professional
   (1) Lack of confidentiality
   (2) Not being respected by health care providers and staff
   (3) Being denied care
   (4) Fears of attempts to change patient's sexual orientation

C. Physician concerns
   (1) Certain historical questions asked of the patient may not elicit the information needed and may unwittingly imply a lack of openness to homosexuality
      a) It is important for physicians to display ease in asking questions to patients about sexual orientation and practices
      b) Physicians should project a non-judgmental manner
   (2) Assumptions about sexual orientation should not be based on past marriage, children or history of sexually transmitted disease
      a) 35% of lesbians have been married
      b) Greater than 70% of lesbians have had heterosexual intercourse
   (3) Involvement of lesbian partner in gynecologic care
      a) Physicians need to show respect for the relationship between the lesbian patient and her partner and treat it as they would a heterosexual one
      b) Physicians should be aware of the legal uncertainties facing lesbian couples

D. Medical issues
   (1) Increased risk of depression
   (2) Increased risk of substance abuse
   (3) Increased risk of suicide, especially in lesbian adolescents
   (4) Although some gynecologic problems are less common in the lesbian population, there are no gynecologic problems that are exclusively found in heterosexual women
   (5) Risk of cervical dysplasia
      a) If there is a past or current history of heterosexual intercourse, there continues to be a risk of cervical dysplasia
      b) Lesbians may be less likely to have regular cervical screening
   (6) Risk of sexually transmitted disease – if in an exclusive lesbian relationship, lesbians are at a lower risk
   (7) Pregnancy
      a) Many lesbians desire pregnancy
      b) Problems encountered by lesbians in achieving pregnancy
         (b. 1) Prejudice from health care professionals
         (b. 2) Availability of prospective fathers including artificial insemination donors
         (b. 3) Insurance coverage
         (b. 4) Custody disputes

214. The student will be able to perceive, recognize and understand the sexual feelings elicited by patients and appropriately manage them.

A. The student will be able to recognize factors of his/her own sexuality that may influence his/her perception and management of patients with psychosexual disorders

B. The student will be able to demonstrate acceptance of the fact that the physician's personal concept of sexuality should not interfere with management of patients

C. The student will be able to establish criteria for referral of patients based upon the student's own attitudes and personal resources
D. The student will be able to establish criteria for referral of patients based upon the patient's needs and personal resources
E. The student will be able to establish criteria for inappropriate relationships
F. The student will be able to establish criteria for sexual harassment

215. Given the seductive patient, the student will be able to

A. Recognize this issue
B. Establish criteria for referral
C. Act in a professional manner
D. Discuss and receive advice on these issues from a colleague

Sexual Abuse

216. The student will discuss the appropriate evaluation and treatment of a female who is abused and of a child who is being sexually abused.

A. Abused woman
   (1) Physical (see objective 159)
   (2) Emotional (see objective 159)
   (3) Sexual
       a) Incidence – approximately 30% of women in the U.S. have been a victim of sexual abuse
       b) Abuse survivors may repress the abuse in varying degrees. They are frequently well compensated and unaware that their history may be impacted on current health.
       c) Asking about a history of abuse needs to become a standard part of each history and physical (see objective 5)
       d) Behavioral and psychological disturbances that have been associated with abuse
           (d. 1) Depression
           (d. 2) Anxiety
           (d. 3) Low self-esteem
           (d. 4) Panic attacks
           (d. 5) Perfectionism
           (d. 6) Agoraphobia
           (d. 7) Flashbacks
           (d. 8) Sexual dysfunction including lack of desire, lack of orgasm and fear of sex or intimacy
           (d. 9) Alcohol or drug dependency
           (d.10) Self-destructive behaviors
           (d.11) Suicidal ideation
       e) Physical complaints that have been associated with sexual abuse
           (e. 1) Chronic pelvic pain
           (e. 2) Abdominal pain
           (e. 3) Chronic headache
           (e. 4) Lethargy
           (e. 5) Obesity
           (e. 6) Sleep disorders
           (e. 7) Eating disorders
           (e. 8) Dyspareunia
           (e. 9) Sexual dysfunction including lack of lubrication
f) Management
   (f. 1) Recognition of connection between past events (abuse) and present
   (f. 2) If a patient gives a history of sexual abuse, ask if she wishes to discuss this further
       (f.2.1) If so
           (f.2.1.1) Identify the abuser
           (f.2.1.2) Determine the age when the abuse occurred and the duration of the abuse
           (f.2.1.3) Has she told anyone?
           (f.2.1.4) What is its effect on the patient today?
           (f.2.1.5) How does the patient wish to proceed with this discussion?
           (f.2.1.6) Offer referral for counseling
       (f.2.2) If not, do not push the patient but give her the opportunity to discuss this in the future if she wishes
   (f. 3) A therapeutic relationship between the primary care provider (e.g., family practitioner, internist, gynecologist) and psychiatrist may help ensure appropriate care and followup
   (f. 4) Education and support
   (f. 5) Hysterectomy for gynecologic complaints usually retards these women's recovery

B. Sexual abuse of children
   (1) Recognize behavioral indicators of depression, more sexual knowledge than appropriate, sexual acting out, low self-worth, excessive masturbation, excess anxieties and fears, runaways
   (2) Child may feel abuse is their fault and guilt may be increased by their sexual pleasure and/or feeling of being special
   (3) If reason to suspect incest, report as required by law and refer entire family for appropriate therapy. Recognize incest intensifies the child's sense of betrayal by others.