Clinical Pharmacy: Education, Hospital Practice and Regulation in the USA

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Goals

- How did clinical pharmacy education evolve in the USA?
- What does it look like today?
- What clinical pharmacy services are being offered in USA hospitals?
- What is the scope of practice regulations in the USA?

Clinical Pharmacy:

A Shift in Practice Philosophy and Education

FROM		TO
Drug Product	→	Drug Therapy
Pharmacy	→	Bedside
Dispenser	→	Caregiver
Solo	→	Team
Knowledge	→	Information
As ordered	→	As best prescribed

Pharmacy Education in the USA

Practice Stimulates Change
Early 1970's

New Roles Required New Skills

- Medical terminology
- Clinical use of drugs in disease and patients
  - Pathophysiology
  - Therapeutics
- Therapeutic problem-solving
- Communication: verbal and written
- Literature evaluation

Need for New Skills Required:

- New Curriculum
- New Approach to Teaching
- New Faculty

Clinical PharmD Curriculum at UCSF Took Shape Quickly

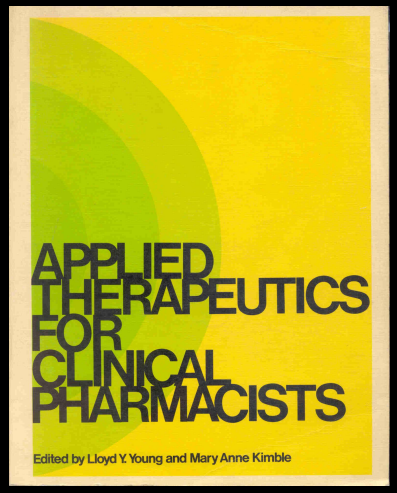
- Strong basic sciences maintained
- More biological and medical sciences
- Chemistry and basic science laboratories decreased
- Therapeutics course added
- One full year of patient care clinical experience required

New Teaching Methods Set in Motion

- Active learning
- Problem solving
- Communication skills
- Teamwork

Pharmacists Added to Faculty to:

- Develop faculty practices in the UCSF Medical Center
- Design new courses
- Write new clinical textbooks: Therapeutics and Pharmacokinetics



Education for a PharmD Degree Now

>95% have degrees (≥ 4 years) at UCSF

~ 15% graduates pursue postgraduate training: residencies, fellowships, degrees

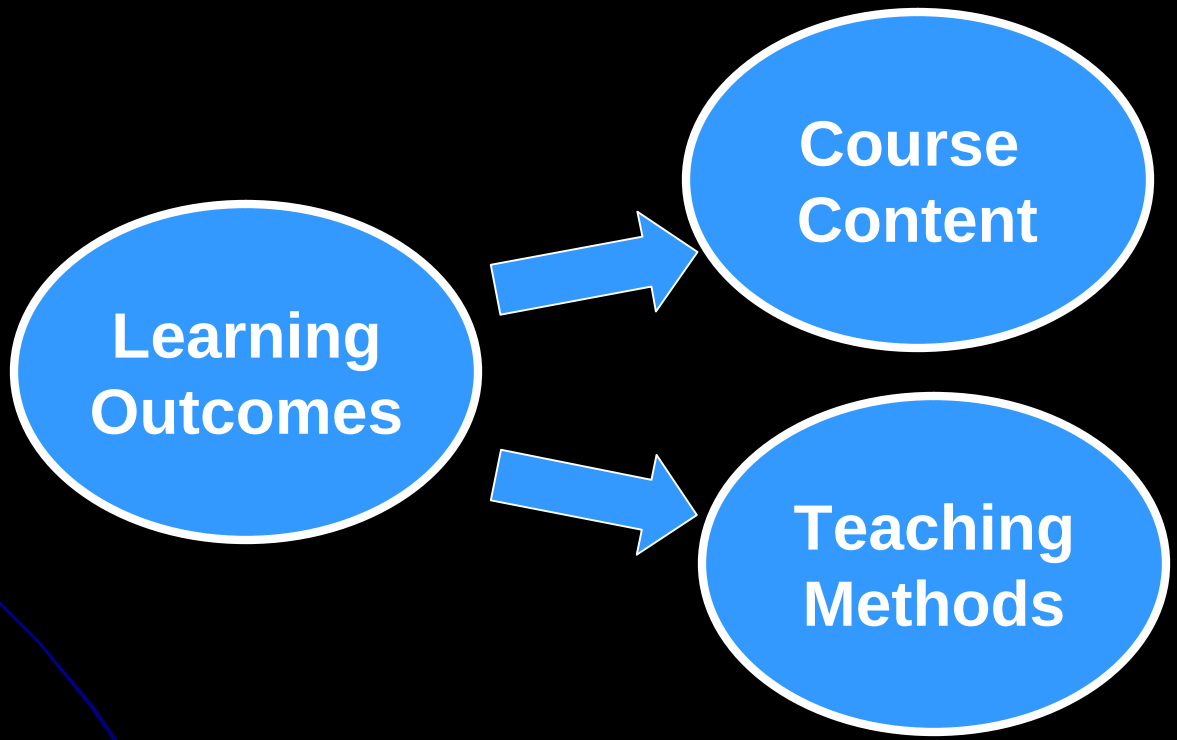
ACPE Accredits PharmD Programs Only Beginning 2000

“Standards 2000”

Standards 2000 Principles

- "New" PharmD
- Prepare practitioners to deliver pharmaceutical care
- *Early* and advanced pharmacy practice experiences
  - *Community*
  - Hospital, other
- Learning outcomes (linked to content and…)
- Teaching, learning, and evaluation processes
- Systematic, continuous assessment and quality improvement (students and program)
- Experimentation and innovation

Learning Outcomes Linked to Content and Methods



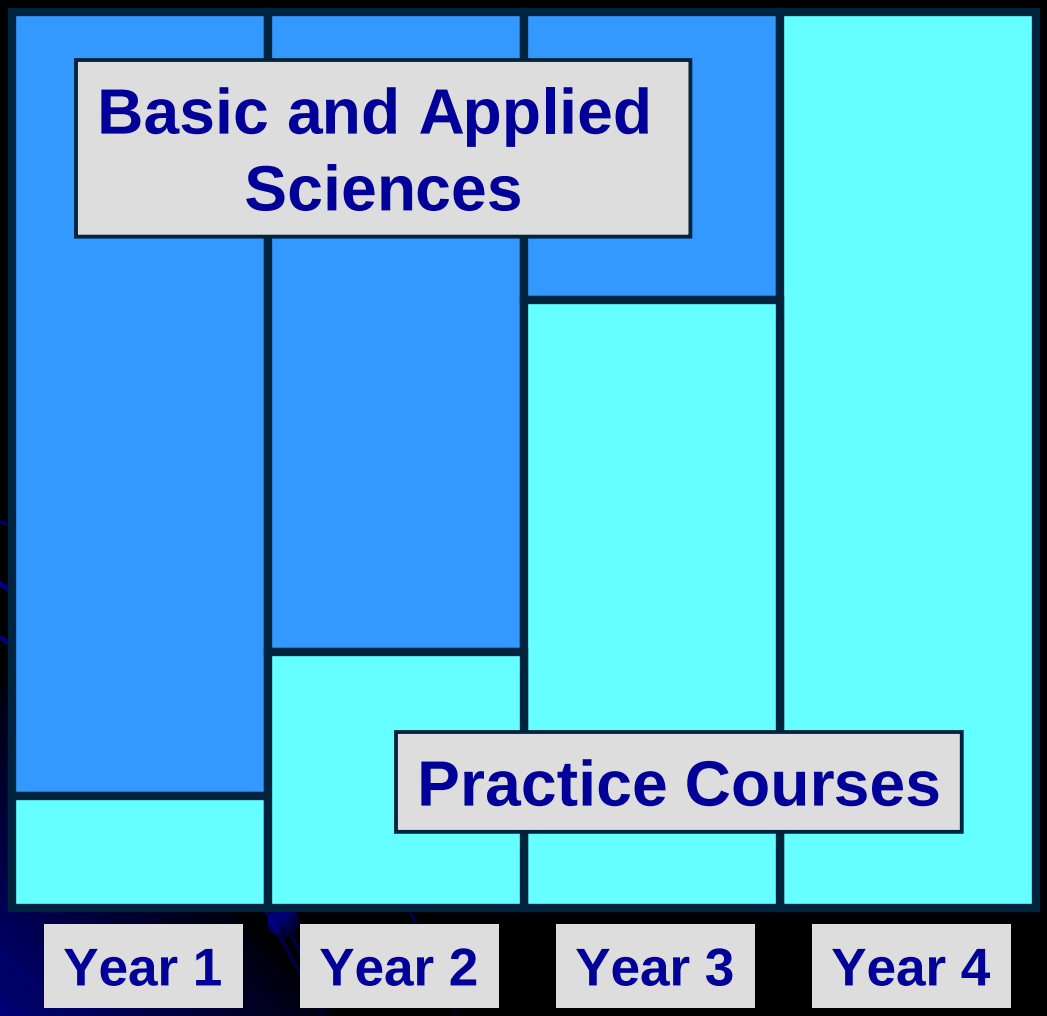
ACPE Educational Outcomes

- Apply science and math to practice
- Conceptual understanding of health care systems and pharmacy practice
- *Effective communication, interpersonal, and collaborative skills*
- Critical-thinking, problem-solving, and decision making skills
- *Information management and analysis skills*

Educational Outcomes

- *Design, implement, manage, and evaluate appropriate treatments for individual patients and diverse patient populations*
- Professional values and ethical behavior
- Patient orientation, cultural sensitivity, personal responsibility
- Self-learning and adaptive skills
- Leadership and entrepreneurial skills that effect change

Typical Curricular Design Today



4 Professional Years

More Medical Biology and Applied Sciences

Anatomy, Microbiology, Histology, Immunology
Physiology, Biochemistry, Pathology

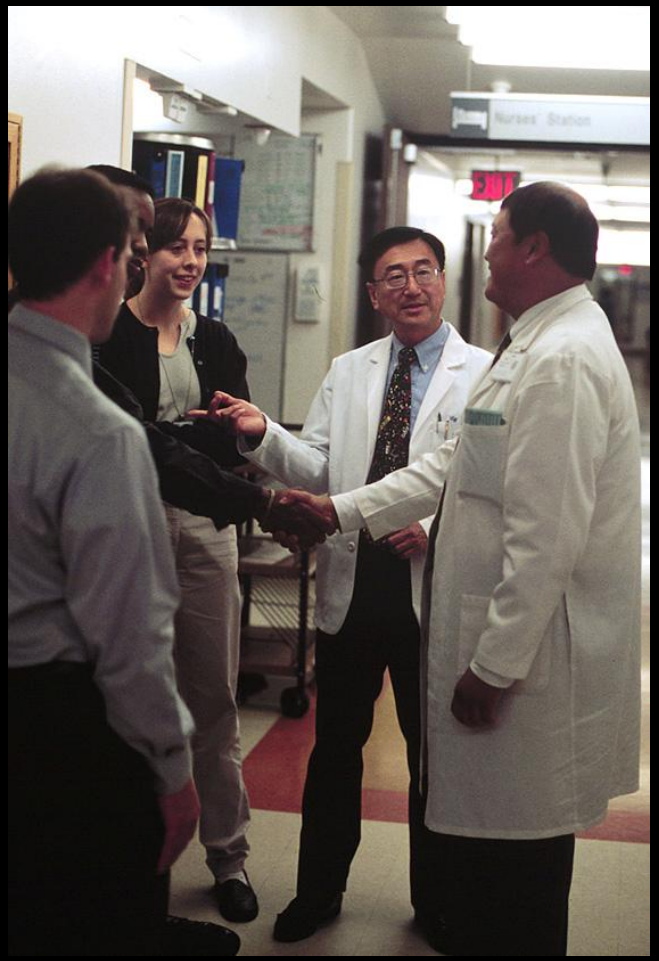
Informatics Literature Evaluation

Informatics Resource Center

Group and Interactive Learning

Student Poster Session

Advanced Practice Experiences



- Practitioner Teachers

Becoming a Pharmacist in the USA

- PharmD graduate from an *accredited* School of Pharmacy
- Take and pass the national licensure examination
- Complete ≅ 1 year practice experience while in pharmacy school (internship)
- Be in good standing with the legal authorities
- Continuing education to maintain license

Clinical Pharmacy Practice in Hospitals

2006 Central Clinical Pharmacy Services in Hospitals

Drug Use Evaluation	90%
In-service Education	66%
Drug Information	40%
Poison Information	19%
Clinical Research	24%
Drug Safety Officer	35%

Bond CA, Raehl, CL. 2006 National Clinical Pharmacy Services Survey: Clinical Pharmacy Service, Collaborative Drug Management, Medication Erros, and Pharmacy Technology. Pharmacotherapy 2008;28(1):1-13.

2006 Patient-Specific Clinical Pharmacy Services in Hospitals

Pharmacokinetic Consultation	87%
ADR Management	81%
Drug Protocol Management	77%
Drug Therapy Monitoring	63%
Medical Rounds Participation	51%
Drug Therapy Counseling	46%
TPN Team Participation	45%
CPR Team Participation	37%
Admission Drug Histories	7.5%

Bond CA, Raehl, CL. Pharmacotherapy 2008;28(1):1-13.

Drug Protocol Management

- Aminoglycosides 64%
- Vancomycin 64%
- Warfarin 38%
- LMW Heparin 33%
- Heparin 30%
- Antiparkinsonian Drugs 23%
- Proton Pump Inhibitors 23%
- HIV Drugs 22%
- Cephalosporins 20%

Bond CA, Raehl, CL. 2006 National Clinical Pharmacy Services Survey: Clinical Pharmacy Service, Collaborative Drug Management, Medication Erros, and Pharmacy Technology. Pharmacotherapy 2008;28(1):1-13.

7 Hospital Clinical Pharmacy Services Save Lives

- Drug use evaluation
- In-service education
- Adverse drug reaction management
- Participation on CPR team
- Drug protocol management
- Participation on medical rounds
- Admission drug histories

Bond CA, Raehl CL. Clinical Pharmacy Services, Pharmacy Staffing, and Hospital Mortality Rates. Pharmacotherapy 2007;27(4):481-493.

Clinical Pharmacy Services Improve Care

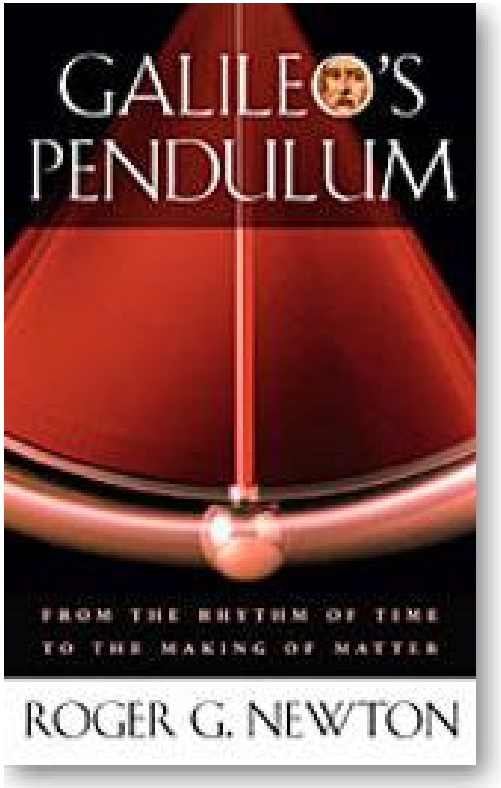
- Decreased
  - Adverse drug events
  - Adverse medication reactions
  - Medication errors
- Improved
  - Medication adherence
  - Drug knowledge
  - Appropriate medication use
- Shortened length of hospital stay

Kaboli PJ et al. Clinical Pharmacists and Inpatient Medical Care: A Systematic Review. Arch Intern Med. 2006;166:955-964

Perhaps We Have Swung Too Far

Distribution Pharmacist

- Product-centric
- Little interaction
- Physically isolated – Central pharmacy or satellite



Specialist Pharmacist

- Physician-centric
- On the wards
- Little interaction with distribution pharmacist

Blended/Integrated Pharmacist

- Nurse/physician/patient/product-centric
- On the wards

Pharmacist is the Chief Medication Safety Officer

- Safe and effective prescribing
  - Physician interaction
- Safe and efficient drug delivery systems
  - Drug selection
  - Drug preparation
  - Drug dosing
  - Drug storage and delivery
- Safe administration and use
  - Nurse collaboration and education
  - Patient/family education
- Safe and effective response
  - Monitoring for dose, therapeutic response, ADEs and medication errors

Scope of Practice
Defined by Pharmacy Practice Acts

Role of the practitioner in the
health care setting

Pharmacy Practice Acts - 1999

Dispensing	100%
Compounding	92%
Consultation	85%
Drug Utilization Review	69%
Drug Product Selection	54%
Drug Administration	21%
PK Consultation	13%

Young MD et al. Pharmacy practice acts: a decade of progress. Ann Pharmacother. 1999 Sep;33(9):920-6

Purpose of Practice Regulations

- **Protect the public**
- **Assure competency**
- **Discipline**

Changes in Healthcare Professions' Scope of Practice: Legislative Considerations.
A collaboration of six healthcare regulatory organizations.

Overlap in Practice Among Pharmacists, Nurses, Physicians

- **Many common skills**
- **Many common procedures carried out by all**

BUT:

- **Can pharmacists provide expanded services safely and effectively?**
- **Will expanded services provided by pharmacists improve access and care?**

Changes in Healthcare Professions'Scope of Practice: Legislative Considerations
A collaboration of six healthcare regulatory organizations.

Arguments for Expanded Scopes of Practice

- Established history of practice scope within the profession
- Education and training prepares practitioners to perform the skill
  - Standards for education and training
  - Supporting evidence for competency
- Evidence for a public health benefit
- Appropriate regulatory environment

Changes in Healthcare Professions'Scope of Practice: Legislative Considerations.
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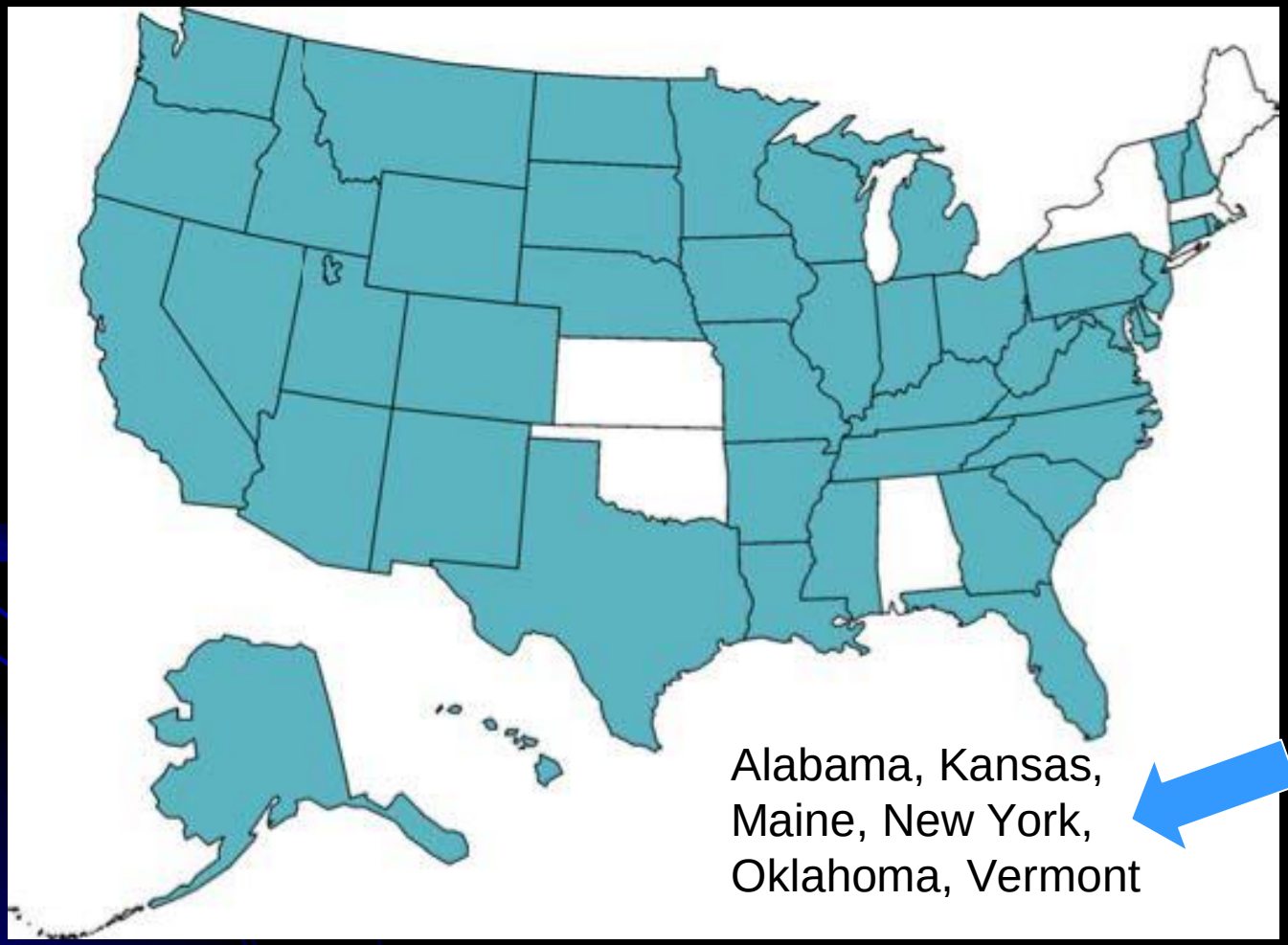
Collaborative Drug Therapy Management Occurs Across the USA



Only 6 States Do Not Allow

Collaborative Practice Agreement

- An **agreement** between one or more physicians and pharmacists
- Under a defined **protocol**, prescriptive authority is delegated to specific pharmacists
- Reviewed and **approved** by appropriate bodies in the hospital (e.g. Executive Medical Committee)

Hammond R, et al. Collaborative drug therapy management by pharmacists-2003 American College of Clinical Pharmacy. Pharmacotherapy 2003;23(9):1210-1225.

Collaborative Practice Agreement Activities

- Initiating, modifying, and monitoring a patient's drug therapy
- Ordering and performing laboratory and related tests
- Assessing patient response to therapy
- Counseling and educating a patient on medications
- Administering medications

Pharmacy Practice Acts - 1999

- Inconsistent among states
- No uniform legal responsibility reflecting contemporary practice
- New laws primarily address progressive practice functions

Young MD et al. Pharmacy practice acts: a decade of progress.
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Pharmacy Today and Tomorrow

USA Pharmacy Today

- PharmD curriculum in all schools
- Clinical pharmacy services in most hospitals
- Expanded scope of practice regulations for clinical practice in most states
- Pharmacist-managed drug therapy in some ambulatory clinics (not widespread)

US Pharmacy Today

- Clinical practice in community pharmacies limited, but growing
- Broader physician recognition of pharmacists as clinicians
- Greatly expanded opportunities for PharmDs

Our Patients – Our Passion