

## Training Students Who Are Competent in Clinical Pharmacology

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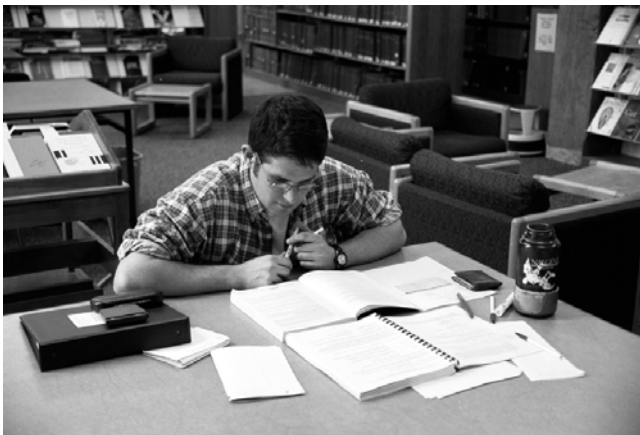
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## Competency Domains (US) ACGME, 1998 LCME, 2005

- 1. Medical knowledge
- 2. Clinical skills for patient care
- 3. Interpersonal and communication skills
- 4. Professionalism
- 5. Practice-based learning and improvement
- 6. Systems-based practice





## 1. Medical Knowledge:

- What each student needs to learn, understand, and be able to apply in order to become a competent resident prescriber.

## 1. Medical Knowledge: Broad topics

- Factors which make each patient unique
- Principles of clinical pharmacokinetics
- Prescribing commonly prescribed drugs or drug classes
- Management of common diseases and medical emergencies
- Rules and regulations that govern prescribing
- Process and regulations governing drug discovery and development

## 1. Medical Knowledge: Broad topics

- Dx, Rx plans for patients with SA problems
- How to find and use most up-to-date information
- Medication errors
- Adverse drug reactions
- Drug-drug interactions
- Complementary and alternative therapies
- Statistical issues and trial design

## Factors which make each patient unique: Subtopics

- Age
- Sex
- Pregnancy, breastfeeding
- Liver function
- Kidney function
- Pharmacogenetic background
- Concurrent meds
- Concurrent medical conditions
- Previous ADRs or allergies

## Factors which make each patient unique: Detailed examples

- Effects of liver function (and liver disease) on drug of choice
- Effect of renal function on choice and dosing of medications
- Effect of prior penicillin allergy on choice of antibiotics
- Effect of pregnancy on treatment of UTI



## 2. Clinical skills for patient care

- What clinical skills each graduate needs in order to provide excellent care to his/her patients

## 2. Clinical Skills: Broad topics

- Communicate well with patients and families about drug-related topics
- Obtain detailed and accurate drug history
- Have a robust process for developing a sound drug therapy plan
- Use IT resources to support clinical decisions
- Prescribe thoughtfully, unambiguously, and clearly

## 2. Clinical skills: Broad topics

- Find recent critical pathways and evidence-based medical information
- Read and understand package insert
- Use therapeutic drug monitoring effectively, when needed
- Interpret and use anbiograms effectively
- Maintain accurate and useful medical record

## Obtain detailed and accurate drug history: Subtopics

- Prior medications: indications, why stopped
- Current Rx meds
- Current OTC meds
- Current topical meds
- Current CAM products (e.g. St Johns Wort)
- Past allergies and ADRs
- Family or genetic information

Obtain detailed and accurate drug history:  
Detailed examples

- Eliciting accurate history to separate allergy from ADR (e.g. opioid-induced nausea or hives)
- Assessing accuracy of history and possible causality (e.g. rash in patient on ampicillin during mono)
- Assessing family history of anesthesia problems (e.g. malignant hyperthermia)



3. Interpersonal and Communication Skills

- How medical students must be able to relate to, and communicate with, their patients and clinical colleagues in order to optimize the effectiveness of their therapeutic plans

3. Interpersonal and Communication Skills: Broad topics

- Create and sustain a therapeutic and ethically sound relationship with patients
- Use effective listening skills and elicit and provide information using effective explanatory and questioning skills
- Work effectively with others as a member or leader of a health care team
- Develop sound communication skills with detail reps from pharmaceutical companies
- Ability to recognize errors, and communicate effectively with patients about them

3. Interpersonal and Communication Skills: Broad topics

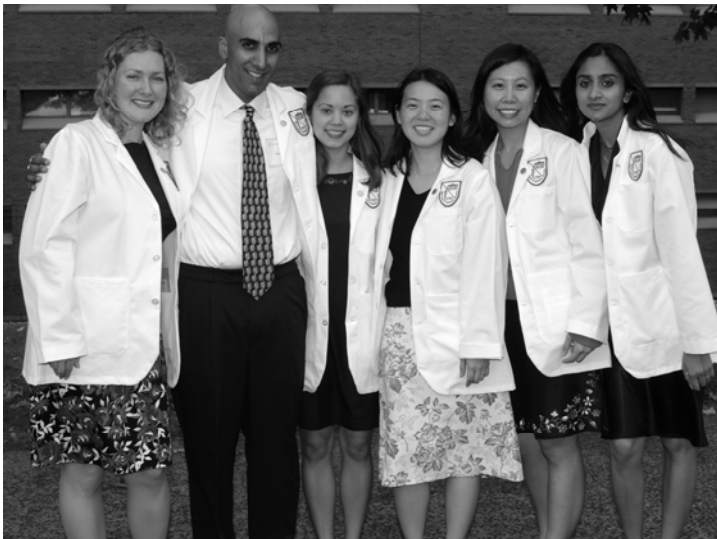
- Explain to patients the drugs that they have learned about through DTC advertising
- Understand how cultural background can alter patient views of drug therapy and disease causation
- Special communication issues related to drug research
- Avoiding collusion of anonymity

Special communication issues related to drug research: Subtopics

- Participation as human subject
- Obtaining truly informed consent
- Helping patients deal with risk and uncertainty
- Explaining results of recent clinical research: absolute difference, relative difference, NNT

Special communication issues related to drug research: Detailed examples

- What elements are essential for informed consent?
- Role of the IRB in approving trials
- How presentation of results in different ways alters patient perception of benefits (1%, 15%, n=100, \$250,000 per LS)



4. Professionalism:

- Medical students must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

4. Professionalism: Broad topics

- Demonstrate respect for patient, show compassion, and model integrity
- Commit to a habit of lifelong learning about drugs, and a commitment to therapeutic excellence
- Understand accountability to society and the profession
- Demonstrate commitment to ethical principles
- Show sensitivity and responsiveness to patients' culture, age, sex, and disabilities

#### 4. Professionalism: Broad topics

- Practice behaviors that support personal health, career fulfillment, and prevent burnout
- Understand the importance of admitting error, and apologizing when appropriate
- Know your own personal limitations in knowledge or therapeutic skills, and feel comfortable asking for help or advice
- Balance commitment of welfare of the individual patient, with concerns for society

#### Understand accountability to society and the profession: Subtopics

- Responsibility for discovering and reporting new knowledge about drugs
- Need to intervene when one observes unethical behavior or an impaired physician
- Compliance with DEA and state rules about prescribing regulated substances

#### Understand accountability to society and the profession: Specific examples

- How to file a MedWatch report of a serious, suspected ADR
- How to communicate with drug company office of medical affairs to report suspected serious ADR
- How to spot and report an impaired physician within your community, hospital, or state board of medicine



#### 5. Practice-based Learning and Improvement:

- Medical students must be able to investigate and evaluate their own patient care practices, appraise and assimilate scientific evidence, and find ways to improve their patient care practices.

### 5. Practice-base Learning and Improvement: Broad topics

- Analyze practice experience and perform practice-based improvement activities
- Locate, appraise, and assimilate evidence from scientific studies related to patients' health problems
- Obtain and use information about their own population of patients and the larger population
- Apply knowledge of study designs and stat methods to appraisal of clinical studies

### 5. Practice-base Learning and Improvement: Broad topics

- Use information technology to manage information, access on-line medical information, and support personal education
- Understand use of critical pathways and guidelines to optimize practice
- Understand role of hospital P&T Committee

### Analyze practice experience and perform improvement activities: Subtopics

- Critical pathways
- Evidence based medicine sources
- Patient safety initiatives
- Medication errors
- Quality improvement initiatives
- PDCA cycles and redesign

### Analyze practice experience and perform improvement activities: Specific examples

- Perform root cause analysis of medication error
- Analyze why some practices have better compliance for aspirin, beta-blockers, and ACE inhibitors in patients S/P acute MI



## 6. Systems-based Practice

- Medical students must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value

## 6. Systems-based practice: Broad topics

- Describe how their patient care affects other health care professionals, the health care organization, and the larger society
- Understand how these elements of the system affect their own practice
- Know how different delivery systems differ in controlling health care costs and allocating resources
- Practice cost-effective health care and resource allocation that does not compromise quality of care
- Advocate for quality patient care and assist patients in dealing with system complexities

## 6. Systems-based practice: Broad topics

- Understand roles of different professionals in the prescribe-transcribe-compound-dispense-administer chain
- Describe how prescribing practices can impact the healthcare system
- Understand how the system can support or hinder complex prescribing such as for substance abuse, palliative care, home treatment with antibiotics
- Describe the role of the FDA, and how it could be strengthened and improved

Understand how the system can support or hinder complex prescribing situations:  
Subtopics

- Rules, regulations social acceptance of treatment for substance abuse
- High dose opioids for palliative care
- Home-based treatment for what used to be treated in hospital

Understand how the system can support or hinder complex prescribing situations: Specific examples

- New rules and regulations for office-based buprenorphine maintenance therapy
- Therapeutic choices for avoiding hospitalization of patient with acute DVT or PE
- Technical issues in prescribing home-based intravenous antibiotics



## People to Thank!!

- Those who have thought about and written about education in clinical pharmacology
  - Maxwell and Walley: Teaching safe and effective prescribing in UK medical schools: a core curriculum for tomorrow's doctors. Br J Clin Pharm 2003;55:496-503.
  - J Gray, L Lewis, D Nierenberg: Clinical pharmacology education in primary care residency programs. Clin Pharmacol Ther 1997;62:237-240.



## More Thanks

- Fellow CP educators: Lionel Lewis, Jean Gray
- Students at Dartmouth, who constantly provide feedback (requested or not!)
- ACGME and LCME
- AAMC (MSOP Expert Panel on Education in Safe and Effective Prescribing Practices)
- Ken Melmon and Howard Morrelli

