THE INTEGRATIVE DISCIPLINES

SECOND TIER

Characteristics and Salient Expression of Internal Medicine's Core Values

- **Lifelong Learning**
- **Clinical Method**
- **Continuity of Care**
- **The Medical Interview or History**
- **Physical Diagnosis**
- **Clinical Epidemiology and Quantitive Clinical Reasoning**
- **Clinical Pharmacology**
- **Scientific Literacy**
- **Legal Medicine**
- **Management of Quality of Health Care**
- **Nutrition**
- **Preventive Medicine**

Lifelong Learning

Internists should be lifelong learners. They should be willing to adjust their concepts and practices in response to new evidence, to learn from their own experience and mistakes, and to improve the practice of medicine through quality improvement, innovation, and discovery.

Few attitudes are as important to the individual practitioner as the desire to learn. Internists must be able to assess their own learning needs and identify their own learning style. They must be aware of the gaps between the ideal, their own goals, and their actual performances. Never are these attitudes tested more severely than when the internist must come to terms with a mistake. Although painful to confront, errors are priceless opportunities for learning and self-improvement.

Although lifelong learning is an attitude, it is also a skill. Each internist should have a personal method for "keeping up." The options now include electronic databases as well as the more traditional approaches of regular reading, conference attendance, and discussion with consultants. Future internists may become members of "learning teams." These teams will use the techniques of quality improvement and learn from each other as they strive to improve individual and collective practices.

See also: Medical Informatics, Management of Quality, Clinical Epidemiology, Professionalism.

Competencies for Lifelong Learning

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Develop a personal method for "keeping up" with new advances and changes in knowledge		
Participate actively in didactic programs and other learning experiences organized within a residency program		
Maintain an attitude of healthy skepticism and curiosity, as evidenced by thoughtful questioning, independent study, and critical analysis of published materials.		
Demonstrate facility in using electronic databases, literature retrieval services, and computer-based diagnostic reasoning programs		
Be able to critically appraise the medical literature, identifying the strengths and weaknesses of an article and its relevance to one's patient population.		
Acquire teaching skills in the ambulatory and inpatient settings		

Illustrative Clinical Settings: Any clinical setting in which residents are challenged to learn, but particularly continuity and inpatient rotations and imbue an attitude of rigor and evidence-based practice.

The Clinical Method

Internists' clinical methods define the discipline of internal medicine as fully as do the age of patients in an internal medicine practice, the locations of care, and even the illnesses of adults. Concepts and understanding of disease, the location of care, and treatments change with time. But the methods used by internists—the essence of internal medicine—do not change. The clinical method is iterative, and each part informs the others. The clinical method encompasses the principles and practices used to solve an individual patient's problem through the interview and examination and by diagnosis, treatment, and observation. The process begins as the patient enters the examining room. The physician begins by asking the patient about the reason for the visit. The physician negotiates the activities for the visit and actively listens, all the while helping the patient tell of the story of the illness. The clinical method continues through the entire encounter and sustains the physician-patient relationship continuously and comprehensively.

See also: Medical Management, Continuity Care, Humanism, Clinical Epidemiology, Preventive Medicine, Medical Interviewing, Physical Examination, and Lifelong Learning.

Competencies for the Clinical Method

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Demonstrate skill in generating hypotheses early in the interview by integrating the patient's demographic characteristics, the initial complaint, his or her appearance, and other information into a preliminary diagnostic opinion		
Obtain appropriate data from the interview, physical examination and diagnostic tests to support or refute the leading hypotheses		
Accurately scan for asymptomatic diseases and their risk factors, applying evidence-based preventive health guidelines to the patient's population, preferences and personal agenda		
Demonstrate diagnostic strategies that deal with ambiguous or incomplete data by the application of probabilistic reasoning, all the while being aware of not-to-be-missed diagnoses		
Utilize the literature, expert opinion and colleagues to support one's diagnostic process		
Function as a personal health manager to organize, arrange and monitor effective delivery of health services, particularly when patients have chronic or complicated illness		
Maintain accurate records, communicate effectively with other providers, and bridge the gaps that can occur when the focus of care shifts between office, hospital, home or chronic care facility		

Illustrative Clinical Settings: Any clinical setting that affords responsibility for patient care, particularly if role-model clinicians are present.

Continuity of Care

Continuity of care, along with comprehensive care and coordinated care, defines the general internist's practice. Although the outpatient office is the principal setting for the practice of general internal medicine, the hospital inpatient unit and even the intensive care unit are also important parts of the general internist's world. An appreciation of the importance of the physician-patient relationship, patient advocacy, case management, professionalism, and continuity should permeate all of these settings.

Some of the specific competencies of continuity of care overlap competencies found in other lists. Certainly, the clinical issues that form the substrate for continuity practice appear elsewhere. The purpose of this list is to identify the range of knowledge, skills and attitudes that make the difference between episodic, fragmented, and occasionally ineffective care and the kind of care that is emblematic of the best that general internal medicine practice can provide.

See also: Professionalism, Ethics, Medical Management, Preventive Medicine, Clinical Epidemiology, History Taking, Clinical Method, and the clinical disciplines that compose outpatient practice.

Competencies for Continuity of Care

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Be able to diagnose and manage the common clinical presentations of office-based adult medicine, including abdominal pain, change in mental status, dizziness, dyspnea, dysuria, fatigue, fever, headache, insomnia, pain syndromes, swelling, syncope and lightheadedness, upper respiratory infections, weight gain and weight loss		
Demonstrate expertise in the frequently required office-based procedures, such as arthrocentesis, cerumen removal, diaphragm fitting, flexible sigmoidoscopy, incision and drainage of abscesses, splinting and bracing, and general wound care		
Know how to modify risk factors for disease by counseling to achieve behavioral change		
Collaborate effectively with members of the health care team and other health professionals		
Be able to use standard functional assessment questionnaires		
Maintain accurate and complete patient records		
Effectively use office-based triage systems and telephone-based care		
Practice efficiently so that patient care proceeds at an acceptable rate, appropriate for the nature of each encounter		

Illustrative Clinical Settings: Continuity practice in a hospital-based or community site.

The Medical Interview or History

Expertise in communication forms the core of an internist's set of skills and certainly is no less important than knowledge of disease. Internists should be masters of the medical interview. Following the seminal work of the Task Force on the Medical Interview (since renamed the Academy for the Doctor-Patient Relationship), the medical interview has been defined as the entire medium of physician-patient interaction. Many of the topics in this curriculum address this interaction. The clinical competencies cannot be acquired without disease-specific interview skills; likewise, the population-based competencies depend directly on contextual knowledge and the ability to take a history appropriate for distinct settings and populations. Here we focus on the generic skills of interviewing. The competencies of the medical interview define what internists should know and be able to do in the discipline of medical interviewing (or history taking), as they communicate with, care for, and provide comfort to their patients.

See also: Humanism, Clinical Method, Continuity of Care, Psychiatry, and several of the clinical disciplines.

Competencies of the Medical Interview

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Understand that the medical history has several stages—the opening, the characterization of symptoms and life setting, the review of symptoms, and the closing: each requires mastery		
Understand the interview's several functions: eliciting the data, pointing toward a diagnosis, forging a relationship, and healing		
Shape the interview to fit the individual characteristics of the patient and the patient's illness or symptoms		
Elicit the patient's history (story) and the context (family, occupational and social milieu) in which the illness or symptoms occur		
Be alert to the patient's verbal and nonverbal behaviors, which are often the way to obtaining the clearest, most consistent narrative of the illness or symptoms		
Develop verbal and nonverbal communication skills in order to facilitate communication, elicit the emotional content of the interview, and provide comfort		
Overcome barriers to communication, including those derived from cultural differences or physical and mental impairment		
Use the interview to identify cognitive impairment, anxiety, denial, and defensiveness; be able to manage each during the interview		
Take a history of sensitive topics such as alcoholism, substance abuse, and sexual functioning and sexuality		
Engage the patient as an ally in treatment planning		

Illustrative Clinical Settings: Any setting that affords opportunities for reflection on communication skills and interviewing.

Physical Diagnosis

Even in this era of burgeoning diagnostic technology, the physical examination remains among the internist's most accurate set of tools. These skills play an essential role in estimating the pretest probability of disease, which is the starting point for test interpretation. Moreover, there is an increasing body of knowledge about accuracy of physical signs. In many instances, bedside assessment is superior to noninvasive technology; in almost all cases, it is more accessible and cost-effective. Expertise in physical diagnosis is a valued characteristic of the well-trained internist. Instruction in and evaluation of physical diagnosis skill should be part of every residency program’s curriculum.

We present first a list of general competency objectives for physical diagnosis, followed by an organ-specific list of the physical findings and maneuvers with which all residents should be familiar.

See also: Clinical Method and the clinical competencies.

Competencies For Physical Diagnosis

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Understand how to apply the concept of operating characteristics (specificity, sensitivity, and likelihood ratios) to the interpretation of physical examination findings		
Understand the pathophysiologic explanation for common physical findings		
Know when to *abandon* a physical finding because new evidence has impugned its validity and when to *adopt* new findings that have been shown to be clinically useful		
Examine patients efficiently and systematically, maximizing accuracy and completeness, ensuring that the patient is comfortable, and protecting the patient's modesty		
Use the physical examination in the context of the entire clinical database to evaluate the patient efficiently and effectively		
Know the content of the screening physical examination that is appropriate for each patient's age, sex, and particular risk factors		
Utilize repeated, focused physical examinations to follow the course of a patient's illness		
Use physical findings to make decisions in settings that do not allow for extensive diagnostic testing		

Illustrative Clinical Settings: Any clinical setting where physical diagnosis skills can be emphasized and reviewed.

Specific Physical Examination Findings

Cardiology Physical Examination Findings

Blood Pressure

1. Measure blood pressure in the upper extremities (right and left arm)
2. Measure blood pressure lower extremities (in the hypertensive patient)
3. Pulsus paradoxus
4. Tilt test (orthostatic change in heart rate and blood pressure)

Pulses

5. Carotid bruits and thrills
6. Irregularity of arterial pulse
7. Water hammer (Corrigan) pulse
8. Pulses parvus and tardus
9. Pulse deficit (in atrial fibrillation)

Neck Veins

10. Estimation of central venous pressure by inspection of the neck
11. Kussmaul's sign
12. Hepatojugular reflux
13. Cannon *a* waves
14. Pulsatile liver of tricuspid regurgitation
15. Giant *v* waves

Inspection and Palpation

16. Inspect the precordium for cardiac impulses
17. Detection of cardiac enlargement by percussion
18. Palpation for size and characteristics of the apex impulse
19. Right ventricular heave
20. Palpation for aortic stenosis thrill

Heart Sounds

21. Increased, decreased, or variability of S_1, S_2
22. Normal and abnormal splitting of S_2
23. S_3 gallop
24. S_4 gallop
25. Pericardial friction rub

Clicks

26. Mitral valve click
27. Ejection click
28. Presystolic click

Systolic Murmurs

29. Tricuspid regurgitation
30. Rivera-Carvallo's maneuver (accentuation of pulmonic and tricupid valve murmurs)
31. Mitral insufficiency
32. Pulmonic stenosis
33. Ventricular septal defect
34. Aortic stenosis

Diastolic Murmurs

35. Mitral stenosis
36. Pulmonary regurgitation
37. Aortic regurgitation

Maneuvers

38. Hand-gripping maneuver (effect on murmurs)
39. Squatting maneuver (effect on murmurs)
40. Valsalva maneuver (effect on murmurs)

Pulmonary Physical Examination Findings

Breath Sounds

1. Bronchial breath sounds
2. Crackles (including distinguishing early from late sounds)
3. Vesicular breath sounds
4. Wheezing
5. Stridor
6. Late inspiratory squeak
7. Amphoric breath sounds

Palpation and Percussion

8. Abnormal tactile fremitus
9. Assessment of diaphragmatic excursion
10. Deviated trachea

Respiratory Patterns and Inspection

11. Paradoxical respiration
12. Respiratory alternans
13. Use of accessory muscles
14. Cheyne-Stokes respiration
15. Kussmaul's respiration

Additional Thoracic Findings and Maneuvers

16. Pleural friction rub
17. E to A egophony
18. Whispered pectoriloquy

Extra-Thoracic Findings

19. Clubbing
20. Central cyanosis and acrocyanosis
21. Plethora of erythrocythemia
22. Edema, right ventricular heave, and other findings of cor pulmonale

Gastroenterologic/Abdominal Physical Examination Findings

Intestinal Signs

1. Changes in bowel sounds
2. Abdominal distention
3. Visible peristalsis
4. Succussion splash

Peritoneal Signs

5. Rebound tenderness
6. Iliopsoas sign

Abdominal Aortic and Vascular Signs

7. Abdominal aneurysm
8. Abdominal arterial murmurs and bruits

Liver, Spleen and Portal Hypertension

9. Identify and palpate lower liver edge
10. Assess for splenic dullness at Traube's space
11. Percuss liver span
12. Palpate lower spleen edge
13. Fluid wave of ascites
14. Shifting dullness
15. Icterus
16. Skin findings of liver disease

Biliary Tract

17. Palpate enlarged gall bladder (Courvoisier's signal)
18. Murphy's sign

Additional Findings

19. Inguinal and scrotal hernias
20. Anal sphincter tone
21. Rectal masses

Ophthalmology Physical Examination Findings

Inspection

1. Redness consistent with conjunctivitis, episcleritis and iritis
2. Scleral icterus
3. Hordeolum, chalazion
4. Ptosis and dysconjugate gaze (myasthenia) of neuromuscular disorders
5. Blepharitis
6. Conjunctival petechiae

Pupillary Findings

7. Anisocoria
8. Afferent defect (Marcus-Gunn pupil)

Funduscopic Funding

9. Cataracts
10. Retinal exudates and hemorrhages
11. Blood or pus in anterior chamber
12. Proliferative and background diabetic retinopathy
13. Hypertensive and atherosclerotic retinopathy
14. Drusen (signs of macular degenerations)
15. Papilledema
16. Hollenhorst plaque (microembolic disease)

Test of Vision

17. Visual acuity
18. Test of visual fields

Otolaryngology Physical Examination Findings

Ears

1. Findings of otitis externa
2. Findings of otitis media
3. Tympanic perforation
4. Hearing deficits

Nose and Sinuses

5. Palpate and percussion for sinus tenderness
6. Abnormalities of nasal mucosa
7. Nasal polyps
8. Nasal septal perforation

Oral Cavity and Tongue

9. Whitish plaques of candida infection
10. Leukoplakia and mucosal abnormalities suggesting malignancy (inspection and palpation)
11. Ulceration
12. Gingival hyperplasia
13. Gingivitis
14. Aphthous ulcers
15. Caries and periodontal disease
16. Atrophic glossitis
17. Macroglossia
18. Migratory glossitis

Oropharynx and Tonsils

19. Acute pharyngitis
20. Acute tonsillitis
21. Peritonsillar abscess

Additional Findings

22. Salivary gland obstruction and/or infection
23. Salivary gland enlargement (including tumors)
24. Detection of cervical adenopathy
25. Palpation of thyroid
26. Nuchal rigidity
27. Findings of deep tissue infection and cellulitis

Gynecologic and Genitourinary Physical Examination Findings

Breast

1. Breast mass
2. Breast discharge

Pelvic Exam Findings

3. Cervical tenderness
4. Vaginal discharge
5. Adnexal mass
6. Uterine enlargement and/or mass
7. Cervical mucosa abnormalities
8. Evidence of hypoestrogenism

Male Genitourinary Findings

9. Prostate enlargement
10. Prostate tenderness
11. Prostate mass
12. Testicular mass
13. Epididymal swelling and/or tenderness
14. Non-descended testicle

15. Signs of hypogonadism

Vascular/Extremities Physical Examination Findings

Circulation

1. Auscultation of carotid, femoral arteries
2. Palpation of carotid, femoral arteries
3. Palpation of peripheral pulses: popliteal, dorsalis pedis, posterior tibial, brachial, radial
4. Cyanosis
5. Changes in temperature
6. Edema
7. Clubbing
8. Palmar erythema
9. Splinter hemorrhages

Additional Findings

10. Dupuytren's contracture
11. Spooning of nails

Dermatology Physical Examination Findings

(The findings are grouped for convenience; no classification scheme is implied.)

Inflammation and Infection

1. Open and closed comedones (acne)
2. Carbuncle and furuncle
3. Herpes simplex, zoster and varicella
4. Infestations (lice and scabies)
5. Tinea versicolor and corporis
6. Syphilis (primary and secondary)
7. Molluscum contagiosum
8. Acne rosacea
9. Verruca (warts)

Papulosquamous

10. Actinic keratosis
11. Eczema
12. Pityriasis rosea
13. Psoriasis
14. Seborrheic dermatitis
15. Lichen planus
16. Lichen simplex chronicum (neurodermatitis)

Skin Cancers and Related Disorders

17. Atypical nevus
18. Basal cell carcinoma
19. Malignant melanoma
20. Nevi
21. Squamous cell carcinoma
22. Angiomas

Allergic and Related conditions

23. Contact dermatitis
24. Atopic dermatitis
25. Urticaria
26. Erythema multiforme/Stevens-Johnson Syndrome

Vascular and Systemic

27. Erythema nodosum
28. Discoid lupus
29. Skin finding of systemic lupus erythematosus
30. Ischemic ulcer
31. Necrosis; gangrene
32. Livedo reticularis and blue toe syndrome
33. Stasis ulcer and dermatitis
34. Petechiae/Purpura/Ecchymosis
35. Palpable purpura

Bullous Diseases

36. Pemphigus
37. Bullous pemphigoid

Additional Findings

38. Burns
39. Xerosis (dry skin)

Rheumatologic Physical Examination Findings

Temporomandibular

1. Findings of temporomandibular joint syndrome

Cervical Spine

2. Range of motion
3. Radiculopathy signs

Lumbosacral Spine

4. Range of motion
5. Localized tenderness
6. Radiculopathy signs (especially L4-5, L5-S1)
7. Sacroiliac tenderness
8. Inspect for kyphosis and abnormal lordosis

Shoulder

9. Range of motion
10. Palpation of biceps tendon groove
11. Palpation of subdeltoid bursa
12. Impingement syndrome findings
13. Opposed supination (biceps tendonitis)

Elbow

14. Range of motion
15. Swelling of olecranon bursitis
16. Tenderness in lateral epicondylitis
17. Ulnar nerve entrapment

Wrist and Hand

18. Swan neck deformity
19. Heberden's nodes
20. Bouchard's nodes
21. Carpal tunnel signs (Tinnels, Phelan's)
22. Thenar eminence atrophy

Hip

23. Range of motion (with pain referral patterns)
24. Asymmetry (including external rotation)
25. Tenderness of trochanteric bursitis

Knee

26. Range of motion and symmetry
27. Ballottement for fluid (and bulge sign)
28. Medial and collateral ligament tear signs
29. Anterior cruciate ligament tear (Lachman's maneuver)
30. Crepitation of osteoarthritis
31. Tenderness and swelling of prepatellar bursa
32. Tenderness over anserine bursa
33. Tibiopatellar tendinitis
34. Swelling of Baker's cyst
35. Signs of patellar femoral arthralgia (chondromalacia)

Ankle and Foot

36. Range of motion, tenderness and swelling
37. Ankle sprain
38. Tenderness of Achilles' tendonitis
39. Signs of plantar fasciitis
40. Signs of podagra

Neurologic Physical Examination Findings

Higher-Level and Cortical Function

1. Mental status exam (including dementia and delusion)
2. Speech and language content
3. Asterixis

Movement, Gait and Station

4. Parkinsonian tremor
5. Cogwheeling
6. Tardive Dyskinesia
7. Ataxic or wide-based gait
8. Spastic gait
9. Parkinsonian gait
10. Intention (essential) tremor

Motor

11. Strength and symmetry of motor exam
12. Muscle tone (spasticity)
13. Pronator "drift"

Sensory

14. Abnormalities of pain (pinprick, light touch, position, vibration)
15. Romberg's sign

Cranial Nerves, Ocular and Oculomotor function

16. Testing cranial nerves 2-10, 12
17. Oculovestibular reflex (Doll's eyes)
18. Anisocoria
19. Pinpoint or dilated (unreactive) pupils
20. Horner's syndrome
21. Papilledema

Reflexes, Normal and Pathologic

22. Deep tendon reflexes
23. Babinski's sign
24. Hoffman's sign

Peripheral Nerves and Neuromuscular Findings (see also Musculoskeletal)

25. Fasciculations
26. Trousseau's sign
27. Chvostek's sign
28. Radial neuropathy
29. Median neuropathy
30. Ulnar neuropathy

Additional Findings

31. Cerebellar testing (upper and lower extremities)
32. Nuchal rigidity
33. Kernig's and Brudzinski's signs

Endocrine Physical Examination Findings

Pituitary

1. Growth retardation
2. Acromegaly
3. Galactorrhea

Thyroid

4. Goiter
5. Thyroid nodules
6. Exopthalmos
7. Findings of hyperthyroidism
8. Findings of hypothyroidism

Adrenal

9. Findings of hypoadrenalcortisolism
10. Findings of hyperadrenalcortisolism

Gonadal Disorders

11. Cryptochidism
12. Klinefelter's syndrome habitus
13. Polycyctic ovary disease findings
14. Findings of male hypogonadism
15. Findings of menopausal state

Bone Disorders

16. Paget's disease findings
17. Osteoporosis findings

Lipid Disorders

18. Skin and tendon signs of hyperlipidemia

Diabetes

19. Neuropathy
20. Retinopathy

Clinical Epidemiology And Quantitative Clinical Reasoning

Clinical epidemiology is the study of how clinical questions (such as diagnosis, prognosis, and treatment) are answered by strong scientific research involving populations and groups of patients. Internists must find ways to cope with a rapidly changing evidence base for medicine, with clinical controversy, and with information overload. They should be able to assess the validity of published evidence for themselves. To do so requires understanding the basic clinical research strategies, such as study design, measurement, and analysis, and the meaning of terms used to describe research results in journals. Internists should also be able to judge the credibility of colleagues (authors of review articles, editorials, teachers, and consultants) who synthesize scientific evidence for them. Medical students do not necessarily acquire these abilities in medical school lectures or during teaching rounds; residency programs must teach this material, reinforce it by example, and monitor how well the housestaff use it in clinical care.

Dealing with uncertainty is one of the internist's fundamental skills. Quantitative clinical reasoning, also known as decision analysis, is the best method for using imperfect data to make decisions under conditions of uncertainty. Presented below are clinical epidemiology skills followed by skills of quantitative reasoning.

See also: Preventive Medicine, Informatics, Management of the Quality of Health Care.

Competencies for Clinical Epidemiology

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Understand how bias and chance affect the accuracy of observations on individual patients		
Assess the validity of original research concerning diagnosis, prognosis, treatment, and prevention		
Know the strengths and weaknesses of randomized clinical trials, case-control studies, cohort studies (retrospective, prospective), and meta-analyses		
Demonstrate a practical strategy for judging the validity of colleagues' synthesis of clinical evidence (for example, review articles, continuing medical education courses, or consultant advice)		
Understand the meaning, uses, and limitations of statistical power, *P* values and confidence intervals, relative risk, attributable risk, and "number needed to treat"		

Competencies for Quantitative Clinical Reasoning

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Understand how to estimate the pretest probability of a disease and how to use Bayes' theorem to estimate post-test probability		
Define and use sensitivity, specificity, and likelihood ratios of diagnostic information		
Know and be able to detect potential biases in estimates of sensitivity and specificity		
Understand the value of decision trees and expected value decision making		
Know how to measure patients' preferences		
Understand and utilize sensitivity analysis and cost-effectiveness analysis		

Illustrative Clinical Settings: Any clinical encounter is an occasion to learn these concepts. Settings particularly well suited are those that challenge residents to make evidence-based decisions in areas of greater or lesser uncertainty and in settings where faculty exemplify and emphasize these concepts.

Clinical Pharmacology

Clinical pharmacology and therapeutics deals with the efficacy and safety of drugs, the optimal clinical use of drugs and the development of new and improved drug therapies. It may draw on such disparate basic sciences as pharmacology, pharmacokinetics, pharmacodynamics, toxicology, and clinical trial design and analysis. Clinical activities emphasize consultation in therapeutic choice and monitoring and the evaluation of new therapies.

Competencies for Clinical Pharmacology

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Know the basic pharmacokinetic parameters of drugs; apply this knowledge to drug monitoring and drug dosage regimen design and adjustment.		
Describe a pharmacotherapeutic approach that includes definition of therapeutic objectives and options, selection of dose and parameters to monitor, and measurement of therapeutic outcome.		
Be able to evaluate the individual patient's therapeutic response by monitoring drug levels, pharmacologic effects, and adverse reactions and by assessing individual variability in drug metabolism.		
Know when to alter drug dosage because of altered drug disposition or conditions that place the patient at unusual risk.		
Know the principles of adverse drug reactions, drug allergies, and drug interactions and how the characteristics of the patient may alter them.		
Know how to use pharmacologic principles and information from poison control centers to diagnose and mange poisonings and drug overdose.		
Understand national and local policies related to drug use, including federal and state regulations drug utilization review ethical issues related to prescribing experimental therapies new drug development and FDA approval		

Illustrative Clinical Settings: Lectures, clinical electives, clinics, inpatient services.

Scientific Literacy

The basic science underlying normal human biology and disease is advancing rapidly. Moreover, practical application of new scientific knowledge to medical care seems to occur more and more quickly. These advances are exciting, but they are also challenging. General internists need to maintain their scientific literacy if they are to provide their patients with the best possible care. Residency training must play its role in supporting internists' need to maintain up-to-date knowledge of basic biomedical science.

The pace of scientific advance is so rapid that any list of topics with which residents should be conversant is likely to become obsolete quickly. Program directors should engage the faculty in deciding which topics to teach. Examples of current topics include cytokines, endothelial biology, cellular mechanisms of oncogenesis, and the biology of atherosclerosis. Lectures, seminars, and clinical rotations are venues in which to teach about basic biology and its expression in disease.

See also: Professionalism, Lifelong Learning, and several clinical disciplines.

Illustrative Clinical Settings: Any clinical rotation or elective is an opportunity to apply the principles of basic science to patient care.

Legal Medicine

Legal Medicine, now often called health care law, has grown to become a legal specialty. In the United States, statute and common law, administrative regulation, and ethical constraints all constrain and regulate the practice of medicine. Legal Medicine encompasses all of these topics. Some legal fundamentals, such as informed consent, advance directives, and confidentiality, affect clinical practice so often that internists should know how they may affect clinical practice. Other aspects of legal medicine either are encountered infrequently or are so complex that the prudent physician needs only to know when to seek legal counsel.

Medical schools do not teach these topics uniformly, and residency programs cannot assume that residents have a common knowledge base. Because the law varies from state to state, the curriculum will vary from program to program. Such common topics as malpractice and informed consent are obedient to national principles, yet their details are governed by state statutes and common law.

Residents acquire much of their understanding of legal medicine from discussions on rounds, during procedures, and while caring for ambulatory patients. Such informal teaching does not suffice for the core of health care law, which is a topic well-suited to didactic teaching. Traditional case-based teaching methods can then expand on this core material.

See also: Ethics, Management of Medical Practice, Clinical Method.

Competencies for Legal Medicine

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Know the legal definition of privacy and its implications for medical care		
Discriminate correctly among requests to breach the confidentiality of patient records		
Identify patients who are incompetent to direct their own care and which of their surrogates are legally empowered to direct the patient's care		
Implement advance directives for end-of-life medical care		
Know the ethical and statutory constraints on the withdrawal or withholding of treatment		
Practice the methods of personal risk management (documentation, communication and instruction, informed consent and follow-up) to avoid frivolous claims of malpractice		
Know statutory requirements to report events (for example, death, reportable diseases, abuse, and neglect) to civil authorities and know how to respond in order to ensure compliance with these regulations		
Know the administrative regulations that govern medical practice and know how to respond in order to be in compliance		
Know the principles of business law that affect the practice of medicine		
Know how bioethics and legal medicine relate to one		

Illustrative Clinical Settings: Any clinical setting, but particularly those that involve conflicts that require the application of legal medicine principles for resolution.

The Management of the Quality of Health Care

In the past, efforts to exert control over the quality of health care have relied upon sanctioning of physicians after retrospective discovery of instances of poor quality care. The essence of the method was to find an error after it occurred and punish the person who made the error. This method has become outdated with the emergence of a new paradigm for quality management in industry in the United States and its application to health care. The new approach changes the production process so that the number of errors decreases. A motivation for applying this principle to health care is the emergence of managed care, with its focus on reducing costs while sustaining or improving the quality of care. The persuasiveness of current efforts to improve quality while reducing costs suggests that physicians-in-training will become involved in quality management and learn how to work with other professionals as members of quality management teams.

See also: Management of Medical Practice, Professionalism, Continuity of Care, Lifelong Learning, and Clinical Epidemiology.

Competencies for the Management of the Quality of Health Care

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Be able to describe the training institution's quality management program		
Know methods for evaluating the effectiveness and efficiency of one's practice patterns		
Be able to describe how to use comparative data to measure variations in practice and thus identify best medical practices		
Know some of the standard measures of care (for example, functional status, return to work rates, measures of morbidity) and how to obtain them		
Know how to interpret the analytic tools utilized in quality improvement (for example, flow charts, fishbone diagrams, control charts)		
Be able to describe the methods used by external agencies and third-party payers to evaluate quality of care		
Know the principles underlying the study of practice patterns by using statistical profiling		
Be able to measure patient satisfaction in one's practice		
Know the method used to develop practice guidelines and critical pathways and how physicians use them in the management of disease		
Be able to describe how to develop a quality improvement project		
Know the physician role in efforts to improve health care		
Know how to lead a health care team that is trying to improve the quality of its services (understand team behavior, working with a team, and reshaping a team)		
Be able to describe measures of severity of illness and comorbidity		
Know the respective roles of the regulatory agencies involved in maintaining quality of medical care (for example, JCAHO, NCQA, HCFA, and state health care councils)		

Illustrative Clinical Settings: Although these competencies can be addressed in the context of clinical care, they are best acquired through participation in quality management teams and related activates.

Nutrition

Clinical nutrition focuses on the importance of nutrition in the maintenance of health and the interrelationship between nutrition and disease. Areas of interest for the general internist include enteral and parenteral nutritional support for hospitalized, homebound, or chronic care patients; nutritional support for surgical and trauma patients; and the role of nutrition in disease prevention. The curriculum should emphasize nutritional assessment and management of patients with nutritional deficiencies or excesses, hypersensitivities, eating disorders, nutritional diseases, and other pathological conditions in which nutrition therapy would be beneficial.

See also: Geriatrics, Adolescent Medicine, Oncology, and several clinical disciplines.

Competencies for Nutrition

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Identify from the history important risk factors for malnutrition, such as advanced age, poor dentition, poverty and isolation, alcoholism, and chronic illness, particularly malignancy and gastrointestinal illness		
In a patient with risk factors for malnutrition or eating disorders, know how to screen for malnutrition through physical examination and appropriate procedures		
Review with a patient the dietary management for these common clinical conditions: obesity, hypertension, hyperlipidemia, diabetes, osteoporosis, congestive heart failure, and renal insufficiency		
Know the indications for and content of enteral and parenteral nutrition		

Illustrative Clinical Settings: Geriatrics, oncology unit, intensive care unit, adolescent unit, shelters, and other free-care clinics.

Preventive Medicine

Preventive medicine focuses on maintaining health and preventing disease, disability, and death. The basic components of preventive medicine include biostatistical principles and methodology; epidemiologic principles and methodology; planning, administration, and evaluation of health and medical programs; recognition and control of environmental and occupational hazards; social, cultural, and behavioral factors in medicine; and application of preventive principles and outcome measures in clinical practice. In the role of primary care physician, the general internist will engage in preventive medicine every working day. Mastery of this topic is essential and, importantly, a source of great satisfaction for general internists.

See also: Clinical Epidemiology, Continuity of Care, Clinical Method, Management of the Quality of Health Care.

Competencies for Preventive Medicine

Competency	Learn in a seminar or conference (specify)	Learn as part of a clinical rotation (specify)
Understand the principles of the determinants of risk of disease		
Understand the principles of periodic health appraisal and the role of screening		
Understand the principles of age-specific profiles of risk		
Understand the principles of prophylaxis of disease		
Understand the principles of counseling to reduce risk		
Know the principles of investigating an epidemic		
Know the methods of behavior modification, risk assessment, and risk modification		
Know how to apply basic principles of critical evaluation of the literature to the study of screening and disease prevention		
Know the principles of office-based strategies for enhancing the delivery of preventive services		
Know the current adult preventive services recommendations of the U.S. Preventive Services Task Force, the American College of Physicians, or the Canadian Task Force on the Periodic Health Examination.		

Illustrative Clinical Settings: Continuity practice, community-based practice.