Innovations in clinical pharmacy education and research

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One of the most dramatic changes in

- pharmacy education
- pharmacy practice

Gloria N. Francke, 1969

Developments in pharmaceutical sciences

- Pharmacokinetics
- Biopharmaceutics

Pharmaceutical education

Clinical Pharmacy

Pharmaceutical practice

Dramatic changes in pharmacy education

- Addition of courses in pharmacokinetics and pharmacodynamics, biopharmaceutics
- Pharmacotherapy-related courses
- Experientials
- Post-graduate residencies
- Problem-based learning
## Pharmacy Education in Europe in 1994

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<tr>
<th>Subject area</th>
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<td>Physics and Mathematics</td>
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Where should we go in Pharmacy Education?

“The advancement of the function of pharmacists in the quality and efficiency of medicines use will require schools of pharmacy to respond with appropriate shifts in the education of the pharmacist as a clinical practitioner.”

Pharmacy Education: Target

Provide pharmacy education that prepares graduates who can function within a diverse and complex pharmaceutical setting.
Pharmacy Education: Focus

Mobilize knowledge
Merge science and practice
Pharmacy Education: Outcome

- Development of **critical thinking** and problem-solving skills
- Transition from dependent to **active, self-directed** lifelong learners
Example: Objectives of the Experiential Learning Module

- Utilise the principles of experiential education and engagement of students in “real-life” activities.
- Describe the importance of workplace skills.
- Instill the importance of competence through lifelong learning habits.
- Provide basic understanding and utility of continuous professional development.
- Provide appropriate leadership skills through example.
Reflecting on your strengths and what you want to learn and improve

Identify 3 SMART learning objectives:
- specific
- measurable
- achievable
- relevant
- timed

Student Portfolio
Complete reflection form at the start and midpoint

Daily record sheet
Evaluation sheet at the start (t0), midpoint (t7) and the end
• Emphasise active engagement of students in the learning models
• Foster scientific inquiry and innovation
• Immerse students in practice early

Models

- Case-based learning
  Flipped Classroom
- Research Projects
  Longitudinal approach
- Experientials
Integration of Science and Practice
Integration of Science and Practice
Pharmacist-led point-of-care genotyping for individualised treatment in cardiology

• Clopidogrel is a prodrug that requires biotransformation to the active metabolite by CYP2C19

• Genetic variation for non functional CYP2C19 has been associated with increased risk of stent thrombosis and higher risk of myocardial infarction, stroke and death
Use of Clopidogrel

Personalised therapy

Cost-effective recommendations

Clinical pharmacist + CYP2C19 genotype results

Limit occurrence of MACE and bleeding

Reduce drug interactions

Slide credit: Wirth F, Azzopardi LM. Pharmacogenetic implications in clopidogrel therapy: A pharmacist-led management approach
Quality System for Clinical Pharmacy Activities

Postgraduate education to support innovation

- Support pharmacists
- Postgraduate education including Level 8 academic degree - equivalent to PhD
  - Applied research
  - Develop advanced skills of assessing scientific knowledge, merging science with application
Postgraduate education to support innovation

Postgraduate doctorate in pharmacy

- Level 8 degree in collaboration with College of Pharmacy, University of Illinois, Chicago
- Develop advanced professional skills in clinical pharmacy and pharmaceutical regulatory sciences
Postgraduate education to support innovation

Postgraduate doctorate in pharmacy

- Inter-professional learning at the professional sites with consultant physicians, nurses and other healthcare professionals

- Take up applied pharmacy research

  Journal clubs, case presentations, scenario analysis, reflective portfolios, presentations and discussions
Skills developed

• Lead and manage medication knowledge, mitigate errors and support decision-making based on evidence-based sources
Postgraduate education to support innovation

Skills developed

• Collect and critically assess clinically relevant data to facilitate innovation in use of drugs, monitoring and management of drug therapy plans
Skills developed

• Identify opportunities for improvement of medication-use systems and development of novel direct patient pharmaceutical services
Empower pharmacists to assume care manager positions and take up leadership roles that will drive policies and developments in pharmaceutical services that draw on scientific, evidence-based and innovative research.
1500, Clinical Pharmacy Services in Europe. Sacra Infermeria Valletta
THANK YOU
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