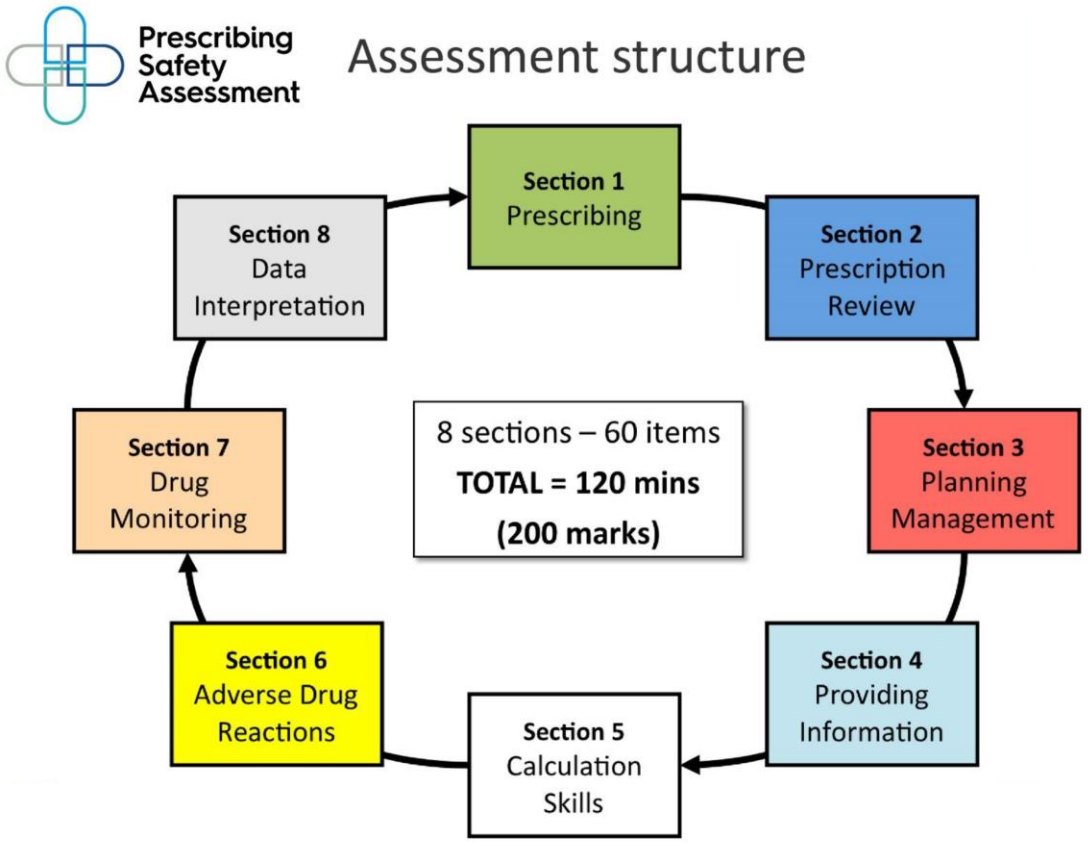
Prescribing

For exams… And Beyond!

Dr William Atkins

SIMPLY FINALS

The PSA (and structure for this talk)



A number of other simply finals talks will have useful prescribing tips too!

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How to Prepare for the PSA

Firstly, know thy enemy!

www.prescribingsafetyassessment.ac.uk
Contains lots of information on the PSA, as well as practice questions.

Secondly, make the most of your resources!

Control + F

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Be Prepared

Section	Description	Marks	Comments
1	Prescribing	80	8 items of 10 marks each
2	Prescription Review	32	8 items of 4 marks each
3	Planning Management	16	8 items of 2 marks each
4	Providing Information	12	6 items of 2 marks each
5	Calculation Skills	16	8 items of 2 marks each
6	Adverse Drug Reactions	16	8 items of 2 marks each
7	Drug Monitoring	16	8 items of 2 marks each
8	Data Interpretation	12	6 items of 2 marks each
	TOTAL MARKS	200	

Clinical setting	Minimum number of items
Medicine	8
Surgery	4
Elderly care	8
Paediatrics	4
Psychiatry	4
Obstetrics & Gynaecology	4
General Practice	8

At least 2 questions on each of the following drug groups:

Opiates
Anticoagulants
Insulins
Antibiotics
Infusion fluids

You should not be asked questions on: Anaesthetics, Chemotherapy, Antipsychotics

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Appendix B. Examples of clinical cases and related item styles

	Medicine	Surgery	Elderly Care	Paediatrics	Psychiatry	Obstetrics & Gynaecology	General Practice
Prescribing	Unstable angina Acute asthma Dyspepsia	Thromboprophylaxis Antibiotics Analgesia	Intravenous fluids Laxatives Analgesia	Allergies Infection (e.g. otitis media, epiglottitis, croup), Reflux	Depression Anxiety	Oral contraception HRT Bladder instability	Hypercholesterolaemia Hypertension Urinary tract infection
Prescription review	Interactions Medication errors Causes of signs and symptoms	Pre-operative assessments NBM	Diuretics Antihypertensives Benzodiazepines Opioids	*Cases of polypharmacy in children will be more difficult to find*	SSRIs Lithium	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)	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	Acute behavioural disturbance	Anticoagulation, UTI in pregnancy	Shingles Community acquired pneumonia
Providing information	Oral hypoglycaemics Corticosteroids Nitrates	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	Steroid reducing dose
Adverse drug reactions	Renal impairment Liver function Hyponatraemia	Bleeding Opioid toxicity Vomiting	Dehydration Collapse Constipation	Hypoglycaemia Vomiting Substance abuse	Benzodiazepines Antimuscarinic effects Antipsychotics	Oestrogenic effects Interactions with the OCP	Headache Ankle swelling Dizziness Lethargy
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	Antibiotic concentrations Fluid replacement	Hb, U&Es, CXR, anti-epileptic concentrations	PEFR, paracetamol poisoning	Lithium concentration	BP and OCP HRT and LFTs	Cholesterol, BP, diuretics and K^+

Section 1
Prescribing

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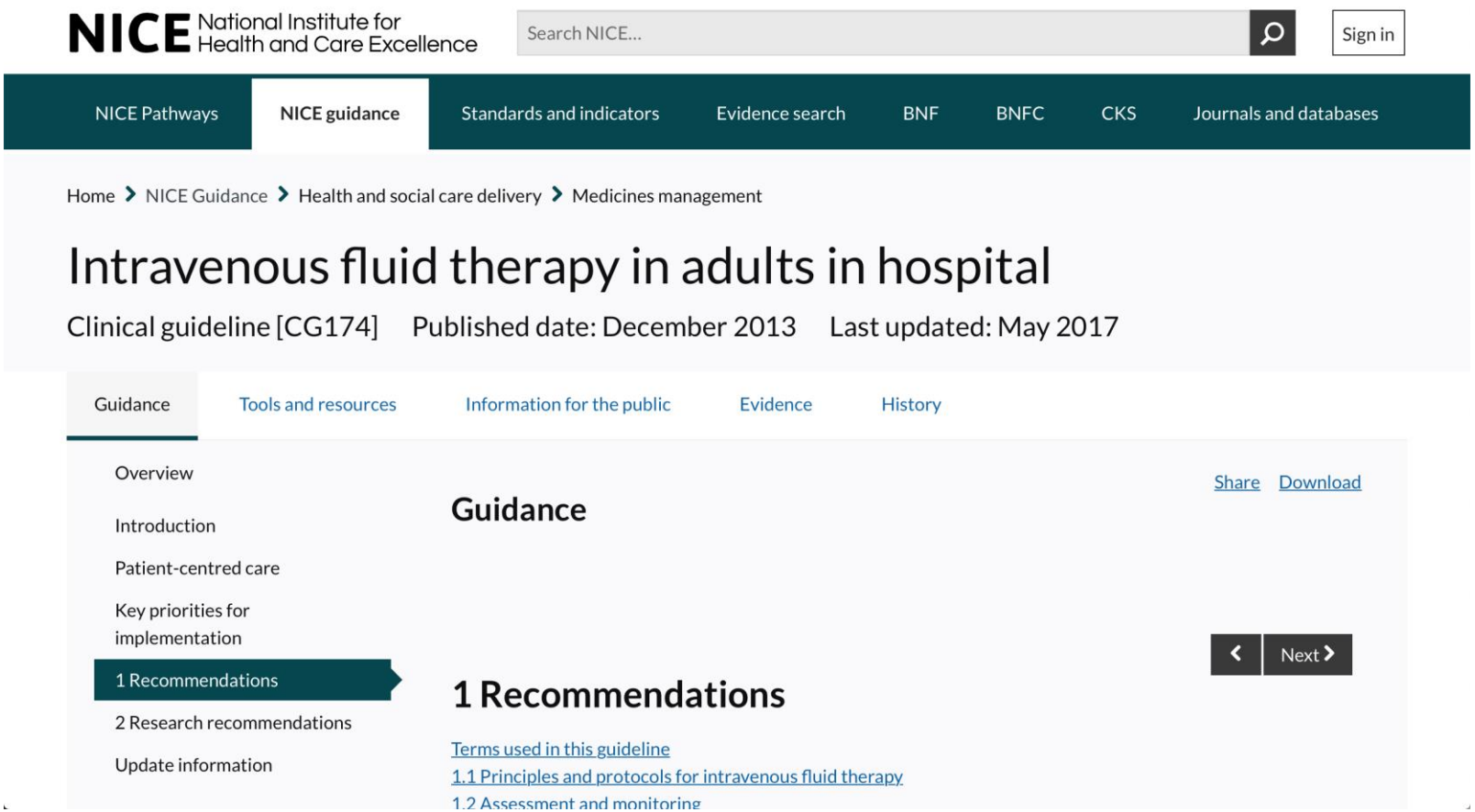
Prescribing – The Basics

1. All prescriptions should legible and should be **SIGNED AND DATED**
2. Always ensure the patients details are present and correct on the prescription
3. Always check the patient's allergy status
4. The dose and route should be clearly specified
5. Always think about the most appropriate route/formulation/timing
6. Avoid abbreviations eg. N/S, and brand names eg. Ventolin
7. Write UNITS and MICROGRAMS in full

Prescribing in the PSA

- Eight prescribing questions worth 10 marks each
- 5 marks for drug choice, 5 marks for dosage, route and frequency
- Each questions requires the prescription of a single drug or intravenous fluid
- Typical scenarios involve treatment of acute conditions, chronic conditions and important symptoms such as pain
- If you ever get stuck make sure you know the “treatment summaries” section of the BNF well!

Fluid Prescribing



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Fluid Prescribing

- Some things to watch out for:
  - Quantity of potassium in a bag of saline. In a 1L bag of saline **0.3% Potassium Chloride = 40mmol KCl**
  - Don’t forget the glucose when prescribing maintenance fluids! 1L of 5% Dextrose contains 50g of glucose
  - NICE guidance suggests in resuscitation always prescribe crystalloids 500ml or less over <15 minutes

Section 2
Prescription Review

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Prescription Review

- 8 items each asking 2 questions worth two marks each (therefore 4 marks per item and 32 marks in total for this section)
- Candidates will be required to interpret a list of medicines and identify:
  - Clinical problems (eg. inappropriate dosage considering renal function)
  - Drug interactions
  - Dosing errors
  - Suboptimal prescriptions

How would you improve this prescription?

DATE →	16/1/19		MEDICINE (Approved Name)	SPECIAL INSTRUCTIONS	PRESCRIBER'S SIGNATURE	PHARMACIST
ROUTE →	PO		FUROSEMIDE		bleep No. A. SMITH	
SPECIFY TIME IF REQUIRED ↓	DOSE ↓	SIGN / DOSE CHANGE ↓				SUPPLY
Morning						REWRITE CHART
Midday						
Evening						
Bedtime	40mg					

DATE →	16/1/19		MEDICINE (Approved Name)	SPECIAL INSTRUCTIONS	PRESCRIBER'S SIGNATURE	PHARMACIST
ROUTE →	PO		PREDNISOLONE		bleep No. A. SMITH	
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IMPLY FINALS

DATE →	16/1/19		MEDICINE (Approved Name)	SPECIAL INSTRUCTIONS	PRESCRIBER'S SIGNATURE	PHARMACIST
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SPECIFY TIME IF REQUIRED ↓	DOSE ↓	SIGN / DOSE CHANGE ↓				SUPPLY
Morning						
Midday						
Evening						
Bedtime	40mg					

Should be given in morning – will keep patient awake!

DATE →	16/1/19		MEDICINE (Approved Name)	SPECIAL INSTRUCTIONS	PRESCRIBER'S SIGNATURE	PHARMACIST
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REWRITE CHART

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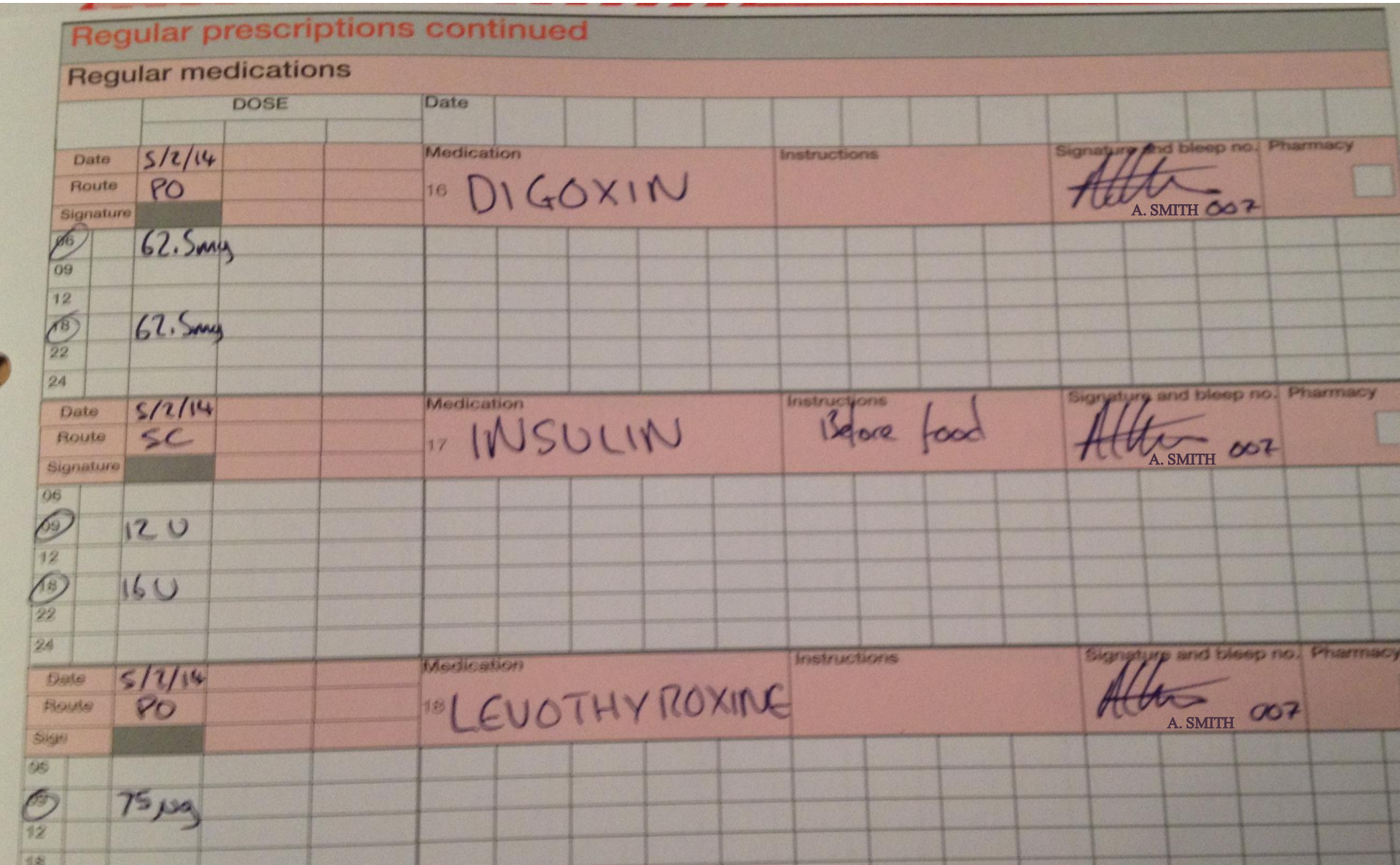
IMPLY FINALS

Spot the mistakes



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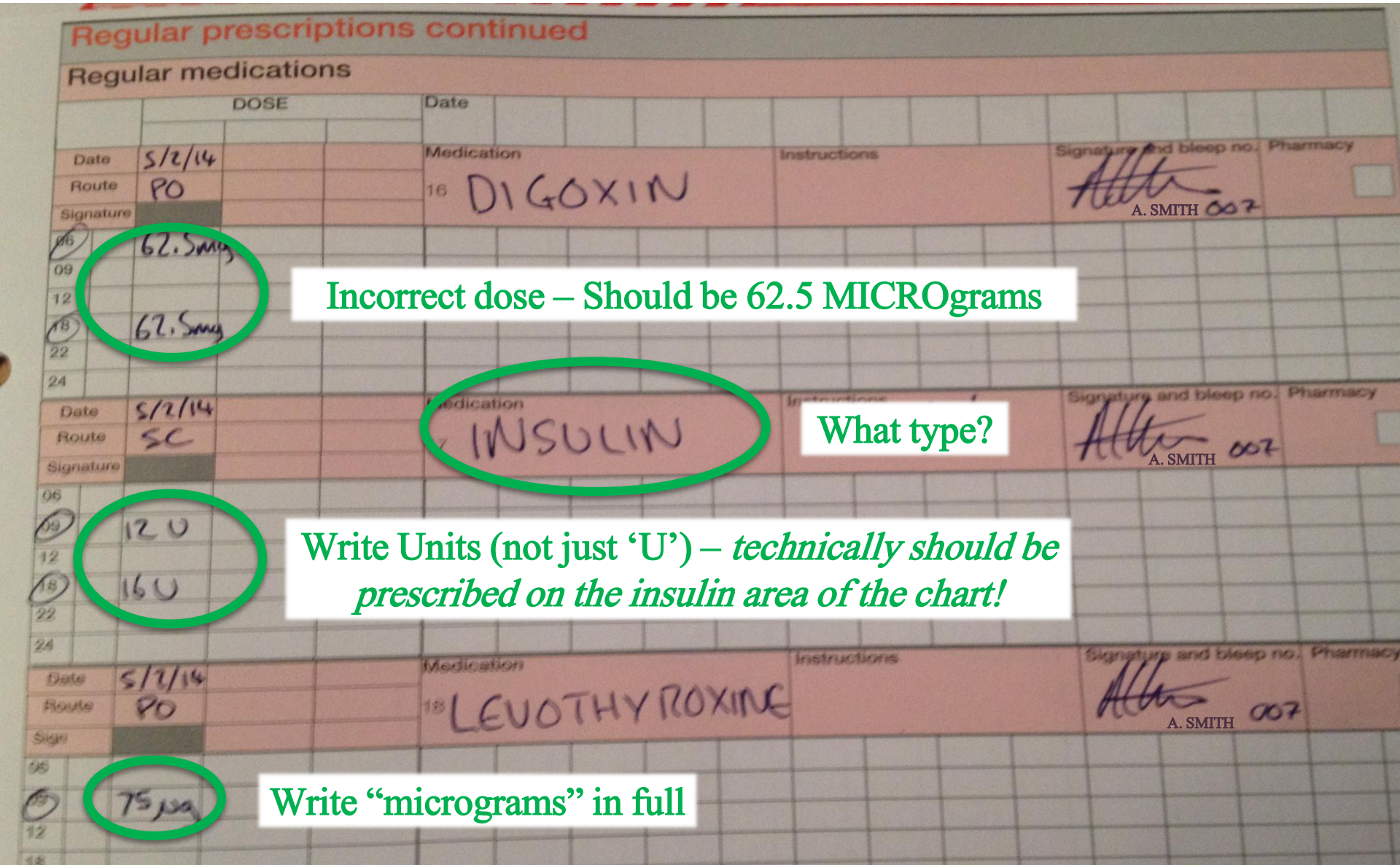
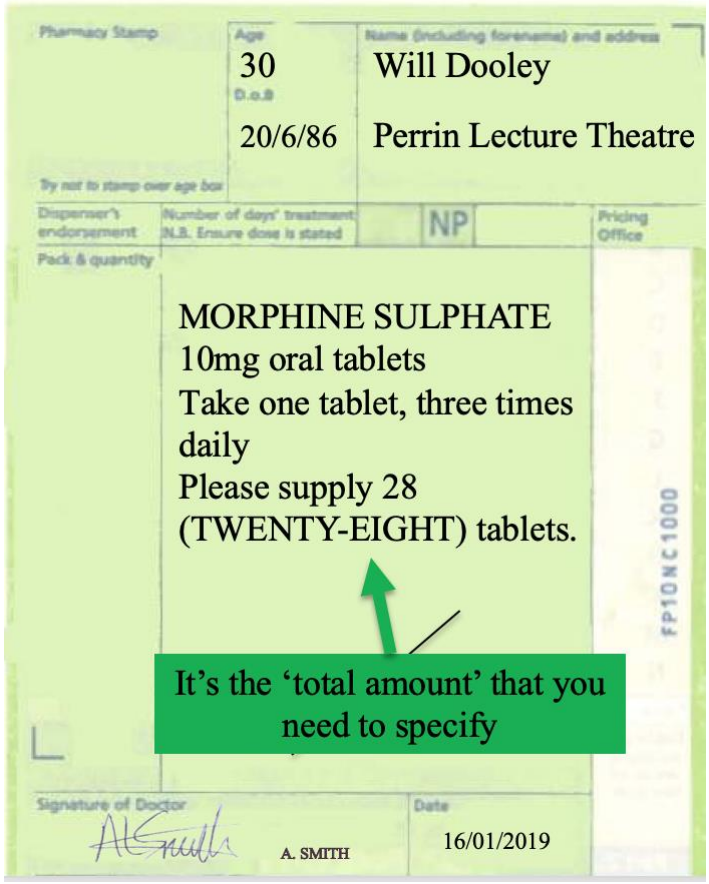


Controlled Drugs

- For Controlled Drugs, you must:
  - Include the name and address of the patient.
  - State the **name** and **strength** of the formulation
  - State the **dose** and **frequency**
  - State the **total amount to be supplied in words *and* figures**

Controlled Drugs



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Section 3
Planning
Management

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Planning management in the PSA

- MCQ style items with 5 options
- Choose which treatment as part of the **initial management** would be most appropriate given the clinical scenario
- 8 questions – 2 marks each
- The likely diagnosis (or differential diagnosis) should be clear from the scenario

Familiarise yourself with management of:

Acute Conditions:

- STEMI
- NSTEMI
- Acute left ventricular failure
- Tachycardia with pulse
- Anaphylaxis
- Acute asthma exacerbation
- Pneumonia
- PE
- GI bleed
- Bacterial meningitis
- Seizure
- Status epilepticus
- Stroke
- Hyperglycemia
- DKA and HHS
- AKI
- Poisoning

Chronic Conditions:

- Hypertension
- Chronic Heart Failure
- Stroke Prevention
- Stable Angina
- Chronic Asthma
- COPD
- Diabetes
- Insomnia
- Constipation
- Diarrhoea
- Pain

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Section 4
Providing Information

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Providing Information

- 6 items In SBA style in which candidates are required to select the **most important** piece of information from a list of five
- Each question is worth 2 marks
- Will be based around scenarios in which patients are about to begin a new treatment or are seeking advice about an existing treatment

Some examples

Drug	Important points of information
Ramipril	Stop in pregnancy – teratogenic
Gliclazide	Eat regularly, don't skip meals – hypo risk
Methotrexate	Regular FBC – neutropenia risk
Warfarin	Monitor INR – bleeding
Long Term Steroids	May need bone and gastric protection Don't stop suddenly – will need weaning down May need to increase dose when unwell "Sick day" dosing
SSRI	Contact doctor if thoughts of self harm, symptoms may not improve/worsen for first 2 weeks
Insulin	Don't stop taking when unwell, you may need more
Bisphosphonate	Take with full glass of water and remain upright for 1 hour

Some Examples

- Warfarin missed doses
  - Take if on same day but do not double dose the next day
- Insulin sick day rules in Type 1 diabetics
  - Never omit and monitor BMs. Maintain adequate fluid and carbohydrate intake. If unable to keep fluids down seek urgent medical attention
- Steroid sick day rules
  - Double glucocorticoid dose in adrenocortical insufficiency

Section 5
Calculation
Skills

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Calculation Skills

- 8 Items worth 2 marks each
- All scenarios will include the minimum information required (and may include additional information such as "**reasonable distracting data**")
- Practice, practice, practice
- However if stuck don't spend all your time on one question!

Example Question

A baby needs 200mg Cefotaxime. Vials contain 0.5g and are made up to a total volume of 2ml

What volume should be given?

- $\frac{Dose\ Required\ (mg)}{Dose\ Available\ (mg)}\ x\ Volume\ (ml)$
- Make sure you are using the same units!
- $\frac{200mg}{500mg}\ x\ 2ml = 0.8mls$

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Calculation Tips

- Drugs expressed in percentages: $\frac{Weight\ (g)}{100\ ml}$
- 1% means:
  - 1g in 100ml for w/v (weight/volume)
  - 1g in 100g for w/w (weight by weight)
  - Therefore 5 mls of 1% Lidocaine contains 50mg of Lidocaine (10mg in 1ml)

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Calculation Tips

- Drugs expressed in ratios: Weight (g) : Volume (ml)
- 1:1000 means:
  - 1g in 1000ml
- 1:10000 means
  - 1g in 10,000ml
- Therefore 10mls of 1:10000 adrenaline contains 1mg of adrenaline

Section 6
Adverse Drug Reactions

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Adverse Drug Reactions

- 8 items consisting of 2 marks each
- SBA style questions with 5 options
- Four main question types:
  - Identify the **most likely** adverse effect of a specific drug
  - Identify a medication **most likely** to have caused a particular clinical presentation
  - Identify medications **most likely** to be causing a clinical presentation as the result of an interaction
  - Determine **most appropriate management** in a patient suffering an adverse drug effect (eg. anaphylaxis, bleeding)

Adverse Drugs Reactions

- Two main types:
  - Type A (Augmented) eg. Bleeding with warfarin
  - Type B (Idiosyncratic) eg. Anaphylaxis with penicillin

Penicillin Allergy

CONTRA-INDICATED

Antibiotics to be avoided in Type I Penicillin allergy

- Amoxicillin
- Benzylpenicillin
- Co-amoxiclav (Augmentin®)
- Flucloxacillin
- Phenoxymethylpenicillin (penicillin V)
- Piperacillin + tazobactam (Tazocin®)

CAUTION

- Avoid if Type I penicillin allergy and patient has mild to moderate infection
- Consider giving, under close observation a 2nd or 3rd generation cephalosporin or meropenem if Type I allergy and patient has a life threatening infection

Antibiotics to be avoided or used with caution in Type I Penicillin allergy

Cephalosporins:

- Cefixime
- Ceftriaxone
- Cefotaxime
- Ceftazidime
- Cefuroxime

Other beta-lactam antibiotics:
Meropenem

CONSIDERED SAFE

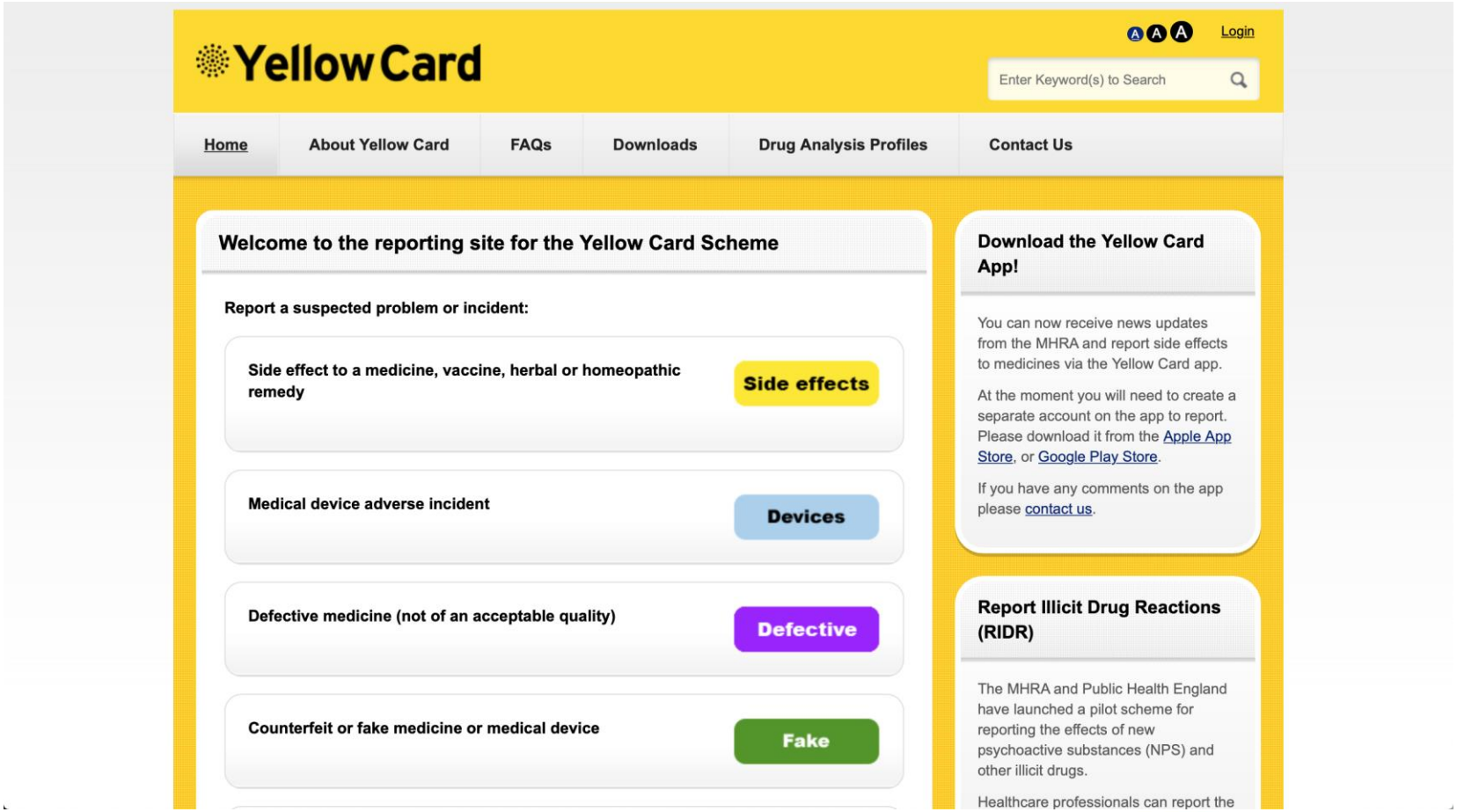
Antibiotics that are safe to use in Type I penicillin allergy

- Amikacin
- Ciprofloxacin
- Clarithromycin
- Clindamycin
- Colistin
- Co-trimoxazole
- Doxycycline
- Erythromycin
- Gentamicin
- Levofloxacin
- Linezolid
- Metronidazole
- Nitrofurantoin
- Rifampicin
- Sodium Fusidate
- Teicoplanin
- Tetracycline
- Tobramycin
- Trimethoprim
- Vancomycin

Adverse Drug Reactions

- Use medicines complete interaction checker
- Be aware of management of anaphylaxis, hypoglycaemia, excessive anticoagulation
- Be familiar with “oral anticoagulants” treatment summary (*Remember Vitamin K = Phytomenadione*). (In clinical practice may need to discuss with haematology if DOAC)
- Be aware of different types of interaction (Drug absorption, excretion, additive effects, antagonistic, Enzyme inducers/inhibitors)

MHRA Yellow Card Reporting Scheme



Section 7
Drug
Monitoring

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Drug Monitoring

- 8 SBA style questions with 5 options
- Candidates are required to demonstrate they understand how to best assess the impact of ongoing or planned treatments by selecting the most appropriate options
- This may include monitoring beneficial or harmful effects

Examples of drug monitoring

- Warfarin – monitor INR
- Levothyroxine – monitor TFTs
  - When starting, monitor TFTs every 4 weeks and titrate dose up in increments of 25-50micrograms.
- ACE Inhibitors/Diuretics – monitor U+Es
- Gentamicin – monitor serum levels due to narrow therapeutic window
- Phenytoin – monitor serum levels due to zero-order kinetics

Section 8
Data
Interpretation

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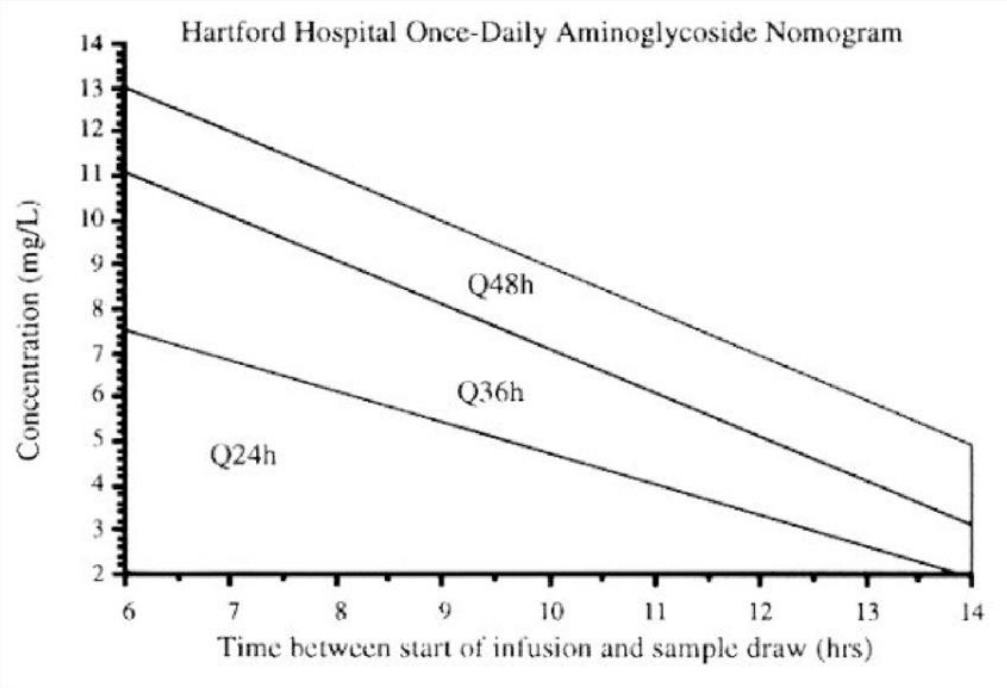
Data Interpretation

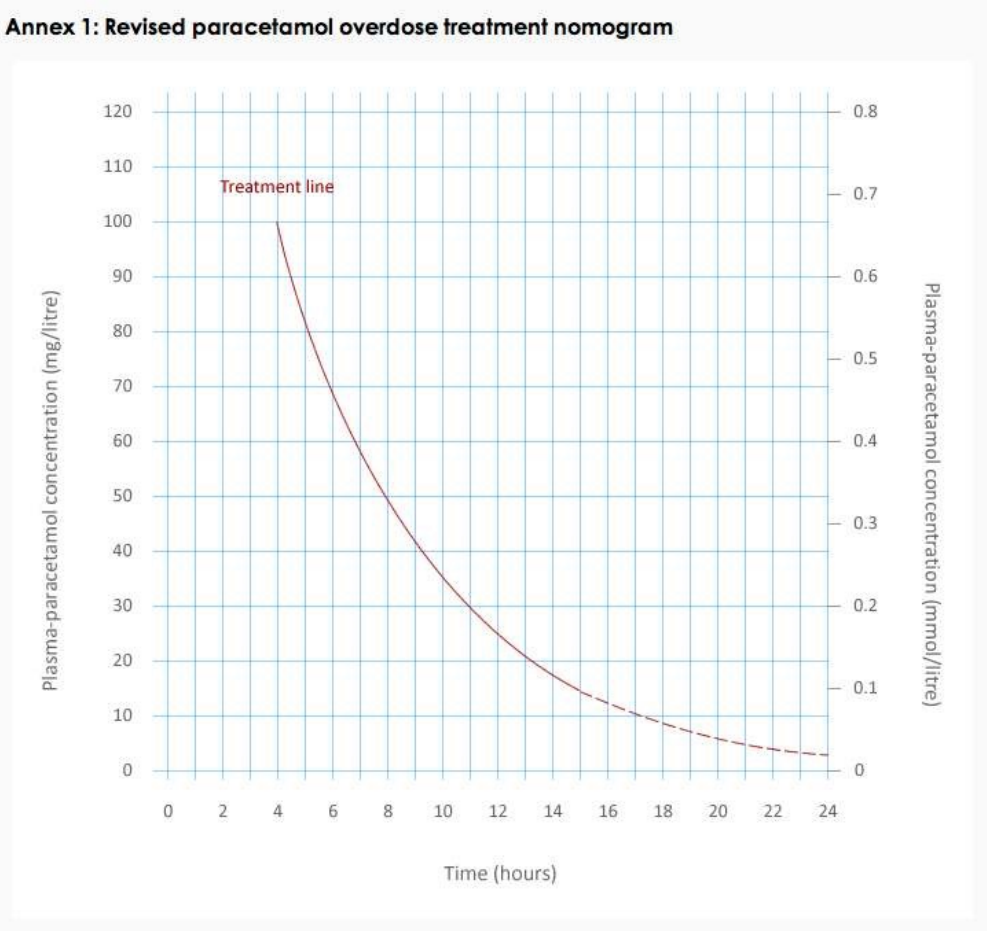
- 6 Items in SBA style with 5 options
- Each item is worth two marks
- Involve interpreting data in a clinical scenario and deciding on the most appropriate course of action with regard to prescribing.

Hartford Normogram

- Commonly used in Gentamicin dosing when calculating the interval at which to give the next dose:



Paracetamol Level Normogram



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Some Final Points

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“PSA Approved” Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
2-hrly	Every 2 hours	NEB	Nebulised
3-hrly	Every 3 hours	PO	Orally
4-hrly	Six times a day	PR	Rectal
6-hrly	Four times a day	SL	Sublingual
8-hrly	Three times a day	SC	Subcutaneous
12-hrly	Twice daily	TOP	Topical
m/r	Modified Release	PV	Vaginal
INH	Inhaled	*Others routes (e.g. buccal, intradermal) should be written in full. You will encounter other prescriptions in clinical practice eg. PRN, NOCTE, MANE*	
IM	Intramuscular		
IV	Intravenous		

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Patient groups to think about

- Liver disease
  - Beware of medications that may exacerbate failure
  - Hypoalbuminaemia can result in toxicity of some highly-protein bound drugs such as phenytoin and prednisolone
- Renal Failure
  - Avoid “nephrotoxics”
  - Dose adjust medications as needed
- Elderly
  - Be aware of polypharmacy
  - Question whether multiple medications are really needed
  - Think about route and compliance
  - Consider smaller doses

Patient groups to think about

- Pregnancy
  - Only prescribe if benefit outweighs risk to foetus
  - Examples: Sodium Valproate, Warfarin, ACE Inhibitors, Tetracyclines, Lithium
  - Paternal teratogens – eg. Methotrexate
- Breastfeeding
  - Avoid certain medications that can be secreted in large levels in breast milk eg: aspirin, lamotrigine, carbimazole
  - Advice available on BNF and LactMed app

Primum non nocere

Prescribing – Some Additional Tips (for busy FY1s!)

1. Remember that if you prescribe a medication it is **your** responsibility
2. Always consider risks and benefits of a medication
3. Consider the patient you are prescribing for eg. age, renal function, liver function, pregnancy
4. Don't prescribe a drug you don't know (read up first!)
5. Use specific sections of drug charts to help you eg. insulin and warfarin prescribing

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Thank you and good luck!

Please give us your feedback!

www.tinyurl.com/SimplyFeedbackWeek3

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we are all about you

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