Basic Standards for Residency Training in Combined Osteopathic Emergency Medicine/Internal Medicine

American Osteopathic Association
and the
American College of Osteopathic Emergency Physicians
and the
American College of Osteopathic Internists

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# BASIC STANDARDS FOR RESIDENCY TRAINING IN COMBINED OSTEOPATHIC EMERGENCY MEDICINE/INTERNAL MEDICINE

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ARTICLE I - INTRODUCTION

These are the basic standards for residency training in combined emergency medicine/internal medicine as approved by the American Osteopathic Association (AOA), the American College of Osteopathic Emergency Physicians (ACOEP) and the American College of Osteopathic Internists (ACOI). These standards are designed to provide the osteopathic resident with advanced and concentrated training in emergency medicine/internal medicine and to prepare the resident for examination for certification in emergency medicine and/or internal medicine.

ARTICLE II - PURPOSES AND OBJECTIVES

A. The purpose of this combined residency program is to:

1. Provide a wide spectrum of educational experiences to enable the resident, upon completion of the program, to be fully competent to practice internal medicine in either the hospital or ambulatory setting and to provide and plan emergency health services as a mature, responsible emergency medicine specialist. Integration of osteopathic principles and practice shall be an essential part of the program. The program must incorporate a primary continuity of care experience in an ambulatory setting in internal medicine, which shall provide the resident with increasing responsibilities in patient care.

2. The most important objective of the combined program should be to graduate a mature, responsible emergency physician/internist who demonstrates sound medical judgment. This judgment and self-confidence must be developed through a process of observing and participating in the diagnosis and management of acute and non-medical ambulatory and hospital healthcare delivery.
ARTICLE III - INSTITUTIONAL REQUIREMENTS

A. To be approved by the AOA for residency training in emergency medicine/internal medicine, an institution\(^1\) must meet all the requirements as formulated in the Residency Training Requirements of the AOA, and sponsor AOA-approved residencies in both internal medicine and emergency medicine.

B. The institution must provide sufficient patient load to properly train a minimum of two (2) residents in the combined program. There shall be a minimum of 25,000 patient visits annually to the emergency facility at in the base hospital.

C. The institution shall maintain an adequate medical library containing carefully selected texts, the latest editions of medical journals and other appropriate publications, in various branches pertaining to training in emergency medicine and internal medicine. The library shall be in the charge of a qualified person who shall act as the custodian of its contents and arrange for the proper cataloging and indexing that will facilitate investigative work by the residents.

D. The institution's Department of Internal Medicine shall have at least two physicians certified in internal medicine by the American Osteopathic Association. One of these physicians shall be designated as the program co-director of the combined residency. Other qualified physicians participating in the training of residents must submit their curriculum vitae and must be approved by the program co-director.

E. There must be a Department of Emergency Medicine, organized according to the recommended standards of the American College of Osteopathic Emergency Physicians at the base hospital. Experienced emergency medicine department faculty must participate in the training of the emergency medicine/internal medicine resident. A minimum of 50% of the emergency medicine department faculty must be board certified in emergency medicine

\(^1\) Hospital, college, organization or other training facility.
by AOA. One of these physicians shall be designated as the program co-director of the combined residency.

F. The program co-directors may be the program directors of existing programs in their appropriate disciplines.

G. The combined program must clearly indicate the qualifications and selection procedures of the teaching staff.

H. The emergency medicine department tends to fall into one of several categories: university hospital, the university-affiliated hospital, community hospital, and the municipal or county hospital. Emergency medicine training must occur in a minimum of two distinct educational settings. However, any hospital in which an emergency medicine residency is based shall conform to certain characteristics.

1. The possibility of expeditious and excellent patient care shall be present. Implicit in this concept is that there shall be adequate space and physician ancillary medical help.

2. The emergency medicine department shall have appropriate funding.

3. A minimum volume of 15,000 patients annually, at each site other than the base hospital, shall qualitatively and quantitatively constitute a sufficient load for the training of emergency medicine residents.

4. The emergency medicine resident must function as a responsible physician and must be responsible for initiating whatever acute evaluation and stabilization might be necessary under ordinary circumstances.

5. The care rendered shall be given with the consultative support of an attending emergency physician or participation by a designated senior emergency medicine
resident, senior residents from appropriate specialty services, and/or appropriate in-patient facilities.

6. The department must have immediate availability of senior resident or staff physician coverage in specialty areas.

I. The Department of Emergency Medicine must provide evidence that there is regular review of the quality of care rendered by all members of this department as well as their utilization of hospital services.

J. The institution must provide an opportunity for training exposure in a supervised ambulatory site for continuity of care training in internal medicine. Institutional clinics, outpatient departments or physicians' offices may be used.

K. The institution must provide a written policy and procedure for the selection of residents, which shall be included in the institutional training protocol for combined emergency medicine/internal medicine.

L. The institution shall execute a contract with each resident in accordance with the Residency Training Requirements of the AOA.

M. Upon satisfactory completion of the training program, the institution shall award the resident an appropriate certificate. The certificate shall confirm the fulfillment of the program requirements, starting and completion dates of the program, and the name(s) of the training institution(s) and the program co-director(s).
ARTICLE IV - PROGRAM REQUIREMENTS

A. The residency training program shall only commence after it has received the recommendations of the AOA Committee on Postdoctoral Training and the approval of the AOA Board of Trustees.

B. The combined residency training program in emergency medicine/internal medicine shall be four (4) years in duration, after completion of an AOA approved internship. The training shall consist of a twenty-four (24) months of training in general internal medicine and twenty-four (24) months of training in emergency medicine. The internal medicine and emergency medicine rotations must be integrated throughout the entire four (4) years and there must be a minimum of four months of each discipline during each of the four (4) training years.

C. There must be evidence that the resident is given appropriate and progressive responsibility during each year of training, under supervision. The manner in which this responsibility is given must be indicated.

D. The residency training in emergency medicine need not take place in one geographical location but the majority of training must take place at the base hospital, provided the training is coordinated to ensure completeness and that the program co-director retains administrative control.

E. The hospital must provide teaching modalities to include:

1. Osteopathic principles and practice.

2. Standard didactic lectures.

3. Combined emergency medicine/internal medicine case conferences.
4. Combined emergency medicine/internal medicine morbidity and mortality conferences.

5. Drug and therapeutic reviews.

6. Journal reviews.

7. Cadaver dissection and animal lab performances of procedures such as tracheostomy and chest tube placement.

8. Manikin practice, such as CPR and intubation.

9. Runs pre-hospital EMS activities.

10. Resident teaching of basic physiology and emergency medical practice to paramedic medical students and other paramedical emergency professionals.

11. Involvement in community EMS projects such as development of 911 phone communications, cardiac monitoring, telemetry.

12. Commercial and university films and video tapes on pertinent subjects and procedures on patients, admitted to or discharged from the emergency medicine/internal medicine departments.

13. Follow-up of patients either admitted or discharged from the emergency medicine/internal medicine departments.

14. Chart reviews.

15. Participation in emergency medicine/internal medicine department administrative functions.
F. The general educational content of the internal medicine aspect of the program shall include the specifics outlined in Appendix A.

G. The program must provide suitable arrangements as needed for outside rotations to ensure the complete education of the resident and for broadening the scope of training. All rotations must meet standards as formulated in the Residency Training Requirements of the AOA.

H. The general educational content of the emergency medicine training shall include the general objectives as outlined in Appendix B.

ARTICLE V - PROGRAM CONTENT

A. The four (4) year training program in combined emergency medicine/internal medicine should be an integrated program, during which there are internal medicine and emergency medicine rotations each year. A sample curriculum is provided in Appendix C. The twenty-four (24) months of internal medicine training should incorporate approximately 50% of the time in general internal medicine services or experience; however, no less than eight months and no more than eighteen months of the twenty-four (24) months should be in general internal medicine. Rotations in the Critical Care Unit (ICU/CCU) will count toward the general internal medicine requirement; however, no more than a total of four months in the Critical Care Unit may be taken during the four-year program.

An ambulatory continuity of care experience should be included, which would best suit the specifics and availabilities of the local program as well as the requirements of the specific training track offered.

Of the twenty-four (24) months of internal medicine training, a minimum of one month’s rotations shall be in each of the following subspecialty rotations:

- Cardiology
- Gastroenterology
- Endocrinology
- Hematology/Oncology
B. A total of six (6) months of elective time is allowed during the four (4) year training program, of which three months will be credited toward internal medicine and three (3) months credited toward emergency medicine training. No more than one (1) month each may be selected from the following list of electives:

- Adolescent medicine
- Ambulatory geriatric medicine
- Community medicine epidemiology
- Dermatology
- Disease prevention/wellness
- ENT
- Gynecology
- Administrative and emergency medicine activities
- Quality assurance in emergency medicine/risk management
- Research activity as it relates to emergency medicine

C. The general structure of the program should be as follows:

1. **YEAR ONE**

   The first year should include major emphasis on inpatient experience in general internal medicine and general emergency medicine.

2. **YEAR TWO**

   The second year should again place major emphasis on inpatient experience in general internal medicine and general emergency medicine. By the end of the second year of training, the resident should have completed subspecialty rotations in cardiology, pulmonary medicine, and gastroenterology. The resident should have progressively more responsibility during the second year of training.
3. **YEARS THREE AND FOUR**

The third and fourth years should begin to de-emphasize the inpatient exposure in internal medicine and introduce the resident to elective rotations in internal medicine and emergency medicine. During these years the resident should have the same level of responsibility as a third year resident in traditional internal medicine or emergency medicine.

**ARTICLE VI - QUALIFICATIONS AND RESPONSIBILITIES OF THE PROGRAM CO-DIRECTORS**

A. General Description and Qualifications

1. The combined emergency medicine/internal medicine training program shall have a co-director from the emergency medicine department and a co-director from the internal medicine department. The co-directors will work jointly in supervision and directing the training program. The program co-directors must be certified by the AOA through the AOBIM or the AOBEM. There may be one program director, in lieu of co-directors, if the program director is certified by the American Osteopathic Association in both internal medicine and emergency medicine.

2. It is recommended that the program co-directors be certified for at least five (5) years prior to assuming this position.

3. The program co-directors must meet the standards of the position as formulated in the Residency Training Requirements of the AOA.

B. Responsibilities
1. The program co-directors' authority in directing the residency training program must be defined in the program documents of the institution.

2. Program co-directors shall be directly responsible to the chairman of each appropriate department as well as the director of medical education to verify that each resident is meeting or exceeding the minimum standards of the program.

3. The program co-directors shall evaluate the residents in the program by documenting the observance of the residents' habits, methods and techniques used in bedside teaching rounds and participation at departmental and interdepartmental conferences.

4. The program co-directors shall arrange affiliations and/or rotations necessary to meet the program objectives.

5. The program co-directors shall, in cooperation with the AOA Department of Education, prepare required materials for inspections.

6. The program co-directors shall provide the resident with all documents pertaining to the training program as well as the requirements for the satisfactory completion of the program.

7. The program co-directors shall be required to submit regular program director reports to the director of medical education and administrator of the institution. Annual reports shall be submitted to both the ACOI and the ACOEP.

8. The program co-directors shall approve and supervise the resident's preparation of required medical/scientific manuscripts.

9. The internal medicine co-director or his/her designee must attend the annual program directors meeting, sponsored by the ACOI, to qualify for continuing approval of the program. The emergency medicine co-director must attend the
annual program director workshop, sponsored by the ACOEP. If there is one program director, he/she shall be required to attend the program directors meeting of the ACOI and ACOEP on alternate years.

10. The program co-directors must be members of the AOA.

11. The program co-directors must meet on a quarterly basis to evaluate the program, residents and teaching faculty. Each program co-director shall be responsible to report to their respective department for the purpose of conducting a program critique and evaluation report. There shall be at least four meetings per year and these meetings shall be included in the minutes of each department.

ARTICLE VII - RESIDENT REQUIREMENTS

A. Applicants for the combined residency training in emergency medicine/internal medicine must:

1. Have graduated from an AOA-accredited college of osteopathic medicine.
2. Have completed a one-year AOA-approved internship.
3. Be and remain members of the AOA during the residency training.
4. Be appropriately licensed in the state in which the training is conducted.

B. During the training program the resident must:

1. Submit a resident’s annual report to the American College of Osteopathic Internists and a resident’s annual report to the American College of Osteopathic Emergency Physicians within thirty (30) days of completion of the training year.
2. Prepare and submit a minimum of two (2) medical manuscripts over the four (4) year training program, which are suitable for publication, on assigned topics requiring library or medical research to the ACOEP. These are to be prepared under the supervision and with the sanction of the emergency medicine program co-director. Complete the medical research component as described in Section IV-G of the Basic Standards for Residency Training in Internal Medicine.

3. Attend all meetings as directed by the program co-directors, including the educational portion of the departments of internal medicine and emergency medicine and participate in major committee meetings. The resident must also participate in the institutional intern/student educational programs.

4. Participate in the annual resident evaluation examinations sponsored by both the ACOI and the ACOEP.

5. Be certified as instructors in advanced cardiac life support and providers in advanced trauma life support.

6. Complete the ACOI resident's clinical evaluation as directed by the internal medicine co-program director prior to the completion of the second year residency year.
APPENDIX A

The general educational content of the internal medicine aspects of the combined emergency medicine/internal medicine residency program shall include:

1. The neuromuscular component of disease and the distinctive osteopathic concept of the evaluating and treating the whole patient in inpatient care and ambulatory care settings.

2. Development of basic cognitive skills pertaining to normal and pathophysiology of the body systems and the correlating clinical applications of medical diagnosis and management.

3. Sufficient training in the following procedures and the development of respective interpretive skills. Verification by the program co-directors, of experience and competency in required procedures is necessary.

   a. **Required:**

      Comprehensive histories and physicals, including structural examination for somatic dysfunction, pelvic and rectal examinations; cardiopulmonary resuscitation; gram stains of sputum with analysis; chest x-ray with interpretation; arterial blood gas puncture and analysis; blood smear interpretation; microscopic examination of the urine; thoracentesis; paracentesis; ECG (EKG) performance and interpretation; central venous line placement; spirometric interpretation; lumbar puncture; local infiltrative anesthesia; tracheal intubation; Flexible sigmoidoscopy, and osteopathic manipulative treatment.

   b. **Recommended:**

      Arterial cannulation; bone marrow aspiration and biopsy; right heart catheterization (Swan Ganz); cardiac stress testing supervision and analysis;
advanced pulmonary function laboratory studies; and arthrocentesis (shoulder and knee).

c.  Optional:
Cricothyrotomy; chest tube placement; electrocardioversion; endoscopic evaluation of the gastrointestinal tract; fiber-optic bronchoscopy; and liver biopsy.

4. Affective content should exist with regard to behavioral aspects involved in the interaction of the patient and related health problems. The program should encourage the resident to understand the contingencies of health and illness and the development of a mature concern regarding the quality of patient care. The resident should be encouraged to develop community and intraprofessional relationships.

5. Elective training is specified in Article V. All elective training must be approved by the program co-director
APPENDIX B

The following general objectives represent levels of achievement in concepts, skills and attitudes of residents in emergency medicine training:

1. The emergency medicine resident must be trained in all phases of emergency care.

2. In order to initiate proper emergency treatment, the emergency medicine resident shall be indoctrinated with the principles of continuity of care.

3. The training program shall enable the resident to rapidly evaluate, organize and initiate the treatment of the emergency patient. The resident's ability to organize and record histories, physical examinations, diagnostic tests and procedures, and initiation of appropriate therapy shall be made an integral part of the training.

4. Due regard shall be given to expected risks arising from therapy as well as the condition being treated.

5. A portion of the training shall include training in special care units supervised by attending physicians.

6. During the training period, the resident must have experience in the care of emergent and non-emergent patients in the hospital emergency department.

7. The emergency medicine resident shall be trained in preventive medicine, especially as it relates to emergency care.

8. Training shall incorporate the application of osteopathic diagnostic and therapeutic measures as they relate to the total care of the patient with emphasis on the management of patients requiring emergency medical care.
9. Opportunity shall be given to each resident to evaluate the results of treatment of patients.

10. Opportunity for research in emergency medicine shall be provided.

11. There shall be training in emergency medical services systems management including:
   
   a. Emergency department and hospital administration.
   b. Forensic medicine and medicolegal problems.
   c. Community relations, including news media.
   d. Emergency transportation and communication.
   e. Mass casualty management and coordination for the hospital and community.
   f. Education of allied health personnel and training in their utilization.

12. In addition to the above content, the emergency medicine residency program should provide training in the conditions and skills listed on the supplemental list in Appendix E.
APPENDIX C
GUIDELINES FOR PREPARATION AND SUBMISSION OF
MEDICAL MANUSCRIPTS, RESEARCH PAPERS AND PROGRESS REPORTS FOR
THE INTERNAL MEDICINE REQUIREMENT

1. All manuscripts must be typed and submitted in an appropriate format acceptable for publication in a standard scientific refereed journal.

2. An abstract must accompany each manuscript. The cover sheet must list the program for which credit is to be applied and a statement that the resident is the primary author or, performed substantive participation in the study and that the paper has been reviewed and approved. This must be signed and attested to by the program director. Manuscripts shall be submitted in one of the following formats only:

   a. A case presentation of a first reported case or other unusual manifestations of a disease which will add to the medical literature, which should include a review of the literature and discussion (acceptable only if submitted for publication).

   b. A report of an original clinical research study approved by the program director and the institutional review authorities.

   c. A case presentation and discussion that challenges existing concepts of diagnosis or treatment and thus recommends further investigation.

Initially, the resident should submit a written proposal to the program director for review and approval as fulfilling the writing requirement. All projects must be performed and prepared under the supervision of the program director or another physician approved by the program director.

Effective for residents beginning training on or after July 1, 1991, residents may work jointly on an original clinical research project, provided a progress report and written
approval of the program director is included in Part II of the Resident Annual Report. Residents may not work jointly on case reports. Residents shall submit the required manuscript within thirty (30) days of the completion of the third year of training in combined internal medicine/emergency medicine.

Clinical research projects that are prospective in nature, may require ongoing accrual of patients to provide sufficient numbers to assure statistical validity. Patient accrual, performance of the study, data analysis, and writing of the paper may represent a long-term project of more than two (2) years. In such a situation, with the approval of the program director, the resident may submit a substantive progress report of the project with a summary of data collected so far and indicating the ongoing nature of the study. This progress report shall be accepted in lieu of the required final manuscript for the third year in a four (4) year program. Final credit will be granted with the submission of an acceptable paper within thirty (30) days of completion of the fourth year of training.
APPENDIX D

MODEL HOSPITAL POLICY ON
ACADEMIC AND DISCIPLINARY DISMISSALS

In July 1993, the Board of Trustees of the American Osteopathic Association adopted the following policy:

The hospital and department have clearly defined procedures for academic and disciplinary action. Academic dismissals result from a failure to attain a proper level of scholarship or non-cognitive skills, including clinical abilities, interpersonal relations, and/or personal and professional characteristics. Institutional standards of conduct include such issues as cheating, plagiarism, falsifying records, stealing, alcohol and/or substance abuse, or any other inappropriate actions or activities.

In cases of academic dismissal, the hospital and department will inform trainees, orally and in writing, of inadequacies and their effects on academic standing. The trainee will be provided a specified period in which to implement specified actions required to resolve academic deficiencies. Following this period, if academic deficiencies persist, the trainee may be placed on probation for a period of three (3) to six (6) months. The trainee may be dismissed following this period, if deficiencies remain and are judged to be unremediable. In accordance with institutional policy, the trainee will be provided an opportunity to meet with evaluators to appeal decisions regarding probation or dismissal. Legal counsel at hearings concerning academic issues will not be allowed.

In cases of disciplinary infractions that are judged unremediable, the hospital and department will provide the trainee with adequate notice, in writing, of specific ground(s) and the nature of the evidence on which the disciplinary action is based. The trainee will be given an opportunity for a hearing in which the disciplinary authority will provide a fair opportunity for the trainee's position, explanations and evidence. Finally, no disciplinary action will be taken on grounds that are not supported by substantial evidence. The department and/or hospital intern training
committee, or house staff education committee, or other appropriate committees will act as the
disciplinary authority. Trainees may be allowed counsel at hearings concerning disciplinary
issues. Pending proceedings on such disciplinary action, the hospital in its sole discretion may
suspend the trainee, when it is believed that such suspension is in the best interests of the
hospital or of patient care.
APPENDIX E

CORE CURRICULUM OUTLINE
WITH BASIC CLINICAL SKILLS IN EMERGENCY MEDICINE

Presentations / Symptoms

1.0 General Disorders

1.1 Altered mental status
1.2 Anorexia
1.3 Apnea
1.4 Ataxia
1.5 Barotrauma
1.6 Bites
1.7 Burns
1.8 Cardiac arrest
1.9 Chemical intoxication
1.10 Chills
1.11 Cold injury
1.12 Coma
1.13 Crying/fussy
1.14 Cyanosis
1.15 Dehydration
1.16 Dizziness
1.17 Drowning
1.18 Dysesthesia
1.19 Dysphasia
1.20 Edema
1.21 Failure to thrive
1.22 Fatigue
1.23 Feeding problems
1.24 Fever
1.25 Genital ulcer
1.26 Heat illness
1.27 Hypertension
1.28 Hypotension
1.29 Lymphadenopathy
1.30 Malaise
1.31 Pain
1.32 Poisoning
1.33 Pruritus
1.34 Purpura
1.35 Rash
1.36 Seizures
1.37 Sexual assault
1.38 Shock
1.39 Suicidal ideation
1.40 Syncope
1.41 Tetany
1.42 Urticaria
1.43 Violence
1.44 Weakness
1.45 Weight loss

2.0 Head and Neck

2.1 Diplopia
2.2 Dysacusis
2.3 Dysphasia
2.4 Dysphonia
2.5 Dysesthesia
2.6 Ear ache
2.7 Ear - foreign body
2.8 Epistaxis
2.9 Eye - foreign body
2.10 Eye pain
2.11 Facial pain
2.12 Headache
2.13 Loss of vision
2.14 Neck pain
2.15 Otorrhea
2.16 Paralysis
2.17 Pharyngitis
2.18 Red eye
2.19 Rhinorrhea
2.20 Seizures
2.21 Stridor
2.22 Toothache
2.23 Torticollis
2.24 Tremor
2.25 Vertigo

3.0 Chest

3.1 Chest pain
3.2 Cough
3.3 Dyspnea
3.4 Hemoptysis
3.5 Hiccoughs
3.6 Palpitations
3.7 Stridor
3.8 Tachycardia
3.9 Wheezing

4.0 Abdomen

4.1 Abdominal pain
4.2 Abnormal vaginal bleeding
4.3 Anuria
4.4 Back pain
4.5 Constipation
4.6 Diarrhea
4.7 Discharge
4.8 Distention
4.9 Dysmenorrhea
4.10 Dyspareunia
4.11 Dysphagia
4.12 Dysuria
4.13 Food poisoning
4.14 Foreign bodies
4.15 Gastrointestinal foreign body
4.16 Hematemesis
4.17 Hematochezia
4.18 Hematuria
4.19 Jaundice
4.20 Melena
4.21 Nausea/vomiting
4.22 Pregnancy
4.23 Priapism
4.24 Pruritus ani
4.25 Rectal pain
4.26 Urinary incontinence
4.27 Urinary retention

5.0 Extremities

5.1 Bleeding
5.2 Crepitance
5.3 Decreased/increased range of motion
5.4 Deformity
5.5 Limp
5.6 Swelling
5.7 Pain
CORE CONTENT AREAS

1.0 ABDOMINAL AND GASTROINTESTINAL DISORDERS

1.1 Esophagus

1.1.1 Motor abnormalities
   1.1.1.1 Esophageal spasm
   1.1.1.2 Achalasia (SEE 13.1.4.3)

1.1.2 Structural disorders
   1.1.2.1 Varices
   1.1.2.2 Rupture (Boerhaave syndrome)
   1.1.2.3 Perforation
   1.1.2.4 Tears (Mallory-Weiss syndrome)
   1.1.2.5 Hematoma
   1.1.2.6 Foreign body (SEE 13.1.5)
   1.1.2.7 Diaphragmatic hernia
   1.1.2.8 Diverticula
   1.1.2.9 Hiatal hernia
   1.1.2.10 Webs, strictures, stenosis, fistulas

1.1.3 Inflammatory disorders
   1.1.3.1 Reflux esophagitis
   1.1.3.2 Caustic injury

1.1.4 Infectious disorders
   1.1.4.1 Herpetic esophagitis
   1.1.4.2 Monilial esophagitis

1.1.5 Tumors

1.2 Liver

1.2.1 Hepatitis
   1.2.1.1 Viral
   1.2.1.2 Bacterial
   1.2.1.3 Parasitic
1.2.1.4 Drug and toxin
1.2.1.5 Alcoholic
1.2.1.6 Prophylaxis

1.2.2 Cirrhosis
  1.2.2.1 Alcoholic
  1.2.2.2 Viral
  1.2.2.3 Biliary obstructive
  1.2.2.4 Drug-induced
  1.2.2.5 Toxin-induced

1.2.3 Hepatic/hepato-renal failure

1.2.4 Tumors of the liver

1.2.5 Abscess
  1.2.5.1 Primary abscess
  1.2.5.2 Metastatic abscess

1.3 Gall Bladder and Biliary Tract
  1.3.1 Cholecystitis
  1.3.2 Cholangitis
  1.3.3 Cholelithiasis and choledocholithiasis
  1.3.4 Gallstone ileus
  1.3.5 Tumors

1.4 Pancreas
  1.4.1 Inflammatory
    1.4.1.1 Acute pancreatitis
    1.4.1.2 Chronic pancreatitis
    1.4.1.3 Pseudocyst/abscess
    1.4.1.4 Pancreatic insufficiency
  1.4.2 Tumors
    1.4.2.1 Islet cell tumors
    1.4.2.2 Carcinoma
1.5 Stomach

1.5.1 Structural lesions
   1.5.1.1 Volvulus
   1.5.1.2 Foreign bodies
   1.5.1.3 Rupture
   1.5.1.4 Gastric outlet obstruction

1.5.2 Inflammatory disorders
   1.5.2.1 Acute gastritis
      1.5.2.1.1 Stress-related gastritis
      1.5.2.1.2 Corrosive gastritis
      1.5.2.1.3 Drug-induced gastritis

1.5.3 Peptic ulcer disease
   1.5.3.1 Duodenal ulcer
   1.5.3.2 Gastric ulcer
   1.5.3.3 Acute gastrointestinal hemorrhage (SEE 13.1.8)

1.5.4 Tumors

1.6 Small Bowel

1.6.1 Motor abnormalities
   1.6.1.1 Obstruction
      1.6.1.1.1 Mechanical
      1.6.1.1.2 Adynamic
   1.6.1.2 Pseudo obstruction

1.6.2 Structural disorders
   1.6.2.1 Aortoenteric fistula
   1.6.2.2 Malabsorption
   1.6.2.3 Meckel's diverticulum (SEE 13.1.4.6)

1.6.3 Inflammatory disorders
   1.6.3.1 Acute appendicitis
   1.6.3.2 Regional enteritis/Crohn's disease
1.6.4 Infectious disorders
   1.6.4.1 Viral
   1.6.4.2 Bacterial
   1.6.4.3 Parasitic

1.6.5 Tumors

1.6.6 Vascular disorders
   1.6.6.1 Mesenteric ischemia
   1.6.6.2 Ischemic colitis

1.7 Large Bowel

1.7.1 Motor abnormalities
   1.7.1.1 Irritable bowel
   1.7.1.2 Constipation
   1.7.1.3 Aganglionic megacolon/Hirschsprung’s (SEE 13.1.4.7)
   1.7.1.4 Obstruction/pseudo obstruction

1.7.2 Structural disorders
   1.7.2.1 Diverticular disease
   1.7.2.2 Volvulus
   1.7.2.3 Vascular dysplasia (angiodyplasia)

1.7.3 Inflammatory disorders
   1.7.3.1 Ulcerative colitis
   1.7.3.2 Radiation colitis

1.7.4 Infectious disorders
   1.7.4.1 Bacterial
   1.7.4.2 Viral
   1.7.4.3 Parasitic
   1.7.4.4 Antibiotic associated

1.7.5 Tumors

1.8 Rectum and Anus

1.8.1 Structural disorders
1.8.1.1 Anal fissure
1.8.1.2 Anorectal fistula (SEE 13.1.1)
1.8.1.3 Hemorrhoids
   1.8.1.3.1 Internal
   1.8.1.3.2 External
1.8.1.4 Rectal prolapse
1.8.1.5 Foreign body
1.8.1.6 Perirectal abscess
1.8.1.7 Perianal/Pilonidal abscess
1.8.2 Inflammatory disorders
   1.8.2.1 Proctitis
1.8.3 Tumors

1.9 Abdominal Wall
   1.9.1 Hernias (SEE 13.1.9)

1.10 Peritoneum
   1.10.1 Ascites
   1.10.2 Spontaneous bacterial peritonitis

2.0 CARDIOVASCULAR DISORDERS

2.1 Pathophysiology
   2.1.1 Congenital disorders
   2.1.2 Acquired disorders
   2.1.3 Effects of aging

2.2 Diseases of the Myocardium, Acquired
   2.2.1 Cardiac failure
2.2.1.1 High output
2.2.1.2 Low output
2.2.1.3 Cor pulmonale

2.2.2 Cardiomyopathy

2.2.3 Ischemic heart disease
2.2.3.1 Angina
   2.2.3.1.1 Stable
   2.2.3.1.2 Variant
   2.2.3.1.3 Unstable

2.2.3.2 Myocardial infarction
2.2.3.3 Cardiogenic shock
2.2.3.4 Ventricular aneurysm

2.2.4 Endocarditis

2.2.5 Valvular heart disease
2.2.5.1 Aortic insufficiency/stenosis
2.2.5.2 Mitral insufficiency/stenosis
2.2.5.3 Pulmonary insufficiency/stenosis
2.2.5.4 Tricuspid insufficiency/stenosis

2.2.6 Myocarditis (SEE 13.2.3.3)

2.3 Diseases of the Pericardium
2.3.1 Pericarditis (SEE 13.2.3.1)
2.3.2 Pericardial effusion/tamponade

2.4 Diseases of the Conduction System (Disturbances of Cardiac Rhythm)
2.4.1 Dysrhythmias (SEE 13.2.1)
2.4.1.1 Atrial flutter/fibrillation
2.4.1.2 Atrial/junctional ectopy
2.4.1.3 Preexcitation syndromes
2.4.1.4 Supraventricular tachycardia/bradycardia
2.4.1.5 Ventricular flutter/fibrillation
2.4.1.6 Ventricular tachycardia
2.4.1.7 Ventricular ectopy
2.4.1.8 QT interval syndrome

2.4.2 Conduction blocks
2.4.2.1 Sinoatrial block
2.4.2.2 Sick sinus syndrome
2.4.2.3 Atrioventricular blocks (1º, 2º, 3º)
2.4.2.4 Bundle branch blocks

2.5 Diseases of the Circulation, Acquired
2.5.1 Arterial
2.5.1.1 Atherosclerosis/insufficiency
2.5.1.2 Aneurysm
   2.5.1.2.1 Aortic/iliac
   2.5.1.2.2 Peripheral arterial
2.5.1.3 Arteritis
2.5.1.4 Emboli
2.5.1.5 Spasm
2.5.1.6 Thrombosis
2.5.1.7 Aortic dissection
2.5.2 Venous
   2.5.2.1 Venous insufficiency/varicosities
   2.5.2.2 Thromboembolism
   2.5.2.3 Thrombophlebitis
2.5.3 Lymphatics

2.6 Congenital Abnormalities of the Cardiovascular System (SEE 13.3.2)
2.6.1 Familial/genetically transmitted disorders
2.6.2 Disorders due to anatomic anomalies
   2.6.2.1 Hypertrophic heart disease
   2.6.2.2 Mitral valve prolapse
2.6.2.3 Patent foramen ovale

2.7 Cardiac Transplant Patient

2.8 Hypertension
2.8.1 Acute hypertensive crisis (SEE 12.3.6)
2.8.2 Chronic hypertension
   2.8.2.1 Essential
   2.8.2.2 Secondary

2.9 Primary Tumors of the Heart

2.10 Myocardial Manifestations of Systemic Diseases
2.10.1 Infections
   2.10.1.1 Early (endocarditis 2º sepsis)
   2.10.1.2 Late (rheumatic fever 2º group A streptococcal infection)
2.10.2 Endocrine and metabolic diseases (SEE 13.3)
2.10.3 Rheumatologic
2.10.4 Renal
2.10.5 Toxic exposures

2.11 Treatment Modalities
2.11.1 Thrombolytic therapy
2.11.2 Pharmacologic agents
2.11.3 Cardiac pacemakers
   2.11.3.1 Temporary
   2.11.3.2 Permanent
2.11.4 Surgical interventions
   2.11.4.1 Vascular reconstruction
   2.11.4.2 Angioplasty
   2.11.4.3 Circulatory augmentation
2.11.4.4 Implantable defibrillators

3.0 CUTANEOUS DISORDERS

3.1 Dermatitis

3.1.1 Acne
3.1.2 Atopic
3.1.3 Contact
3.1.4 Dyshidrotic eczema
3.1.5 Exfoliative
3.1.6 Lichen simplex
3.1.7 Psoriasis
3.1.8 Seborrhea
3.1.9 Stasis
3.1.10 Photosensitivity
3.1.11 Nummular eczema

3.2 Infections

3.2.1 Bacterial

3.2.1.1 Abscesses
3.2.1.2 Cellulitis/lymphangitis
3.2.1.3 Erysipelas
3.2.1.4 Folliculitis
3.2.1.5 Impetigo
3.2.1.6 Bacterial exanthems

3.2.2 Fungal

3.2.2.1 Candida
3.2.2.2 Tinea

3.2.3 Parasitic

3.2.3.1 Pediculosis
3.2.3.2 Scabies

3.2.4 Viral
3.2.4.1 Aphthous ulcers
3.2.4.2 Herpes simplex
3.2.4.3 Herpes zoster
3.2.4.4 Molluscum contagiosum
3.2.4.5 Warts
3.2.4.6 Viral exanthems

3.3 Maculopapular Lesions
3.3.1 Pityriasis rosea
3.3.2 Purpura and petechiae
3.3.3 Urticaria

3.4 Papular/Nodular Lesions
3.4.1 Epidermal inclusion cysts
3.4.2 Fibroma
3.4.3 Hemangioma
3.4.4 Lipoma
3.4.5 Nevi
3.4.6 Lichen planus

3.5 Erythemas
3.5.1 Erythema multiforme
3.5.2 Erythema nodosum

3.6 Vesicular/Bullous Lesions
3.6.1 Pemphigus/pemphigoid
3.6.2 Scalded skin syndrome
3.6.3 Toxic epidermal necrolysis
3.7 Cancers
  3.7.1 Basal cell
  3.7.2 Kaposi's sarcoma
  3.7.3 Melanoma
  3.7.4 Squamous cell

3.8 Cutaneous Manifestations of Allergic Reactions

3.9 Cutaneous Manifestations of Systemic Disease

4.0 ENDOCRINE, METABOLIC, AND NUTRITIONAL DISORDERS (SEE 13.3)

4.1 Acid-Base Disturbances
  4.1.1 Metabolic
    4.1.1.1 Acidosis
    4.1.1.2 Alkalosis
  4.1.2 Mixed acid-base disorders
  4.1.3 Respiratory
    4.1.3.1 Acidosis
    4.1.3.2 Alkalosis

4.2 Adrenal Disease
  4.2.1 Hyperadrenalism (Cushing's syndrome)
  4.2.2 Hypoadrenalism (Addison's disease)

4.3 Fluid and Electrolyte Disturbances
  4.3.1 Calcium
  4.3.2 Chloride
  4.3.3 Magnesium
4.3.4 Phosphorus
4.3.5 Potassium
4.3.6 Sodium
4.3.7 Water
4.3.8 syndrome of inappropriate antidiuretic hormone

4.4 Glucose Metabolism
4.4.1 Diabetes mellitus
   4.4.1.1 Diabetic ketoacidosis
   4.4.1.2 Hyperosmolar coma
4.4.2 Hypoglycemic syndromes

4.5 Nutritional Disorders (SEE 13.8.2)
4.5.1 Wernicke-Korsakoff syndrome
4.5.2 Vitamin deficiency
4.5.3 Vitamin excess

4.6 Parathyroid Disease

4.7 Pheochromocytoma

4.8 Pituitary Disorders
   4.8.1 Panhypopituitarism
   4.8.2 Growth hormone abnormalities
   4.8.3 Tumors

4.9 Thyroid Disorders
   4.9.1 Hyperthyroidism/thyroid storm
   4.9.2 Hypothyroidism/myxedema (SEE 13.3.2.2)
   4.9.3 Thyroiditis

4.10 Endocrine Manifestations of Neoplasia
5.0 ENVIRONMENTAL DISORDERS

5.1 Diving Emergencies/Dysbarism
   5.1.1 Acute gas embolism
   5.1.2 Decompression sickness

5.2 Submersion Incidents
   5.2.1 Near drowning
   5.2.2 Cold water immersion

5.3 Electrical Injury (SEE 18.4.17.4.2)
   5.3.1 Lightning injury
   5.3.2 AC/DC current
   5.3.3 High voltage/low voltage

5.4 High-Altitude Illness
   5.4.1 Acute mountain sickness
   5.4.2 High-altitude cerebral edema
   5.4.3 High-altitude pulmonary edema

5.5 Radiation Injury

5.6 Poisonous Plants (SEE 17.2.34)

5.7 Smoke Inhalation (SEE 17.2.26)

5.8 Temperature-Related Illness
   5.8.1 Heat
   5.8.2 Cold
5.8.2.1 Hypothermia
5.8.2.2 Frostbite

5.9 Bites and Stings (SEE 18.4.17.6)
5.9.1 Arthropods
   5.9.1.1 Insects
   5.9.1.2 Spiders
   5.9.1.3 Scorpions
5.9.2 Mammals
5.9.3 Marine organisms
5.9.4 Reptiles

6.0 HEAD, EAR, EYE, NOSE, THROAT DISORDERS (SEE 13.7)

6.1 Ear
   6.1.1 Cellulitis/abscess of external ear
   6.1.2 Foreign body
   6.1.3 Labyrinthitis
   6.1.4 Malignant otitis externa
   6.1.5 Mastoiditis
   6.1.6 Meniere's disease
   6.1.7 Otitis externa
   6.1.8 Otitis media (SEE 13.7.6)
   6.1.9 Tympanic membrane perforation

6.2 Nose
   6.2.1 Epistaxis anterior
   6.2.2 Epistaxis posterior
   6.2.3 Nasal foreign body (SEE 13.7.2)
   6.2.4 Rhinitis
6.2.5 Sinusitis (SEE 13.7.9)
   6.2.5.1 Acute
   6.2.5.2 Chronic

6.3 Oropharynx/Throat
   6.3.1 Foreign body
   6.3.2 Gingivitis (SEE 13.7.10)
   6.3.3 Larynx/trachea
      6.3.3.1 Acute diphtheric laryngitis
      6.3.3.2 Acute non-diphtheric infection
         6.3.3.2.1 Bacterial tracheitis
         6.3.3.2.2 Epiglottitis
         6.3.3.2.3 Laryngitis
   6.3.4 Ludwig’s angina
   6.3.5 Oral candidiasis
   6.3.6 Pericoronitis
   6.3.7 Periodontal abscess
   6.3.8 Tonsillitis/peritonsillar abscess (SEE 13.7.8)
   6.3.9 Pharyngitis (SEE 13.7.7 and 16.1)
   6.3.10 Retropharyngeal abscess (SEE 13.7.15)
   6.3.11 Sialoadenitis
   6.3.12 Sialolithiasis
   6.3.13 Stomatitis
   6.3.14 Temporomandibular joint disorders
   6.3.15 Uvulitis

6.4 Eye (SEE 18.4.6)
   6.4.1 External eye
      6.4.1.1 Blepharitis
      6.4.1.2 Chalazion/hordeolum
6.4.1.3 Conjunctivitis
6.4.1.4 Corneal abrasions
6.4.1.5 Dacryocystitis/dacryoadenitis
6.4.1.6 Foreign body
6.4.2 Anterior pole
  6.4.2.1 Cataract
  6.4.2.2 Glaucoma
  6.4.2.3 Hyphema/hypopyon
  6.4.2.4 Iritis.
6.4.3 Posterior pole
  6.4.3.1 Choroiditis
  6.4.3.2 Optic neuritis
  6.4.3.3 Papilledema
  6.4.3.4 Retinal detachment
  6.4.3.5 Vascular occlusion
    6.4.3.5.1 Central retinal artery
    6.4.3.5.2 Central retinal vein
  6.4.3.6 Vitreous hemorrhage
  6.4.3.7 Retinal manifestations of systemic diseases
6.4.4 Orbit
  6.4.4.1 Panophthalmitis
  6.4.4.2 Periorbital/preseptal orbital cellulitis (SEE 13.12.1.1.1 and 13.12.1.1.2)

6.5 Cavernous Sinus Thrombosis

7.0 HEMATOLOGIC DISORDERS (SEE 13.4)

7.1 Hemostatic Disorders (SEE 13.4.3)
  7.1.1 Clotting factor disorders
    7.1.1.1 Hemophilias
7.1.1.2 Acquired

7.1.2 Disseminated intravascular coagulation

7.1.3 Platelet disorders
  7.1.3.1 Immune thrombocytopenic purpura
  7.1.3.2 Thrombotic thrombocytopenic purpura
  7.1.3.3 Drug inactivation of platelets

7.1.4 Von Willebrand’s disease

7.2 Lymphomas (SEE 13.4.5)

7.3 Pancytopenia

7.4 Red Blood Cell Disorders
  7.4.1 Anemia (SEE 13.4.1)
    7.4.1.1 Aplastic
    7.4.1.2 Hemolytic
      7.4.1.2.1 Glucose-6-phosphate dehydrogenase deficiency
      7.4.1.2.2 Hemolytic uremic syndrome
    7.4.1.3 Hypochromic/microcytic
    7.4.1.4 Megaloblastic
    7.4.1.5 Normochromic normocytic
    7.4.1.6 Hemoglobinopathies (SEE 13.4.2)
      7.4.1.6.1 Sickle cell disease/trait
      7.4.1.6.2 Sickle C disease
      7.4.1.6.3 Thalassemia

  7.4.2 Polycythemia

7.5 Transfusions
  7.5.1 Autotransfusion
  7.5.2 Complications
    7.5.2.1 Febrile
7.5.2.2 Hemolytic
7.5.2.3 IgA-mediated
7.5.2.4 Disease transmission risk
    7.5.2.4.1 HIV
    7.5.2.4.2 Hepatitis
7.5.2.5 Of massive transfusions
7.5.3 Component therapy
7.5.4 Synthetic blood replacement
7.5.5 Indications for transfusion

7.6 White Blood Cell Disorders
7.6.1 Leukemia (SEE 13.4.4)
7.6.2 Leukemoid reaction
7.6.3 Leukopenia
7.6.4 Multiple myeloma

8.0 IMMUNE SYSTEM DISORDERS

8.1 Humoral Immunity

8.2 Cellular Immunity

8.3 Chemical Mediators
8.4 Complement

8.5 Autoimmune Diseases
    8.5.1 Acute rheumatic fever
    8.5.2 Collagen vascular diseases
        8.5.2.1 Dermatomyositis
        8.5.2.2 Polymyositis
8.5.2.3 Reiter’s
8.5.2.4 Rheumatoid arthritis
8.5.2.5 Sarcoidosis
8.5.2.6 Systemic lupus erythematosus
8.5.2.7 Scleroderma
8.5.3 Nephritis
8.5.4 Thyroiditis
8.5.5 Vasculitis

8.6 Immune Deficiency Syndromes
8.6.1 HIV
8.6.2 Immunosuppression
8.6.3 Drug-related
8.6.4 Radiation-induced
8.6.5 Malnutrition

8.7 Transplant-Related Problems
8.7.1 Rejection

8.8 Hypersensitivity
8.8.1 Anaphylactic/anaphylactoid reactions
8.8.2 Angioedema
8.8.3 Allergic rhinitis
8.8.4 Drug allergies
8.8.5 Serum sickness

9.0 SYSTEMIC INFECTIOUS DISORDERS

9.1 Bacterial
9.1.1 Botulism
9.1.2 Gonococcal disease
9.1.3 Bacteremia/sepsis
9.1.4 Mycobacterial infections
  9.1.4.1 Tuberculosis
  9.1.4.2 Atypical mycobacteria
9.1.5 Meningococcemia
9.1.6 Plague
9.1.7 Tetanus
9.1.8 Toxic shock syndrome
9.1.9 Spirochetes
  9.1.9.1 Lyme disease
  9.1.9.2 Syphilis
9.1.10 Chlamydia
9.1.11 Mycoplasma (SEE 16.10.3)

9.2 Fungal

9.3 Protozoan Parasites
  9.3.1 Malaria
  9.3.2 Toxoplasmosis

9.4 Rickettsial
  9.4.1 Rocky Mountain spotted fever
  9.4.2 Ehrlichiosis

9.5 Viral
  9.5.1 HIV
  9.5.2 Infectious mononucleosis
  9.5.3 Influenza
  9.5.4 Mumps
  9.5.5 Polio
9.5.6 Rabies
  9.5.6.1 Disease
  9.5.6.2 Prophylaxis
9.5.7 Rubella (SEE 13.12.4.4)
9.5.8 Roseola (SEE 13.12.4.3)
9.5.9 Varicella/zoster (SEE 13.12.4.5)
9.5.10 Herpes simplex

9.6 Travel-Related (SEE 9.7.2 and 13.15)

9.7 Prevention
  9.7.1 Prophylaxis
  9.7.2 Immunizations (SEE 13.15 and 20.4.20)

10.0 MUSCULOSKELETAL DISORDERS (NONTRAUMATIC)

10.1 Bony Abnormalities
  10.1.1 Aseptic necrosis of hip
  10.1.2 Osteogenesis imperfecta
  10.1.3 Osteomyelitis
  10.1.4 Tumors
  10.1.5 Bone cysts
  10.1.6 Osteoporosis
  10.1.7 Osteomalacia
  10.1.8 Bone spurs
  10.1.9 Paget’s disease

10.2 Joint Abnormalities
  10.2.1 Arthritis
    10.2.1.1 Septic
10.2.1.2 Gout/pseudogout
10.2.1.3 Collagen vascular
10.2.1.4 Degenerative
10.2.2 Osteochondritis dessecans

10.3 Disorders of the Spine
10.3.1 Ankylosing spondylitis
10.3.2 Spondylolysis/spondylolisthesis
10.3.3 Disk disorders
   10.3.3.1 Herniated nucleus pulposus
   10.3.3.2 Discitis
10.3.4 Low back syndromes (OM considerations)
   10.3.4.1 Acute sprain
   10.3.4.2 Sacroiliitis
   10.3.4.3 Sciatica
   10.3.4.4 Tumors
   10.3.4.5 Cauda equina syndrome
10.3.5 Spinal stenosis

10.4 Overuse Syndromes
10.4.1 Tendonitis
10.4.2 Bursitis
10.4.3 Fibrositis
10.4.4 Muscle strains
10.4.5 Carpal tunnel syndrome

10.5 Muscle Abnormalities
10.5.1 Muscular dystrophies
10.5.2 Rhabdomyolysis
10.5.3 Myositis
10.5.4 Myositis ossificans
10.6 Soft Tissue Infections
   10.6.1 Necrotizing fasciitis
   10.6.2 Gangrene
   10.6.3 Paronychia
   10.6.4 Felon
   10.6.5 Tenosynovitis

11.0 NERVOUS SYSTEM DISORDERS

11.1 Stroke
   11.1.1 Subarachnoid hemorrhage
      11.1.1.1 Cerebral aneurysm
      11.1.1.2 Arteriovenous malformation
   11.1.2 Intracerebral hemorrhage
   11.1.3 Ischemic stroke
      11.1.3.1 Embolic
      11.1.3.2 Thrombotic
   11.1.4 Transient ischemic attack

11.2 Cranial Nerve Disorders
   11.2.1 Bell’s palsy
   11.2.2 Trigeminal neuralgia
   11.2.3 Other cranial nerves

11.3 Demyelinating Disorders
   11.3.1 Multiple sclerosis

11.4 Infections/Inflammatory Disorders
   11.4.1 Abscess
      11.4.1.1 Brain
11.4.1.2 Epidural
11.4.2 Encephalitis (SEE 13.5.2)
11.4.3 Meningitis (SEE 13.5.2)
11.4.4 Myelitis
11.4.5 Neuritis

11.5 Neuromuscular Disorders
11.5.1 Landry’s/Guillain-Barré syndromes
11.5.2 Myasthenia gravis
11.5.3 Amyotrophic lateral sclerosis

11.6 Peripheral Neuropathy
11.6.1 Compression syndromes
11.6.2 Toxic and other neuropathies

11.7 Spinal Cord Compression

11.8 Hydrocephalus (SEE 13.5.4)
11.8.1 Acute
11.8.2 Normal pressure
11.8.3 CNS shunt malfunction

11.9 Seizure Disorders
11.9.1 Status epilepticus
11.9.2 Focal seizures
11.9.3 Generalized seizures
11.9.4 Pseudo seizures

11.10 Headache

11.11 Pseudotumor Cerebri/Benign Intracranial Hypertension
11.12 Tumors
11.13 Movement Disorders

12.0 OBSTETRICS AND DISORDERS OF PREGNANCY

12.1 Contraception
12.2 Pregnancy, Uncomplicated

12.3 Pregnancy, Complicated
   12.3.1 Ectopic
   12.3.2 Hyperemesis gravidarum
   12.3.3 Abortion
      12.3.3.1 Threatened
      12.3.3.2 Inevitable
      12.3.3.3 Incomplete
      12.3.3.4 Complete
      12.3.3.5 Septic
      12.3.3.6 Missed
   12.3.4 Abruptio placentae
   12.3.5 Placenta previa
   12.3.6 Toxemia/pregnancy-induced hypertension (SEE 2.8.1)
      12.3.6.1 Preeclampsia
      12.3.6.2 Eclampsia
   12.3.7 Rh incompatibility
   12.3.8 Hydatidiform mole
   12.3.9 Underlying illness

12.4 Labor, Uncomplicated

12.5 Labor, Complicated
12.5.1 Premature rupture of membranes
12.5.2 Preterm labor
12.5.3 Failure to progress
12.5.4 Fetal distress
12.5.5 Ruptured uterus

12.6 Delivery, Uncomplicated
12.6.1 Presentation
12.6.2 Position
12.6.3 Lie
12.6.4 Episiotomy

12.7 Delivery, Complicated
12.7.1 Presentation
12.7.2 Dystocia
12.7.3 Prolapsed cord
12.7.4 Retained placenta (SEE 12.8.1)
12.7.5 Uterine inversion
12.7.6 Multiple births
12.7.7 Stillbirth
12.7.8 Emergency cesarean section (SEE 18.5.2.3 and 23.4.2.3)

12.8 Postpartum Complications
12.8.1 Retained products of conception (SEE 12.7.4)
12.8.2 Hemorrhage
12.8.3 Endometritis
12.8.4 Mastitis

13.0 PEDIATRIC DISORDERS
13.1 Abdominal/Gastrointestinal (SEE 1.0)

13.1.1 Anorectal fissures (SEE 1.8.1.2)

13.1.2 Appendicitis

13.1.3 Colic/formula intolerance

13.1.4 Congenital lesions

13.1.4.1 Tracheoesophageal fistula

13.1.4.2 Esophageal atresia

13.1.4.3 Achalasia (SEE 1.1.1.2)

13.1.4.4 Pyloric stenosis

13.1.4.5 Biliary atresia

13.1.4.6 Meckel’s diverticulum (SEE 1.6.2.3)

13.1.4.7 Aganglionic megacolon/Hirschsprung’s (SEE 1.7.1.3)

13.1.5 Foreign bodies (SEE 1.1.2.6)

13.1.6 Gastroenteritis/enterocolitis

13.1.6.1 Viral

13.1.6.2 Bacterial

13.1.6.3 Parasitic

13.1.6.4 Allergic

13.1.6.5 Inflammatory bowel disease

13.1.6.6 Toxin-induced

13.1.7 Gastroesophageal reflux

13.1.8 Gastrointestinal bleeding (SEE 1.5.3.3)

13.1.8.1 Upper

13.1.8.2 Lower

13.1.9 Hernias (SEE 1.9.1)

13.1.9.1 Inguinal

13.1.9.2 Umbilical

13.1.10 Intussusception

13.1.11 Malrotation of the bowel with volvulus

13.1.12 Tumors

13.1.12.1 Neuroblastoma
13.1.12.2 Wilms tumor

13.2 Cardiovascular
13.2.1 Dysrhythmias (SEE 2.4.1)
   13.2.1.1 Fast
   13.2.1.2 Irregular
   13.2.1.3 Slow

13.2.2 Congenital heart disease
   13.2.2.1 Left to right shunts
   13.2.2.2 Right to left shunts
   13.2.2.3 Obstructive lesions

13.2.3 Acquired heart disease
   13.2.3.1 Pericarditis (SEE 2.3.1)
   13.2.3.2 Infective endocarditis (SEE 2.2.6)
   13.2.3.3 Myocarditis (SEE 2.2.6)
   13.2.3.4 Rheumatic fever

13.3 Endocrine/Metabolic (SEE 2.10.2 and 4.0)
13.3.1 Glucose metabolism
   13.3.1.1 Diabetes mellitus
   13.3.1.2 Diabetic ketoacidosis
   13.3.1.3 Hypoglycemia

13.3.2 Congenital abnormalities (SEE 2.6)
   13.3.2.1 Adrenal hyperplasia
   13.3.2.2 Hypothyroidism (SEE 4.9.2)

13.3.3 Inborn errors of metabolism

13.4 Hematologic (SEE 7.0)
13.4.1 Anemias (SEE 7.4.1)
13.4.2 Hemoglobinopathies (SEE 7.4.1.6)
13.4.3 Hemostatic disorders (SEE 7.1)
13.4.4 Leukemias (SEE 7.6.1)
13.4.5 Lymphomas (SEE 7.2)

13.5 Neurologic
13.5.1 Encephalopathies
   13.5.1.1 Reye's syndrome
13.5.2 Meningitis/encephalitis (SEE 11.4.3 and 11.4.2)
   13.5.2.1 Aseptic/viral
   13.5.2.2 Bacterial
13.5.3 Seizures (SEE 13.16.4)
   13.5.3.1 Febrile
   13.5.3.2 Nonfebrile
13.5.4 Hydrocephalus/ventricular shunts (SEE 11.8)
13.5.5 Neuromuscular disorders
13.5.6 Tumors

13.6 Orthopedic (SEE 18.4.12.2.2.1 and 18.6.7)
13.6.1 Legg-Calvé-Perthes disease
13.6.2 Septic joint
13.6.3 Osteomyelitis
13.6.4 Slipped capital femoral epiphysis
13.6.5 Transient synovitis
13.6.6 Tumors
   13.6.6.1 Ewing's sarcoma
   13.6.6.2 Osteogenic sarcoma
13.6.7 Osgood-Schlatter disease
13.6.8 Congenital dislocation of the hip

13.7 Head, Ear, Eye, Nose, Throat (SEE 6.0 and 18.6.2)
13.7.1 Epiglottitis.
13.7.2 Foreign bodies (SEE 6.2.3)  
13.7.3 Laryngotracheobronchitis (croup)  
13.7.4 Nasopharyngitis (upper respiratory infection)  
13.7.5 Otitis externa  
13.7.6 Otitis media (SEE 6.1.8)  
13.7.7 Pharyngitis (SEE 6.3.9)  
13.7.8 Tonsillitis/peritonsillar abscess (SEE 6.3.8)  
13.7.9 Sinusitis (SEE 6.2.5)  
13.7.10 Gingivostomatitis (SEE 6.3.2)  
13.7.11 Torticollis  
13.7.12 Tracheitis/bacterial  
13.7.13 Tumor  
  13.7.13.1 Retinoblastoma  
13.7.14 Congenital cysts  
13.7.15 Retropharyngeal abscess (SEE 6.3.10)  
13.7.16 Cervical adenitis  

13.8 Psychiatric  
13.8.1 Abuse (SEE 14.2 and 18.6.1.4)  
13.8.2 Eating disorders (SEE 4.5)  
13.8.3 Depression/suicide (SEE 14.2.2 and 14.9.1)  
13.8.4 Acute psychosis  
13.8.5 Behavioral disorders (SEE 14.0)  

13.9 Respiratory (SEE 16.1)  
13.9.1 Bronchiolitis  
13.9.2 Bronchopulmonary dysplasia  
13.9.3 Cystic fibrosis (SEE 16.6.4)  
13.9.4 Foreign bodies  
13.9.5 Asthma /reactive airway disease (SEE 16.6.1)  
13.9.6 Pneumonia
13.9.6.1 Chlamydial
13.9.6.2 Mycoplasmal
13.9.6.3 Bacterial
13.9.6.4 Viral
   13.9.6.4.1 Parainfluenza
   13.9.6.4.2 Respiratory syncytial
13.9.7 Pertussis

13.10 Bacteremia and Sepsis (SEE 13.16.3)

13.11 Rheumatologic
   13.11.1 Juvenile rheumatoid arthritis
   13.11.2 Kawasaki syndrome
   13.11.3 Schönlein-Henoch purpura

13.12 Skin and Soft Tissue Infections
   13.12.1 Bacterial
      13.12.1.1 Cellulitis
         13.12.1.1.1 Orbital (SEE 6.4.4.2)
         13.12.1.1.2 Periorbital/preseptal (SEE 6.4.4.2)
      13.12.1.2 Impetigo
      13.12.1.3 Staphylococcal scalded skin syndrome
   13.12.2 Infestations
      13.12.2.1 Pediculosis
      13.12.2.2 Scabies
   13.12.3 Fungal
      13.12.3.1 Candida
      13.12.3.2 Tinea/kerion
   13.12.4 Viral exanthema
      13.12.4.1 Erythema infectiosum
      13.12.4.2 Measles
13.12.4.3 Roseola (SEE 9.5.8)
13.12.4.4 Rubella (SEE 9.5.7)
13.12.4.5 Varicella/zoster (SEE 9.5.9)

13.13 Genitourinary
   13.13.1 Congenital kidney abnormalities
      13.13.1.1 Polycystic kidney disease
      13.13.1.2 Horseshoe kidney
      13.13.1.3 Congenital absence of kidney
   13.13.2 Penile
      13.13.2.1 Balanitis
      13.13.2.2 Phimosis/paraphimosis (SEE 19.2.1.3)
      13.13.2.3 Priapism
   13.13.3 Testicular
      13.13.3.1 Torsion
      13.13.3.2 Undescended testis
   13.13.4 Urinary tract infections
   13.13.5 Vaginal foreign bodies
   13.13.6 Renal failure (SEE 15.4)

13.14 Sudden Infant Death Syndrome/Acute Life-Threatening Event

13.15 Immunizations (SEE 9.7.2 and 20.4.20)

13.16 Neonatal
   13.16.1 Assessment
   13.16.2 Jaundice
   13.16.3 Sepsis (SEE 13.10)
   13.16.4 Seizures (SEE 13.5.3)

13.17 Pediatric/Neonatal Resuscitation
13.17.1 Fluid and electrolyte management (SEE 18.6.1.3)

14.0 PSYCHOBEHAVIORAL DISORDERS (SEE 13.8.5)

14.1 Thought Disorders
   14.1.1 Schizophrenia
   14.1.2 Delusional paranoia

14.2 Mood Disorders (SEE 13.8.1)
   14.2.1 Bipolar disorder
   14.2.2 Depression (SEE 13.8.3)

14.3 Anxiety Disorders
   14.3.1 Posttraumatic stress
   14.3.2 Panic
   14.3.3 Phobia
   14.3.4 Obsessive-compulsive
   14.3.5 Catatonic

14.4 Somatoform Disorders
   14.4.1 Hysterical conversion
   14.4.2 Hypochondriasis

14.5 Factitious Disorders
   14.5.1 Munchausen syndrome
   14.5.2 Drug-seeking behavior

14.6 Addictive Behavior
   14.6.1 Substance abuse
   14.6.2 Eating disorders
       14.6.2.1 Anorexia nervosa
14.6.2.2 Bulimia

14.7 Personality Disorders
14.7.1 Antisocial
14.7.2 Histrionic
14.7.3 Obsessive/compulsive
14.7.4 Passive/aggressive
14.7.5 Borderline personality

14.8 Organic Brain Syndromes
14.8.1 Delirium
14.8.2 Dementia
  14.8.2.1 Alzheimer's disease
  14.8.2.2 Multi-infarct
14.8.3 Amnesia
  14.8.3.1 Traumatic
  14.8.3.2 Transient global
14.8.4 Intoxication and withdrawal
  14.8.4.1 Alcohol
  14.8.4.2 Sympathomimetics and cocaine
  14.8.4.3 Hallucinogens
  14.8.4.4 Phencyclidine
  14.8.4.5 Opioids
  14.8.4.6 Sedatives/hypnotics/anxiolytics

14.9 Risk Assessment
14.9.1 Suicidal risk or self abuse (SEE 13.8.3)
14.9.2 Risk of violence against others (i.e., abuse behavior) (SEE 14.12.1)

14.10 Involuntary Competency Assessment/Commitment (SEE 20.7.2.1)
14.11 Treatment Modalities
  14.11.1 Major tranquilizers
  14.11.2 Sedatives/hypnotics
  14.11.3 Physical restraints
  14.11.4 Management of violence (SEE 20.4.21)
  14.11.5 Community resource utilization

14.12 Patterns of Violence/Abuse/Neglect
  14.12.1 Family violence (SEE 13.8.1, 14.9.2 and 18.1.11.2.1.3)
  14.12.2 Sexual assault (SEE 19.3).

15.0 RENAL DISORDERS

15.1 Structural Disorders
  15.1.1 Renal calculi
  15.1.2 Obstructive uropathy
  15.1.3 Renal obstruction

15.2 Infection
  15.2.1 Pyelonephritis
  15.2.2 Perinephric abscess

15.3 Glomerular Disorders
  15.3.1 Glomerulonephritis
  15.3.2 Nephrotic syndrome

15.4 Acute and Chronic Renal Failure (SEE 13.13.6)

15.5 Interstitial Tubular Necrosis
15.6 Interstitial Nephritis

15.7 Tumors

15.8 Complications of Dialysis

16.0 THORACIC-RESPIRATORY DISORDERS

16.1 Acute Upper Airway Obstruction (SEE 6.3.9, 13.9)
   16.1.1 Tracheostomy/complications

16.2 Breast Disorders
   16.2.1 Fibrocystic disease
   16.2.2 Tumor
   16.2.3 Infections

16.3 Disorders of Pleura, Mediastinum, and Chest Wall
   16.3.1 Costochondritis
   16.3.2 Mediastinal masses
   16.3.3 Mediastinitis
   16.3.4 Pleural effusions/empyema
   16.3.5 Pleurisy
   16.3.6 Pneumomediastinum
   16.3.7 Pneumothoraces (SEE 18.4.10.12)
      16.3.7.1 Spontaneous
      16.3.7.2 Iatrogenic
      16.3.7.3 Tension

16.4 Hyperventilation Syndrome
16.5 Non-cardiogenic Pulmonary Edema (Adult Respiratory Distress Syndrome)

16.6 Obstructive/Restrictive Lung Disease
   16.6.1 Asthma (SEE 13.9.5)
   16.6.2 Bronchitis
   16.6.3 Chronic obstructive pulmonary disease
   16.6.4 Cystic fibrosis (SEE 13.9.3)
   16.6.5 Interstitial fibrosis
   16.6.6 Environmental/industrial exposure

16.7 Physical and Chemical Irritants/Insults
   16.7.1 Chemical agents
   16.7.2 Foreign bodies
   16.7.3 Aspiration of gastric contents

16.8 Primary Pulmonary Hypertension

16.9 Pulmonary Embolism/Infarct
   16.9.1 Venous thromboembolism
   16.9.2 Fat
   16.9.3 Septic
   16.9.4 Amniotic fluid

16.10 Pulmonary Infections
   16.10.1 Bacterial
   16.10.2 Fungal
   16.10.3 Mycoplasma (SEE 9.1.11)
   16.10.4 Lung abscess
   16.10.5 Bronchiectasis
   16.10.6 Opportunistic
   16.10.7 Septic embol
16.10.8 Tuberculosis
16.10.9 Viral

16.11 Thoracic Outlet Syndrome (OM considerations)

16.12 Pulmonary Tumors

16.13 Sarcoidosis

16.14 Sleep Apnea Syndromes.

17.0 TOXICOLOGIC DISORDERS

17.1 Principles
   17.1.1 Toxicologic information
   17.1.2 Toxicologic diagnostic modalities
   17.1.3 Toxidromes
   17.1.4 Treatment modalities
      17.1.4.1 Antidotes
      17.1.4.2 Skin decontamination
      17.1.4.3 Gastric decontamination
         17.1.4.3.1 Emetics
         17.1.4.3.2 Lavage
      17.1.4.4 Enhanced elimination
         17.1.4.4.1 Activated charcoal
         17.1.4.4.2 Cathartics/whole bowel irrigation
         17.1.4.4.3 Diuresis
         17.1.4.4.4 Dialysis/hemoperfusion
         17.1.4.4.5 Hyperbaric oxygen
   17.1.5 Withdrawal syndromes
17.2 Drug and Chemical Classes

17.2.1 Acetaminophen

17.2.2 Alcohols
   17.2.2.1 Ethanol
   17.2.2.2 Ethylene glycol
   17.2.2.3 Isopropyl alcohol
   17.2.2.4 Methanol

17.2.3 Analgesics/anesthetics (SEE 22.2.1)

17.2.4 Anticholinergics/cholinergics

17.2.5 Anticoagulants (SEE 22.2.3)

17.2.6 Anticonvulsants (SEE 22.2.4)

17.2.7 Antidepressants
   17.2.7.1 Lithium
   17.2.7.2 Monoamine oxidase inhibitors
   17.2.7.3 Cyclic antidepressants

17.2.8 Antiparkinsonian drugs

17.2.9 Antihistamines (SEE 22.2.5)

17.2.10 Antipsychotics (SEE 22.2.6)

17.2.11 Bronchodilators (SEE 22.2.7)

17.2.12 Cannabis

17.2.13 Carbon monoxide (SEE 5.7)

17.2.14 Cardiovascular drugs (SEE 22.2.8)
   17.2.14.1 Antiarrhythmics
   17.2.14.2 Antihypertensives
   17.2.14.3 Digitalis preparations
   17.2.14.4 Calcium channel blockers
   17.2.14.5 $-Blockers

17.2.15 Caustic agents

17.2.16 Cocaine

17.2.17 Cyanides, hydrogen sulfide
17.2.18 Food additives
17.2.19 Hallucinogens
17.2.20 Hazardous material spills (SEE 21.4.3)
17.2.21 Heavy metals and chelation
17.2.22 Household/industrial poisons
17.2.23 Hormones/steroids (SEE 22.2.9)
17.2.24 Hydrocarbons/halogenated hydrocarbons
17.2.25 Hypoglycemics/insulin (SEE 22.2.10)
17.2.26 Inhaled toxins (SEE 5.7)
17.2.27 Iron
17.2.28 Isoniazid
17.2.29 Local anesthetics (SEE 22.2.12)
17.2.30 Locally acting drugs (SEE 22.2.13)
   17.2.30.1 Antacids
   17.2.30.2 Antiseptics
   17.2.30.3 Cathartics
   17.2.30.4 Laxatives
17.2.31 Irritant gases
17.2.32 Marine toxins
   17.2.32.1 Ciguatera
   17.2.32.2 Scombroid
17.2.33 Methemoglobinemia
17.2.34 Mushrooms/poisonous plants (SEE 5.6)
17.2.35 Nitrogen compounds
17.2.36 Nonsteroidal anti-inflammatories
17.2.37 Organophosphates/carbamate
17.2.38 Opiates/opioids (SEE 22.2.16)
17.2.39 Salicylates
17.2.40 Sedatives/hypnotics
   17.2.40.1 Barbiturates
   17.2.40.2 Benzodiazepines
17.2.40.3 Chloral hydrate
17.2.41 Stimulants/sympathomimetics
17.2.42 Strychnine

18.0 TRAUMATIC DISORDERS (SEE 21.4.3.3)

18.1 Principles of Care
  18.1.1 Prehospital trauma care
  18.1.2 Triage
  18.1.3 Resuscitation and stabilization
    18.1.3.1 Hemorrhagic shock
    18.1.3.2 Neurogenic shock
  18.1.4 Role of the emergency physician
  18.1.5 Team response
  18.1.6 Reassessment and monitoring
  18.1.7 Diagnosis
  18.1.8 Treatment
  18.1.9 Consultation
  18.1.10 Disposition
  18.1.11 Injury prevention and control
    18.1.11.1 Epidemiology overview
    18.1.11.2 Cause of injury
      18.1.11.2.1 Intentional injury
        18.1.11.2.1.1 Homicide
        18.1.11.2.1.2 Suicide
        18.1.11.2.1.3 Family violence: elder abuse, child abuse, domestic violence (SEE 14.12.1 and 18.6.1.4)
      18.1.11.2.2 Unintentional injury
        18.1.11.2.2.1 Motor vehicle crashes
        18.1.11.2.2.2 Falls
18.1.11.2.2.3 Drownings
18.1.11.2.2.4 Poisonings
18.1.11.2.2.5 Burns and fire-related injuries
18.1.11.2.2.6 Occupational injuries

18.2 Radiologic Evaluation
18.2.1 Plain radiography
18.2.2 Contrast radiography
18.2.3 Computed tomography scan
18.2.4 Angiography
18.2.5 Magnetic resonance imaging
18.2.6 Ultrasonography (SEE 23.3.7)

18.3 Mechanism of Injury
18.3.1 Blunt
18.3.2 Penetrating
18.3.2.1 Gunshot wounds
18.3.2.1.1 Ballistics
18.3.2.2 Stab wounds
18.3.2.3 Clinical forensics
18.3.3 Kinematics

18.4 Diagnosis and Management by Anatomic Areas
18.4.1 Head trauma
18.4.1.1 Scalp lacerations/avulsions
18.4.1.2 Skull fractures
18.4.1.3 Brain concussions, contusions
18.4.1.4 Intracranial hematomas
18.4.1.5 Brainstem injuries
18.4.1.6 Penetrating head trauma
18.4.1.7 Cerebrospinal fluid leaks (otorrhea, rhinorrhea)
18.4.2 Spinal cord and peripheral nervous system trauma
   18.4.2.1 Complete spinal cord injuries
   18.4.2.2 Incomplete cord injuries
   18.4.2.3 Cauda equina injuries
   18.4.2.4 Nerve root injuries
   18.4.2.5 Brachial and lumbosacral plexus injuries
   18.4.2.6 Peripheral nerve injuries

18.4.3 Injuries of the spine
   18.4.3.1 Fractures
      18.4.3.1.1 Cervical
      18.4.3.1.2 Thoracic
      18.4.3.1.3 Lumbar
      18.4.3.1.4 Sacral/coccygeal
   18.4.3.2 Dislocations/subluxations
      18.4.3.2.1 Unilateral facet
      18.4.3.2.2 Bilateral facet
      18.4.3.2.3 Ligamentous injuries

18.4.4 Facial fractures
   18.4.4.1 Frontal sinus
   18.4.4.2 Mandibular
   18.4.4.3 Maxillary
   18.4.4.4 Nasal
   18.4.4.5 Orbital
   18.4.4.6 Dental fractures and avulsions
   18.4.4.7 Zygomatic

18.4.5 Soft tissue facial injuries
   18.4.5.1 Complex lacerations
   18.4.5.2 Avulsions
   18.4.5.3 Severe abrasions
   18.4.5.4 Parotid gland/duct injuries
   18.4.5.5 Nerve injuries
18.4.6 Ophthalmologic trauma (SEE 6.4)
   18.4.6.1 Corneal abrasions/lacerations
   18.4.6.2 Foreign bodies
   18.4.6.3 Iritis
   18.4.6.4 Hyphema
   18.4.6.5 Lens dislocation
   18.4.6.6 Retinal detachment
   18.4.6.7 Penetrating globe injuries
   18.4.6.8 Eyelid lacerations
   18.4.6.9 Lacrimal duct injuries
   18.4.6.10 Corneal burns
      18.4.6.10.1 Acid
      18.4.6.10.2 Alkali
      18.4.6.10.3 Ultraviolet

18.4.7 Otologic trauma
   18.4.7.1 Lacerations
   18.4.7.2 Avulsions
   18.4.7.3 Subperichondrial hematoma
   18.4.7.4 Tympanic membrane perforation

18.4.8 Neck trauma
   18.4.8.1 Vascular injuries
      18.4.8.1.1 Carotid artery
      18.4.8.1.2 Internal and external jugular veins
      18.4.8.1.3 Thoracic duct
   18.4.8.2 Penetrating neck trauma
      18.4.8.2.1 Anterior and posterior triangle injuries
      18.4.8.2.2 Anatomic zones (I, II, III) and injuries specific to them
      18.4.8.2.3 Mandatory versus selective exploration

18.4.9 Laryngotracheal injuries
   18.4.9.1 Lacerations
18.4.9.2 Crush injuries
18.4.9.3 Vocal cord avulsions/hematomas
18.4.9.4 Fractured larynx
18.4.9.5 Tracheal transection
18.4.9.6 Compression with hematomas

18.4.10 Chest trauma
18.4.10.1 Penetrating chest trauma
18.4.10.2 Rib fractures
18.4.10.3 Sternal fractures
18.4.10.4 Flail chest
18.4.10.5 Clavicle fracture/dislocation
18.4.10.6 Aortic disruption
18.4.10.7 Myocardial contusion
18.4.10.8 Pulmonary contusion
18.4.10.9 Pericardial tamponade
18.4.10.10 Vascular injuries
18.4.10.11 Tracheobronchial tree injuries
18.4.10.12 Pneumothoraces (SEE 16.3.7)
   18.4.10.12.1 Simple
   18.4.10.12.2 Open
   18.4.10.12.3 Tension
18.4.10.13 Hemothorax

18.4.11 Abdominal trauma
18.4.11.1 Penetrating abdominal trauma
18.4.11.2 Abdominal wall contusion
18.4.11.3 Solid viscus injuries
18.4.11.4 Hollow viscus injuries
18.4.11.5 Vascular injuries
18.4.11.6 Diaphragmatic rupture
18.4.11.7 Evisceration
18.4.11.8 Mesenteric avulsion, hematoma
18.4.11.9 Bladder rupture, contusion
18.4.11.10 Renal injuries
   18.4.11.10.1 Contusions
   18.4.11.10.2 Lacerations
   18.4.11.10.3 Renal vascular injuries
18.4.11.11 Ureteral injuries
18.4.12 Upper extremity bony trauma
   18.4.12.1 Fractures (open and closed)
      18.4.12.1.1 Phalangeal
      18.4.12.1.2 Metacarpal
      18.4.12.1.3 Carpal
      18.4.12.1.4 Forearm
      18.4.12.1.5 Supracondylar
      18.4.12.1.6 Humeral shaft and head
      18.4.12.1.7 Scapula
   18.4.12.2 Dislocations/subluxations
      18.4.12.2.1 Shoulder
         18.4.12.2.1.1 Acromioclavicular
         18.4.12.2.1.2 Glenohumeral
      18.4.12.2.2 Elbow
         18.4.12.2.2.1 Radial head
         18.4.12.2.2.2 Posterior
      18.4.12.2.3 Wrist
         18.4.12.2.3.1 Lunate
         18.4.12.2.3.2 Perilunate
      18.4.12.2.4 Hand
         18.4.12.2.4.1 Metacarpophalangeal joint
         18.4.12.2.4.2 Interphalangeal joint
18.4.13 Lower extremity bony trauma
   18.4.13.1 Fractures (open and closed)
      18.4.13.1.1 Phalangeal
18.4.13.2.1 Phalangeal
18.4.13.2.2 Lisfranc
18.4.13.2.3 Ankle
18.4.13.2.4 Knee
18.4.13.2.5 Patellar
18.4.13.2.6 Hip

18.4.14 Soft tissue extremity injuries
18.4.14.1 Tendon injuries
18.4.14.1.1 Partial lacerations
18.4.14.1.2 Complete transections
18.4.14.1.3 Tendon ruptures
18.4.14.2 Periarticular injuries
18.4.14.2.1 First-, second-, and third-degree sprains
18.4.14.2.2 Injuries to bursa
18.4.14.2.3 Ligamentous lacerations
18.4.14.3 Injuries to joints
18.4.14.3.1 Penetrating injuries
18.4.14.3.2 Rupture of joint capsule
18.4.14.4 Compartment syndromes/crush injuries
18.4.14.5 Penetrating soft tissue injuries
18.4.14.6 High pressure injection injuries
18.4.14.7 Amputations/replantation
18.4.15 Pelvic fractures
18.4.15.1 Pubic rami
18.4.15.2 Straddle
18.4.15.3 Iliac crest
18.4.15.4 Malgaigne
18.4.16 Injuries of the genitalia
18.4.16.1 Female
18.4.16.1.1 Labial contusion/hematoma
18.4.16.1.2 Vaginal laceration
18.4.16.2 Male
18.4.16.2.1 Penis
18.4.16.2.1.1 Fracture
18.4.16.2.1.2 Avulsion/amputation
18.4.16.2.2 Penetrating injury
18.4.16.2.3 Urethral
18.4.16.2.4 Scrotal
18.4.16.2.5 Testicular
18.4.17 Cutaneous injuries
18.4.17.1 Principles of wound management (SEE 23.9.8)
18.4.17.2 Lacerations
18.4.17.3 Avulsions
18.4.17.4 Burns
18.4.17.4.1 Thermal
18.4.17.4.2 Electrical (SEE 5.3)
18.4.17.4.3 Chemical
18.4.17.5 Puncture wounds
18.4.17.6 Bite wounds (SEE 5.9)

18.5 Trauma in Pregnancy
18.5.1 Principles of care
18.5.2 Clinical assessment and management
  18.5.2.1 Anatomic/physiologic alterations in the pregnant woman
  18.5.2.2 Fetal monitoring
  18.5.2.3 Emergency department cesarean section (SEE 12.7.8 and 23.4.2.3)
18.5.3 Types of injuries
  18.5.3.1 Uterine rupture
  18.5.3.2 Placental abruption
  18.5.3.3 Preterm labor
  18.5.3.4 In utero injuries to the fetus
  18.5.3.5 Penetrating injuries to the uterus

18.6 Special Considerations for Pediatric Trauma Victim
18.6.1 Clinical assessment and management
  18.6.1.1 Anatomic/physiologic differences from adults
  18.6.1.2 Airway management
  18.6.1.3 Fluid resuscitation (SEE 13.17.1)
  18.6.1.4 Recognition of child abuse (SEE 13.8.1 and 18.1.11.2.1.3)
18.6.2 Head trauma (SEE 13.7)
18.6.3 Spinal injuries
  18.6.3.1 Spinal cord injury without radiologic abnormality (SCIWORA)
18.6.4 Chest trauma
18.6.5 Abdominal trauma
18.6.6 Burns
18.6.7 Fractures (SEE 13.6)
  18.6.7.1 Greensstick
  18.6.7.2 Torus
  18.6.7.3 Epiphyseal

19.0 UROGENITAL/GYNECOLOGIC DISORDERS

19.1 Genital Tract/Female
  19.1.1 Ovarian disorders
    19.1.1.1 Ovarian cyst
    19.1.1.2 Ovarian torsion
    19.1.1.3 Tumors
  19.1.2 Vagina and vulva
    19.1.2.1 Foreign bodies (SEE 13.13.5)
    19.1.2.2 Imperforate hymen
  19.1.3 Uterus
    19.1.3.1 Endometriosis
    19.1.3.2 Dysfunctional uterine bleeding
    19.1.3.3 Tumors
    19.1.3.4 Uterine prolapse
  19.1.4 Cervix
    19.1.4.1 Carcinoma
    19.1.4.2 Cysts
    19.1.4.3 Leukoplakia
  19.1.5 Infectious disorders
    19.1.5.1 Bartholinian abscess
    19.1.5.2 Cervicitis
    19.1.5.3 Pelvic inflammatory disease
      19.1.5.3.1 Endometritis
      19.1.5.3.2 Salpingitis
19.1.5.3.3 Tubo-ovarian abscess
19.1.5.3.4 Fitz-Hugh Curtis syndrome
19.1.5.4 Vulvovaginitis
19.1.5.5 Urethritis

19.2 Genital Tract/Male

19.2.1 Congenital
19.2.1.1 Hydrocele
19.2.1.2 Hypospadias
19.2.1.3 Phimosis (SEE 13.13.2.2)
19.2.1.4 Varicocele
19.2.1.5 Undescended testis (SEE 13.13.3.2)
19.2.1.6 Inguinal hernia (SEE 13.1.9.1)

19.2.2 Structural
19.2.2.1 Paraphimosis (SEE 13.13.2.2)
19.2.2.2 Peyronie's disease
19.2.2.3 Priapism
19.2.2.4 Testicular torsion (SEE 13.13.3.1)
19.2.2.5 Urethral strictures
19.2.2.6 Urethral foreign bodies
19.2.2.7 Prostatic hypertrophy

19.2.3 Inflammation/infection
19.2.3.1 Epididymitis/orchitis
19.2.3.2 Balanitis (SEE 13.13.2.1)
19.2.3.3 Gangrene of the scrotum (Fournier's gangrene)
19.2.3.4 Prostatitis
19.2.3.5 Urethritis

19.2.4 Tumors

19.3 Sexual Assault (SEE 14.12.2)
19.4 Genital Lesions
  19.4.1 Chancroid
  19.4.2 Granuloma inguinale
  19.4.3 Condyloma acuminata

20.0 ADMINISTRATIVE ASPECTS OF EMERGENCY MEDICINE

20.1 Academic Emergency Medicine
  20.1.1 Faculty/staff
    20.1.1.1 Credentials
    20.1.1.2 Career development
    20.1.1.3 Recruitment
  20.1.2 Research
    20.1.2.1 Diagnostic testing logic
    20.1.2.2 Statistical concepts
    20.1.2.3 Epidemiologic fundamentals
  20.1.3 Institutional affiliations
    20.1.3.1 University
    20.1.3.2 Community
  20.1.4 Teaching/curriculum
  20.1.5 Testing/evaluation

20.2 Certification and Licensure Requirements
  20.2.1 Allied health licensure
    20.2.1.1 Emergency medical technician/EMT-1/EMT-paramedic
    20.2.1.2 Nurses
    20.2.1.3 Physician extenders/midlevel providers
  20.2.2 Continuing medical education
  20.2.3 Physician licensure
  20.2.4 Specialty and subspecialty certification
20.3 Information Systems
   20.3.1 Practice
   20.3.2 Research

20.4 Departmental Administration
   20.4.1 Accreditation
      20.4.1.1 National organizations on accreditation of healthcare standards
   20.4.2 Billing/reimbursement
      20.4.2.1 Medicaid
      20.4.2.2 Medicare
      20.4.2.3 Insurance
      20.4.2.4 Managed care/capitation
   20.4.3 Budgeting
   20.4.4 Cost containment principles
   20.4.5 Equipment and supplies
      20.4.5.1 Adult
      20.4.5.2 Pediatric
   20.4.6 Facility design
   20.4.7 Forms
   20.4.8 Health care financing
   20.4.9 Marketing
   20.4.10 Medical records/documentation
   20.4.11 Personnel management
   20.4.12 Public relations
   20.4.13 Quality improvement
   20.4.14 Staffing requirements
   20.4.15 Policies and procedures
   20.4.16 Nursing practice
   20.4.17 Interdepartmental relations
   20.4.18 Patient flow
   20.4.19 Observation units/clinical decision units
20.4.20 Infection control (SEE 9.7.2 and 13.15)
20.4.21 Security, violence in the emergency department (SEE 14.11.4)

20.5 Ethics
20.5.1 Ethical principles
   20.5.1.1 Beneficence/non-maleficence
   20.5.1.2 Decision-making capacity
   20.5.1.3 Privacy and confidentiality
   20.5.1.4 Autonomy
   20.5.1.5 Ethical decision-making
   20.5.1.6 Justice
   20.5.1.7 Allocation of health care resources
20.5.2 Professional relations
   20.5.2.1 Physician-patient
   20.5.2.2 Physician-physician
      20.5.2.2.1 Peer review
      20.5.2.2.2 Impairment (SEE 20.13.4)
      20.5.2.2.3 Incompetence
   20.5.2.3 Physician-emergency health professional
   20.5.2.4 Physician-hospital
   20.5.2.5 Physician-societal
20.5.3 Life-sustaining treatment
   20.5.3.1 Advance directives
   20.5.3.2 Medical decision surrogates
20.5.4 Academic ethics
   20.5.4.1 Research responsibilities
   20.5.4.2 Publication ethics

20.6 Hospital Administration
20.6.1 Departmental interaction
20.6.2 Governance
20.6.3 Structure
20.7 Medical-Legal Aspects

20.7.1 Consent

20.7.1.1 Expressed, implied.

20.7.1.2 Informed

20.7.1.3 Uninformed

20.7.1.3.1 Incompetent patients

20.7.1.3.2 Minors

20.7.2 Laws

20.7.2.1 Commitment (SEE 14.10)

20.7.2.2 Drug-related

20.7.2.2.1 Controlled substances

20.7.2.2.2 Drug abuse

20.7.2.2.3 Food and Drug Administration regulations

20.7.2.2.4 Investigational drugs

20.7.2.3 Good Samaritan laws

20.7.2.4 Patient transfer regulations / EMTALA

20.7.2.5 Regulations regarding reportable conditions

20.7.2.5.1 Abuse

20.7.2.5.2 Assault

20.7.2.5.3 Communicable disease

20.7.2.5.4 Seizures/loss of consciousness

20.7.2.5.5 Deaths

20.7.2.5.5.1 Coroner’s cases

20.7.2.5.6 Transfusion restrictions

20.7.2.5.7 Organ donation

20.7.2.6 Liability

20.7.2.6.1 Duty to treat

20.7.2.6.2 Duty to third party

20.7.2.6.3 Intentional torts

20.7.2.6.3.1 Battery

20.7.2.6.3.2 False imprisonment.
20.7.2.6.4 Insurance
20.7.2.6.5 Malpractice
20.7.2.6.6 Negligence
20.7.2.6.7 Patient-related
   20.7.2.6.7.1 Privileged communications
   20.7.2.6.7.2 Research
   20.7.2.6.7.3 Termination of patient care
20.7.2.6.8 Resuscitation decisions
20.7.2.6.9 Risk management
20.7.2.6.10 Testimony

20.7.3 Expert witnesses

20.8 Clinical Pathways

20.9 Medical Staff
   20.9.1 Committees
   20.9.2 Credentialing
   20.9.3 Disciplinary policy
   20.9.4 Structure

20.10 Medical Organizations

20.11 Practice Management
   20.11.1 Benefits
   20.11.2 Contracts
      20.11.2.1 Employee
         20.11.2.1.1 Group
         20.11.2.1.2 Hospital
         20.11.2.1.3 Staff
      20.11.2.2 Independent contractor
   20.11.3 Structure
20.12 Skills
   20.12.1 Accounting
   20.12.2 Management
   20.12.3 Negotiations
   20.12.4 Physician interpersonal skills
       20.12.4.1 Effective patient-physician communication
           20.12.4.1.1 Diversity issues
       20.12.4.2 Hostile encounters/complaints
       20.12.4.3 Grief reactions

20.13 Wellness
   20.13.1 Wellness maintenance
   20.13.2 Stress management
       20.13.2.1 Unique stressors
       20.13.2.2 Reduction techniques
       20.13.2.3 Debriefing (SEE 21.4.2.8)
   20.13.3 Shift work
   20.13.4 Physician impairment (SEE 20.5.2.2.2)
   20.13.5 Family dynamics

21.0 EMERGENCY MEDICAL SERVICES/DISASTER MEDICINE

21.1 EMS System Organization
   21.1.1 System components
       21.1.1.1 Pre-hospital personnel
       21.1.1.2 Emergency department personnel
       21.1.1.3 Transport services
       21.1.1.4 Lead agency and local organizations
   21.1.2 Categorization and designation of levels of services
   21.1.3 Specialized care centers
21.2 EMS System Operations
   21.2.1 Communications system
      21.2.1.1 Radio configuration
      21.2.1.2 Dispatch
      21.2.1.3 Communications protocols
   21.2.2 Patient care protocols
      21.2.2.1 Scene triage and treatment
      21.2.2.2 Hospital triage and treatment
   21.2.3 Transport vehicles
      21.2.3.1 Ground
      21.2.3.2 Air
      21.2.3.3 Water access
   21.2.4 Medical control
      21.2.4.1 Medical director
      21.2.4.2 Offline and online supervision.
   21.2.5 Governmental controls
      21.2.5.1 Development and implementation of regulations
      21.2.5.2 Funding
      21.2.5.3 Certification/recertification
   21.2.6 EMS administration
      21.2.6.1 System monitoring and maintenance
      21.2.6.2 Serving as a training resource
      21.2.6.3 Resource allocation
      21.2.6.4 Stress/burnout of EMS personnel
      21.2.6.5 Scene violence
   21.2.7 System overload
   21.2.8 EMS continuous quality improvement

21.3 EMS Education
   21.3.1 CPR, first aid, and EMS awareness training
      21.3.1.1 First responders
21.3.1.2 General public

21.3.2 EMT training
  21.3.2.1 Basic
  21.3.2.2 Intermediate
  21.3.2.3 Paramedic

21.3.3 EMS continuing education/skills maintenance

21.3.4 Injury prevention and safety

21.3.5 Assessment of environmental, biologic, and toxicologic hazards

21.4 Disaster Medicine

21.4.1 Definition of disaster
  21.4.1.1 Disaster assessment
  21.4.1.2 Epidemiology of disasters
  21.4.1.3 Philosophy of disaster management and the incident command system
  21.4.1.4 Types of disaster/nomenclature
    21.4.1.4.1 Explosions and fires
    21.4.1.4.2 Mass crowd gathering events
    21.4.1.4.3 Medical response to terrorist incidents (conflict related)
    21.4.1.4.4 Natural
    21.4.1.4.5 Transportation disasters
    21.4.1.4.6 Technologic industrial/HAZMAT

21.4.2 Phases of disaster response
  21.4.2.1 Notification
  21.4.2.2 Search and rescue
  21.4.2.3 Triage
  21.4.2.4 Medical care of disaster victims
  21.4.2.5 Disaster communications
  21.4.2.6 Record keeping
  21.4.2.7 Transportation and evacuation
  21.4.2.8 Debriefing/critical incident stress debriefing (CISD) (SEE 20.13.2.3)
  21.4.2.9 Recovery
21.4.3 Disaster medical care (SEE 17.2.20)
   21.4.3.1 Rapid assessment of emergency health care needs
   21.4.3.2 Medical care at mass casualties
   21.4.3.3 Disaster specific medical problems (SEE 18.0)
     21.4.3.3.1 Mental health and behavioral consequences
       21.4.3.3.1.1 For disaster victims
       21.4.3.3.1.2 For professionals
       21.4.3.3.1.3 Critical incident stress debriefing (CISD)
     21.4.3.3.2 Shock and its treatment in field situations
     21.4.3.3.3 Trauma casualties
     21.4.3.3.4 Crush syndrome/injury
     21.4.3.3.5 Compartment syndrome
     21.4.3.3.6 Mass burn care
     21.4.3.3.7 Pulmonary casualties
     21.4.3.3.8 Pediatric casualties
     21.4.3.3.9 Neuropsychiatric casualties
     21.4.3.3.10 Toxic-chemical casualties
     21.4.3.3.11 Radiation exposure casualties
     21.4.3.3.12 Blast injuries
   21.4.3.4 Medical supply/equipment management
     21.4.3.4.1 Essential drugs for disasters
     21.4.3.4.2 Pharmaceutical distribution/control
     21.4.3.4.3 Role of immunizations
   21.4.3.5 Public health issues after disasters
   21.4.3.6 Nonmedical emergency responders

21.4.4 Disaster information services
   21.4.4.1 Local/national/international disaster information
   21.4.4.2 Public relations
   21.4.4.3 Media coordination
   21.4.4.4 Legal aspects

21.4.5 Disaster education
21.4.5.1 Hospital disaster planning
21.4.5.2 Disaster drills
21.4.5.3 Post-disaster injury prevention and surveillance
21.4.6 Disaster medical assistance teams (DMATs)
21.4.7 International relief assistance
   21.4.7.1 Coordination
   21.4.7.2 Volunteers

21.5 Research
   21.5.1 Assessment of new methods and procedures.
   21.5.2 Testing of new equipment and technologic advances
   21.5.3 Data collection/analysis

22.0 CLINICAL PHARMACOLOGY

22.1 Principles
   22.1.1 Pharmacokinetics
   22.1.2 Drug interactions
   22.1.3 Adverse reactions
   22.1.4 Drugs in pregnancy/breast-feeding
   22.1.5 Effect of age
   22.1.6 Withdrawal syndromes
   22.1.7 Neonatal/pediatric considerations

22.2 Drug Classes
   22.2.1 Analgesics/anesthetics (SEE 17.2.3)
      22.2.1.1 Fentanyl
      22.2.1.2 Ketamine
      22.2.1.3 Nitrous oxide
   22.2.2 Antibiotics
22.2.3 Anticoagulants (SEE 17.2.5)
22.2.4 Anticonvulsants (SEE 17.2.6)
22.2.5 Antihistamines (SEE 17.2.9)
22.2.6 Antipsychotics (SEE 17.2.10)
  22.2.6.1 Dystonia
  22.2.6.2 Tardive dyskinesia
  22.2.6.3 Neuroleptic malignant syndrome
22.2.7 Bronchodilating agents (SEE 17.2.11)
22.2.8 Cardiovascular drugs (SEE 17.2.14)
  22.2.8.1 Antiarrhythmic
  22.2.8.2 Antihypertensives
  22.2.8.3 Digoxin
  22.2.8.4 Calcium channel blockers
22.2.9 Hormones/steroids (SEE 17.2.23)
22.2.10 Hypoglycemics (SEE 17.2.25)
  22.2.10.1 Oral agents
  22.2.10.2 Insulin
22.2.11 Intravenous fluids
22.2.12 Local anesthetics (SEE 17.2.29)
  22.2.12.1 Esters
  22.2.12.2 Amides
22.2.13 Locally acting drugs (SEE 17.2.30)
  22.2.13.1 Antacids
  22.2.13.2 Antiseptics
  22.2.13.3 Cathartics
  22.2.13.4 Laxatives
22.2.14 Neuromuscular blocking agents
  22.2.14.1 Depolarizing
  22.2.14.2 Nondepolarizing
22.2.15 Nonsteroidal anti-inflammatories
22.2.16 Opiates/opioids (SEE 17.2.38)
22.2.17 Sedatives/hypnotics
   22.2.17.1 Barbiturates
   22.2.17.2 Benzodiazepines
   22.2.17.3 Chloral hydrate
22.2.18 Thrombolytics
22.2.19 Tocolytics, oxytocics

23.0 PROCEDURES/SKILLS

23.1 Airway Techniques
   23.1.1 Cricothyrotomy
   23.1.2 Heimlich maneuver
   23.1.3 Intubation
      23.1.3.1 Nasotracheal
      23.1.3.2 Orotracheal
      23.1.3.3 Rapid sequence
      23.1.3.4 Fiberoptic
   23.1.4 Mechanical ventilation
   23.1.5 Percutaneous transtracheal ventilation
   23.1.6 Airway adjuncts

23.2 Anesthesia
   23.2.1 Local
   23.2.2 Regional intravenous anesthesia
   23.2.3 Regional nerve blocks

23.3 Diagnostic Procedures
   23.3.1 Arthrocentesis.
   23.3.2 Cystourethrogram
   23.3.3 Lumbar puncture
23.3.4 Nasogastric intubation
23.3.5 Pericardiocentesis
23.3.6 Peritoneal lavage
23.3.7 Bedside ultrasonography (SEE 18.2.6)
  23.3.7.1 Cardiac
  23.3.7.2 Abdominal
  23.3.7.3 Traumatic
  23.3.7.4 Pelvic
23.3.8 Anoscopy
23.3.9 Thoracentesis
23.3.10 Tonometry
23.3.11 Slit lamp examination
23.3.12 Electrocardiogram interpretation
23.3.13 Radiographic interpretation

23.4 Genital/Urinary
  23.4.1 Bladder catheterization
    23.4.1.1 Foley catheters
    23.4.1.2 Suprapubic catheterization
  23.4.2 Delivery of newborn
    23.4.2.1 Breech delivery
    23.4.2.2 Normal delivery
    23.4.2.3 Perimortem cesarean section (SEE 12.7.8 and 18.5.2.3)

23.5 Head and Neck
  23.5.1 Control of epistaxis
    23.5.1.1 Anterior packing
    23.5.1.2 Posterior packing/balloon placement
    23.5.1.3 Cautery
  23.5.2 Laryngoscopy
  23.5.3 Nasopharyngeal endoscopy
23.6 Hemodynamic Techniques
    23.6.1 Arterial catheter insertion
    23.6.2 Central venous access
        23.6.2.1 Femoral
        23.6.2.2 Jugular
        23.6.2.3 Subclavian
        23.6.2.4 Umbilical
        23.6.2.5 Venous cutdown (SEE 23.6.4)
        23.6.2.6 Intraosseous infusion
    23.6.3 Peripheral venous cutdown (SEE 23.6.2.5)
    23.6.4 Pulmonary artery catheter insertion

23.7 Skeletal Procedures
    23.7.1 Fracture/dislocation immobilization techniques
    23.7.2 Fracture/dislocation reduction techniques
    23.7.3 Spine
        23.7.3.1 Cervical traction techniques
        23.7.3.2 Immobilization techniques
            23.7.3.2.1 Backboard techniques

23.8 Thoracic
    23.8.1 Cardiac pacing
        23.8.1.1 Cutaneous
        23.8.1.2 Transvenous
    23.8.2 Defibrillation/cardioversion
    23.8.3 Cardiorrhaphy
    23.8.4 Pericardiotomy
    23.8.5 Thoracostomy
    23.8.6 Thoracotomy

23.9 Other Techniques
23.9.1 End-tidal CO₂ monitoring
23.9.2 Gastric lavage
23.9.3 Incision - drainage
23.9.4 Intestinal tube insertion
23.9.5 Pulse oximetry
23.9.6 Sengstaken-Blakemore tube insertion
23.9.7 Wound closure techniques (SEE 18.4.17.1)
23.9.8 Trephination, nails
23.9.9 Peak expiratory flow rate measurement
23.9.10 Excision of thrombosed hemorrhoids
23.9.11 Foreign body removal
23.9.12 Conscious sedation

23.10 Laboratory Skills
   23.10.1 Venipuncture
   23.10.2 Arterial blood gas sampling
   23.10.3 Microscopy
   23.10.4 Gram stain preparation/interpretation

23.11 Multiple Patient Management

23.12 Universal Precautions