

2nd National Pharmacy Conference South Africa

**Producing well rounded healthcare
professionals through integrating
science and practice**

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Pharmacy Curriculum

Balance of Science and Practice: At the cross roads again!

- Recognition by the public
- Historical curriculum context
- Current scenario analysis
- Current and future professional/health practitioner needs and roles
- Education for current as well as future innovations
- Re-calibrating the curriculum to accommodate changing professional practices/societal and health care needs



Community Standing of Pharmacists

- In public/consumer surveys Pharmacists are consistently ranked second only to nurses in trustworthiness and ethics and professionalism
- Why is this: approachability, free service, ready availability (first line of call to a health practitioner) or genuine belief in being most knowledgeable about drugs?



What are Megatrends?

Profound trajectory of social, environmental or technological changes occurring over the coming decades

The four Ps of the Future

- Possible
- Plausible
- Probable
- Preferable



From *Global Megatrends - Seven Patterns of Change Shaping our Future* (Stefan Hajkowitz)

Global Megatrends

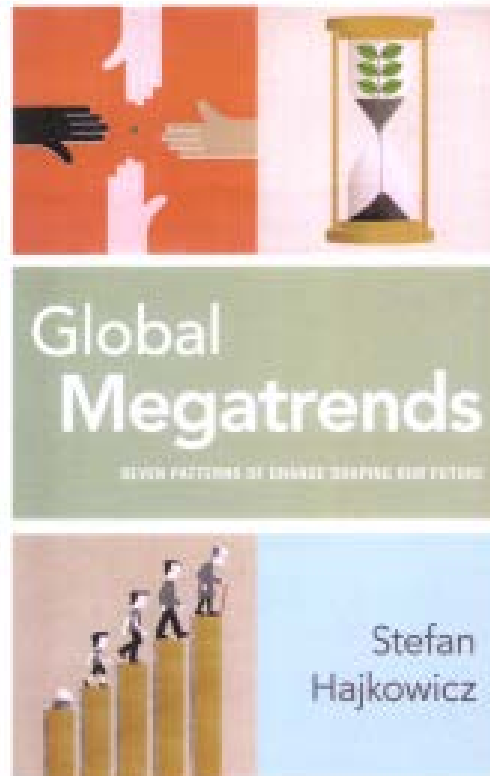


Fig. 4.1: Global megatrends that will change the way we live.

Drivers of Healthcare Megatrends



Healthcare's re-invention is being driven by two main factors

- The search for economic sustainability - healthcare spending is on an unsustainable trajectory because of demographic shifts (ageing for example) and globalization
- Digital disruption- digital health has emerged to enable approaches that are dramatically more cost-effective



Disruptive Technologies



- Mobile internet
- Autonomous/advanced robotic systems (enhanced senses, dexterity & intelligence- will take/do human work)
- Internet of Things
- Autonomous vehicles
- Next generation genomics (joining DNA science with advanced computational/analytical capabilities)
- Advanced materials
- 3 D printing and regenerative medicine (extending length and quality of life)
- Energy storage (better batteries- the tipping point of energy supply)
- Informatics (turning data into knowledge into power)

From McKinsey Global Institute Report May 2013 (Manyika et al); Stefan Hajkovicz (Global Megatrends)

Megatrends in Pharmacy- How will they affect emerging therapies and services

- Automation (less hands-on dispensing)
- Greater role for Pharmacy technicians and wider scope of practice for Pharmacists
- Collaborative practice (GPs, Specialists, Pharmacists, Allied Health Practitioners)
- More drugs will be complex biologic molecules with the need to understand their basic physico-chemical properties and mechanism(s) of action and toxicity
- Which health practitioner is the most soundly trained in the basic biomedical sciences underpinning the discovery, delivery, pharmacokinetics, pharmacodynamics and pharmacogenomics of these new therapies?
- Pharmacists and Pharmacy students/graduates have the greatest understanding of the science that underpins current and future pharmacy practice or clinical pharmacy or healthcare more generally (doctors diagnose and then a health/disease management plan will be developed in a collaborative manner)
- This will be the expectation from patients as well as from governments

Traditional Pharmacy Services

Community Pharmacy

- Dispensing
- Compounding
- Counselling
- Medication review
- Vaccinations

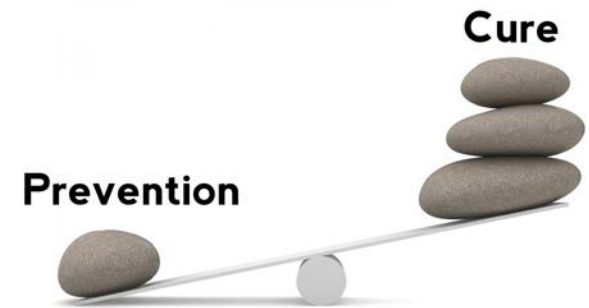
Hospital/Clinical Pharmacy

- ADR Monitoring
- Pharmaco-vigilance
- Ward rounds/Grand rounds
- Drug information
- Medicines reconciliation



New/Emerging Pharmacy Services: Preventive Care Services

- Diabetes prevention (pre-diabetes testing)
- Osteoporosis screening/prevention
- Weight management
- CHD prevention (BP & cholesterol testing)
- Immunization/vaccination (wider scope)
- Advice on complex genetic disorders (e.g., mitochondrial disease)
- Genotyping (CYP 450)
- Point of care testing (e.g., HIV testing)



New/Emerging Pharmacy Services: Medicines Management/QUM



- Medicines Review(HMR/MMR)
- Chronic disease management (diabetes care, asthma management)
- Drug information (CMI/PI) for Western and Complementary Medicines
- Improving Adherence
- Predicting/detecting ADR/drug interactions
- Naloxone administration
- Medical cannabis (safe/legal distribution; change to Narcotics Act, assess suitability of cultivators)

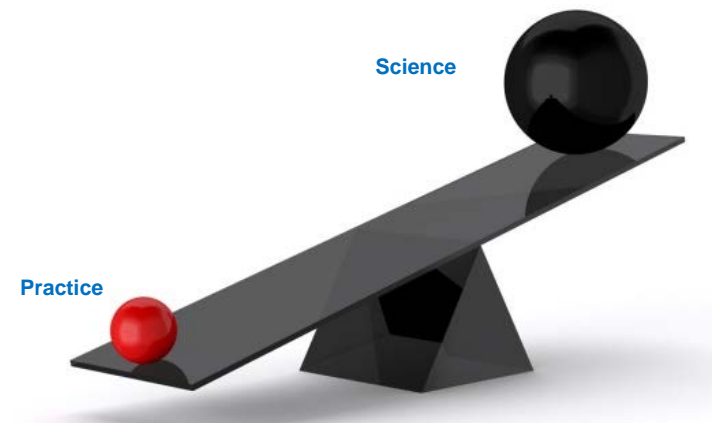
Pharmacy Curriculum- Where have we come from?

- Apprenticeship scheme (Rudiments of Pharmacology- Materia Medica Program in Australia, part of Medicine)
- Three Year bachelor's degree (1960 onwards)
- Four Year bachelor's degree (from 1997)
- GEMs courses (M Pharm introduced in 2004; 3 plus 2 year course)
- Pre-registration year including Intern Training Program, ITP
- All Pharm D? (not in Australia); five year integrated program?
- NRAS- national registration and accreditation scheme (to ensure patient safety and health workforce mobility)



Pharmacy Degree Programs: Balance of science and practice

- Historically dominated by STEMM (science, technology, engineering, mathematics & medicine) subjects
- Then weighted in favour of biomedical/pharmaceutical sciences
- Followed by a radical shift to pharmacy practice/clinical pharmacy (especially in the US) at the expense of underpinning sciences
- Now a need to re-calibrate the balance but emphasizing the relevance and introducing emerging biomedical/pharmaceutical sciences (to match emerging drug complexity)



Future of Pharmacy Education



- Retain and strengthen underpinning sciences- but examine breath and depth of these and relevance to keep pace with changing health practitioner roles and the key scientific contributions from Pharmacists
- Integrate Pharmaceutical Sciences/Pharmacotherapy and Pharmacy Practice/Clinical Pharmacy- not in silos
- Address curricular integration- structure of therapeutics and foundation/advanced sciences
- Units of Study based on disease states and/or body systems
- Adopt a spiral curriculum, where key concepts are introduced early and then the same concepts are emphasised throughout the curriculum with each encounter increasing in complexity that re-enforces previous learning
- FIP Education Conference in Nanjing will adopt a resolution that good pharmacy practice is underpinned by a strong foundation in the sciences

Pharmacy/Health Practitioner Workforce Trends

Tackle this via posing the following questions:

1. What is the new quantity of tasks that have to be carried out?
2. What is the nature of these tasks? and
3. Who has the advantage in carrying out these tasks?



Science is Critical to Pharmacist Roles in New Emerging Therapies and Services

Specific examples

- Generics
- Biologics / Biosimilars
- Nanomedicine and Nanotoxicity
- Personalised Medicine



Conclusions: Future of Pharmacy Education and Workforce

- Prepare for a different Pharmacy and Healthcare workforce
- Embrace technology-enhanced but pedagogically sound professional education underpinned by relevant science that evolves as professional roles evolve



Disclaimer

I hold a number of roles in different organisations



- Dean and Professor of Pharmacy at The University of Sydney
- President / Director of Council of Pharmacy Schools, Australia and NZ (CPS, A&NZ)
- Councillor, Australian Pharmacy Council, APC
- Member, Pharmaceutical Sub-Committee of the Advisory Committee on Prescription Medicines, ACPM (TGA)
- Chair, Australian Pharmacy Leaders Forum (an umbrella group of ten Pharmacy organisations)
- Consultant to Pharmaceutical Industry

VIEWS EXPRESSED IN THIS PRESENTATION RELATE ONLY TO MY ROLE AT THE UNIVERSITY OF SYDNEY



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