

## Prescribing: sharing our experiences

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## Issues to be covered

- What is prescribing
- Assessment, including certainty-based assessment and learning
- Importance of standardised systems

## Adverse drug events (ADE)

- Quality in Australian Healthcare study  $n=14179$ <sup>1</sup>
  - 1.8% of admissions associated with ADE
  - 1.1% of QH admissions 2005 associated with ADE<sup>2</sup>
- ADEs: 0.7% - 24.9% per hospital admission
- Preventable: 19% - 61%
- 52% ADEs associated with prescribing, 11% with transcribing component of medication<sup>3</sup>

1: Wilson et al, MJA 1995; 2: QH IDC Report 2005; 3: Bates, JAMA 1995

## Hospital admissions – 2000-1

- Angina: 88,500
- Myocardial infarction: 37,500
- Asthma: 49,000
- Diabetes: 46,000

## Hospital admissions – 2000-1

- Angina: 88,500
- Myocardial infarction: 37,500
- Asthma: 49,000
- Diabetes: 46,000
- Medication-related 140,000

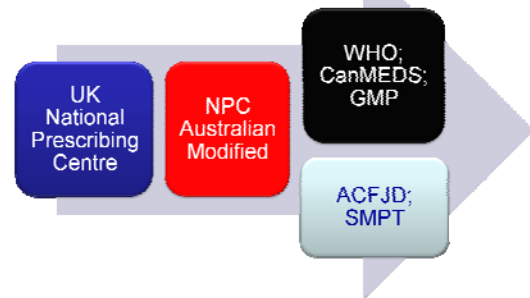
## What's happening in prescribing?

- Non-medical
  - Increasing number of professions are prescribing
  - No agreed common core competencies
- Medical
  - No or little agreement on core competencies
  - No agreed methods of assessment

## Rational prescribing – WHO Model

1. Define patient's problem
2. Specify therapeutic objective(s)
3. Choose your standard drug and verify its suitability
4. Start treatment
5. Give information, instructions & warnings
6. Monitor (and stop) treatment

## Mapping the 4 Domains of Prescribing



## 4 Domains of Prescribing



## Competence

- is the ability to perform a specific task, action or function successfully
- more than enabling knowledge
- rather the appropriate application of knowledge
- includes how needed knowledge effectively obtained
- ideally, should include how competencies are acquired and how assessed

### Info Gathering

- Take/ review medical & medication hx; physical examination; Investigations
- Compare medical & medication hx
- Assess adherence to meds; risk factors for non-adherence
- View/ assess patient's needs holistically (psychosocial, physical)

### Info Gathering

- Access and interpret all relevant records for past management
- Review nature, severity and significance of the symptoms/problem/diagnosis
- Consider natural history of the clinical problem/diagnosis
- Request and interpret relevant diagnostic tests

- Diagnosis
- Consider drug & non-drug options
- Balance benefits and risks of specific drug(s)
- Consider drug-drug, drug-comorbidity interactions
- Consider cost/availability of options
- Select drug, form, route, dose, frequency, duration

**Clinical Decision Making**

- To other medical staff/ prescribers
- Pharmacy staff to review; dispense; arrange supply
- Nursing staff to administer
- Patients/carers to administer
- Contingency plans

**Communicate decision – Prescribe**

**Monitor & Review**

Review:

- Control of symptoms and signs
- Adherence
- Patient's outcomes
- Consider need to tailor therapy to patient, continued or ceased
- Any need to consult?

**Domain**

- Information gathering

**Competency**

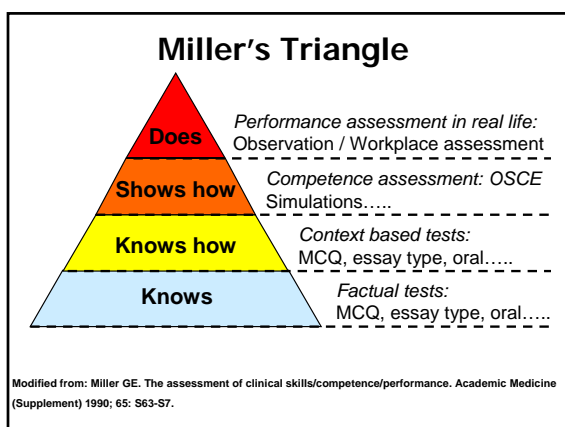
- Assess adherence to current & past medications and risk factors for non-adherence

**Learning objectives**

- Knows the risk factors for non-adherence
- Know the evidence for strategies to improve adherence
- Acquires skills for detecting non-adherent behaviour
- Acquires skills for encouraging medication adherence

**Assessment**

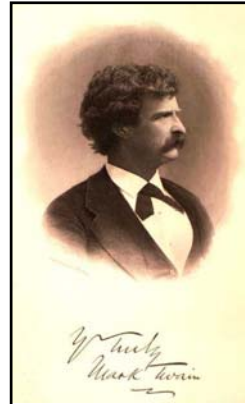
- MCQ
- OSCEs
- MiniCEX (Clinical Examination)



### Common Workplace-based Assessment Strategies

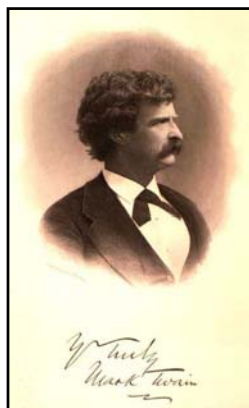
- Supervisors' ratings of performance observed over a period of time
- Mini-clinical evaluation exercise (Mini-CEX)
- Direct observation of procedural skills (DOPS – prescribing audits)
- Case-based discussion (CBD)
- 360 degree (multi-source) assessment (includes Peer Assessment Tool)

## Using Certainty Based Assessment in inter-professional delivery of a safe prescribing workshop



*"I was gratified to be able to answer promptly, and I did!"*

*W. Twain  
Mark Twain*



*"I was gratified to be able to answer promptly, and I did!"*

*I said I didn't know."*

*W. Twain  
Mark Twain*

## Questions for Faculty

A student's answer may be:

Correct

- Did they know it?
- Was it a lucky guess?

Incorrect

- Was it a well held misconception?
- Was it an unlucky guess?

DO WE CARE?

**When you know a thing,  
to hold that you know it.  
And when you do not know a thing,  
to allow that you do not know it.  
This is knowledge.**

**Confucius(551 BC - 479 BC)**

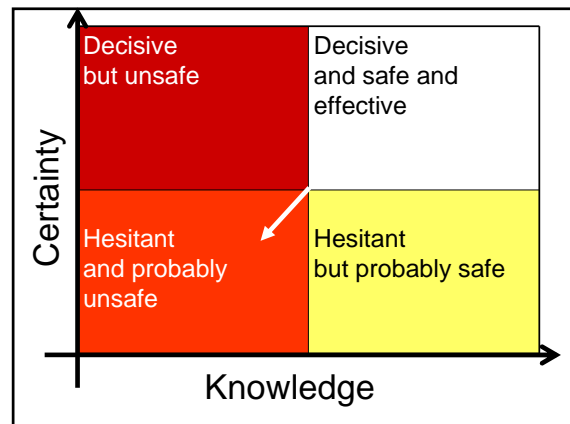


## Background

- Workshop for doctors new to Qld public hospitals
- To enhance skills & awareness of safe prescribing practices
- Based on Safe Medication Prescribing Tutorials
- Delivered by multidisciplinary team: doctor, nurses, pharmacists

## Certainty-Based Learning

- Begins by asking the learner a set of questions
- Then, filling important knowledge gaps with critical content
- Combines knowledge assessment & prescriptive learning into one process
- CBL offers a contextually-smart learning environment similar to a rigorous QI process with a focus on learning



## Methods (1)

- Participant knowledge, application & awareness of gaps in knowledge ascertained using MCQs throughout the workshop

### PLUS

- Indication of certainty level
- Workshop content adjusted to meet learning needs

Which of the following does not cause a reduction in serum potassium?

1	Salbutamol
2	Prednisolone
3	Metabolic acidosis
4	Insulin
5	Diarrhoea

How certain are you?

In a 60 y man with CRF and recent weakness (creatinine 380 mmol/L,  $K^+$  7.9 mmol/L), what initial management is LEAST appropriate?

1	iv calcium gluconate
2	Nebulised salbutamol
3	iv insulin
4	Resonium A
5	Continuous ECG monitoring

How certain are you?

Which one of the following medications does not augment the effect of warfarin?

1	Aspirin
2	Roxithromycin
3	St John's Wort
4	Metronidazole
5	Ginkgo

How certain are you?

In a patient on warfarin 4mg a day for AF, an INR of 5.5 & no evidence of bleeding, you would?

- 1 Stop warfarin for one day and recommence in dose of 3mg a day
- 2 Stop warfarin for 3 days and recommence in dose of 3mg a day
- 3 Stop warfarin for one day and recommence in dose of 2mg a day
- 4 Stop warfarin for 3 days and recommence in dose of 2mg a day
- 5 Stop warfarin, give Vit K and restart warfarin after a few days

How certain are you?

What medication would you use for DVT prevention in a 65 y, 90 kg, obese man admitted with CCF and creatinine clearance of 30mL/min?

- 1 Enoxaparin 20mg a day
- 2 Enoxaparin 40mg a day
- 3 Enoxaparin 40mg twice a day
- 4 Unfractionated heparin (subcut) 5000 units once a day
- 5 Unfractionated heparin (subcut) 5000 units twice a day

How certain are you?

### MCQ Example – Responses

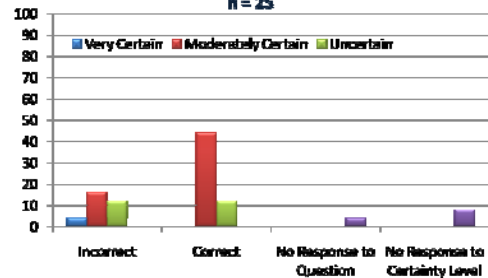
What medication would you use for DVT prevention in a 65 y, 90 kg, obese man admitted with CCF and creatinine clearance of 30mL/min?

n = 25

		Very Certain (%)	Moderately Certain (%)	Un-certain (%)	No Response (%)
Enoxaparin 20mg a day	✓	0	12	0	8
Enoxaparin 40mg a day	✗	0	12	8	NA
Enoxaparin 40mg twice a day	✗	4	4	4	NA
Unfractionated heparin (subcut) 5000 units once a day	✗	0	0	0	NA
Unfractionated heparin (subcut) 5000 units twice a day	✓	0	32	12	NA
No response to question	NA	NA	NA	NA	4

What medication would you use for DVT prevention in a 65 y, 90 kg, obese man admitted with CCF and creatinine clearance of 30mL/min?

Correctness of Response vs Certainty Level (%)  
n = 25



### Workshop Modules

- Admission Medication History Taking and Introduction to MAP form
  - Communication task – patient in ED
- IV Fluids and Electrolytes/Antibiotics
  - Communication task – interact with a nurse
- Anticoagulation (+ Warfarin/Heparin Chart)
  - Communication task – patient starting warfarin
- Discharge Communication and PBS
  - Communication task – interact with pharmacist

### Results - Knowledge

- 16 MCQs administered during workshop

	Incorrect (%)	Correct (%)
Certainty	4	37.5
	17	17.5
	11	6
	Knowledge	

## Results - Knowledge

- 16 MCQs administered during workshop

	Incorrect (%)	Correct (%)
Certainty	Decisive but unsafe 21	Decisive and safe and effective 55
	11	6

Knowledge →

## Educational activities

- Facilitated by standardised processes
- Medical schools should prepare graduates for internship; ensure:
  - Safe
  - Familiar with common forms and systems

## Medical Education 1900-2000+

- Science based
- Problem based
- Case based
- Systems based, using current (& hopefully, standardised) processes

## Standardisation of Systems

- Means doing the same thing in the same way in the same circumstance. Benefits include:
  - improvement in safety and efficacy of systems
  - increased familiarity when staff rotate
  - reduction in opportunities for patient harm
- Should be evidence based
- Enables effective education and training of specific tasks and procedures

## MAP

- One place to capture complete & accurate medication history on admission
- Facilitates medication reconciliation
- Form kept in bedside folder near active medication chart
- Currently implemented in ~80% QH beds

MAP form

Area to record medicines taken prior to presentation to hospital

## BGL-Insulin Charts

- Two developed
  - BGL monitoring and intravenous insulin chart
  - BGL monitoring and subcutaneous insulin administration chart
- Processes demonstrated to be safer
  - IV insulin infusion rates documented incorrectly decreased from 10.4% to 5.6% ( $p=0.0004$ )
  - Improvements in clarity of Insulin prescribing. Opportunity for error as a result of unclear order decreased from 41.8% to 12.2% ( $p<0.0002$ )

## Recent changes

- Good compliance except nurses not calling docs with out-of-range BGLs
- Recent development of the 'Children's Early Warning Tool' (CEWT) and the Adult Deterioration Detection Scale (ADDS)
- Insulin Forms Version 3 has borrowed from this methodology

The image shows a 'Blood Glucose Record - Adult' chart for a patient named Alan. The chart tracks blood glucose levels (BGL) and insulin doses (Novorapid and Lantus) over a period of time. The top section shows BGL readings with columns for 'Full' and 'Partial' readings. The middle section shows insulin doses for Novorapid and Lantus. The bottom section shows a summary of the data, including the number of doses and the total amount of insulin administered.

## Other forms include:

- Inpatient Medication Chart
- Heparin Prescribing and Administration
- Intravenous and Subcutaneous Fluids
- End-of-bed decision support
  - Fluid and electrolyte
  - Warfarin
- PCA & Epidural Analgesia
- Graseby Syringe Driver Subcutaneous Medication Infusion
- Mental Health Depot Medication

## Now, we can develop centrally:

- Decision support
- Audit systems
- Alerts
- Education programs for all staff
  - Medical
  - Nursing
  - Pharmacy

## Nurse Medication Risk Awareness

- Initially, 6 scenarios, based on the 6 administration rights that examined nurses' ability to identify potential medication error and knowledge of how these may be avoided
- Now 36 scenarios available - general medicine(23) and surgery, intensive care(2), maternity(2), paediatrics(2), mental health(5), rural/remote(2)
- Used in over 100 QH hospitals
- Soon to be on-line

## Safe medication practice tutorials: a practical approach to preparing prescribers

Jan Coombes, Charles Mitchell, Danielle Stowasser, University of Queensland, Australia

Teachers should include patient safety measures

### INTRODUCTION

**C**linically significant prescribing errors occur in between 0.3 and 39.1 per cent of prescriptions, many of which result in patient harm.<sup>1,2</sup>

the causes and frequency of medication errors, which included prescribing errors. The report identified models of good practice to improve medication safety, many of which focus on reducing prescribing errors.<sup>3</sup>

as the cornerstone in the improvement of the safety of prescribing. Recommendations included enhanced pharmacology and therapeutics training for medical students and junior doctors.<sup>4</sup> The General Medical Council (GMC) in the UK recommends that graduate doctors have knowledge and

A report by the British

A recent symposium focused

## Content of the program

1. Human error and incident analysis
2. Medication history taking & confirmation
3. General prescribing, ADRs & antibiotics
4. Anticoagulation
5. Discharge medication; continuum of care
6. Fluids and electrolytes
7. Insulin and BGL management
8. Analgesics and narcotics

## Focus of program

- NOT pharmacology/ therapeutics lecture(s)
- To raise awareness of risks in medication management system
- To introduce students to the mechanism of safely communicating treatment decisions to “the team”
- To develop skills in history taking, prescribing
- To introduce to basic principles around prescribing of key high risk medications

## High Risk Medications

- **P**otassium and concentrated electrolytes
- **I**nsulin and oral hypoglycaemics
- **N**arcotics
- **C**ytotoxics
- **H**eparin & warfarin
- **A**ntibiotics (aminoglycosides and penicillin allergy)
- **A**nalgesics & NSAIDs

Wilson, MJA 1995; Leape, JAMA 1995; Dean, Lancet 2002

## Intern Training

Suite of resources on topics such as:

- Medication history
- Reconciliation on admission and discharge
- Pain relief/narcotics
- Antibiotics
- Anticoagulants
- Fluid & electrolytes
- BGL & insulin
- Polypharmacy

## Discussion Questions

- What standardisation is happening in your hospitals?
- Is the prescribing cycle a reasonable framework to formulate the required competencies for prescribing?
- What are you doing in the teaching space? Care to share?
- **It's time for a national approach**