Educational resources and assessments for prescribers

Interprofessional education conference, Cardiff, 17th May 2013

Professor Simon Maxwell

University of Edinburgh, UK

s.maxwell@ed.ac.uk

Plan

- Prescribing: a challenge for all of us
- How good is prescribing education?
- Does prescribing education improve prescribing?
- How can we provide better prescriber training?
- How can we assess prescribing competence?
- Future questions

Prescribing: a challenge of all of us

An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study. Dornan et al, 2009

General Medical Council

124,260 medication orders

Prescriber	Description	On admission	During stay	When drug chart re-written	TTA[1]/Discharge Rx	Not known	Not given	NA	TOTAL
FY1	Orders written	14487	10365	7567	16271	342	624	360	50016
	Errors - number	1871	882	311	1038	18	46	24	4190
	Errors - %	12.9	8.5	4.1	6.4	5.3	7.4	6.7	**8.4**
FY2	Orders written	14297	7117	4011	8127	380	626	223	34781
	Errors - number	2175	611	130	546	34	50	22	3568
	Errors - %	15.2	8.6	3.2	6.7	8.9	8.0	9.9	**10.3**
FTSTA[2]s	Orders written	6638	4968	1903	2782	173	200	170	16834
	Errors - number	785	312	90	163	13	17	11	1391
	Errors - %	11.8	6.3	4.7	5.9	7.5	8.5	6.5	**8.3**
NCCG[3]s	Orders written	1268	1447	820	622	120	111	7	4395
	Errors - number	141	80	30	37	3	8	1	300
	Errors - %	11.1	5.5	3.7	5.9	2.5	7.2	14.3	**6.8**
Consultants	Orders written	1037	1421	166	446	14	82	11	3177
	Errors - number	76	77	8	25	1	0	1	188
	Errors - %	7.3	5.4	4.8	5.6	7.1	0.0	9.1	**5.9**
Total	**Orders written**	**44496**	**29014**	**15189**	**31502**	**1260**	**1876**	**923**	**124260**
	Errors - number	**5973**	**2194**	**599**	**2001**	**83**	**145**	**82**	**11077**
	Errors - %	**13.4**	**7.6**	**3.9**	**6.4**	**6.6**	**7.7**	**8.9**	**8.9**

Available at http://www.gmc-uk.org/about/research/research_commissioned_4.asp

PROTECT Study - Scotland

Ryan et al.

	Total	F1	F2	Other	Unknown
Overall					
Number of medicines prescribed	45392	23394	5427	9907	6664
Number of errors	3209	1638	406	757	408
Error Rate (%)	7.1	7.0	7.5	7.6	6.1
Teaching Hospitals					
Number of medicines prescribed	25214	12641	3903	4208	4462
Number of errors	2216	1152	308	426	330
Error Rate (%)	8.8	9.1	7.9	10.1	7.4
District General Hospitals					
Number of medicines prescribed	20178	10753	1524	5699	2202
Number of errors	993	486	98	331	78
Error Rate (%)	4.9	4.5	6.4	5.8	3.5

Causes of prescribing errors

Systems factors

- Working hours
- Patient throughput
- Professional support from colleagues
- Senior supervision
- Poor knowledge of workplace systems
- Availability of information
- Decision support

Prescriber factors

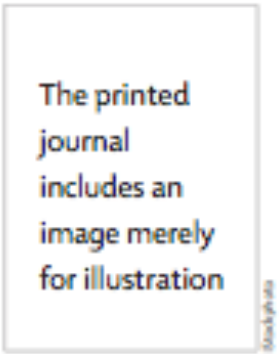
- Knowledge
  - Clinical pharmacology
- Skills
  - Obtaining information
  - Communicating
- Attitudes
  - Coping with risk/ uncertainty
  - Monitoring of prescribing
  - Checking routines

Editorial. *Lancet* 2009;**374**:1945

How to reduce prescribing errors

It is the middle of the night, and you have been asked to see a patient on the ward who is in pain. You assess the patient, prescribe an analgesic, and head wearily to the next ward. Fortunately, a nurse notices that the medicine you have prescribed might adversely, perhaps dangerously, interact with one the patient is already taking. The nurse rings you and a potential calamity is averted. The patient's pain is relieved by another drug.

Many doctors will recall similar instances when a colleague—perhaps another doctor, but more probably a pharmacist or a nurse—prevented a prescribing error from affecting a patient. Teamwork at its best, perhaps, increase their practical prescribing components including prescribing under supervision during student assistantships. Teaching is needed that equips students with the skills to apply pharmacological theory to practice, especially when faced with patients with complex problems on multiple drugs already. Specific on-the-job training in practical prescribing should become routine when foundation year 1 doctors begin their posts. For more senior doctors, the EQUIP study authors suggest that prescribing practice should be included in higher specialist training and in continuing professional development.



- "shocking"
- "almost one in ten hospital prescriptions were wrong"
- "recommendations ..[majority involved better training].. deserve recognition and warrant urgent implementation"

11 Dec 2009

How to reduce prescribing errors

Kent Woods, Chief Executive for the UK's Medicines and Healthcare products Regulatory Agency, told *The Lancet* that "teaching of clinical pharmacology and therapeutics is patchy across medical schools and in some has declined to an unacceptable level". Clinical pharmacologists are well placed to teach medical students and postgraduate doctors, but pharmacists too have a key educational role to play.

Therapeutics—the practical application of pharmacology to the prevention, treatment, and alleviation of disease—needs to become part of every doctor's undergraduate training and continuing professional development. Sustained on-the-job interprofessional training would help to remind doctors of best prescribing practices.

Lancet 2009;374:1945

How good is prescribing education?

BJCP British Journal of Clinical Pharmacology

DOI:10.1111/j.1365-2125.2010.03665.x

Teaching of clinical pharmacology and therapeutics in UK medical schools: current status in 2009

Lelia O'Shaughnessy,[1,2] Inam Haq,[2] Simon Maxwell[3] & Martin Llewelyn[1,2]

[1]Division of Medicine, [2]Medical Education Unit, Brighton and Sussex Medical School, Brighton, East Sussex and [3]Clinical Pharmacology Unit, University of Edinburgh Clinical Research Centre, Western General Hospital, Edinburgh, UK

Correspondence
Dr Martin J. Llewelyn PhD FRCP, Division of Medicine, Brighton and Sussex Medical School, Falmer, East Sussex BN1 9PS, UK.
Tel.: +44 1273 876671
Fax: +44 1273 877884
E-mail: m.j.llewelyn@bsms.ac.uk

Keywords
clinical pharmacology, therapeutics, undergraduate education

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O'Shaugnessy *et al*. BJCP 2010;**70**:143-148

How good is prescribing education?

- Anecdote
  - Students
  - Those teaching students (clinical pharmacologists)
  - Those supervising junior hospital prescribers (physicians)
- Surveys of student opinion
- Regulatory visits
- Hospital prescribing audits/assessments
- *Reliable and valid assessment of knowledge, skills and attitudes relevant to prescribing*

Heaton et al.
Brit J Clin Pharmacol
2008;66:128-134

BJCP British Journal of Clinical Pharmacology

DOI:10.1111/j.1365-2125.2008.03197.x

Undergraduate preparation for prescribing: the views of 2413 UK medical students and recent graduates

Amy Heaton, David J. Webb & Simon R. J. Maxwell

Clinical Research Centre, University of Edinburgh, Western General Hospital, Edinburgh, UK

Correspondence
Dr Simon Maxwell, MD, PhD, FRCP, FRCPE, Clinical Research Centre, Western General Hospital, Crewe Road South, Edinburgh EH4 2XU, UK.
Tel: +44 0131 242 9214
Fax: +44 242 9125
E-mail: s.maxwell@ed.ac.uk

S.R.J.M. conceived the idea for the study. S.R.J.M. and A.H. developed the study design and survey website. A.H. took responsibility for promoting the survey to medical students and recent graduates from UK medical schools with support from D.J.W. and S.R.J.M. All authors were involved in writing and approving the final manuscript.

Keywords
drug, education, patient safety, prescribing, undergraduate

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1 April 2008
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19 May 2008

WHAT IS ALREADY KNOWN ON THIS SUBJECT

- Adverse drug events are common in National Health Service (NHS) hospitals where junior doctors take responsibility for most of the prescribing.
- Safe and effective prescribing of drugs is a core competency expected of all medical graduates.
- There is a perception from some of those who supervise the prescribing of drugs in the NHS that undergraduate teaching in this area may be deficient, although this view is contested.

WHAT THIS STUDY ADDS

- Our study suggests that a large proportion of medical students and recent graduates from UK medical schools who responded also believe that their teaching and assessment in this area was inadequate.
- This result implies that those responsible for overseeing undergraduate education should urgently review teaching and assessment of competency in relation to prescribing in all UK medical schools.

AIMS

To gather opinions from UK medical students and recent graduates about their undergraduate training to prescribe and their confidence about meeting the relevant competencies identified by the General Medical Council (GMC).

METHODS

We designed a web-based survey that was distributed to UK medical students and first year Foundation doctors (graduation years 2006–2008) via medical schools and postgraduate networks.

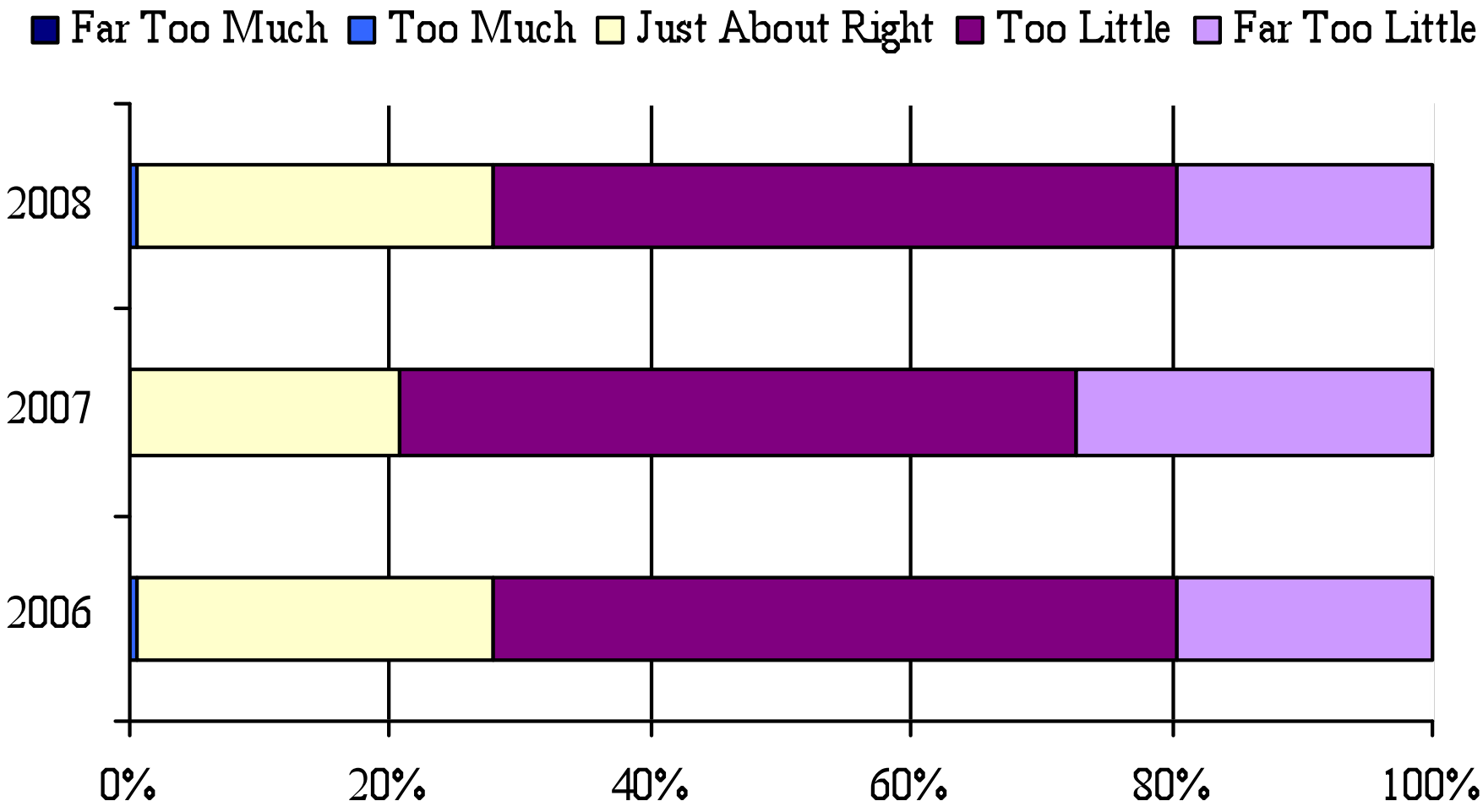
RESULTS

Analysis was restricted to 2413 responses from students graduating in 2006–2008 from the 25 UK medical schools (mean 96.5 per school) with a complete undergraduate curriculum. Distinct courses and assessments in 'clinical pharmacology & therapeutics (or equivalent)' were identified by 17% and 13%, respectively, with mode of learning described most commonly as 'opportunistic learning during clinical attachments' (41%). Only 38% felt 'confident' about prescription writing and only a minority (35%) had filled in a hospital prescription chart more than three times during training. The majority (74%) felt that the amount of teaching in this area was 'too little' or 'far too little', and most tended to disagree or disagreed that their assessment 'thoroughly tested knowledge and skills' (56%). When asked if they were confident that they would be able to achieve the prescribing competencies set out by the GMC, 42% disagreed or tended to disagree, whereas only 29% agreed or tended to agree.

CONCLUSIONS

Many respondents clearly perceived a lack of learning opportunities and assessment related to the safe and effective use of drugs and had little confidence that they would meet the competencies identified by the GMC. There is an urgent need to review undergraduate training in this area.

‘I feel that the amount of teaching in Pharmacology, Therapeutics & Prescribing during my course is (was)’



Heaton et al. *Brit J Clin Pharmacol* 2008;**66**:128-134

How prepared are medical graduates to begin practice? A comparison of three diverse UK medical schools.

General Medical Council

Illing J, Peile E, Morrison J, et al, 2008.

- 250 interviews, 479 doctor questionnaires, 78 senior questionnaires, 420 F1 prescribing assessments and learning portfolio data
- There was a consistent thread, from primary sample data throughout the year, and from triangulation data, of under-preparedness for prescribing. Weaknesses were identified both in the pharmacological knowledge underpinning prescribing, and the practical elements of calculating dosage, writing up scripts, drug sheets, etc.
- Prescribing was also the main area of practice in which errors were reported by respondents, indicating a significant potential risk.
- Data from the safe prescribing assessment ……[showed that]…. 19% of Newcastle and 16% of Warwick graduates passed. Assuming that this is a fair and appropriate test of prescribing at the level of an F1, it highlights a weakness in prescribing.

Illing et al. *How prepared are medical graduates to begin practice?* 2008. **www.gmc-uk.org**

Does prescribing education improve prescribing?

Training improves prescribing

- Lots of evidence
- Most clin.pharm./pharmacy-led interventions
- Most assessments under ‘controlled’ conditions
- Most short term
  - Garbutt et al. *Teach Learn Med* 2006;**18**:244–50
  - Scobie et al. *Med Educ* 2003;**37**:434–437
  - Langford et al. *BMJ* 2001;**322**:1424
  - Vollebregt et al. *Br J Clin Pharmacol* 2006;**61**:345–51
  - De Vries *et al*. *Lancet* 1995;**346**:1454

BJCP British Journal of Clinical Pharmacology

DOI:10.1111/j.1365-2125.2009.03395.x

Do educational interventions improve prescribing by medical students and junior doctors? A systematic review

Sarah Ross & Yoon K Loke[1]

University of Aberdeen, Aberdeen and [1]*University of East Anglia, Norwich, UK*

Correspondence
Dr Sarah Ross, Clinical Lecturer, Division of Medical and Dental Education, University of Aberdeen, Medical School, Polwarth Building, Foresterhill, Aberdeen AB25 2ZN, UK.
Tel: + 44 0 12 2455 3015
Fax: + 44 0 12 2455 4761
E-mail: s.ross@abdn.ac.uk

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drug prescriptions, junior doctors, medical education, medical students

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Screened 3,189 studies but only 22 met criteria (15 controlled trials)

- Real world prescribing (1/15)
- OSCE Stations (5/15) – number 1 to 9
- Written short answer (6/15)
- Calculations (1/15)
- MCQs/SAQs (2/15)

Ross & Loke. *Br J Clin Pharmacol*. 2009;**67**:662-70

Does education actually improve prescribing?

- Large numbers of students/trainees required
- Long and detailed follow-up
- Detecting events adverse events related to poor prescribing represents a major challenge
- Difficulty in measuring good prescribing practice
- Achieving random allocation of learning style
- Constant change in curricula (other confounders)
- Multi-factorial nature of prescribing events
- Lack of will to do this

How can we provide better prescriber training?

PATIENT

History - examination - investigations

Prescribing sub-competencies

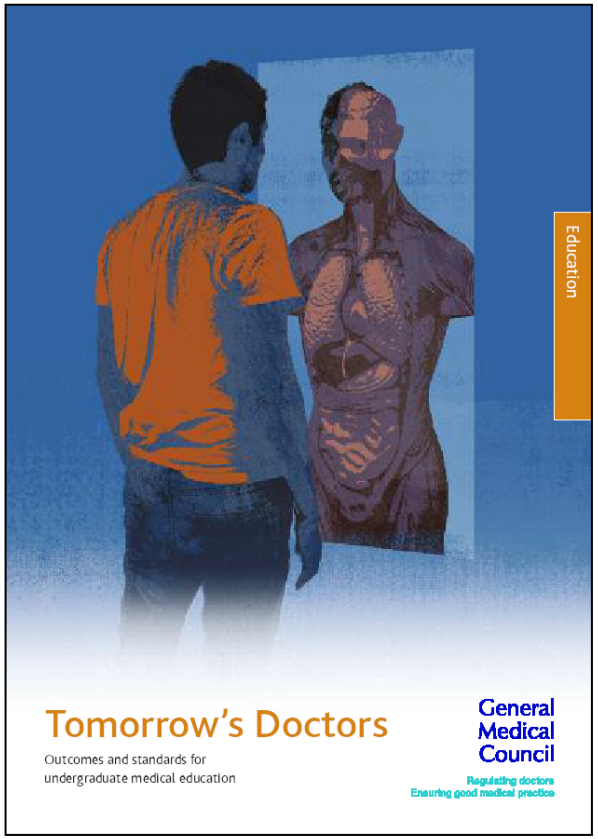
1	Make a diagnosis	Knowledge	Judgement	Skill
2	Establish therapeutic goal	Knowledge	Judgement	Skill
3	Choose the therapeutic approach	Knowledge	Judgement	Skill
4	Choose the drug	Knowledge	Judgement	Skill
5	Choose the dose, route and frequency	Knowledge	Judgement	Skill
6	Choose the duration of therapy	Knowledge	Judgement	Skill
7	Write the prescription	Knowledge	Judgment	Skill
8	Inform the patient	Knowledge	Judgment	Skill
9	Monitor drug effects	Knowledge	Judgement	Skill
10	Review/alter prescription	Knowledge	Judgement	Skill

The educational challenges

- ‘Knowledge rich’ area
  - Large numbers of medicines
- Rapid change
  - new drugs, new ways of using them
- Difficulty in gaining prescribing practice
  - Patient safety concerns
- Cross-cutting through the curriculum
- Integrates knowledge, skills, judgement

Clear learning outcomes

- **Core learning outcomes** should be **clearly identified** for the students, including knowledge and understanding about drugs, skills related to the prescribing of drugs, and attitudes towards drug therapy.
- 'Outcomes-based curriculum' now widely introduced
- Recent developments
  - Safe Prescribing Working Group 2007
  - Tomorrow's Doctors 2009
  - BPS Curriculum – Ross & Maxwell BJCP

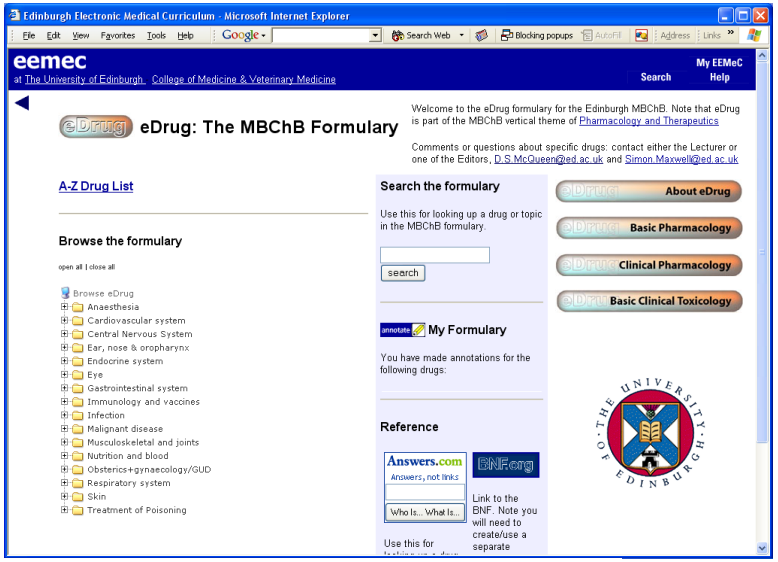


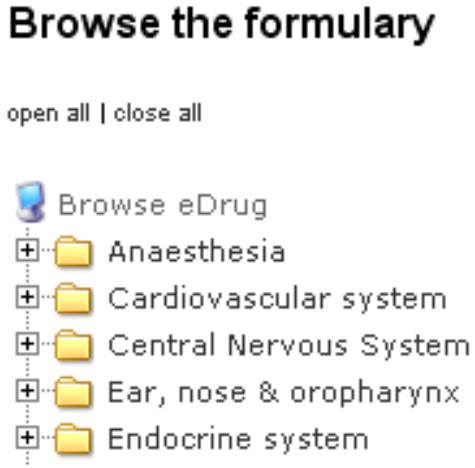
Learning Environment

- Leadership and visibility
- Knowledge and understanding
  - CPT principles, drugs, therapeutics
- Student formularies
- Problem solving
- *Skills practice*
- eLearning initiatives
- Assessment

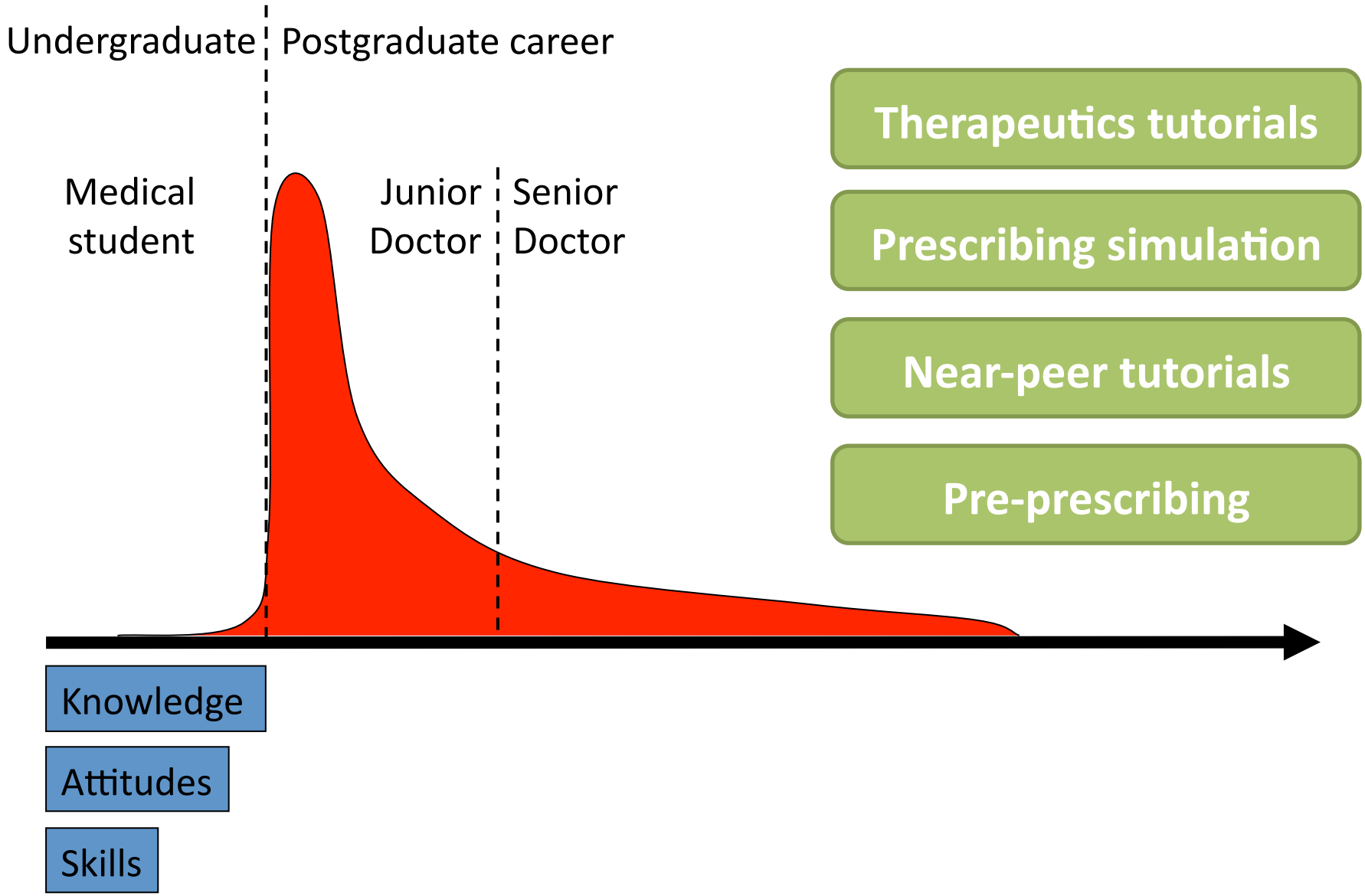
Student Formularies

- The factual burden imposed by the large numbers of medicines that are encountered should be eased by prioritising learning around a core list of around **100 commonly used drugs** (a **student formulary**).





Managing the graduation transition



e-Learning resources

eLearning resources

- Virtual Learning Environments
- Cost-effective
- Convenient
- Influence extends beyond manpower
- Learning can be monitored
- User (rather than teacher) driven
- Flexible/interactive

But should be part of a 'blended' learning solution

www.prescribe.ac.uk

Prescribe

e-Learning for Clinical Pharmacology & Prescribing

BPS BRITISH PHARMACOLOGICAL SOCIETY

Home

Welcome to ***Prescribe***, the online resource for prescribers in training.

Prescribe is being developed by the British Pharmacological Society as an e-Learning resource to support the training of medical students and students of other healthcare professions. It aims to support the acquisition of the knowledge and skills required for safe and effective use of medicines in the National Health Service.

Prescribing news

06.04.12 A *BMJ* commentary discusses reform of the policy towards **illicit drug** use. read more

06.04.12 Research shows that **prescribing for women patients** is less likely to follow guidelines than prescribing for their male counterparts. read more

06.04.12 A brief review of gene-drug associations (**pharmacogenetic**) and discussion of why few have been incorporated into clinical practice or guidelines. read more

31.03.12 A *Lancet* paper offers further evidence that **aspirin** has protective effects against **cancer**. read more

31.03.12 A paper in *Ann Int Med* suggests that **anti-platelet drugs** offer little if any benefit to patients with **chronic kidney disease**. read more

23.03.12 A brief BMJ review of the use of **emergency contraception**. read more

What's new in *Prescribe*

08.02.12 A link to a fantastic lecture given by Professor David Nutt, the former Chair of the Advisory Committee on Drugs Misuse, who was sacked by the last Government, after expressing views on the illogical position taken on misuse of drugs can be found in the Prescribe library. read more

01.01.12 HAPPY NEW YEAR from all at *Prescribe*. We hope the site will develop significantly over coming months.

03.11.11 Why is it that the response to drugs can diminish over time? New session on Pharmacodynamics - *Desensitisation and tolerance* just added.

07.05.11 The Prescribe glossary has now been updated to contain one hundred further entries. Suggestions for more information for all users are welcomed and should be sent to editors@prescribe.ac.uk

13.04.11 Two new sessions on pharmacodynamics were launched covering topics such as potency, efficacy, dose-response curves, agonists and antagonists

Prescribe Curriculum

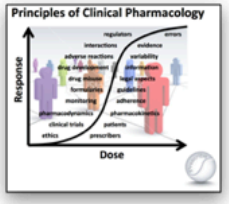
The Prescribe curriculum is based on the British Pharmacological Society's core curriculum for medical students and covers all the relevant knowledge and skills outcomes identified by the General Medical Council in its recommendations on undergraduate medical education (Tomorrow's Doctors 2009). These reflect earlier proposals made by the Safe Prescribing Working Group, convened by the Medical Schools Council in 2007.

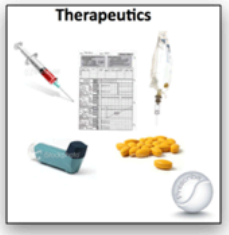
The curriculum is divided into four sections:

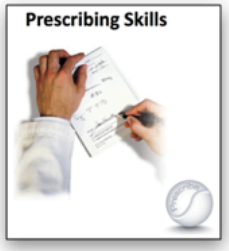
- Section 1 – Principles of Clinical Pharmacology
- Section 2 – Drugs
- Section 3 – Therapeutics
- Section 4 – Prescribing Skills

To access the modules and learning sessions in each of these sections click the links on the right.

To download a pdf version of the Prescribe curriculum and learning objectives click here.

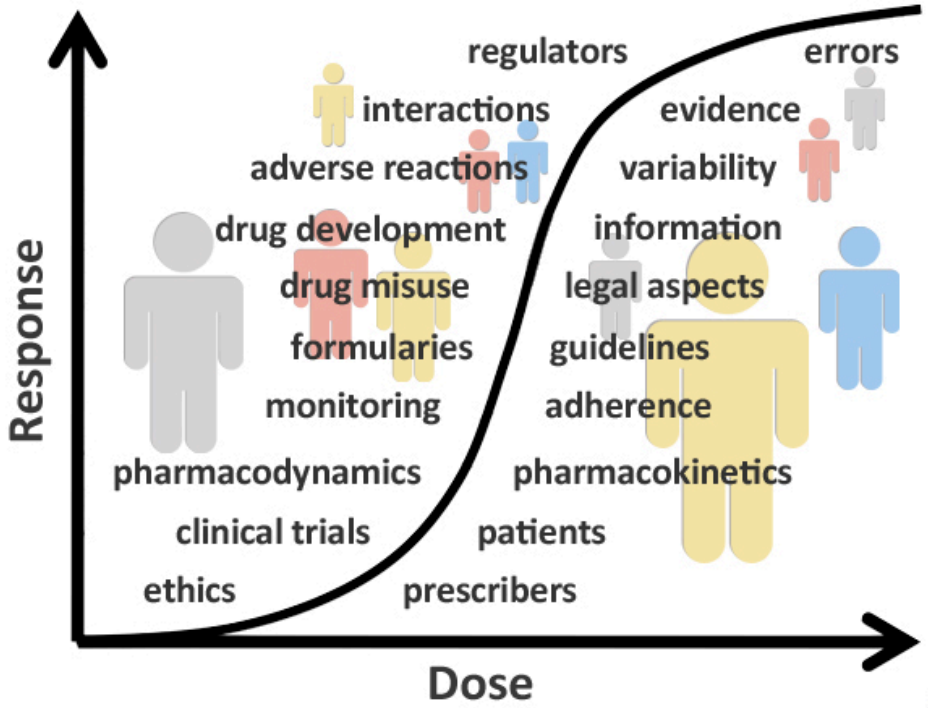






Section 1 - Principles of Clinical Pharmacology

This section will cover the basic principles of pharmacology, clinical pharmacology and toxicology that underpin rational prescribing. These sessions will introduce students to some of the important generic principles of clinical pharmacology that apply to all areas of therapeutics.



Pharmacokinetics I – Introduction to pharmacokinetics

Authors John Mucklow, Simon Maxwell

Section Principles of Clinical Pharmacology

Module Pharmacokinetics

Description

This session forms a basic introduction to important concepts in pharmacokinetics such as absorption, distribution, metabolism and elimination of drugs and explains why these concepts are relevant to prescribers.

Learning objectives

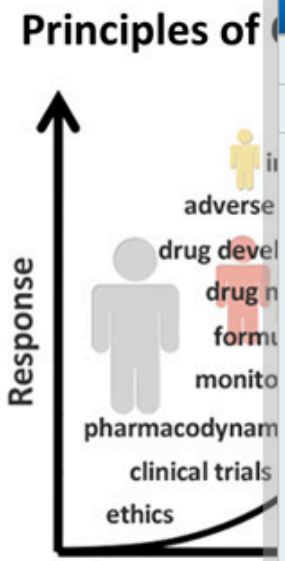
By the end of this session you will be able to:

- Define the term pharmacokinetics
- Describe the four phases of pharmacokinetics
- Explain why an understanding of pharmacokinetics is relevant to prescribers

Prerequisites

Before commencing this session you should have:

- An understanding of basic physiological concepts, including cells and membranes, body compartments, lipid and water solubility, and the functions of the liver, kidney and the cardiovascular system
- Completed the related *Prescribe* sessions in the module *Principles of Clinical Pharmacology/Pharmacodynamics*



Contents

As already seen, an agonist is a ligand that binds to a receptor and produces a conformational change that initiates an intracellular signal (Fig 12).

An **antagonist** is a ligand that binds to a receptor but does not produce the conformational change that initiates an intracellular signal. Occupation of the receptor by an antagonist prevents the binding of any other ligand and so 'antagonises' the biological response to the agonist.

Competitive antagonists (Fig 13) bind to the same site on the receptor as the agonist with which they are competing (**Fig 14**). The inhibition (reduction in response to the agonist) they produce can be overcome by increasing the dose of the agonist.

Non-competitive antagonists (Fig 15) inhibit the receptor activity by binding to a different part of the receptor or associated pathway from the agonist (Fig 16). Simply increasing the dose of the agonist cannot overcome their effects and so the maximum response to the agonist (its 'efficacy') is reduced.

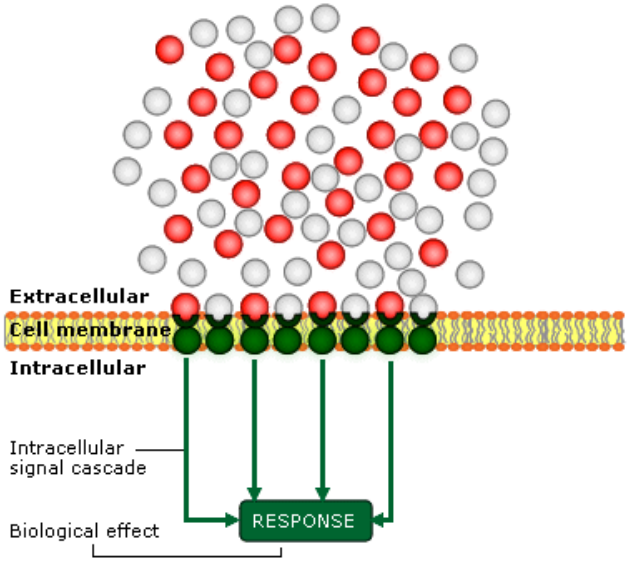


Fig 14 The competitive antagonist competes with the agonist for receptor occupancy and prevents it from producing a full biological response (unless the agonist concentration is greatly increased to overcome the competition).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Script
Standard Computerised Revalidation Instrument for Prescribing and Therapeutics
NHS
Health Education West Midlands
The Principles of Prescribing
Prescribing in Medical Emergencies
Managing the Risks of Prescribing
Prescribing in Special Circumstances
Therapeutic Groups
Clinical Governance
Advanced Prescribing
SHORTLISTED
BMJ Group Improving Health Awards
Patient Safety AWARDS 2013
FINALIST
Welcome to SCRIPT
This innovative e-Learning programme is designed to help you in your learning and knowledge of safe prescribing. It is easy to use: just register, login and use the resources.
There are 40 modules in the seven groups displayed on the left-hand side containing interactive videos & graphics, & clinical case exercises for you to test your learning & measure your progress.
Those modules marked with an asterisk (*) are mandatory for West Midland F1 trainees.
We hope you find this toolkit useful. Safe prescribing!
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Underpins good prescribing practice
Allows a flexible approach to learning
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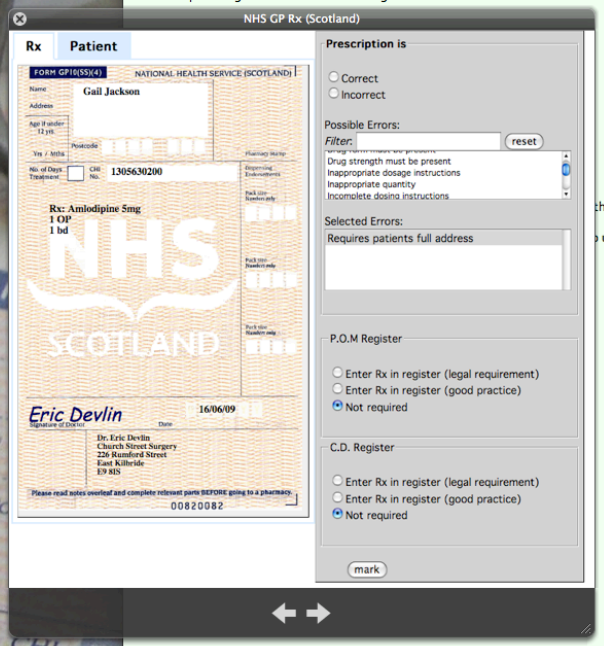
About SCRIPT

SCRIPT is a web based tool that allows students to gain practical experience of handling mock prescriptions, and identifying legal, ethical and clinical errors. The system allows for localisation (patient and prescriber addresses) and randomly generates names and other data to generate a vast array of permutations on a set of over 600 prescriptions, covering NHS GP, dental, veterinary and private scripts, registers, labels and endorsing. The system supports both Scottish and English prescriptions.

Students gain immediate feedback on their performance when using the on-line prescription tutor, as it highlights any errors they make or miss, and keeps a personal record of all the students attempts on the tutor. The tutor assesses the students using a customisable marking guide, allowing staff to determine the marking scheme used, or even remove marking to allow for a feedback only operating mode.

Users have identified the tutorial as user-friendly and that the feedback is very useful in highlighting problem areas, the tutor providing both an excellent learning tool and revision aid.

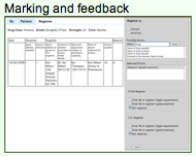


throughout the UK.

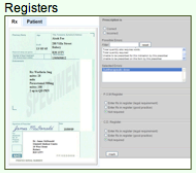
use it as part of their course.

GP Rx

Marking and feedback



Registers



English Rx

Feedback with no marking/ scores

image lightbox uses TopUp

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National Prescribing Curriculum

National Prescribing Service Limited

Welcome to the NPS National Prescribing Curriculum web site. The site provides an interactive learning environment to encourage the development and practise of rational prescribing skills.

Medical, nursing and pharmacy students should obtain a username and password from their University. Junior medical officers and other new practitioners should obtain a username and password from the medical education office at their allocated hospital. Visitors should enter "visitor" for both the username and password.

Visitor access is restricted to the COPD (Chronic Obstructive Pulmonary Disease) module in the Student prescribing modules and to the Diabetes and Insomnia modules in the Junior practitioner modules. Visitor modules are fully functional except for the prescribing screens where the functionality is limited for demonstration purposes.

If you have any questions or problems we would like to hear about them. Please email the project team.

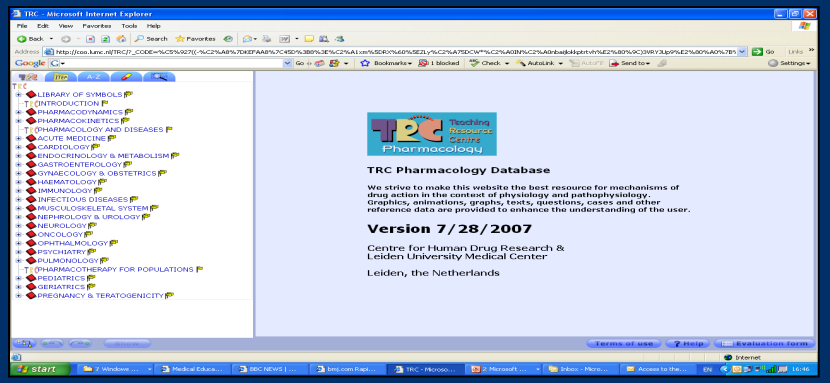
Take the student survey – feedback to NPS

Student Prescribing Modules

Junior Practitioner Modules

Dental Student Program

Visitors should enter "visitor" for both the user name and password.



NPC Newsletter 2007

Prescribing assessment

Why assess prescribing?

- Clinical governance/patient safety reasons
  - Assessment might be a marker of competence to enter into (or continue in) clinical practice
  - Protection of patients – patient safety
- Educational reasons
  - Measure the success of training
  - Identify the need for improvements in training

Prescribing Skills Assessment

BPS BRITISH PHARMACOLOGICAL SOCIETY
Today's science, tomorrow's medicines

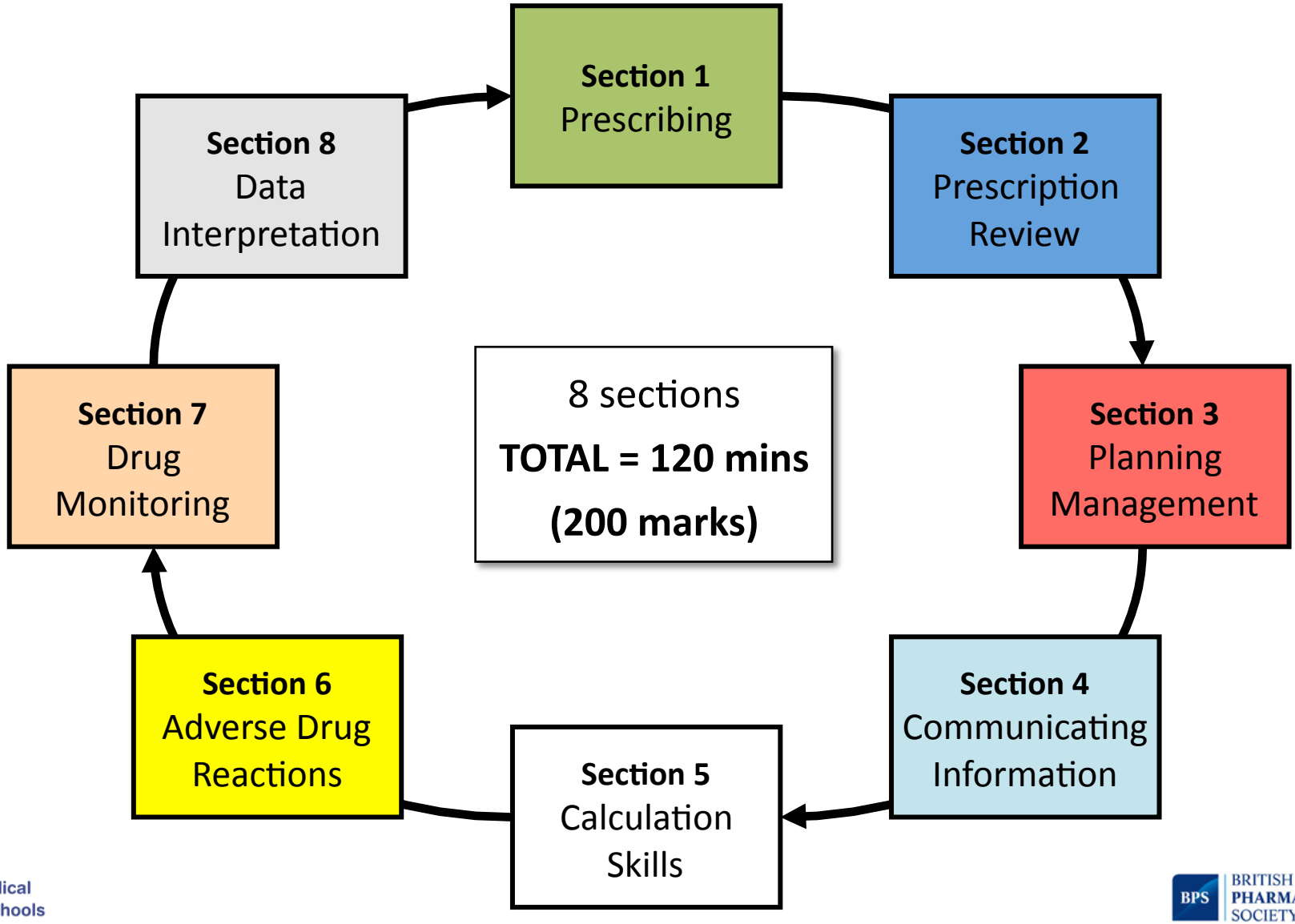
Medical Schools Council

- No validated, reliable and widely accepted measure of prescribing performance currently exists
- Developed jointly by *Medical Schools Council* and *British Pharmacological Society*
- Pass/fail assessment of ability to prescribe medicines
- A national prescribing assessment would
  - pool academic resources
  - serve to raise and unify standards (drive learning)
  - provide equity in assessment

PSA: Basic principles

- Should be passed **before qualification** and subsequent assumption of NHS prescribing responsibilities
- It will be available to be taken during the final year and **can be repeated** if necessary
- Delivered **online**
- 'Open book' with access to the **British National Formulary**
- Assesses prescribing competencies **relevant to Foundation doctors** that map onto those in ***Tomorrow's Doctors* 2009**
- Will test **skills and deductive powers** (as well as knowledge) relevant to early postgraduate practice

Prescribing Skills Assessment

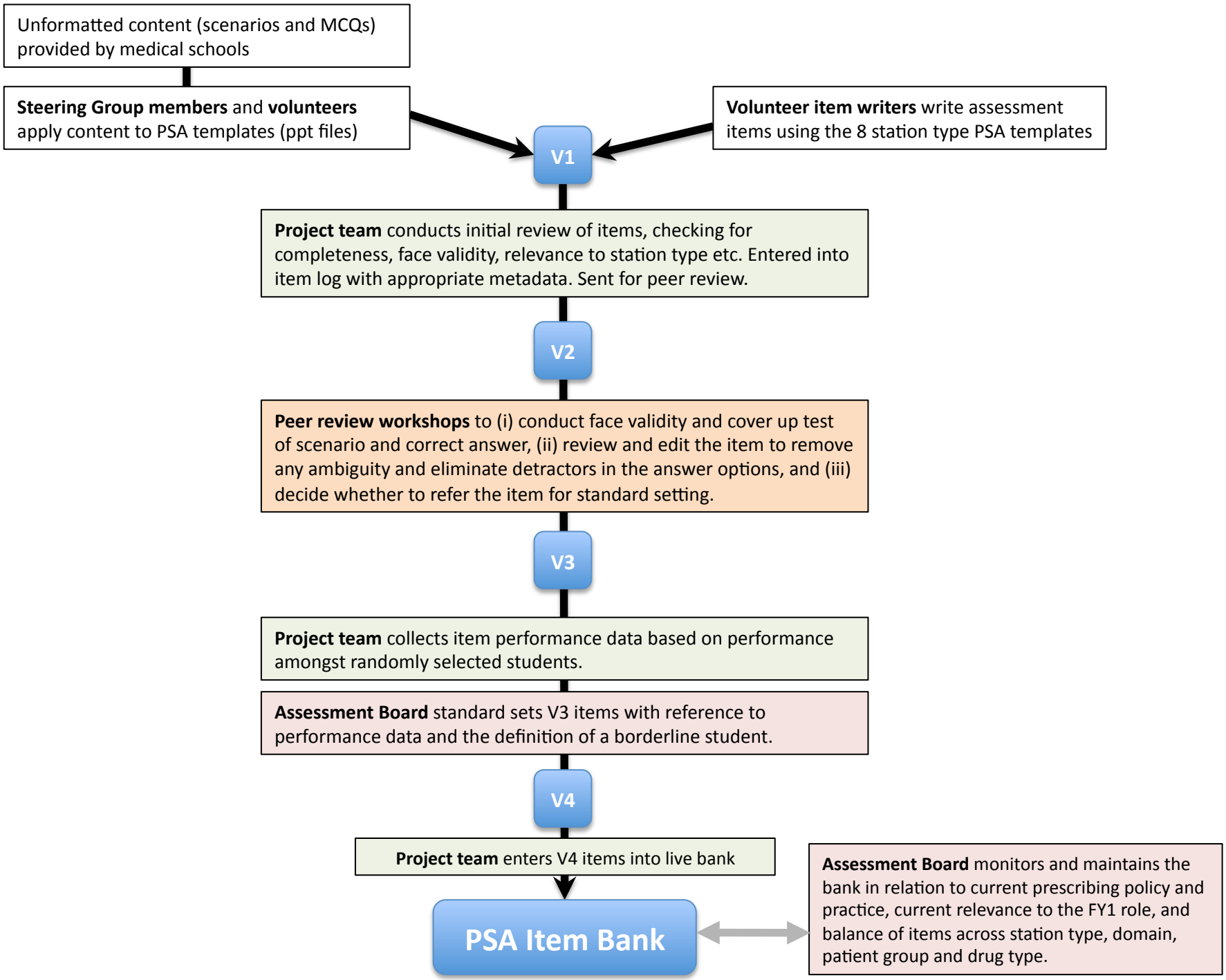


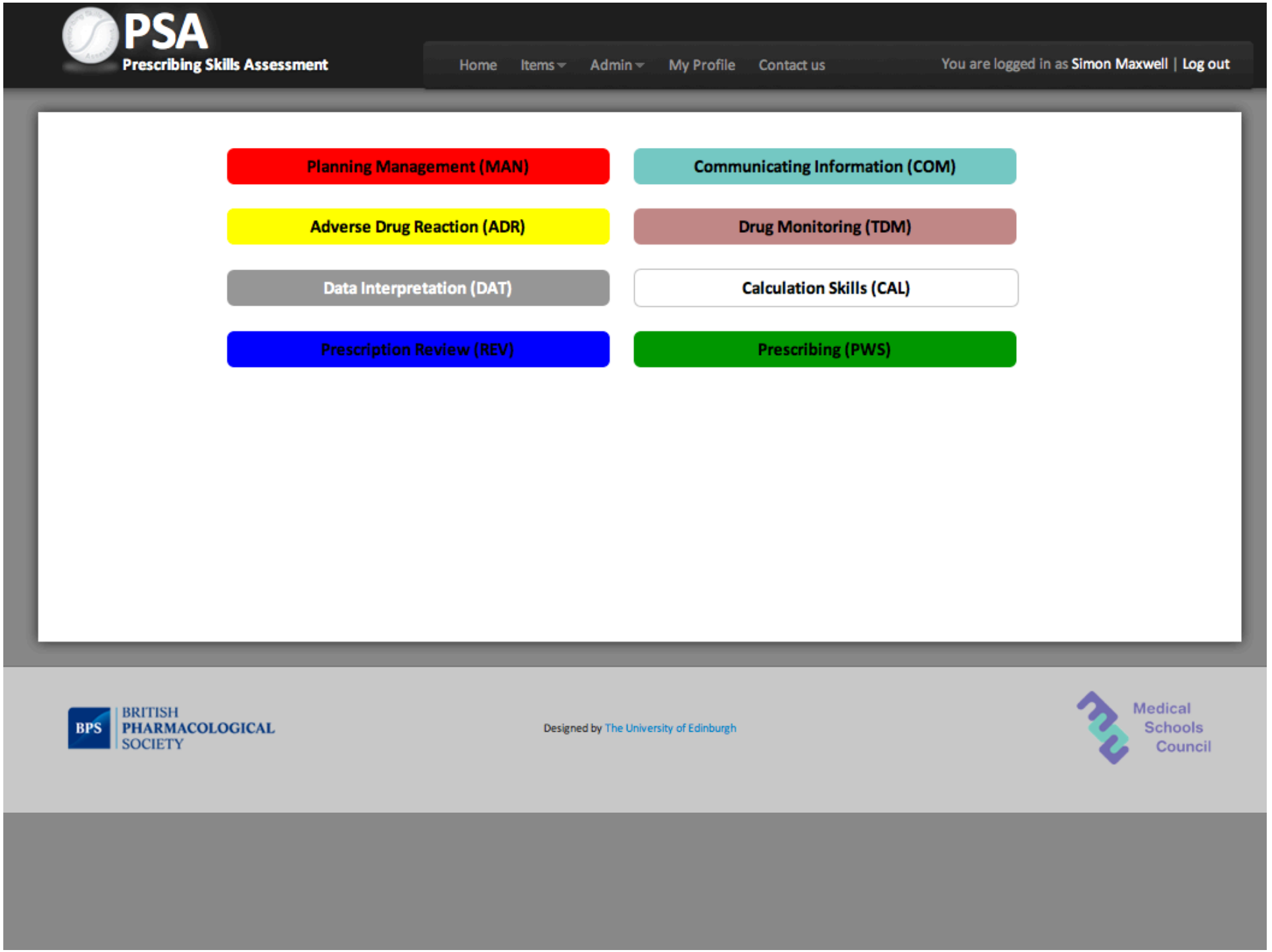
Medical Schools Council

BPS BRITISH PHARMACOLOGICAL SOCIETY
Today's science, tomorrow's medicines

Prescribing Skills Assessment Blueprint

	Medicine [A]	Surgery [B]	Elderly Care [C]	Paediatrics [D]	Psychiatry [E]	Obstetrics & Gynaecology [F]	General Practice [G]
Prescribing	Unstable angina Acute asthma Dyspepsia	Thromboprophylaxis Antibiotics Analgesia	Intravenous Fluids Laxatives Analgesia	Allergies Infection (e.g. otitis media, epiglottitis, croup), Reflux	Depression Anxiety Acute behavioural disturbance	Oral contraception HRT Bladder instability	Hypercholesterolaemia Hypertension Urinary tract infection
Prescription review	Interactions Medication errors Causes of symtoms and signs	Pre-operative assessments	Diuretics Antihypertensives Benzodiazepines Opioids	*Cases will be more difficult to find*		Reviewing prescribing in pregnancy Interactions with OCP	Patients presenting with common symptoms
Planning management	Acute (e.g. asthma, pulmonary oedema, MI), Chronic (e.g. COPD, diabetes, angina)	Acute (e.g. bleeding, low BP, acute abdo) Chronic (e.g. IBD, oncology)	Acute (e.g. back pain) Chronic (e.g. Parkinson's disease, dementia)	Asthma Acute anaphylaxis Diabetic Ketoacidosis Dehydration	*Cases will be more difficult to find*	*Cases will be more difficult to find*	*Cases will be more difficult to find*
Communicating information	Oral hypoglycaemics Corticosteroids Nitrates etc.	Tamoxifen Antibiotics Heparin Finasteride	Anticoagulants Bisphosphonates Diuretics Anti-epileptics Hypnotics	Vaccinations Insulin Cystic fibrosis Acne	Antidepressants Benzodiazepines Antipsychotics	Advising about drugs in breast feeding Advising about drugs preconception OCP, HRT	Antihypertensives Nicotine replacement NSAIDs, latanoprost Sildenafil Vaccinations
Calculation Skills	Aminophylline infusion	Infusion rates (e.g. dopamine), intravenous fluid volumes	Digoxin elixir	Fluid replacement Dosing by weight Buccal midazolam	Intravenous lorazepam Haloperidol injection	Lidocaine injections	
Adverse drug reactions	Renal impairment Liver function Hyponatraemia etc.	Bleeding Opioid toxicity Vomiting	Dehydration Collapse Constipation	Hypoglycaemia Vomiting Substance abuse	Benzodiazepines Antimuscarinic effects Antispsychotics	Oestrogenic effects Interactions with the OCP	Headache Ankle swelling Dizziness Lethergy etc.
Drug monitoring	Digoxin, Insulin, Methotrexate, Amiodarone, Oxygen	Fluid replacement Blood transfusion Antibiotics Anticoagulants	Carbimazole Theophylline Anti-epileptics	Asthma therapy Diabetes	Lithium Antipsychotic drugs	Monitoring safety of OCP	Statins ACE inhibitors Antibiotics
Data interpretation	TFTs, glucose, INR, renal function etc	Antibiotic levels Fluid replacement	Hb level, UEs, CXR, anti-epileptic concentrations	PEFR, paracetamol poisoning	Lithium level	BP and OCP HRT and LFTs	Cholesterol, BP, diuretics and K


Unformatted content (scenarios and MCQs) provided by medical schools
Steering Group members and **volunteers** apply content to PSA templates (ppt files)
Volunteer item writers write assessment items using the 8 station type PSA templates
V1
Project team conducts initial review of items, checking for completeness, face validity, relevance to station type etc. Entered into item log with appropriate metadata. Sent for peer review.
V2
Peer review workshops to (i) conduct face validity and cover up test of scenario and correct answer, (ii) review and edit the item to remove any ambiguity and eliminate detractors in the answer options, and (iii) decide whether to refer the item for standard setting.
V3
Project team collects item performance data based on performance amongst randomly selected students.
Assessment Board standard sets V3 items with reference to performance data and the definition of a borderline student.
V4
Project team enters V4 items into live bank
PSA Item Bank
Assessment Board monitors and maintains the bank in relation to current prescribing policy and practice, current relevance to the FY1 role, and balance of items across station type, domain, patient group and drug type.


PSA
Prescribing Skills Assessment
Home
Items
Admin
My Profile
Contact us
You are logged in as Simon Maxwell | Log out
Planning Management (MAN)
Communicating Information (COM)
Adverse Drug Reaction (ADR)
Drug Monitoring (TDM)
Data Interpretation (DAT)
Calculation Skills (CAL)
Prescription Review (REV)
Prescribing (PWS)
BPS
BRITISH
PHARMACOLOGICAL
SOCIETY
Designed by The University of Edinburgh
Medical
Schools
Council

Prescribing Item

ID | 687

This question item is worth **10**

Case presentation
A 62-year-old woman is admitted to hospital with a 3-day history of increasing breathlessness, wheeze and dry cough. **PMH**. COPD with several admissions for exacerbations. **DH**. Salbutamol inhaler 200 micrograms as required, tiotropium inhaler 18 micrograms daily, fluticasone propionate 250 micrograms with salmeterol 50 micrograms inhaler (Seretide 250 Accuhaler®) 12-hrly. Treatment with prednisolone 30 mg orally daily has already been started by the GP.

On examination
She appears distressed, and is centrally cyanosed and coughing.
Temperature 37.1°C, HR 112/min, BP 116/72 mmHg, RR 30/min, O_2 sat 90% (94–99) breathing air. PEFR 120 L/min. She is using her accessory muscles to breathe.
Auscultation of the chest reveals widespread wheezes bilaterally.

Investigations
Hb 146 g/L (115–165), WCC 9.8 × 10^9/L (4.0–11.0).
Na^+ 140 mmol/L (137–144), K^+ 4.2 mmol/L (3.5–4.9), U 7.2 mmol/L (2.5–7.0), Cr 85 µmol/L (60–110). CXR shows hyperinflated lungs.

Prescribing request
Please write a prescription for ONE drug that will provide rapid relief of her bronchospasm.
(use the hospital 'once-only medicines' prescription chart provided)

ONCE ONLY MEDICINES

Date DD/MM/YYYY	Time HH:MM	Medicine (Approved Name)	Dose	Route	Prescriber Signature	Time Given	Given By

Prescription Review Item

ID | 705

This question item is worth **4 marks**

Case presentation
A 70-year-old man is admitted from home following a collapse. Clinical examination reveals that he is dehydrated and hypotensive. His current regular medicines, as recorded by his daughter, are listed (right).

Question A
Identify the TWO prescriptions that are *most likely* to have contributed to his dehydration.
(mark them with a tick in column A)

Question B
Identify ONE prescription that would constitute a potentially fatal prescribing error if it were transcribed onto the in-patient prescription chart.
(mark it with a tick in column B)

CURRENT PRESCRIPTIONS

Drug	Dose	Route	Freq.	A	B
amiodarone	200 mg	ORAL	daily	☐	☐
amitriptyline	75 mg	ORAL	nightly	☐	☐
atenolol	500 mg	ORAL	daily	☐	☐
bendroflumethiazide	5 mg	ORAL	daily	☐	☐
prazosin	1 mg	ORAL	12-hrly	☐	☐
simvastatin	20 mg	ORAL	nightly	☐	☐
spironolactone	25 mg	ORAL	daily	☐	☐

Calculation Skills Item

ID | 798

This question item is worth **2 marks**

Case presentation
A 55-year-old man is to be given a dose of 40 mg of furosemide by IV injection to treat acute left ventricular failure. Furosemide injection is available in ampoules containing 50 mg in 5 mL.

Calculation
What volume of furosemide injection should he be given?
(Write your answer in the box below)

Answer mL

Adverse Drug Reaction Item

ID | 814

This question item is worth **2 marks**

Case presentation
A 56-year-old woman presents to her GP with aching of her arms and legs. **PMH.** Type 2 diabetes mellitus, hypertension, hypercholesterolaemia, recent bronchitis. **DH.** Her current regular medicines are listed (right).

Question
Identify the TWO prescriptions that are *most likely* to interact to cause the aching of her arms and legs.
(mark them with a tick)

PRESCRIPTION OPTIONS	
aspirin 75 mg orally daily	☐
clarithromycin 500 mg orally 12-hrly	☐
lisinopril 5 mg orally daily	☐
metformin 500 mg orally 12-hrly	☐
simvastatin 40 mg orally nightly	☐

PSA Progress

- 2010-04 Paper-based pilots (8 schools/1,000 students)
- 2011-05 Online pilot (2 schools/200 students)
- 2011-09 Question item author training (60 authors)
- 2012-02 Major peer-review event (bank – 600 items)
- 2012-04 Online pilot (8 schools/1,300 students)
- 2013-02 Major peer-review event (bank – 1,200 items)
- 2013-05 Online pilot (29 schools/6000 students)
- 2014 *Planned implementation ?*

Positive outcomes for learners

- Summative assessment of prescribing that is fair and equally applied across medical schools (and hospitals)
- Formative education tool
- Stimulate better training experiences
- Enhanced confidence