SPE3 Feedback session

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User notes

- This is a formative exam
- **Please do not share outside of your cohort**
  - This will lessen the use for future years

If not sure about something based on the feedback or anything else PSA related, feel free to email me at v.kapil@qmul.ac.uk with your query and if we can't figure out by email, we can Teams

User notes

- Please use this for your learning around the topics and familiarising yourself with the BNF(s)

- The PWS questions will be hand-marked
- Any truly disputable questions/answers will not have made it into a final PSA exam
- PWS (10-point prescribing) mark schemes potentially will vary in the real exam, but this is a reasonable indicative guide

- There is no reasonable way to reproduce the full “look” of the PSA exam with the Rogo/SPE system

Summary statistics

- Internal Anghoff method pass mark 61%
  - Fail (<61%)
  - Borderline pass (61-65%)
  - Good pass (>65%)

  - As a rule of thumb, you should do the PWS and REV questions with at least half your overall time left
  - If you think you will spend too long on a calculation, I suggest you move on first
  - Be familiar with the BNF
  - Work through any screenshots I have provided

Prescribing Item

ID	PWS10 7

This question item is worth **10 marks**

You may use the BNF at any time

Case presentation

A 46-year-old woman has been unable to take her usual medications for Addison's disease due to viral gastroenteritis causing vomiting. She is admitted into hospital in a collapsed state **PMH**. Addison's disease. **DH.** Hydrocortisone orally 10mg in morning, 5mg in afternoon, 5mg in evening; fludrocortisone 100 micrograms orally daily.

She is diagnosed with an Addisonian crisis with hypotension and hypoglycaemia. She has been given appropriate intravenous fluid and glucose resuscitation.

Examination (after initial fluid resuscitation and glucose treatment)

BP 118/68 mmHg, pulse 96 regular
Sats 98% OA, RR 12, chest clear
Blood capillary glucose 8.2 mmol/l
GCS 14/15

ECG sinus rhythm

Prescribing request

Write a prescription for ONE drug that will help to treat her condition

(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 *including surname*	Time Given	Given By

Learning point – select the dose for the right indication!

Indications and dose

For HYDROCORTISONE

Thyrotoxic crisis (thyroid storm)

By intravenous injection

For Adult
100 mg every 6 hours, to be administered as sodium succinate.

Adrenocortical insufficiency resulting from septic shock

By intravenous injection

For Adult
50 mg every 6 hours, given in combination with fludrocortisone.

Acute hypersensitivity reactions such as angioedema of the upper respiratory tract and anaphylaxis (adjunct to adrenaline)

By intravenous injection

For Adult
100–300 mg, to be administered as sodium succinate.

Corticosteroid replacement, in patients who have taken more than 10 mg prednisolone daily (or equivalent) within 3 months of minor surgery under general anaesthesia

By intravenous injection, or by intravenous infusion

For Adult
Initially 25–50 mg, to be administered at induction of surgery, the patient's usual oral corticosteroid dose is recommenced after surgery.

Adrenal crisis

Initially by intramuscular injection, or by intravenous injection

For Adult
Initially 100 mg, then (by continuous intravenous infusion) 200 mg every 24 hours, diluted in Glucose 5%, alternatively (by intramuscular injection or by intravenous injection) 50 mg every 6 hours, dose increased to 100 mg every 6 hours in patients who are severely obese.

Prescribing Item | ***Answer Page*** | **ID** PWS107 | This question item is worth **10 marks** | You may use the BNF at any time

	A. Drug choice	Score	Feedback/justification		B. Dose, route, freq.	Score	Feedback/justification
1	Hydrocortisone	5	Hydrocortisone is the initial management of Addisonian crises		100mg intramuscular or intravenous	5	Correct dose and route
					>100 mg intramuscular or intravenous	4	
					<100 mg intramuscular or intravenous	2	
					Oral doses	0	
2	Fludrocortisone	0	Initial management will be hydrocortisone			0	

Prescribing item

ID	PWS202

This question item is worth **10 marks**

You may use the BNF at any time

Case presentation
A 38-year-old woman in her 2nd trimester is attends the antenatal ward with a 3-day history of foul-smelling urine, dysuria and fever. **PMH.** None. **DH.** No regular medicines. **SH.** She is a non-smoker.

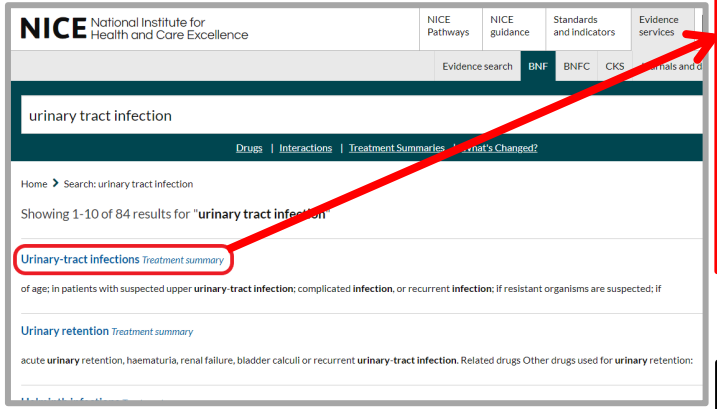
On examination
Appears well
Temperature 37.8°C.
There is no renal angle or abdominal tenderness.
Pulse 92/min, blood pressure 112/84 mmHg

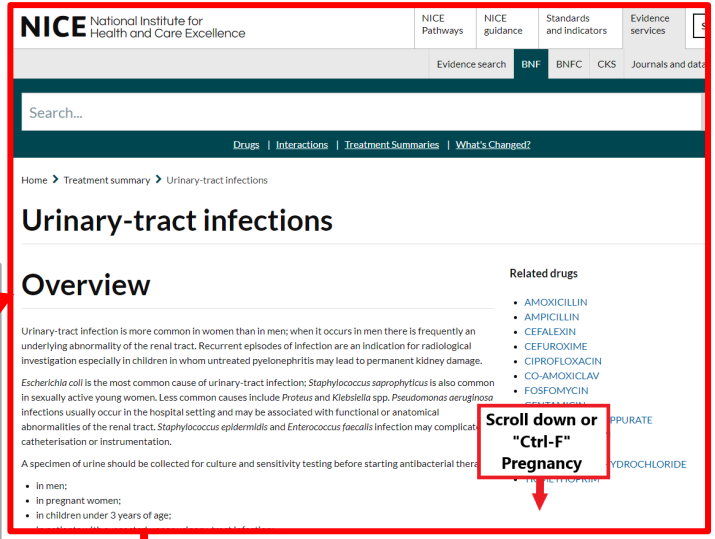
Investigations
Urinalysis reveals nitrites ++++, leucocytes ++++, no protein.

She is clinically well, and is due to be discharged with medications.

Prescribing request
Write a prescription for ONE drug that will be continued as an outpatient to treat her condition
(use the hospital 'regular medicines' prescription chart provided)

		Date → / Time ↴						
Medicine (Approved name)		6	☐					
		8	☐					
Dose	Route	12	☐					
Prescriber Signature *including surname*	Start date (DD/MM/YYYY)	14	☐					
		18	☐					
Notes	Pharmacy	22	☐					


NICE National Institute for Health and Care Excellence
NICE Pathways
NICE guidance
Standards and indicators
Evidence services
Evidence search
BNF
BNFC
CKS
urinary tract infection
Drugs | Interactions | Treatment Summaries | What's Changed?
Home > Search: urinary tract infection
Showing 1-10 of 84 results for "urinary tract infection"
Urinary-tract infections Treatment summary
of age; in patients with suspected upper urinary-tract infection; complicated infection, or recurrent infection; if resistant organisms are suspected; if
Urinary retention Treatment summary
acute urinary retention, haematuria, renal failure, bladder calculi or recurrent urinary-tract infection. Related drugs Other drugs used for urinary retention:


NICE National Institute for Health and Care Excellence
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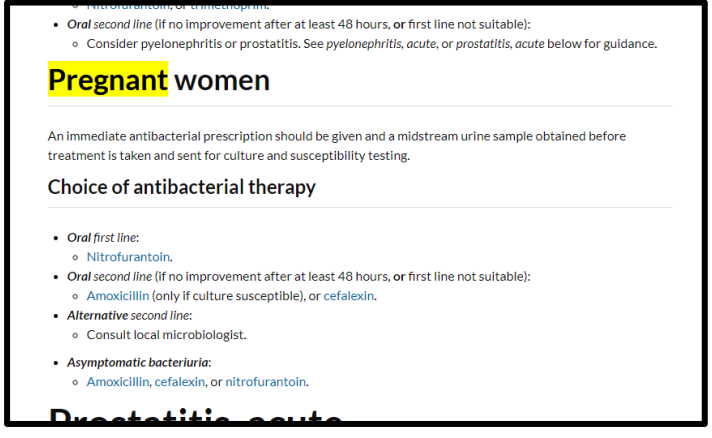
CKS
Search...
Drugs | Interactions | Treatment Summaries | What's Changed?
Home > Treatment summary > Urinary-tract infections
Urinary-tract infections
Overview
Urinary-tract infection is more common in women than in men; when it occurs in men there is frequently an underlying abnormality of the renal tract. Recurrent episodes of infection are an indication for radiological investigation especially in children in whom untreated pyelonephritis may lead to permanent kidney damage.
Escherichia coli is the most common cause of urinary-tract infection; Staphylococcus saprophyticus is also common in sexually active young women. Less common causes include Proteus and Klebsiella spp. Pseudomonas aeruginosa infections usually occur in the hospital setting and may be associated with functional or anatomical abnormalities of the renal tract. Staphylococcus epidermidis and Enterococcus faecalis infection may complicat
catheterisation or instrumentation.
A specimen of urine should be collected for culture and sensitivity testing before starting antibacterial thera
in men;
in pregnant women;
in children under 3 years of age;
Related drugs
AMOXICILLIN
AMPICILLIN
CEFALEXIN
CEFUROXIME
CIPROFLOXACIN
CO-AMOXICLAV
FOSFOMYCIN
PPURATE
YDROCHLORIDE
Scroll down or "Ctrl-F" Pregnancy


Nitrofurantoin, or trimethoprim.
Oral second line (if no improvement after at least 48 hours, or first line not suitable):
Consider pyelonephritis or prostatitis. See pyelonephritis, acute, or prostatitis, acute below for guidance.
Pregnant women
An immediate antibacterial prescription should be given and a midstream urine sample obtained before treatment is taken and sent for culture and susceptibility testing.
Choice of antibacterial therapy
Oral first line:
Nitrofurantoin.
Oral second line (if no improvement after at least 48 hours, or first line not suitable):
Amoxicillin (only if culture susceptible), or cefalexin.
Alternative second line:
Consult local microbiologist.
Asymptomatic bacteriuria:
Amoxicillin, cefalexin, or nitrofurantoin.

Pregnancy antibiotics for UTIs - principles

	First trimester	Second trimester	Third trimester
Nitrofurantoin	Suitable in first and second trimesters (but may be second line to penicillins)		**should be avoided at term (may produce neonatal haemolysis)**
Penicillins and cephalosporins	Suitable for treating urinary-tract infection during pregnancy, BUT second line in BNF **(if not allergic)**		
Sulfonamides (e.g. sulfamethoxazole – in folate synthesis pathway) and quinolones (e.g. ciprofloxacin / levofloxacin)	**Avoided during pregnancy**		
Trimethoprim	**Avoided particularly in the first trimester**	**Manufacturers recommend avoiding throughout**	

Prescribing Item | ***Answer Page*** | **ID** PWS202 | This question item is worth **10 marks** | You may use the BNF at any time BNF

	A. Drug choice	Score	Feedback/justification		B. Dose, route, frequency	Score	Feedback/justification
1	Nitrofurantoin	5	First line in BNF (but in other trusts amox may be first line)		50 mg orally 6-hrly (or 100mg orally 12hrly for MODIFIED RELEASE)	5	This is the optimum dose
					100 mg orally 6 hrly	3	
2	Amoxicillin Cefalexin	4	Beta lactams or orally active cephalosporins are appropriate in pregnancy May be second line		500 mg orally 8-hrly 500 mg orally 12-hrly	4	This is the optimal dosage and should be given for up to 7 days No clear indication for intravenous antibiotics
					Any above but either too low or high oral dose	2	Too high dose
					Appropriate iv dose	1	Intravenous route is reserved for those unable to take orally.
3	Cephalosporins with only IV formulations	1	These will work but are reserved for those unable to tolerate oral medications		Appropriate iv dose	1	
4	Trimethoprim	0	Should be avoided if possible, especially in first trimester		All doses	0	
5	Sulphonamides	0	Contraindicated in pregnancy		All doses	0	

Prescribing Item

ID PWS309

This item is worth **10 marks**

You may use the BNF at any time

Case presentation
A 50-year-old man presents to the Emergency Department with complete dysphagia due to a food bolus. He is made "nil by mouth" pending endoscopy tomorrow. **PMH** Nil. **DH.** Nil.

On examination
Temperature 37.1°C, HR 72/min and regular, BP 122/70 mmHg, O_2 sat 99% on RA. Weight 70kg

He has received already:
1L 5% dextrose/0.15% KCl over 12h

Prescribing request
Write a prescription for ONE intravenous fluid that would be most appropriate for the patient to receive next
(use the hospital fluid prescription chart provided)

Date DD/MM/YYYY	Start Time HH:MM	Infusion Solution	Volume	Duration	Infusion Rate [mL/min]	Signature *including surname*
				please select ▼		

NICE National Institute for Health and Care Excellence

Search BNF...

Sign in

NICE Pathways | NICE guidance | Standards and indicators | Evidence search | BNF | BNFC | CKS | Journals and databases

Drugs | Interactions | Treatment summaries | What's changed? | About BNF

Home > Treatment summary > Fluids and electrolytes

You are viewing BNF. If you require BNF for Children, use BNFC.

Fluids and electrolytes

Electrolyte replacement therapy

The electrolyte concentrations (intravenous fluid) table and the electrolyte content (gastro-intestinal secretions) table may be helpful in planning replacement electrolyte therapy; faeces, vomit, or aspiration should be saved and analysed where possible if abnormal losses are suspected.

Oral preparations for fluid and electrolyte imbalance

Sodium and potassium salts, may be given by mouth to prevent deficiencies or to treat established deficiencies of mild or moderate degree.

Oral potassium

Compensation for potassium loss is especially necessary:

- in those taking digoxin or anti-arrhythmic drugs, where potassium depletion may induce arrhythmias;

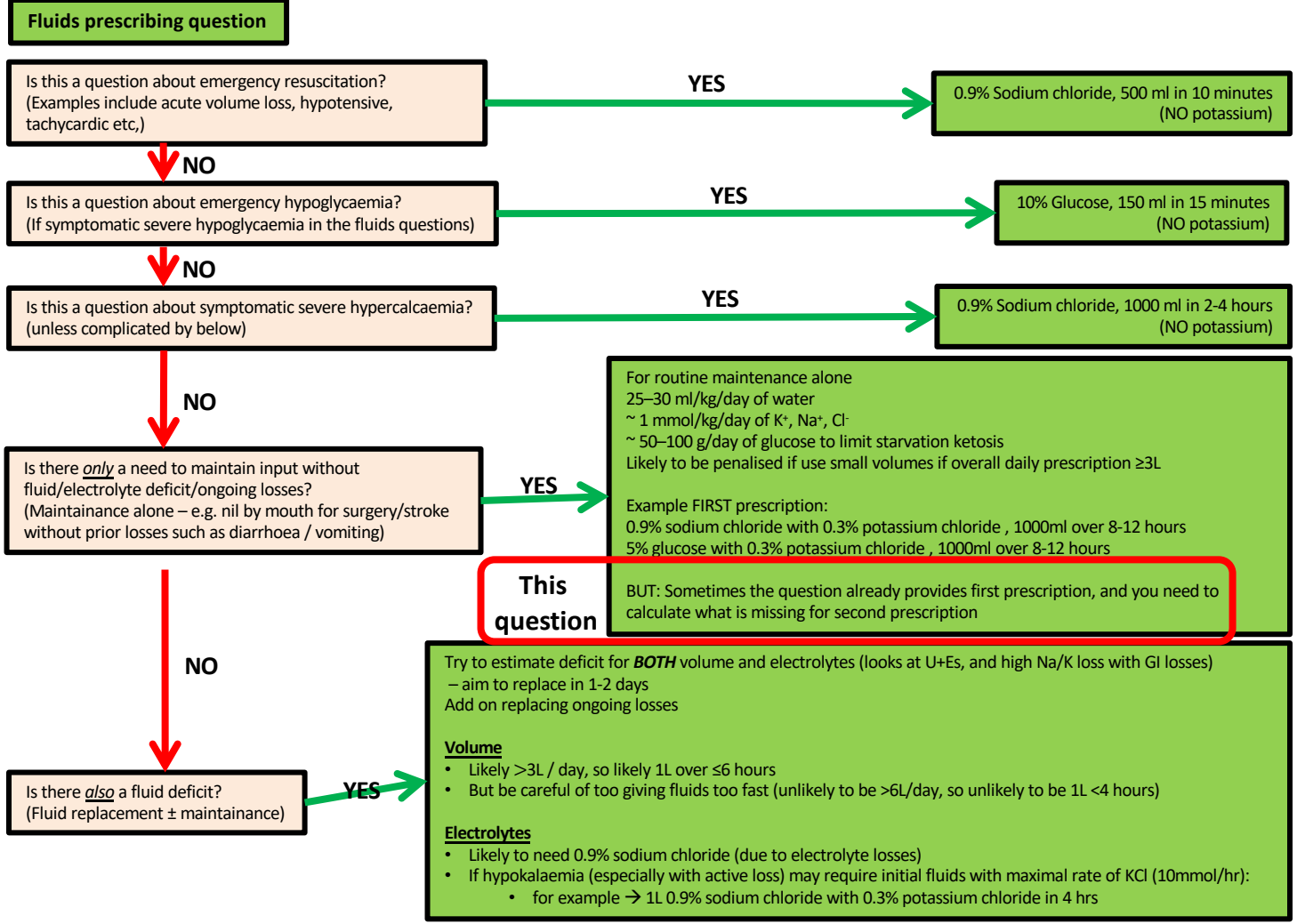
This section is not helpful for PSA

Related drugs

- ALBUMIN SOLUTION
- CALCIUM GLUCONATE
- FUROSEMIDE
- GELATIN
- GLUCOSE
- SODIUM
- SODIUM CHLORIDE WITH GLUCOSE

Related Treatment Summaries

- Diarrhoea (acute)


Fluids prescribing question
Is this a question about emergency resuscitation?
(Examples include acute volume loss, hypotensive, tachycardic etc,)
YES
0.9% Sodium chloride, 500 ml in 10 minutes
(NO potassium)
NO
Is this a question about emergency hypoglycaemia?
(If symptomatic severe hypoglycaemia in the fluids questions)
YES
10% Glucose, 150 ml in 15 minutes
(NO potassium)
NO
Is this a question about symptomatic severe hypercalcaemia?
(unless complicated by below)
YES
0.9% Sodium chloride, 1000 ml in 2-4 hours
(NO potassium)
NO
Is there only a need to maintain input without fluid/electrolyte deficit/ongoing losses?
(Maintainance alone – e.g. nil by mouth for surgery/stroke without prior losses such as diarrhoea / vomiting)
YES
For routine maintenance alone
25–30 ml/kg/day of water
~ 1 mmol/kg/day of K+, Na+, Cl-
~ 50–100 g/day of glucose to limit starvation ketosis
Likely to be penalised if use small volumes if overall daily prescription ≥3L
Example FIRST prescription:
0.9% sodium chloride with 0.3% potassium chloride , 1000ml over 8-12 hours
5% glucose with 0.3% potassium chloride , 1000ml over 8-12 hours
BUT: Sometimes the question already provides first prescription, and you need to calculate what is missing for second prescription
This question
NO
Is there also a fluid deficit?
(Fluid replacement ± maintainance)
YES
Try to estimate deficit for BOTH volume and electrolytes (looks at U+Es, and high Na/K loss with GI losses)
– aim to replace in 1-2 days
Add on replacing ongoing losses
Volume
Likely >3L / day, so likely 1L over ≤6 hours
But be careful of too giving fluids too fast (unlikely to be >6L/day, so unlikely to be 1L <4 hours)
Electrolytes
Likely to need 0.9% sodium chloride (due to electrolyte losses)
If hypokalaemia (especially with active loss) may require initial fluids with maximal rate of KCl (10mmol/hr):
for example → 1L 0.9% sodium chloride with 0.3% potassium chloride in 4 hrs

IV fluids – this question

Daily requirements are [NICE guidelines]:		Previous / ongoing losses	This scenario	Suggested prescription
25–30 ml/kg/d water	= 1750-2100mL water/day	None	Already had 1L in 12hrs	Therefore consider **1000mL in 12 hours**
1 mmol/kg/day sodium, chloride	= 70 mmol/day	None	None in previous 12hr	Therefore other fluids should contain Na^+ and Cl^+ • Consider **0.9% sodium chloride (+- potassium, see later)** or other balanced crystalloids (cannot adjust potassium)
1 mmol/kg/day potassium	= 70 mmol/day	None	(Has had 1L with 0.15% KCl) Therefore already had 20 mmoL in 12hrs	Therefore requires at least 40 mmol KCl • Available in **0.9% sodium chloride with 0.3% KCl (note: 0.3% KCl = 40mmol/L KCl)** • I would suggest that balanced crystalloids (with only 3-5 mmol/L KCl) may be insufficient in context of earlier
50–100 g/day glucose (NB. glucose 5% contains 5 g/100ml)		None	Already had 50g in 12hrs	No need to have glucose, so should still be based on above

Prescribing Item

ID PWS309

This item is worth **10 marks**

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He has received already:
1L 5% dextrose/0.15% KCl over 12h

Prescribing request
Write a prescription for ONE intravenous fluid that would be most appropriate for the patient to receive next
(use the hospital fluid prescription chart provided)

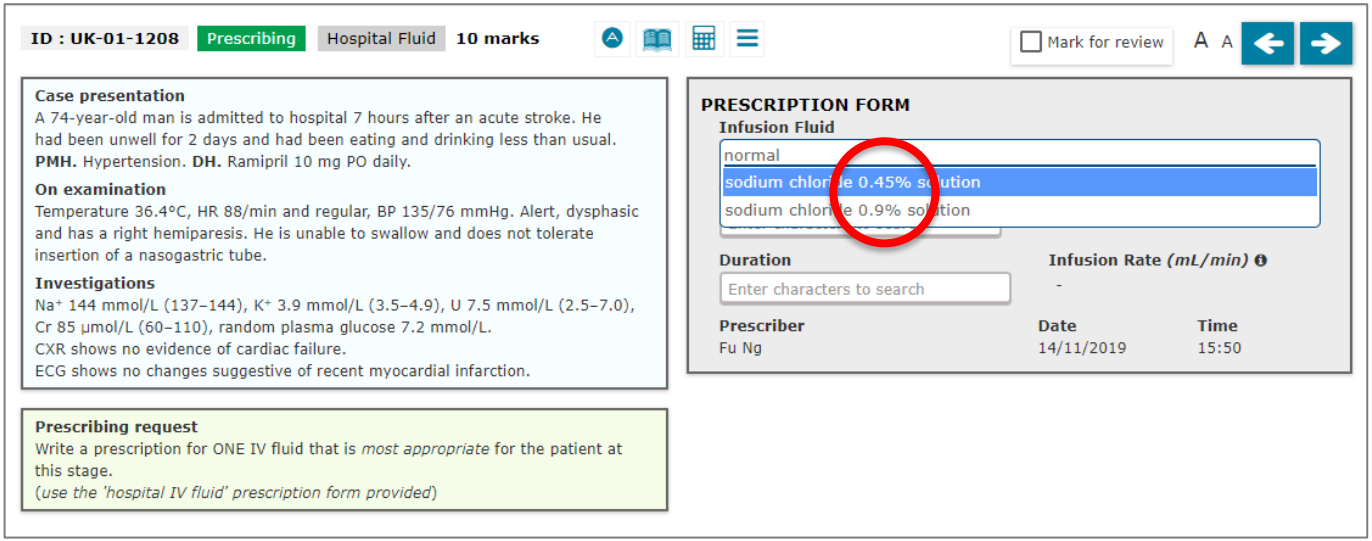
Date DD/MM/YYYY	Start Time HH:MM	Infusion Solution	Volume	Duration	Infusion Rate [mL/min]	Signature *including surname*
				please select ▼		

Prescribing Item | ***Answer Page*** | T D PWS 309 | This question item is worth **10 marks** | You may use the BNF at any time

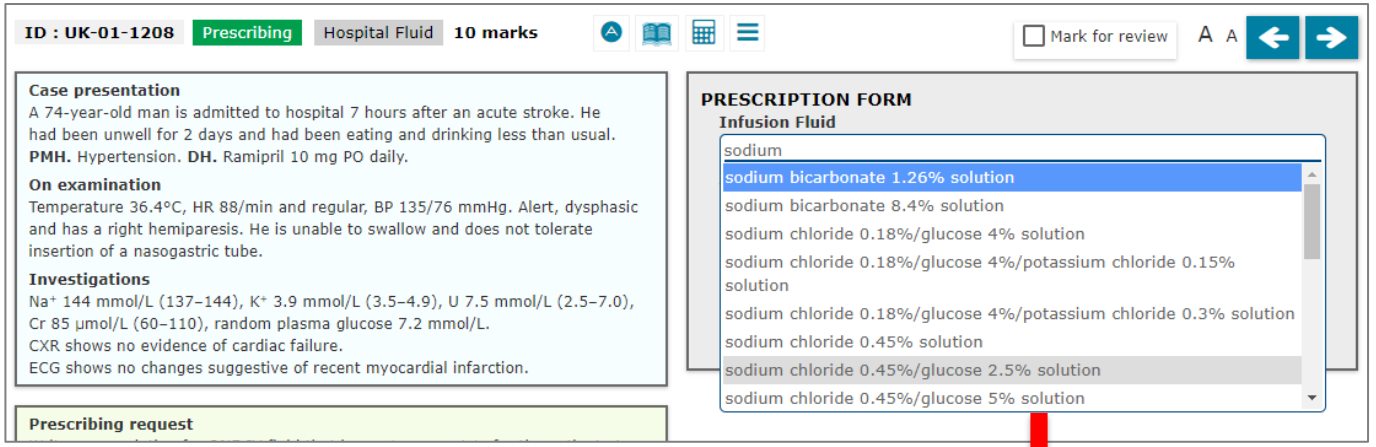
A. Drug choice		Score	Feedback/justification		B. Dose and route	Score	Feedback/justification
1	0.9% sodium chloride with 0.3% KCl	5	See previous slide for feedback		1L in 12 hours (accept 10 hours)	5	See previous slide for feedback
					1L in 4-8 hours OR 1L in 16-24 hours	3	Either too fast or too slow
					Smaller volumes	1	Inappropriate to prescribe smaller volumes if patient stable
2	0.9% sodium chloride with 0.15% KCl	4	Insufficient potassium		1L in 12 hours	4	See previous slide for feedback
					1L in 4-8 hours OR 1L in 16-24 hours	2	Either too fast or too slow
3	Hartmann's, Ringer's, Plasmalyte (or other balanced solutions) 0.9% sodium chloride (wihtout KCl)	3	insufficient potassium		1L in 12 hours	3	See previous slide for feedback
					1L in 4-8 hours OR 1L in 16-24 hours	1	Either too fast or too slow
4	5% glucose with 0.3% KCl	3	Insufficient to meet sodium requirements		1L in 12 hours	3	See previous slide for feedback
					1L in 4-8 hours OR 1L in 16-24 hours	1	Either too fast or too slow
5	5% glucose (without KCl)	1	Insufficient sodium and potassium		1L in 12 hours	1	See previous slide for feedback
6	Other fluids	0	Likely to score very low				

Be familiar with the PSA exam interface

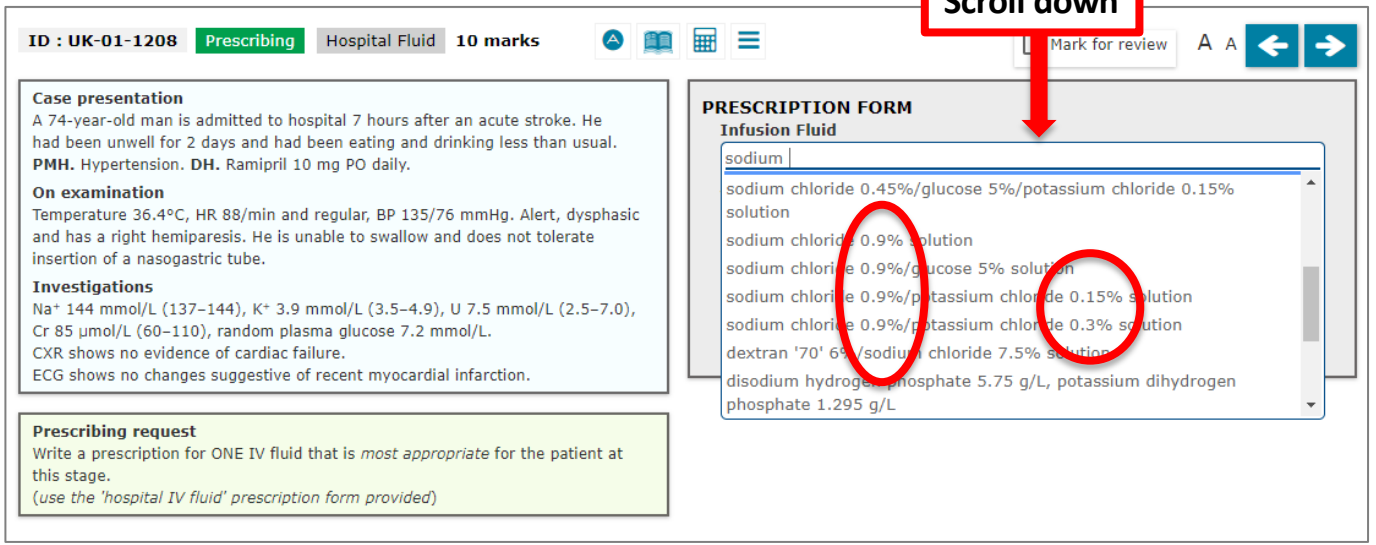
- Use the demonstration paper and click through



NOTE: Not “normal saline”


ID : UK-01-1208
Prescribing
Hospital Fluid
10 marks
Mark for review
A A
Case presentation
A 74-year-old man is admitted to hospital 7 hours after an acute stroke. He had been unwell for 2 days and had been eating and drinking less than usual.
PMH. Hypertension. DH. Ramipril 10 mg PO daily.
On examination
Temperature 36.4°C, HR 88/min and regular, BP 135/76 mmHg. Alert, dysphasic and has a right hemiparesis. He is unable to swallow and does not tolerate insertion of a nasogastric tube.
Investigations
Na+ 144 mmol/L (137–144), K+ 3.9 mmol/L (3.5–4.9), U 7.5 mmol/L (2.5–7.0), Cr 85 µmol/L (60–110), random plasma glucose 7.2 mmol/L.
CXR shows no evidence of cardiac failure.
ECG shows no changes suggestive of recent myocardial infarction.
Prescribing request
PRESCRIPTION FORM
Infusion Fluid
sodium
sodium bicarbonate 1.26% solution
sodium bicarbonate 8.4% solution
sodium chloride 0.18%/glucose 4% solution
sodium chloride 0.18%/glucose 4%/potassium chloride 0.15% solution
sodium chloride 0.18%/glucose 4%/potassium chloride 0.3% solution
sodium chloride 0.45% solution
sodium chloride 0.45%/glucose 2.5% solution
sodium chloride 0.45%/glucose 5% solution

Scroll down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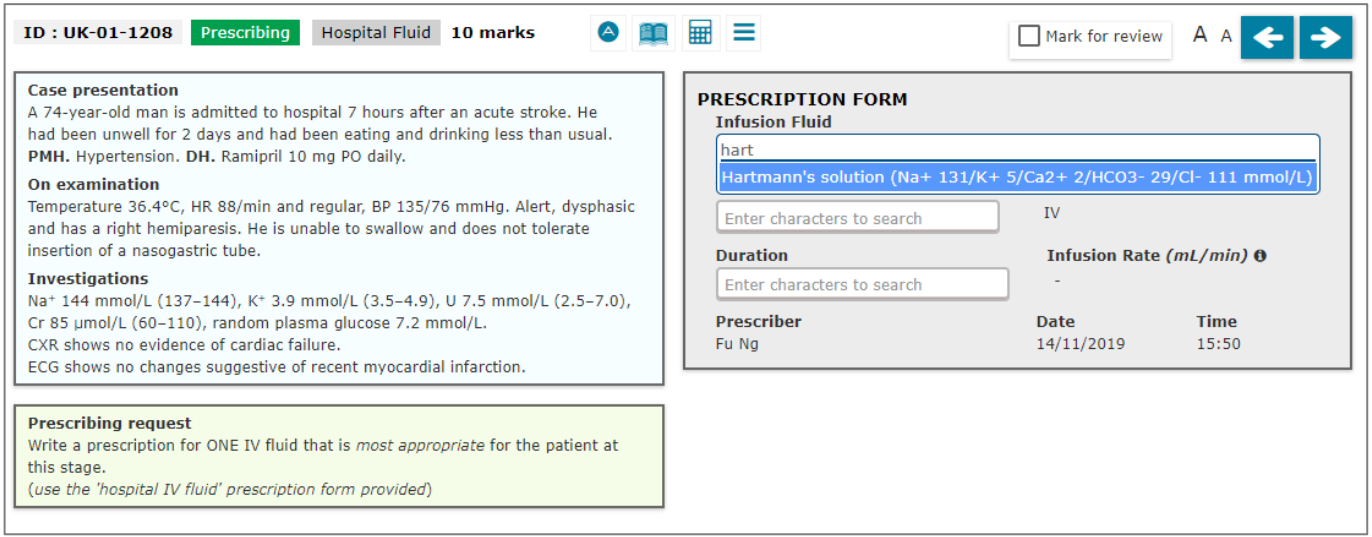
CXR shows no evidence of cardiac failure.
ECG shows no changes suggestive of recent myocardial infarction.
Prescribing request
Write a prescription for ONE IV fluid that is most appropriate for the patient at this stage.
(use the 'hospital IV fluid' prescription form provided)
PRESCRIPTION FORM
Infusion Fluid
sodium
sodium chloride 0.45%/glucose 5%/potassium chloride 0.15% solution
sodium chloride 0.9% solution
sodium chloride 0.9%/glucose 5% solution
sodium chloride 0.9%/potassium chloride 0.15% solution
sodium chloride 0.9%/potassium chloride 0.3% solution
dextran '70' 6% /sodium chloride 7.5% solution
disodium hydrogen phosphate 5.75 g/L, potassium dihydrogen phosphate 1.295 g/L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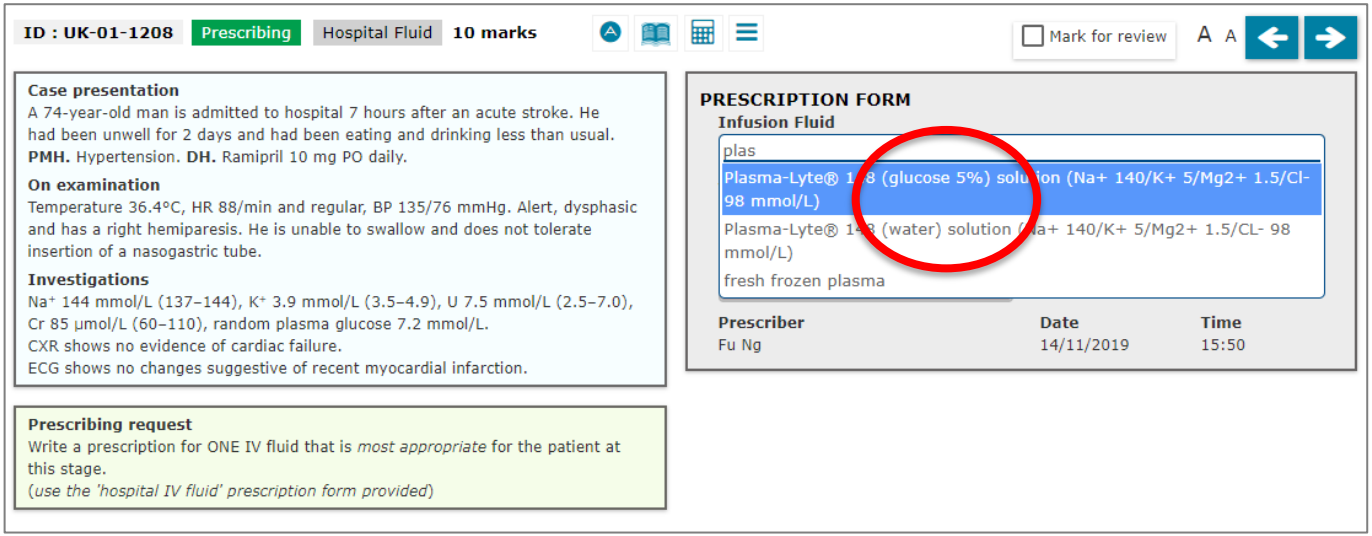
Investigations
Na+ 144 mmol/L (137–144), K+ 3.9 mmol/L (3.5–4.9), U 7.5 mmol/L (2.5–7.0), Cr 85 µmol/L (60–110), random plasma glucose 7.2 mmol/L.
CXR shows no evidence of cardiac failure.
ECG shows no changes suggestive of recent myocardial infarction.
Prescribing request
Write a prescription for ONE IV fluid that is most appropriate for the patient at this stage.
(use the 'hospital IV fluid' prescription form provided)
PRESCRIPTION FORM
Infusion Fluid
hart
Hartmann's solution (Na+ 131/K+ 5/Ca2+ 2/HCO3- 29/Cl- 111 mmol/L)
Enter characters to search
IV
Duration
Enter characters to search
Infusion Rate (mL/min)
-
Prescriber
Fu Ng
Date
14/11/2019
Time
15:50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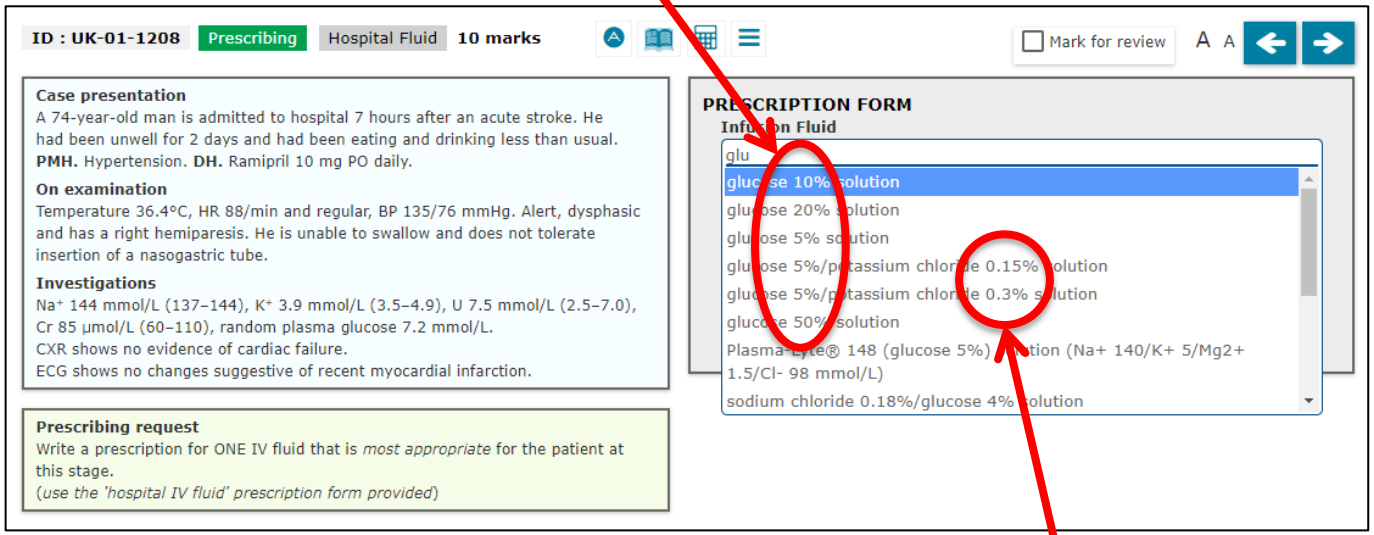
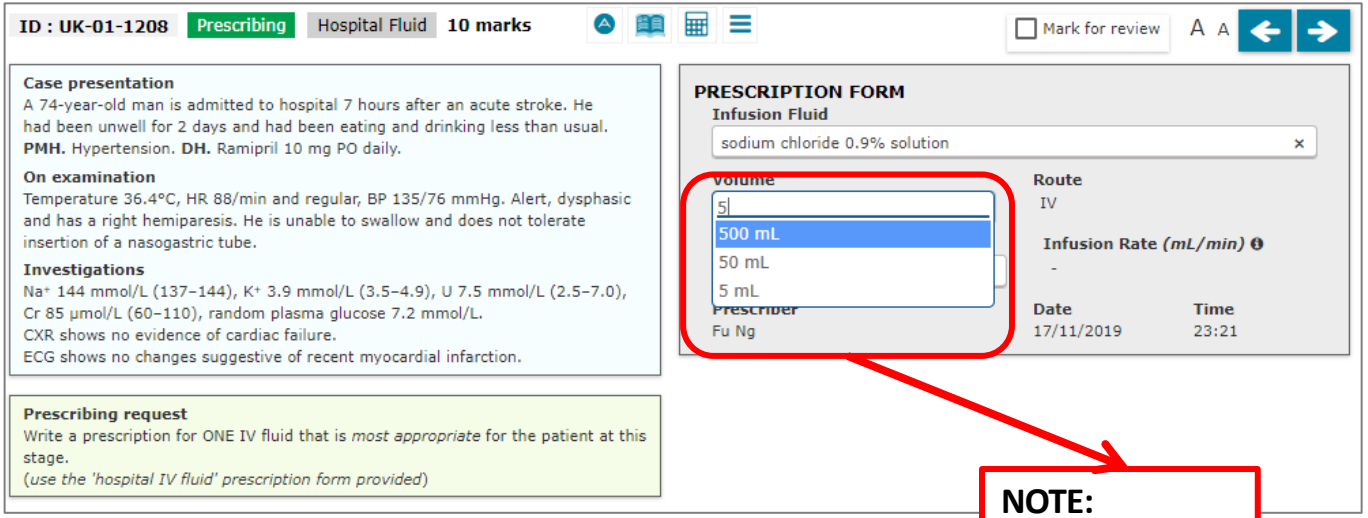
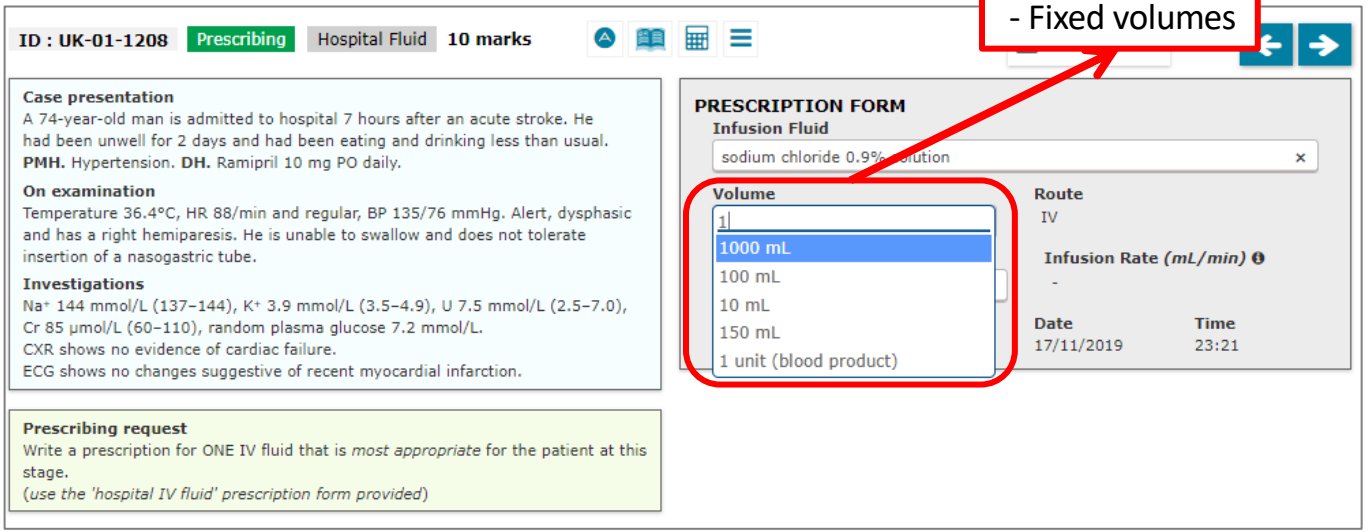
Investigations
Na+ 144 mmol/L (137–144), K+ 3.9 mmol/L (3.5–4.9), U 7.5 mmol/L (2.5–7.0), Cr 85 µmol/L (60–110), random plasma glucose 7.2 mmol/L.
CXR shows no evidence of cardiac failure.
ECG shows no changes suggestive of recent myocardial infarction.
Prescribing request
Write a prescription for ONE IV fluid that is most appropriate for the patient at this stage.
(use the 'hospital IV fluid' prescription form provided)
PRESCRIPTION FORM
Infusion Fluid
plas
Plasma-Lyte® 148 (glucose 5%) solution (Na+ 140/K+ 5/Mg2+ 1.5/Cl- 98 mmol/L)
Plasma-Lyte® 148 (water) solution (Na+ 140/K+ 5/Mg2+ 1.5/CL- 98 mmol/L)
fresh frozen plasma
Prescriber
Fu Ng
Date
14/11/2019
Time
15:50

NOTE: Not “dextrose”

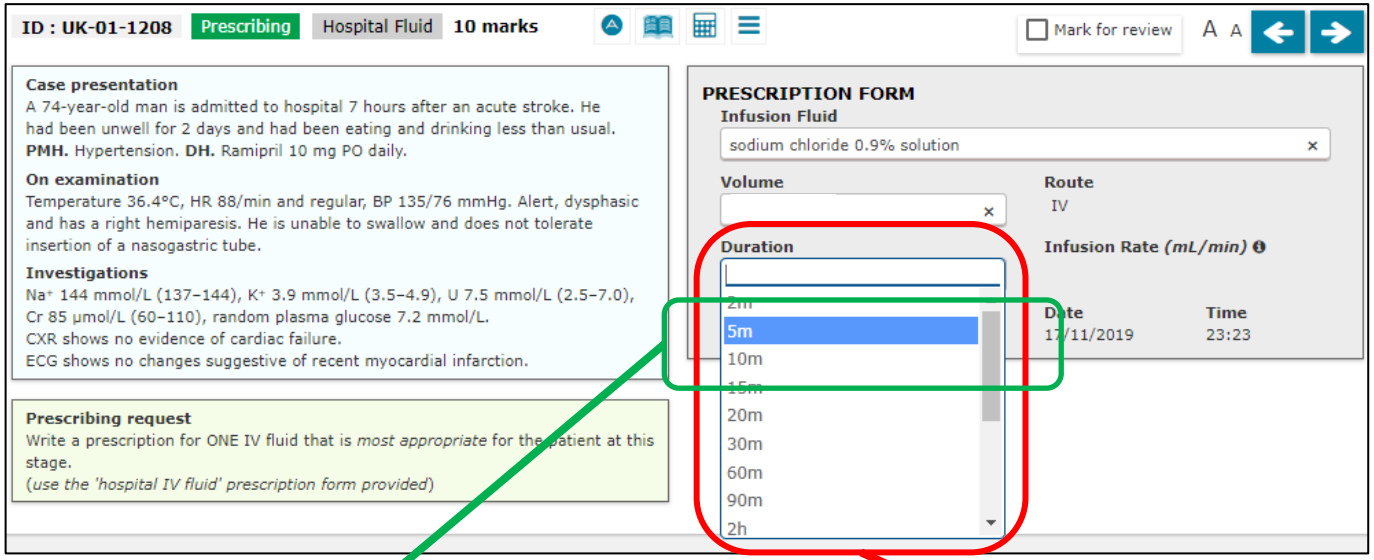


NOTE:
0.15% potassium chloride = 20mmol/L
0.3% potassium chloride = 40mmol/L





NOTE:
- Fixed volumes



NOTE:
Resus Bolus of 500ml “less than 15 minute”

NOTE:

- Fixed time durations
- No “stat” prescription
- unlikely able to give bolus 500ml in 2 minutes

Prescribing Item

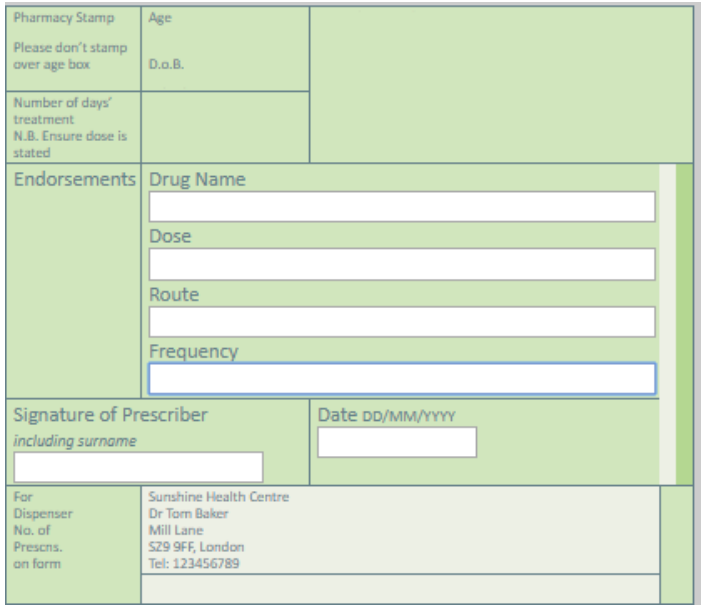
ID PWS411

This item is worth **10 marks**

You may use the BNF at any time

Case presentation

A 72 year old man presents to his General Practitioner after developing severe pain on his torso, 2 weeks after an attack of shingles. **PMH**. Hypertension, type II diabetes, gastric ulcer secondary to NSAIDs. **DH.** Amlodipine 5 mg orally daily, Metformin 850mg orally twice a day, paracetamol 1 grams four times a day, omeprazole 20mg orally daily.



Prescribing request

Write the initial prescription for ONE drug that will help to improve his symptoms.

(use the general practice prescription form provided)

Learning Point - What is being treated?

- **KEY MESSAGE –** Read the question on which is the condition/symptom is being treated.
  - The correct answer to this question was to treat the pain
  - If you were asked to treat the **condition**, you would consider treating the infection
    - (e.g. while the infection is active within 72 hours of the rash)

Prescribing Item	Answer Page	ID	PWS411	This item is worth **10 marks**	You may use the BNF at any time

	A. Drug choice	Score	Feedback/justification	B. Dose, route, freq.	Score	Feedback/justification
1	Pregabalin	5	Part of first-line choices for neuropathic pain	Orally, Initially 150 mg daily in 2–3 divided doses, then increased if necessary to 300 mg daily in 2–3 divided doses, dose to be increased after 3–7 days, then increased if necessary up to 600 mg daily in 2–3 divided doses, dose to be increased after 7 days.	5	Choose initial script not titration
				Higher than staring dose	2	
2	Amitriptilline or Nortriptiline	5	Part of first-line choices for neuropathic pain [Unlicensed indication]	Orally. Initially 10-25 mg once daily for A or 10mg once daily for N	5	
				Higher than staring dose	2	
3	Gabapentin	5	Part of first-line choices for neuropathic pain	Orally. Initially 300 mg once daily on day 1, then 300 mg twice daily on day 2, then 300 mg 3 times a day on day 3, alternatively initially 300 mg 3 times a day on day 1, then increased in steps of 300 mg every 2–3 days in 3 divided doses, adjusted according to response; maximum 3.6 g per day	5	Choose initial script not titration
				Higher than staring dose	2	
4	Tramadol	2	Opioid analgesia may be effective, but not first line	Appropriate dosing	2	
5	Codeine/Lidocaine	1	Opioid analgesia may be effective, but not first line	Appropriate dosing	1	
6	Morphine/Capsaicin	0	Although may be effective, only to be started in specialist care (not in GP)			
7	Co-codamol	0	Already on full dose			

Prescription Review Item

ID	REV00 3am

This question item is worth **4 marks**

You may use the BNF at any time

Case presentation

A 79-year-old woman presents to Accident and Emergency with a painful left hip. She reports that she became dizzy two hours after taking her tablets. Her friend tested her capillary blood glucose minutes after the fall – 9.5 mmol/L. **PMH.** Hypercholesterolaemia, hypertension, type 2 diabetes mellitus, neuropathic pain, giant cell arteritis. **DH.** Her current regular medicines are listed (right). **SH.** Lives alone, independent.

Investigations

Blood Glucose: 8.2 mmol/L
Full blood count and U+Es - normal
X-ray of left hip: fractured neck of femur.

Question A

Select TWO medications that are most likely to have raised her risk of fractures.
(*mark them with a tick in column A*)

Question B

Select TWO prescriptions that are *most likely* to be contributing to her fall.
(*mark them with a tick in column B*)

CURRENT PRESCRIPTIONS

Drug name	Dose	Route	Freq.	A	B
Amitriptilline	75 mg	ORAL	Nightly		✓
Aspirin	75 mg	ORAL	Daily		
Atorvastatin	20 mg	ORAL	Daily		
Gaviscon	10 ml	ORAL	PRN		
Gliclazide MR	30mg	ORAL	DAILY		
Metformin	1000 mg	ORAL	Twice daily		
Omeprazole	20mg	ORAL	Daily	✓	
Prednisolone	15 mg	ORAL	Daily	✓	
Ramipril	10 mg	ORAL	Daily		✓
Senna	15 mg	ORAL	Nightly		

Answer box

Question A Marks per correct tick [2]

Prednisolone in this dose is common in giant cell arteritis. However, steroids in these doses taken long-term cause major problems including osteoporosis and diabetes

Proton-pump inhibitors can increase the risk of fractures (particularly when used at high doses for over a year in the elderly) (in adults)

Question B Marks per correct tick [1]

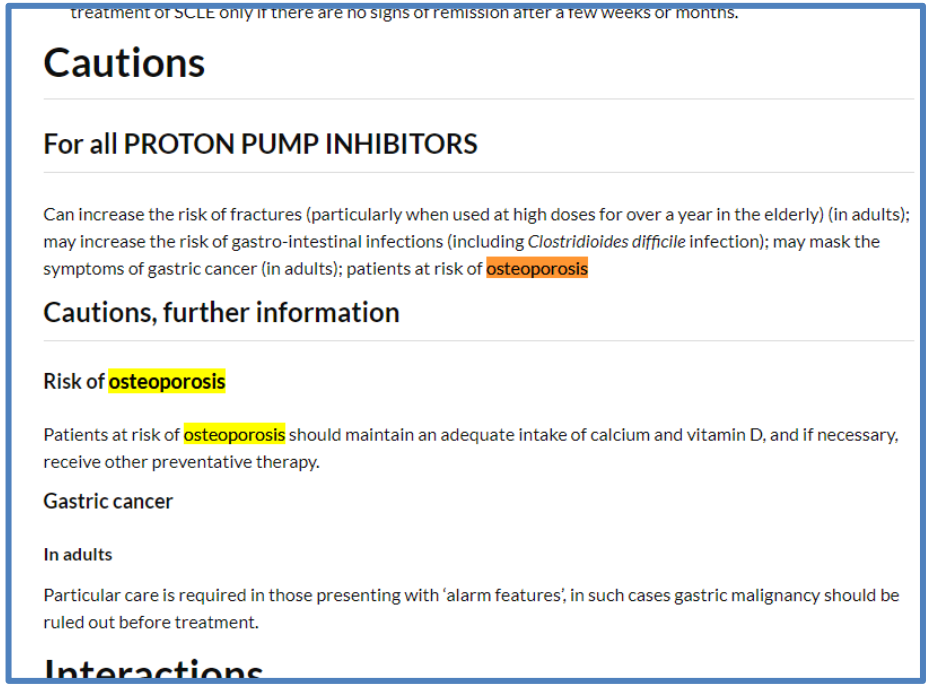
Ramipril-associated hypotension can make the patient feel dizzy and lead to falls. For ramipril daily doses of 5mg and above, ideally split into two doses given 12-hourly. A hypoglycaemic episode from the sulfonylurea is unlikely given glucose level. Amitriptilline, particularly at higher doses, increases the risk of falls and postural hpotension. (GI bleed is a possibility taking steroid and aspirin without PPI protection but urea and haemoglobin are reported in 'normal range').

Question (A) – Risk of medicines-related osteoporosis

- Steroids
- PPIs at high doses can increase risk of fractures, especially in elderly over long courses
- Long-term androgren suppression (e.g. LHRH agonists such as buserelin, goserelin for prostate cancer)
- LMWHs (long tem)
- There are other rarer causes

Learning point: Consider other subheadings

- Side effects can also be under:
  - Cautions
  - Important safety information etc.



treatment of SCLE only if there are no signs of remission after a few weeks or months.

Cautions

For all PROTON PUMP INHIBITORS

Can increase the risk of fractures (particularly when used at high doses for over a year in the elderly) (in adults); may increase the risk of gastro-intestinal infections (including *Clostridioides difficile* infection); may mask the symptoms of gastric cancer (in adults); patients at risk of osteoporosis

Cautions, further information

Risk of osteoporosis

Patients at risk of osteoporosis should maintain an adequate intake of calcium and vitamin D, and if necessary, receive other preventative therapy.

Gastric cancer

In adults

Particular care is required in those presenting with 'alarm features', in such cases gastric malignancy should be ruled out before treatment.

Interactions

Question (B) – Risk of medicines-related falls

- Drugs that increase the overall risk of falls (and the baseline risk has many other factors)
  - Benzodiazepines, Z-drugs
  - Antidepressants (especially TCAs and SNRIs, less so SSRIs)
  - Monoamine oxidase inhibitors
  - Most antipychotics
  - Opiates
  - Most antihypertensives (especially alpha-blockers, diuretics, centrally acting antihypertensives)

  - Some anti-Parkinson's medications (e.g. selegiline, ropinirole)
  - (Less commonly) some antiepileptics

  - In theory, those that cause hypoglycaemia, bleeding but need some evidence of those to answer in PSA…

Prescription Review Item

ID REV00 4am

This question item is worth **4 marks**

You may use the BNF at any time

Case presentation

A 57-year-old man attends his GP following discharge from hospital after being treated for an infective exacerbation of chronic obstructive pulmonary disease. He is reporting muscle aches and headaches. **PMH.** Chronic back pain, chronic obstructive pulmonary disease and hypertension. **DH.** In addition to simvastatin 80 mg orally daily, current regular medicines are listed (right).

Examination

BP 188/102 mmHg, pulse 84/min regular

Question A

Select the TWO prescriptions that are most likely to interact with simvastatin to increase the risk of myopathies.
(mark them with a tick)

Question B

Select TWO prescriptions that are *most likely* to be contributing to his poorly controlled hypertension.
(*mark it with a tick*)

CURRENT PRESCRIPTIONS

Drug name	Dose	Route	Freq.	A	B
Amiloride	5 mg	ORAL	daily		
Amlodipine	10mg	ORAL	Daily	✓	
Amoxicillin	500mg	ORAL	8-hrly		
Beclomethasone	200 micrograms	INH	12-hrly		
Clarithromycin	500mg	ORAL	12-hrly	✓	
Enoxaparin	40mg	SC	daily		
Ipratropium	40 micrograms	INH	8-hrly		
Naproxen	500 mg	ORAL	12-hrly		✓
Omeprazole	20mg	ORAL	daily		
Prednisolone	40 mg	ORAL	daily		✓

Answer box

Question A Marks per correct tick 1

Clarithromycin inhibits statin metabolism and therefore puts the patient at risk of statin-induced rhabdomyolysis.

Question B Marks per correct tick 1

both glucocorticoids and non-steroidal anti-inflammatory drugs can raise blood pressure through salt and water retention

Question (B) – Risk of medicines-related hypertension

- Inhaled beclomethasone is not associated with hypertension due to limited systemic effects
- NSAIDs are known to contribute to higher blood pressure

Prescription Review Item | ID REV009 | This item is worth **2 marks** | You may use the BNF at any time

Case presentation
A 33-year-old woman is reviewed in the pre-conception clinic with a view to getting pregnant soon. **PMH.** Atrial fibrillation, mitral stenosis from previous rheumatic fever, hypertension, rheumatoid arthritis, asthma. **DH.** Listed on table.

Question A
Select the TWO prescriptions that should not be prescribed in someone actively considering pregnancy.
(*mark them with a tick in column A*)

Question B
Select the ONE prescription that contain a dosing error.
(*mark them with a tick in column B*)

CURRENT PRESCRIPTIONS

Drug name	Dose	Route	Freq.	A	B
Apixaban	5 mg	ORAL	12-hrly	x	
Digoxin	125 mg	ORAL	Daily		
Folic acid	5 mg	ORAL	Weekly		
Paracetamol	1 grams	ORAL	6-hrly		
Methotrexate	12.5 mg	ORAL	Weekly	x	
Methyldopa	250 mg	ORAL	6-hrly		
Symbicort® 100/6	Two puffs	INH.	12-hrly		
Terbutaline	500 micrograms	INH.	6-hrly		

Answer box

Question A and B	Marks per correct tick	1 (for A) 2 (for B)

Methotrexate is teratogenic.
Apixaban has not been studied in pregnancy, and is currently not recommended. LMWH is recommended anticoagulant during pregnancy.

Digoxin is prescribed in micrograms.

Learning Points Question (A) - Anticoagulation in pregnancy

- Low molecular weight heparins are used because they do not cross the placenta
  - LMWH have a lower risk of osteoporosis and of heparin-induced thrombocytopenia compared to unfractionated heparin

- **Monitoring**
  - anti-Factor Xa activity may be necessary in pregnancy
  - NOTE: will also need to monitor platelets (for heparin-induced thrombocytopenia)

- Dosed according to **renal function**

- Other anticoagulants are not recommended / contraindicated in pregnancy
  - Warfarin and direct oral anticoagulants

  (e.g. apixaban, dabigatran, edoxaban, rivaroxaban)

Learning Points Question (A) - DMARDs in pregnancy

- With pregnancy, **most** DMARDs are recommended to be **avoided**:
  - e.g. methotrexate, penicillamine, hydroxychloroquine, azathioprine, ciclosporin, leflunomide, monoclonal antibodies

- If you see a DMARD with pregnancy, there is a strong chance that this is the medication that is contraindicated.
  - It may very rarely be used in highly specialised cases, but that is never as a F1 doctor (and therefore not the PSA)

Learning Points Question (B) – Unit errors and 10x (or other factor) errors

- Be wary or medications that are typically in **micrograms** or **grams** ranges (most medications are in the mg ranges)
- A **non-exhaustive** list:

Micrograms	Tamsulosin, fludrocortisone (not hydrocortisone), levothyroxine, digoxin, naloxone, inhalers, ipratropium nebs
Milligrams (1 to low 100s)	Most medications
100s mg – grams	Some antibiotics, metformin, some anti-epileptics
Grams	Paracetamol, calcium carbonate, N-acetylcysteine

- 10x errors can be more difficult to spot and depends on your experience

Prescription Review Item

ID REV01 2

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 63-year-old woman is admitted to hospital for an elective knee replacement. Her post operative recovery is complicated by a mild surgical site infection. **PMH.** Atrial fibrillation, chronic obstructive pulmonary disease, osteoarthritis. **DH.** In addition to apixaban 5 mg orally 12hrly, her other medications are listed on table. Allergy to penicillin.

She reports that her tongue has a change in colour.

Examination
Oral candidiasis

Question A
Select the ONE prescriptions that should not be prescribed together with apixaban.
(*mark them with a tick in column A*)

Question B
Select the TWO prescriptions that *most likely* to increase the risk of oral candidiasis.
(*mark them with a tick in column B*)

CURRENT PRESCRIPTIONS

Drug name	Dose	Route	Freq.	A	B
Digoxin	125 micrograms	ORAL	Daily		
Doxycycline	200 mg	ORAL	Daily		x
Enoxaparin	20 mg	S.C.	Daily	x	
Ibuprofen	200 mg	ORAL	PRN		
Morphine sulfate	10 mg	ORAL	PRN		
Paracetamol	1 g	ORAL	6-hrly		
Simvastatin	20 mg	ORAL	Daily		
Symbicort® 100/6	Two puffs	INH.	12-hrly		x
Tiotropium	18 micrograms	INH.	Daily		

Answer box

Question A Marks per correct tick 2

The patient is already fully anti-coagulated on apixaban [a non VKA anticoagulant] and therefore there is an increased risk of bleeding with dual therapy and the LMWH should be stopped.

Question B Marks per correct tick 1

Symbicort contains an inhaled corticosteroid, which is appropriate mouthcare is not instituted, can increase the risk of oral candidiasis
Broad spectrum antibiotics also increase the risk of oral candidiasis

Question (B) – Medications increasing the risk of fungal infections

- Candidiasis may be more prevalent in patients receiving:
  - Corticosteroids
    - Inhaled → oral candidiasis
    - Systemic → vaginal (more than oral) candida
  - Broad-spectrum antibiotics
  - Cytotoxics / immunosupression

- For oral candidiasis
  - Treatment
    - First line - Oral nystatin (100,000 units, 4x/day)
    - Second line oral fluconazole, IF:
      - Unresponsive infections
      - Topical antifungal drug cannot be used or if the patient has dry mouth
      - Immunocompromised patients

Planning Management Item

ID MAN009

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 54-year-old man is an in-patient for management of infective endocarditis. He feels lighted headed and sweaty after taking his regular insulin but is then taken for an echocardiogram before getting a chance to eat his breakfast. **PMH.** Type I diabetes mellitus, hypertension. **DH.** Flucloxacillin 2g intravenously 4-hrly; Mixtard 30 Insulin 28 units twice daily with meals.

Examination
Blood pressure 128/72 mmHg, pulse 88/minute regular
Glasgow Coma Scale 15/15
Capillary blood glucose 2.2 mmol/L

Question
Select the *most appropriate* management option at this stage.
(*mark it with a tick*)

MANAGEMENT OPTIONS

A	50% glucose 30 mL intravenously
B	Glucagon 1 mg intramuscularly
C	Liquid glucose 15 grams orally
D	Reduce morning insulin
E	Withhold evening insulin

Answer box

Option A Justification

Option B Justification

Glucagon IM is option is obtunded/seizures

Option C Justification

BNF states: initially glucose 15–20 g is given by mouth either in fast acting carb form. As awake and GCS normal, oral route preferrable to invasive treatment

Option D Justification

Doesn't treat current hypoglycaemia, and the cause of the hypoglycaemia is missing a meal (rather than dose being too high)

Option E Justification

Doesn't treat current hypoglycaemia, and the cause of the hypoglycaemia is missing a meal (rather than dose being too high)

Hypoglycaemia management

- Dependent on:
  - Alert vs. unconscious
  - IV access vs. no access

	Management
Alert	Glucose 15-20 g orally in liquid form followed by sustained carbohydrate
Reduced consciousness	1. Glucagon (1mg subcutaneously or intramuscularly) 2. 10% glucose (150-200ml) intravenously • NOT 50% (too concentrated and risk of extravasation injury)
Unconscious Seizures Aggressive	1. Glucagon (1mg subcutaneously or intramuscularly) 2. 10% glucose (150-200ml) intravenously or 20% (75mL-100) iv delivering 15-20g • NOT 50% (too concentrated and risk of extravasation injury)

Planning Management Item

ID	MAN031

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 21-year old woman developed severe morning sickness requiring treatment in the first trimester of her first pregnancy. **PMH**. None. **DH.** Folic acid 400 micrograms orally daily**.**

On examination
Temperature 37°C, HR 88/min and regular, BP 124/74 mmHg, RR 14/min, O_2 sat 99% on air, HS normal, chest sounds clear.

Question
Select the *most appropriate* management option at this stage. (*mark it with a tick*)

MANAGEMENT OPTIONS

A	Dexamethasone 8 mg orally	
B	Domperidone 10 mg orally	
C	Haloperidol 1.5 mg orally	
D	Ondansetron 80 mg orally	
E	Promethazine 25 mg orally	x

Answer box

Option A Justification

Dexamethasone is typically used for nausea/vomiting related to cancer. It is not typically used in pregnancy

Option B Justification

Domperidone is not typically used in pregnancy

Option C Justification

Haloperidol is used in nausea / vomitting relating to palliative care, but not pregnancy

Option D Justification

Ondansetron is an option but wrong dose

Option E Justification

Promethazine is a first-line treatment for nausea and vomiting in pregnancy.

Nausea and labyrinth disorders

Drug treatment

Scroll down

Antiemetics should be prescribed only when the cause of vomiting is known because otherwise they may delay diagnosis, particularly in children. Antiemetics are unnecessary and sometimes harmful when the cause can be treated, such as in diabetic ketoacidosis, or in digoxin or antiepileptic overdose.

If antiemetic drug treatment is indicated, the drug is chosen according to the aetiology of vomiting

Antihistamines are effective against nausea and vomiting resulting from many underlying conditi

Nausea and vomiting in the first trimester of pregnancy is common and will usually resolve spontaneously within 16 to 20 weeks. For women who have nausea and vomiting, offer appropriate self-care advice (such as rest, oral hydration and dietary changes), and inform them about other available support (e.g. self-help information and support groups) and when to seek urgent medical advice. Take into consideration that a number of interventions may have already been tried. Antiemetics should be considered for women with persistent symptoms where self-care measures have been ineffective. If a non-pharmacological option is preferred, ginger may be helpful for mild to moderate nausea.

For women who choose pharmacological treatment, offer an antiemetic considering the advantages and disadvantages of each option, as well as patient preference, and their experience with treatments in previous pregnancies. Although few drug options are specifically licensed for nausea and vomiting associated with pregnancy, their use is established practice. Antiemetic options include: chlorpromazine hydrochloride, cyclizine, doxylamine with pyridoxine, metoclopramide hydrochloride, prochlorperazine, promethazine hydrochloride, promethazine teoclate, and ondansetron. For further information on antiemetic options, see NICE guideline: **Antenatal care** (available at: www.nice.org.uk/guidance/ng201). Assess the response to treatment after 24 hours; if the response is inadequate, switch to an antiemetic from a different therapeutic class. Reassess after 24 hours and if symptoms have not settled, specialist opinion should be sought. For women who have moderate to severe nausea and vomiting, consider intravenous fluids and adjunctive treatment with acupressure.

Feedback Session Discussion Point

- If there are more than one *plausible* options, the way to differentiate between them could be:
  - A treatment summary which states which is first line (see previous slide in this case)
  - Other PMH (including pregnancy) which makes some options less appropriate
  - Other investigations (e.g. renal function) which makes some options (or the proposed dose) less appropriate

Planning Management Item

ID	MAN035

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 56 year old woman attends the Emergency Department with increasing shortness of breath worsening over two days. She is wheezy, but has not had an increase in sputum production or fevers. **PMH**. Chronic obstructive pulmonary disease (FEV_1 < 50% predicted). **DH.** Fostair 100/6 (100 micrograms beclomethasone diproprionate / 6 micrograms formoterol) one puff inhaled 12hrly, Spiriva (tiotropium) 18 micrograms inhaled once daily, salbutamol 200 micrograms inhaled as required.

On examination
Temperature 36°C, HR 88/min and regular, BP 124/74 mmHg, , RR 26/min, O_2 sat 85% on air, HS normal, chest sounds wheezy throughout.

Investigations:
Arterial blood gases on air - pH 7.37 (7.35–7.45), pO_2 6.8 kPa (11.3–12.6), pCO_2 9.0 kPa (4.7–6.0), HCO_3^- 36.2 mmol/L (21–29), base excess 3.2 mmol/L (±2).
CXR hyperinflated. No consolidation, effusions, oedema or pneumothorax

She is also being treated with nebulised bronchodilators and oral steroids.

Question
Select the *most appropriate* oxygen therapy at this stage.
(*mark it with a tick*)

MANAGEMENT OPTIONS

A	15L/min oxygen via non-rebreath mask	
B	3L/minute oxygen via nasal cannulae	
C	28% oxygen via Venturi mask	x
D	Non-invasive ventilation, titrating oxygen to achieve oxygen saturations of 88-92%	
E	No supplementary oxygen	

Oxygen therapy – a reminder of *theory* (may differ in clinical practice)

Low-concentration (controlled) oxygen therapy for patients at risk of hypercapnic respiratory failure, more likely in those with:

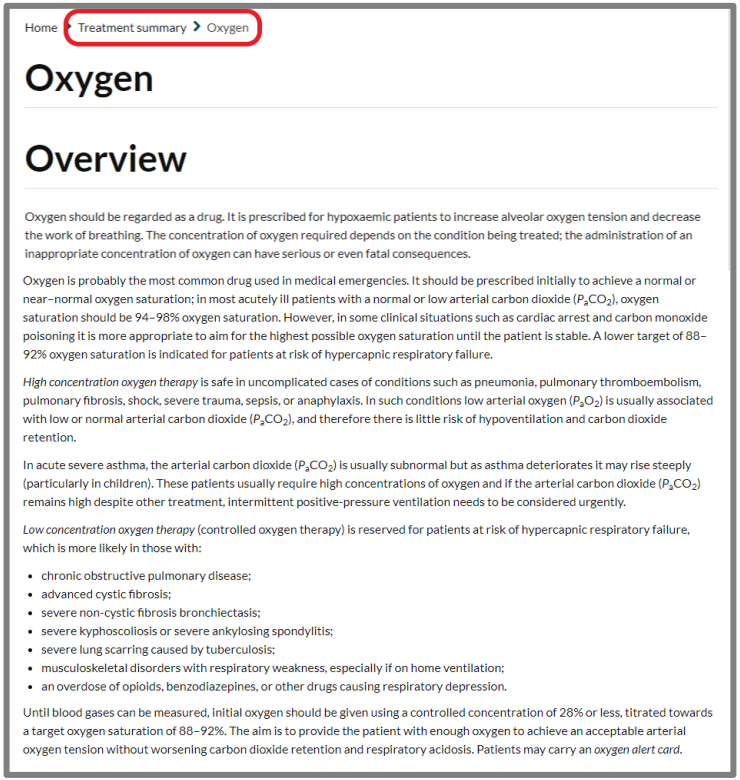
- chronic obstructive pulmonary disease;
- advanced cystic fibrosis;
- severe non-cystic fibrosis bronchiectasis;
- severe kyphoscoliosis or severe ankylosing spondylitis;
- severe lung scarring caused by tuberculosis;
- musculoskeletal disorders with respiratory weakness.

Initial oxygen should be given using a controlled concentration of 24 or 28%, titrated towards a target oxygen saturation of 88–92%.

- The controlled concentration is usually achieved with a venture valve/mask
- Repeated arterial blood gasses may be required

High concentration oxygen therapy

- safe in uncomplicated cases of conditions such as pneumonia, pulmonary thromboembolism, pulmonary fibrosis, shock, severe trauma, sepsis, or anaphylaxis.



Home › Treatment summary › Oxygen

Oxygen

Overview

Oxygen should be regarded as a drug. It is prescribed for hypoxaemic patients to increase alveolar oxygen tension and decrease the work of breathing. The concentration of oxygen required depends on the condition being treated; the administration of an inappropriate concentration of oxygen can have serious or even fatal consequences.

Oxygen is probably the most common drug used in medical emergencies. It should be prescribed initially to achieve a normal or near–normal oxygen saturation; in most acutely ill patients with a normal or low arterial carbon dioxide (P_aCO_2), oxygen saturation should be 94–98% oxygen saturation. However, in some clinical situations such as cardiac arrest and carbon monoxide poisoning it is more appropriate to aim for the highest possible oxygen saturation until the patient is stable. A lower target of 88–92% oxygen saturation is indicated for patients at risk of hypercapnic respiratory failure.

High concentration oxygen therapy is safe in uncomplicated cases of conditions such as pneumonia, pulmonary thromboembolism, pulmonary fibrosis, shock, severe trauma, sepsis, or anaphylaxis. In such conditions low arterial oxygen (P_aO_2) is usually associated with low or normal arterial carbon dioxide (P_aCO_2), and therefore there is little risk of hypoventilation and carbon dioxide retention.

In acute severe asthma, the arterial carbon dioxide (P_aCO_2) is usually subnormal but as asthma deteriorates it may rise steeply (particularly in children). These patients usually require high concentrations of oxygen and if the arterial carbon dioxide (P_aCO_2) remains high despite other treatment, intermittent positive-pressure ventilation needs to be considered urgently.

Low concentration oxygen therapy (controlled oxygen therapy) is reserved for patients at risk of hypercapnic respiratory failure, which is more likely in those with:

- chronic obstructive pulmonary disease;
- advanced cystic fibrosis;
- severe non-cystic fibrosis bronchiectasis;
- severe kyphoscoliosis or severe ankylosing spondylitis;
- severe lung scarring caused by tuberculosis;
- musculoskeletal disorders with respiratory weakness, especially if on home ventilation;
- an overdose of opioids, benzodiazepines, or other drugs causing respiratory depression.

Until blood gases can be measured, initial oxygen should be given using a controlled concentration of 28% or less, titrated towards a target oxygen saturation of 88–92%. The aim is to provide the patient with enough oxygen to achieve an acceptable arterial oxygen tension without worsening carbon dioxide retention and respiratory acidosis. Patients may carry an *oxygen alert card*.

Planning Management Item

ID MAN042

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 78 year-old woman with end-stage lung cancer has been an inpatient, and has her anaglesia uptitrated. For the last three days her opiate analgesia has been:
- Regular morphine sulfate MR 60 mg orally twice daily, and
- As required Oramorph oral solution (morphine sulphate 10mg/5ml) 7.5 ml, 4 doses in total

It is decided to transfer her on to Durogesic Dtrans (fentanyl) patches.

Question
Which one of the following dosage regimens would provide an equivalent dose for current opiate use?
(*mark it with a tick*)

MANAGEMENT OPTIONS

A	'100' fentanyl patch transdermally replace every 3 days	
B	'100' fentanyl patch transdermally replace every 5 days	
C	'50' fentanyl patch transdermally replace every 3 days	
D	'75' fentanyl patch transdermally replace every 3 days	X
E	'75' fentanyl patch transdermally replace every 5 days	

Answer box

REGULAR dose
60mg x2/day = 120mg/24hr

AS REQUIRED dose
7.5mls of morphine solution 10mg/5ml = 15mg/dose
Four doses in 24hours = 60mg morphine/24hrs.

Therefore total 180 mg morphine /24 hours

"Prescribing in Palliative" care section of BNF shows approximations for interchanging morphine / fentanyl. Fentanyl '75' patch is most appropriate. Opioid Analgesic section of BNF shows fentanyl patches release 75microg/hour of fentanyl for 72hours. Hence new prescription is: one fentanyl '75' patch every 72 hours.

NOTE: different patches have different durations of action

Converting opiate formulations - requested topic

- Please be familiar with **“Prescribing in palliative care”** section of your BNF
- Opiate equivalence is in the **“Transdermal route”** subsection

- Conversions typically happen when pain is controlled on stable doses

- Calculate the equivalent daily oral morphine dose
  - Regular **AND** “prn” medications
- Be wary of:
  - Concentration of oral morphine
  - Parenteral morphine requires further conversion
  - Other “non-morphine” preparations that requires further calculations
    - e.g. codeine, diamorphine, oxycodone, hydromorphone, tramadol
    - In **“Equivalent doses of opioid analgesics”** subsection

Buprenorphine patches are *approximately* equivalent to the following 24-hour doses of oral morphine

morphine salt 12 mg daily	≡ buprenorphine '5' patch
morphine salt 24 mg daily	≡ buprenorphine '10' patch
morphine salt 36 mg daily	≡ buprenorphine '15' patch
morphine salt 48 mg daily	≡ buprenorphine '20' patch
morphine salt 84 mg daily	≡ buprenorphine '35' patch
morphine salt 126 mg daily	≡ buprenorphine '52.5' patch
morphine salt 168 mg daily	≡ buprenorphine '70' patch

Formulations of transdermal patches are available as 72-hourly, 96-hourly and 7-day patches, for further information see buprenorphine. Conversion ratios vary and these figures are a guide only. Morphine equivalences for transdermal opioid preparations have been approximated to allow comparison with available preparations of oral morphine.

72-hour Fentanyl patches are *approximately* equivalent to the following 24-hour doses of oral morphine

morphine salt 30 mg daily	≡ fentanyl '12' patch
morphine salt 60 mg daily	≡ fentanyl '25' patch
morphine salt 120 mg daily	≡ fentanyl '50' patch
morphine salt 180 mg daily	≡ fentanyl '75' patch
morphine salt 240 mg daily	≡ fentanyl '100' patch

Communicating Information Item

ID COM003

This question item is worth **1 mark**

You may use the BNF at any time

Case presentation
A 15 year old man is about to be discharged from hospital with a new diagnosis of Type I diabetes mellitus. He has been issued a prescription for long- and short-acting insulin.

Question
Select the ONE *most appropriate* information option that should be communicated to the patient.
(*mark it with a tick*)

INFORMATION OPTIONS

A	He can miss his insulin dose once a week without consequence	
B	He should ensure the timing of taking the short acting insulin should remain constant	
C	He should seek medical advice if he is unable to drink fluids due to nausea and vomiting	✓
D	He will need to have blood tests for HbA1c levels	
E	He will need to monitor his capillary blood glucose six times daily	

Answer box

Option A Justification

Adherence to an insulin regime is of the utmost importance, and young males, especially teenagers, find this difficult to adapt to at first.

Option B Justification

The timing of insulin should be adjusted according to meal times.

Option C Justification

If he is unable to eat/drink, he may require hospitalisation / intravenous fludis

Option D Justification

Although he will need HbA1c levels, this is not the most important information to be discussed

Option E Justification

Although he needs to monitor his capillary glucose, this is too frequent

Sick day rules - Type I diabetes mellitus

- Never omit insulin (may need increased – local guidance usually provided)
- Maintain adequate (sugar-free) fluid intake
- Maintain regular carbohydrate intake – if unable to take solids, in liquid carbohydrate format

- Consider anti-emetic if nauseated
- Consider oral electrolyte replacement in diarrhoea

- If prolonged inability to keep down fluids (e.g. >4hrs), then likely needs hospital admission
- Increased blood glucose monitoring (e.g. 4hr-ly, and even more frequently if >moderate ketones)
- Ketone testing 2-4 hrly
  - If persistently elevated, or elevated while low blood glucose – may need hospital admission

- Diabetic specialist nurse should provide individualised plan

Sick day rules - Type II diabetes mellitus

Medications	Advice
Patients on oral medication only	• Stop metformin, SLGT2i, GLP-1 analogues (and potentially some CV meds like ACE-I and diuretics) when unwell and restart when well
Patients taking **insulin** therapy	• Never omit insulin (if regular prescription) • Emphasis on the importance of regular carbohydrate intake • Minimum twice-daily self-blood glucose monitoring • Seek advice if blood glucose persistently elevated (e.g. > 17) • Diabetic specialist nurse should provide individualised plan

Communicating Information Item

ID	COM011

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
An 64 year old lady has *C Difficile* colitis and has been started on oral vancomycin.

Question
Select the *most appropriate* information option that should be communicated to the patient.
(*mark it with a tick*)

INFORMATION OPTIONS

A	If vancomycin fails to clear the infection, then she may require anti-TNF therapies	
B	Intravenous vancomycin is as effective as oral vancomycin for C Difficile colitis	
C	Oral vancomycin is given 4 times daily	x
D	She will be cleared of any skin colonisation of MRSA	
E	She will require regular blood tests to check liver function	

Answer box

Option A Justification

Immunosuppression would be likely life threatening in the case of severe C Difficile infection

Option B Justification

IV vancomycin would not be effective as would not reach bowel lumen. IV metronidazole is secreted into bowel which is why it is an option in combination with other therapies

Option C Justification

Correct

Option D Justification

Oral vancomycin does not clear MRSA colonization (IV vancomycin may be appropriate for MRSA associated infections)

Option E Justification

Medication works mainly in bowel, but manufacturer advises monitoring serum-vancomycin concentration in inflammatory intestinal disorders.

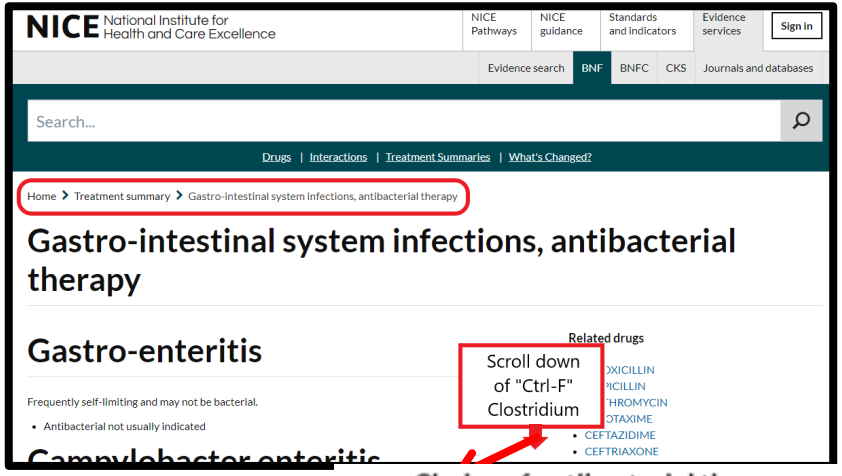
Clostridium difficille

Higher risk of developing *C. dificille* colitis when also taking:	
Antibiotics	Clindamycin and second- and third-generation cephalosporins (especially in older people)
	Quinolones, carbapenems (for example, imipenem and meropenem)
	Prolonged courses of aminopenicillins (for example, ampicillin and amoxicillin).
Proton pump inhibitors	

Clostridium difficille

		Treatment
First line (mild/moderate – first episode)		Oral vancomycin
Second line		Oral fidaxomicin
	(or with recurrence)	

- Note: Oral route is preferable for local site of action in GI tract
- Oral vancomycin not well absorbed, but manufacturer advises monitoring serum-vancomycin concentration in inflammatory intestinal disorders.
- Metronidazole iv (+oral vanc) reserved for life threatening infection under specialist supervision



Clostridioides difficile infection

Clostridioides difficile (*C. difficile*) infection occurs when normal gut microbiota are suppressed, allowing levels of toxin producing strains of *C. difficile* to flourish. The toxin damages the lining of the colon and causes diarrhoea. Infection can be mild, moderate, severe, or life-threatening; complications include pseudomembranous colitis, toxic megacolon, colonic perforation, sepsis, and death.

C. difficile infection is most common in patients who are currently taking or have recently taken antibacterials. Clindamycin, cephalosporins (especially third and fourth generation), fluoroquinolones, and broad-spectrum penicillins have been frequently associated with *C. difficile* infection. Infection risk increases with longer duration of antibacterial treatment, concurrent use of multiple antibacterials, or multiple antibacterial courses. Other risk factors for *C. difficile* infection include current use of acid suppressing drugs (such as proton pump inhibitors), age over 65 years, prolonged hospitalisation, underlying comorbidity, exposure to other people with the infection, and previous history of *C. difficile* infection(s).

For guidance on classification of *C. difficile* infection severity and non-antibacterial management options (such as faecal microbiota transplant for patients with recurrent episodes of *C. difficile* infection), see NICE guideline: **Clostridioides difficile infection** (see *Useful resources*). For guidance on diagnosis, infection control, and the management of life-threatening disease, see UK Health Security Agency (UKHSA) collection: **Clostridioides difficile: guidance, data and analysis** (available at: www.gov.uk/government/collections/clostridium-difficile-guidance-data-and-analysis).

Choice of antibacterial therapy

For patients who cannot take oral medicines, seek specialist advice about other enteral routes (such as nasogastric tube or rectal catheter).

First episode of mild, moderate, or severe *C. difficile* infection

- ***Oral** first line:*
  - Vancomycin.
- ***Oral** second line:*
  - Fidaxomicin.
- If first and second line antibacterials are ineffective: seek specialist advice.

Further episode of *C. difficile* infection

- ***Oral** first line* for infection within 12 weeks of symptom resolution (relapse):
  - Fidaxomicin.
- ***Oral** first line* for infection more than 12 weeks after symptom resolution (recurrence):
  - Vancomycin or fidaxomicin.

Life-threatening *C. difficile* infection

- Specialist may offer oral vancomycin **with** intravenous metronidazole.

Communicating Information Item

ID COM016

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 54-year-old man with a new diagnosis of atrial fibrillation was assessed for his risk of thromboembolic disease, and the patient-doctor decision was to start warfarin.

Question
Select the *most appropriate* information option that should be communicated to the patient.
(*mark it with a tick*)

INFORMATION OPTIONS

A	He must not drink alcohol on warfarin
B	He must not eat green leafy vegetables
C	He must use barrier contraception during sexual intercourse
D	If he has haematuria he should seek medical attention
E	If he requires antibiotics, he will need to stop warfarin

Answer box

Option A	Justification
	Should try to abstain but can drink alcohol as long as similar amounts most days as acute binges can be cause enzyme inhibition of the enzymes of warfarin metabolism
Option B	**Justification**
	Recommended to eat similar amounts per day as contains vitamin K
Option C	**Justification**
	Warfarin is teratogenic for women of childbearing age, but unlike methotrexate, men taking warfarin does not influence fetal development
Option D	**Justification**
	Unexpected bleeding must be investigated, at least with an INR check
Option E	**Justification**
	Antibiotics may be enzyme inducers/inhibitors of warfarin metabolism so will need careful INR monitoring, but not necessarily means stopping warfarin

Warfarin COMS

Good info from: https://www.nhs.uk/conditions/warfarin/ (not accessible during PSA)

- Missed doses
  - Take if on same day, but do not double dose the next day
- Seek medical attention if you:
  - Pass melaena, haematemesis, haemoptysis, haematuria, PR bleeding, increased or unexpected PV bleeding
  - Prolonged (>10 minutes) epistaxis, bleeding gums
  - Unusual headaches
  - Have a fall or an accident, or significant head injury
- Rashes and hair loss is common
- Be wary of drug-drug interactions (including OTC medications)
- Be wary of green leafy vegetables, vegetable oils and cereal grains which may contain large amounts of Vitamin K.
- Do not binge drink
- May need to be stopped prior to surgery or dental work
- Body piercings are not recommended (risk of bleeding / infection)
- Can have IM injection (e.g. vaccines) if INR is within range, but may also consider SC injection
- Avoid martial arts and kickboxing (and be wary of other contact sports)

Calculation Skills Item

ID CAL014

This question item is worth **2 marks**

You may use a calculator at any time 

Case presentation

A 54-year old woman is seen in clinic for an autoimmune condition. The plan is for her to wean off the oral steroids slowly. She is currently prescribed prednisolone 30 mg orally daily. She is to continue on this dose for 5 days, and to step down by 5 mg every subsequent 5 days until she completely stops the prednisolone

Prednisolone is to be dispensed as 5mg tablets for her.

Calculation

How many 5mg prednisolone tablets should be dispensed to allow her to finish her tapering course?

(Write your answer in the box below)

Answer **105** tablets

Answer box

Correct answer

105 tablets

Working

30mg = 6 tablets for 5 days → 30 tablets
25mg = 5 tablets for 5 days → 25 tablets
20mg = 4 tablets for 5 days → 20 tablets
15mg = 3 tablets for 5 days → 15 tablets
10mg = 2 tablets for 5 days → 10 tablets
5mg = 1 tablet for 5 days → 5 tablets

Therefore total number of tablets required =
30+25+20+15+10+5 = 105 tablets

Calculation Skills Item	ID	CAL015am	This question item is worth **2 marks**	You may use a calculator at any time 

Case presentation
A 28-year old woman is in Obstetrics High Dependency Unit with a diagnosis of pre-eclampsia. In addition to her other management, she has been prescribed intravenous labetalol infusion at a rate of 500 micrograms/minute.

Labetalol is available as 100mg/20mL.

Calculation
What rate of labetalol infusion should be started?
(Write your answer in the box below)

Answer 6 mL/hr

Answer box

Correct answer

6mL/hr

Working

Labetalol concentration = 100mg/20ml = 5mg/ml

Dose = 500 micrograms/minute.
= 0.5mg/minute
= 0.5 x 60 mg/hour
= 30 mg/hr

Rate required = dose/concentration
= 30mg/hr / 5mg/ml
= 6 ml/hr

Calculation Skills Item

ID CAL017

This item is worth **2 marks**

You may use a calculator at any time

Case presentation

A 34 year old man is in the Emergency Department being treated for diabetic ketoacidosis. To prepare his fixed rate intravenous insulin infusion, a final concentration of 50 units soluble insulin in 50 mL 0.9% sodium chloride is required.

Soluble insulin is presented as a 10mL vial containing 100 units/mL.

Calculation

What volume (mL) of stock soluble insulin (100 units/mL) should be used to make the infusion?

(Write your answer in the box below)

Answer 0.5 mL

Answer box

Correct answer

0.5 mL

Working

100 units of insulin in 1mL
Therefore 50 units in 0.5mL.

The information regarding 50ml of 0.9% sodium chloride is not required.
Total volume of the vial (10ml) is also not required.

Calculation Skills Item

ID	CAL028

This item is worth **2 marks**

You may use a calculator at any time

Case presentation

A 6-month-old child (Body surface area = 0.4 m^2) has been admitted to the paediatric ward. He requires 500 mg/m^2 acyclovir intravenously 8hrly for 10 days.

Aciclovir is available in 250 mg vials, and must be used immediately after reconstitution. Any left over drug must be disposed and not kept for the next dose.

Calculation

How many 250 mg vials of aciclovir will he require over the period of his treatment?

(Write your answer in the box below)

Answer 30 vials

Answer box

Correct answer

30 vials

Working

Each dose = 500mg x 0.4m^2 = 200mg

Each vial must be used immediately therefore need 1 vial for each dose

One vial, for three doses for 10 days

= 1 x 3 x 10 vials

= 30 vials

Adverse Drug Reactions Item – Type A

ID	ADR110

This item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 56-year-old man with Parkinson's Disease is having his medications uptitrated. His dose has been increased to 'Sinemet' 37.5/150 (37.5 mg carbidopa and 150 mg levodopa) one tablet orally three times a day

Question
Select the adverse effect that is *most likely* to be caused by this treatment.
(*mark it with a tick*)

MANAGEMENT OPTIONS

A	Dyskinesia	✓
B	Falls	☐
C	Fevers	☐
D	Palpitations	☐
E	Weight gain	☐

Answer box

Option A	Justification
Dyskiensias (together with nausea) is one of the most common side effects	
Option B	Justification
While falls can occur (with multiple contributing factors), it is less common compared to dyskinesias	
Option C	Justification
Not a known side effect, and while abrupt discontinuation may result in neuroleptic malignant syndrome, this is uncommon	
Option D	Justification
Palpitations can occur, but not as commony as dyskinesias	
Option E	Justification
Weight changes (both increase and loss) can occur, but not as commony as dyskinesias	

Feedback Session Discussion Points

- The issue is that almost all the side effects listed in BNF is “Frequency not known”.
  - This is an ALPHABETICAL ORDERED list (i.e. not a list in priority/frequency order)
  - This group encompases side effects that can range from “very common” to “very rare”.
  - This is typical for older drugs where reporting of side effects from clinicians are poor – so they do not have exact values to provide a frequency

- Be wary that many dopaminergic drugs for Parkinson’s Disease have the important (but less common) issues with impulse control disorders

Adverse Drug Reactions Item – Type B

ID	ADR205

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 43-year-old woman develops muscle rigidity, high temperatures, delirium and sweating 2 weeks after being commenced on several medications following an in-patient psychiatric stay for depressive psychosis. **PMH.** Type II diabetes mellitus, gastroeosophageal reflux disease, depression, chronic back pain. **DH.** See right

Question
Select the medication that is *most likely* to have caused this adverse effect.
(*mark it with a tick*)

ADVERSE EFFECT OPTIONS

A	Amitriptiline 25 mg orally daily	☐
B	Metformin 850 mg orally twice daily	☐
C	Morphine MR 20 mg orally 12hrly	
D	Olanzapine 10 mg orally daily	✓
E	Ranitidine 150 mg orally 12hrly	☐

Answer box

Option A Justification

TCAs do not cause neuroleptic malignant syndrome

Option B Justification

No issues

Option C Justification

Morphine does not cause neuroleptic malignant syndrome

Option D Justification

She has neuroleptic malignant syndrome, very similar features to serotonin syndrom]. 4-14 days usually after exposure to anti-psychotics.

Option E Justification

No issues

Neuroleptic malignant syndrome

- Mainly caused by antipsychotic drugs (“typical” higher risk than “atypical”)

- Features
  - Hyperthermia, fluctuating level of consciousness, muscle rigidity, and **autonomic dysfunction** with pallor, tachycardia, labile blood pressure, sweating, and urinary incontinence
  - Complications include rhabdomyolysis, acute renal failure, hyperkalaemia, seizures
- Management
  - Discontinuation of the antipsychotic drug is essential because there is no proven effective treatment
  - But bromocriptine and dantrolene have been used

- Easily confused with (apart from offending drug):
  - Serotonin syndrome
  - Malignant hyperthermia
  - Anticholinergic toxicity

Adverse Drug Reactions Item – Type C

ID ADR305

This item is worth **2 marks**

You may use the BNF at any time

Case presentation

An 18-year-old woman attends her General Practitioner. She reports that her depression persists despite non-pharmacological management. They jointly decide to start paroxetine 20 mg orally daily. **PMH.** Depression, irritable bowel syndrome, migraines and polycystic ovarian syndrome. **DH.** In addition to the paroxetine, her medications are listed (right).

Question

Select the prescription that is *most likely* to be interact with paroxetine to cause adverse effects.
(*mark it with a tick*)

PRESCRIPTION OPTIONS

A	Cerazette [desogestrel] 75 micrograms daily	☐
B	Mebeverine 150mg, 20min before meals	☐
C	Metformin 500mg twice daily	☐
D	Omeprazole 20mg daily	☐
E	Sumatriptan 100 mg orally as required (maximum 300 mg total daily dose)	✓

Answer box

Option A Justification

There is no significant interaction with destrogrel

Option B Justification

Drug used for irritable bowel syndrome

Option C Justification

There is no significant interaction with metformin

Option D Justification

There is no significant interaction with omeprazole

Option E Justification

Sumatriptan has serotonin receptor agonist activity, and in combination with paroxetine increases the risk of serotonin syndrome

Serotonin syndrome (page 1/2)

- What is it?
  - Collection of symptoms, which varies and ranges in severity
    - Fever, agitation, **increased reflexes (and clonus)**, tremor, sweating, dilated pupils, and diarrhoea
    - Occasionally seizures and rhabdomyolysis

- When does it occur?
  - Typically due to the use of two or more serotonergic medications (or overdose of one serotonergic agent)
  - SSRIs (e.g. citalopram, fluoxetine, paroxetine), SNRIs (e.g. duloxetine), TCAs (e.g. amitriptylline), MAOi (e.g. selegiline), buspirone
  - Pethidine, tramadol, codeine, linezolid, triptans
  - Amphetamines (pharmaceutical or recreational), ecstasy/MDMA
  - Antiemetics affecting serotonin - metoclopramide, ondansetron
  - Components of certain over the counter drugs
    - Dextromethorphan, St. John's wort, L-tryptophan, 5-hydroxytrytophan

Serotonin syndrome (page 2/2)

- How to treat?
  - Get advice from National Poisons Information Service
  - Stopping offending medications, supportive therapy, active cooling (not antipyretic drugs)
  - Possibly cyproheptadine (ITU setting)
  - +- benzodiazepines

- Easily confused with (apart from offending drug):
  - Neuroleptic malignant syndrome
  - Malignant hyperthermia
  - Anticholinergic toxicity

Adverse Drug Reactions Item – Type D

I D	ADR407

This item is worth **2 marks**

You may use the BNF at any time

Case presentation

A 30-year-old man attends a Gastroenterology clinic as follow up after a recent flare of his Crohn's disease. He has been taking prednisolone 10 mg orally daily, and it is expected that he will be continuing for at least 3 to 6 months. **PMH**. Crohn's disease. **DH.** In addition to the prednisolone, he is also taking azathioprine 125mg orally daily.

Question

Select the *most appropriate* option to prevent complications of the long-term prednisolone prescription.
(*mark it with a tick*)

MANAGEMENT OPTIONS

A	Adcal-D3® (1.5 g calcium carbonate, 400 units colecalciferol) one tablet 12hrly	
B	Alendronic acid 70 mg orally once weekly	x
C	Lansoprazole 30 mg orally daily	
D	None required	
E	Sando-K® (12 mmol K^+ / 8 mmol Cl^-) three tablets 12hrly	

Answer box

Option A Justification

AdcalD3 is used for Vitamin D / Calcium deficiency (and not for bone prophylaxis in long-term steroid use)

Option B Justification

CORRECT - Taking long term steroids requires bisphosphonate therapy to reduce the risk of osteoporosis

Option C Justification

PPI for the prevention of gastritis for those with long-term therapy are used in selected cases (see next slide) that this man does not clearly fit. It might be considered, but it will not be as high priority as a bisphosphonate

Option D Justification

This man requires bone protection in context of his long-term steroids

Option E Justification

There is no evidence of hypokalaemia, and there is no need for ***routine*** potassium supplementation in long-term steroid therapy

Long-term steroids – when to consider bisphosphonates / PPI?

Consider…	If…
Consider a bisphosphonate (alendronate or risedronate)	Taking high doses of oral corticosteroids (≥prednisolone 7.5 mg daily for 3 months or longer)
Consider a proton pump inhibitor	At high risk of gastrointestinal bleeding or dyspepsia: • History of gastroduodenal ulcer, gastrointestinal bleeding, or gastroduodenal perforation. • Older age. • Use of drugs that are known to increase the risk of gastrointestinal bleeding, such as NSAIDs / anticoagulants • Serious comorbidity, such as advanced cancer
Potassium supplementation *not routinely* prescribed (but U+Es may be monitored)	

Data Interpretation Item

ID	DAT003a m

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 86-year-old woman with asthma and atrial fibrillation was admitted to hospital with a fractured neck of femur. She was normally maintained successfully on digoxin 125 micrograms orally daily. This was stopped for 3 days peri-operatively and re-commenced at 8am today. **PMH.** Atrial fibrillation, severe asthma. **DH.** Warfarin (target INR 2-3), Fostair® 200/6 (beclomethasone dipropionate 200 micrograms / formoterol 6 micrograms) two inhaled 12hly, tiotropium 5 micrograms inhaled daily, salbutamol inhaled as required.

Examination
Fully conscious and comfortable.
Pulse 122-136/minute, irregular
BP 152/74 mmHg.

Investigations
Plasma digoxin level 0.6 nmol/L (range 1-2) when tested 6h after dose.

Question
Based on the information provided, select the *most appropriate* decision option with regard to optimising her atrial fibrillation rate control
(*mark it with a tick*)

DECISION OPTIONS

A	Digoxin loading dose 250 micrograms intravenously	✓
B	Digoxin-Fab fragments intravenously	☐
C	Increase daily digoxin dose to 250 micrograms orally daily	☐
D	Reduce daily digoxin dose to 62.5 micrograms orally daily	☐
E	Stop digoxin and start bisoprolol 5mg orally daily	☐

Answer box

Option A Justification

This represents an appropriate loading dose to increase her serum level acutely whilst the oral dose is restarted & reaches steady state

Option B Justification

There are no symptoms or signs of digoxin toxicity.

Option C Justification

This represents a very large increase in usual daily dose which is inappropriate as the reason her level is low is due to her medication having been stopped for 3 days

Option D Justification

This represents an inappropriate decrease in dose which requires increasing as her plasma level is low

Option E Justification

She may not tolerate a β-blockade due to asthma, and it would be prefered to treat her atrial fibrillation with a drug that she is known to tolerate

Feedback Session Discussion Point

- (Digoxin should not have been stopped for surgery)

she:

- Is not digitoxic (so answers B+D are wrong)
- Is currently not haemodynamically compromised (so she has time to get the dosing right)
- Is known to do well with digoxin, and there is potential contraindication to beta-blockers (so answer E is wrong)
- Was previously on the right dose prior to temporily stopping digoxin (so increasing the dose in C is wrong)

Data Interpretation Item | ID DAT010 | This question item is worth **2 marks** | You may use the BNF at any time

Case presentation
A 24-year-old woman presents to the Emergency Department 4h post overdose with an unknown number of aspirin tablets. **PMH.** depression. She is asymptomatic **DH.** St John's Wort

Investigations

Plasma aspirin level:	632 mg/L	
Plasma potassium: 4.0 mmol/L	(3.8-5.1)	
Venous pH:	7.3	(7.35-7.45)

Question
Select the *most appropriate* decision option with regard to the management of her aspirin overdose
(*mark it with a tick*)

DECISION OPTIONS

A	0.9% sodium chloride 1L over 4 hours	
B	Activated charcoal 50 grams orally	
C	Haemodialysis	
D	Repeat pH monitoring in 4h	
E	Sodium bicarbonate 225 mmol intravenously	✓

Answer box

Option A Justification

Supportive care will form part of managing aspirin overdose, but this treatment of intravenous fluids will not increase salicylate excretion

Option B Justification

May be useful if within <1h post overdose

Option C Justification

When levels >700mg/kg, may consider straight to dialysis (senior decision)

Option D Justification

There can be slow abdorption of aspirin so more regular monitoring is used with clinical assessment to guide prognosis and treatment

Option E Justification

Used in the treatment of aspirin overdose (those which do not meet criteria for haemodialysis)

Aspirin overdose

- Features
  - Initial respiratory alkalosis, followed by severe metabolic acidosis
  - Nausea, vomiting, hypoglycaemia, hyperpyrexia, non-cardiogenic pulmonary oedema, coma

- Management
  - Consider activated charcoal if
    - <1hr of ingestion,
    - Toxic dose (>125mg/kg),
    - and protected airway (see next slide)
  - If metabolic acidosis, give sodium bicarbonate (50-100 mmol); aim urine pH 7.5-8.5, blood pH<7.55
  - If aspirin levels >500mg/L, give intravenous sodium bicarbonate 225mmol
  - If aspirin levels >700mg/L or adverse features (coma, seizures, pulmonary oedema, renal failure), consider haemodialysis

Feedback Session Discussion Point

- Is pH 7.30 severe acidosis and therefore haemodialysis is the right answer?

- There is no regularly agreed cut-offs, but most would say:
  - 7.25-7.35 Mild
  - 7.15-7.25 Moderate
  - <7.15 Severe

- So haemodialysis is not the right option for now

Activated charcoal for *selected* poisoning cases

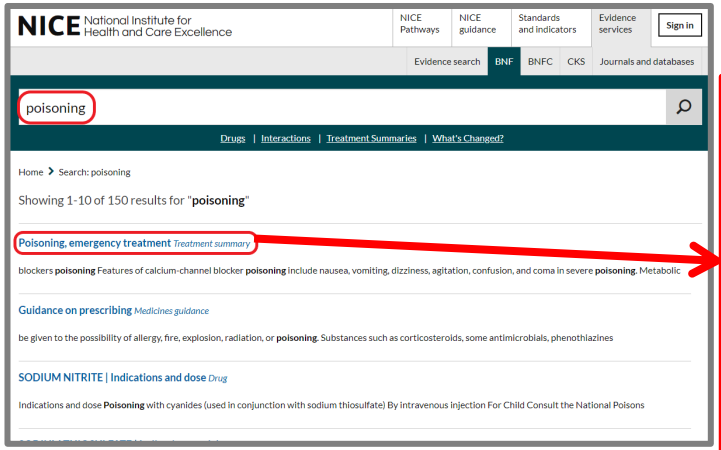
- Prevent absorption
  - Activated charcoal **within 1h of ingestion**
  - 50 mg orally in conscious patient
  - 50 mg by NG tube if obtunded (but needs protected airway)
  - Also caution in those with reduced gastrointestinal motility (risk of obstruction)

- NOT to be used with substances that do not bind to charcoal
  - Ethylene glycol, Iron, Lithium, Methanol, Strong acids and alkalis

Haemodialysis for overdose for *limited* poisioning cases

- Haemodialysis can be consider for severe overdoses with drugs with low volume of distribution:
  - E.g. Aspirin, lithium, valproate, ethylene glycol, methanol and phenobarbital

- This is a **specialist decision**


NICE National Institute for Health and Care Excellence
NICE Pathways
NICE guidance
Standards and indicators
Evidence services
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Evidence search
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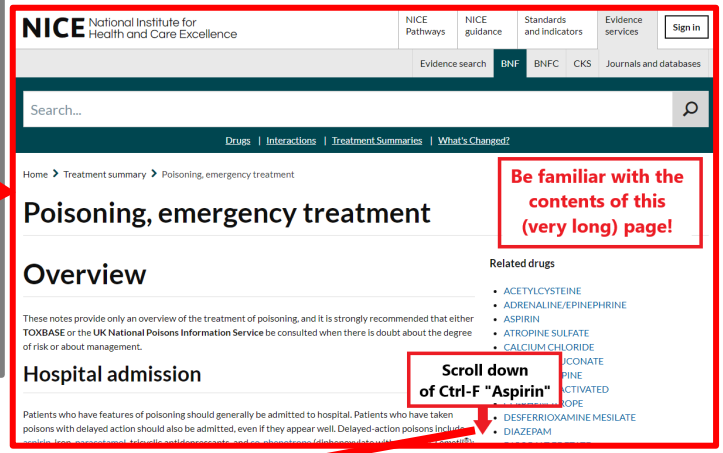
BNFC
CKS
Journals and databases
poisoning
Drugs | Interactions | Treatment Summaries | What's Changed?
Home › Search: poisoning
Showing 1-10 of 150 results for "poisoning"
Poisoning, emergency treatment Treatment summary
blockers poisoning Features of calcium-channel blocker poisoning include nausea, vomiting, dizziness, agitation, confusion, and coma in severe poisoning. Metabolic
Guidance on prescribing Medicines guidance
be given to the possibility of allergy, fire, explosion, radiation, or poisoning. Substances such as corticosteroids, some antimicrobials, phenothiazines
SODIUM NITRITE | Indications and dose Drug
Indications and dose Poisoning with cyanides (used in conjunction with sodium thiosulfate) By intravenous injection For Child Consult the National Poisons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NICE Pathways
NICE guidance
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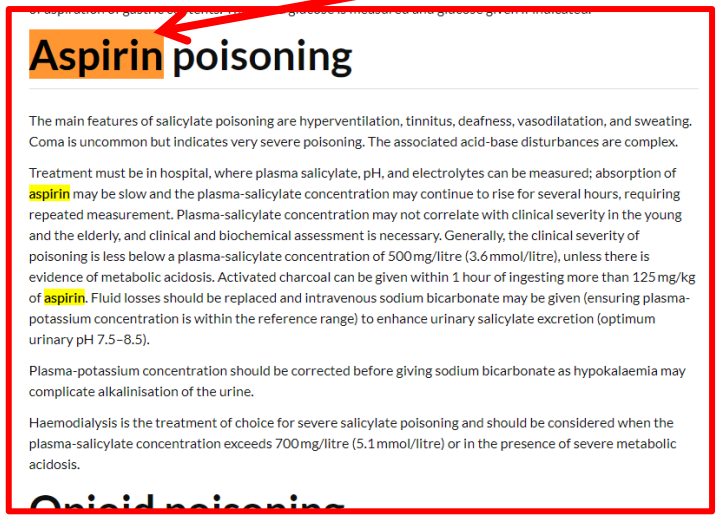
Search...
Drugs | Interactions | Treatment Summaries | What's Changed?
Home › Treatment summary › Poisoning, emergency treatment
Poisoning, emergency treatment
Be familiar with the contents of this (very long) page!
Overview
These notes provide only an overview of the treatment of poisoning, and it is strongly recommended that either TOXBASE or the UK National Poisons Information Service be consulted when there is doubt about the degree of risk or about management.
Hospital admission
Patients who have features of poisoning should generally be admitted to hospital. Patients who have taken poisons with delayed action should also be admitted, even if they appear well. Delayed-action poisons include
Related drugs
ACETYLCYSTEINE
ADRENALINE/EPINEPHRINE
ASPIRIN
ATROPINE SULFATE
CALCIUM CHLORIDE
DESFERRIOXAMINE MESILATE
DIAZEPAM
Scroll down of Ctrl-F "Aspirin"


Aspirin poisoning
The main features of salicylate poisoning are hyperventilation, tinnitus, deafness, vasodilatation, and sweating. Coma is uncommon but indicates very severe poisoning. The associated acid-base disturbances are complex.
Treatment must be in hospital, where plasma salicylate, pH, and electrolytes can be measured; absorption of aspirin may be slow and the plasma-salicylate concentration may continue to rise for several hours, requiring repeated measurement. Plasma-salicylate concentration may not correlate with clinical severity in the young and the elderly, and clinical and biochemical assessment is necessary. Generally, the clinical severity of poisoning is less below a plasma-salicylate concentration of 500 mg/litre (3.6 mmol/litre), unless there is evidence of metabolic acidosis. Activated charcoal can be given within 1 hour of ingesting more than 125 mg/kg of aspirin. Fluid losses should be replaced and intravenous sodium bicarbonate may be given (ensuring plasma-potassium concentration is within the reference range) to enhance urinary salicylate excretion (optimum urinary pH 7.5–8.5).
Plasma-potassium concentration should be corrected before giving sodium bicarbonate as hypokalaemia may complicate alkalinisation of the urine.
Haemodialysis is the treatment of choice for severe salicylate poisoning and should be considered when the plasma-salicylate concentration exceeds 700 mg/litre (5.1 mmol/litre) or in the presence of severe metabolic acidosis.

Data Interpretation Item | ID | DAT011 | This question item is worth **2 marks** | You may use the BNF at any time

Case presentation
A 14-year-old girl is being treated with tobramycin 150mg intravenously 8-hrly for a pseudomonal chest infection. **PMH.** Cystic fibrosis, secondary diabetes. **DH.** Insulin, salbutamol, carbocysteine

Investigations
Serum tobramycin level:

Pre dose	3 mg/L (range <2 mg/L)
Post dose	10mg/L (range 8-12 mg/L)

Question
Select the *most appropriate* decision option with regard to the management of her tobramycin prescription
(*mark it with a tick*)

DECISION OPTIONS

A	Change to tobramycin 150mg inhaled 8-hrly	
B	Change to tobramycin 100mg intravenously 8-hrly	☐
C	Change to tobramycin 150mg intravenously 12-hrly	✓
D	Change to tobramycin 200mg intravenously 12-hrly	
E	No change to treatment	☐

Answer box

Option A	Justification
Inhaled therapy is not appropriate in this setting	
Option B	Justification
Will reduce peak (post-dose) level required for antibacterial activity and potentially result in reduce antimicrobial activity	
Option C	Justification
Correct - Trough too high, need to increase length of time between doses to allow to drop down to below trough level required	
Option D	Justification
Increasing dose will potentially increase the post-dose (peak) levels to toxic (above range) levels. Additionally, there is an unpredictable effects on trough trough levels (pre-dose) when changing 2 parameters	
Option E	Justification
Pre dose too high: risk of toxicity	

Antibiotics therapeutic drug monitoring

- For antibiotics that require therapeutic drug monitoring, BNF does provide the usual target levels
- This however should already be in the PSA question
- In “real-life” you should also consult local microbiology guidance

In adults

Serum aminoglycoside concentrations **must** be determined in the elderly.

In patients with normal renal function, aminoglycoside concentrations should be measured after 3 or 4 doses of a multiple daily dose regimen and after a dose change.

For multiple daily dose regimens, blood samples should be taken approximately 1 hour after intramuscular or intravenous administration (‘peak’ concentration) and also just before the next dose (‘trough’ concentration). If the pre-dose (‘trough’) concentration is high, the interval between doses must be increased. If the post-dose (‘peak’) concentration is high, the dose must be decreased.

For once daily dose regimens, consult local guidelines on serum concentration monitoring.

In children

In children with normal renal function, aminoglycoside concentrations should be measured after 3 or 4 doses of a multiple daily dose regimen.

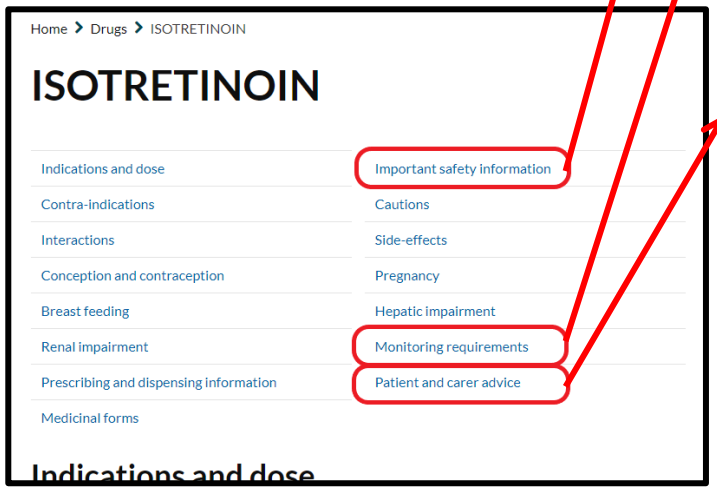
Blood samples should be taken just before the next dose is administered (‘trough’ concentration). If the pre-dose (‘trough’) concentration is high, the interval between doses must be increased. For multiple daily dose regimens, blood samples should also be taken approximately 1 hour after intramuscular or intravenous administration (‘peak’ concentration). If the post-dose (‘peak’) concentration is high, the dose must be decreased.

Feedback Session Discussion Point

- a short “syllabus” for DAT questions
  - Be familiar with how to work out your next management step based on results of these investigations
  - Be familiar with how to find guides in the BNF (if available)

Data interpretation – please know how to manage (learning points of your previous sessions):		
Paracetamol overdose	Know/find management for all different timepoints, and staggered	[Treatment summaries → Poisoning, emergency treatment]
Warfarin and INR	Know/find what to do with high INR • Need to know INR and severity of any bleeding	[Treatment summaries → Oral anticoagulant]
Other kinds of anticoagulation monitoring	Know what monitoring options for other anticoagulants	Not easily found in BNF
Antibiotic sensitivity / MC+S result	Know how to work through • e.g. sensitivities, contraindications/allergies, severity, renal dysfunction with adjusted doses	Not in BNF
Antibiotic therapeutic drug monitoring	Know how to interpret peak / trough levels	In the "monitoring requirements" for some antibiotics (e.g. gentamicin)
Adjusting insulin doses	Know how to adjust insulin doses based on blood glucose diary	Not in BNF
Statins and CK / LFTs / cholesterol	Know/find when to adjust/stop statins	In the "monitoring requirements" for most statins [BUT NOT for cholesterol targets – that you will need to know]
Oxygen therapy	Know the different co-morbidities with different oxygen therapy strategies • Know the different targets for these comorbidities • Know how to interpret arterial blood gases	Not very useful, should know clinically [Treatment summaries → Oxygen]
Converting opiates	Know how to calculate *total daily* opiate requirements Know how to find equivalent doses	Needs practice!!! [Treatment summaries → Prescribing in Palliative Care]
TFT monitoring	Know how to interpret and adjust medications	Not in BNF
Lithium levels	Know what if toxic, or if to change doses	Monitoring not explained in BNF (you need to know) Treating lithium toxicity in [Treatment summaries → Poisoning, emergency treatment]
Adjusting dose for renal dysfunction	Be able to recognise when patient has renal dysfunction Be familiar with how to find dosing adjustments (if required)	Be familiar with how to change doses based on "Renal Impairment" information with each drug

Monitoring requirements (and other tabs) are (sometimes) your friends



Important safety information

MHRA/CHM advice: Isotretinoin (Roaccutane®): rare reports of erectile dysfunction and decreased libido (October 2017)

With oral use

An EU-wide review has concluded that on rare occasions, oral isotretinoin, indicated for severe acne, may cause sexual side-effects, including erectile dysfunction and decreased libido.

Monitoring requirements

Monitoring of patient parameters

With oral use

Measure hepatic function and serum lipids before treatment, 1 month after starting and then every 3 months (reduce dose or discontinue if transaminase or serum lipids persistently raised).

Patient and carer advice

With oral use

Warn patient to avoid wax epilation (risk of epidermal stripping), dermabrasion, and laser skin treatments (risk of scarring) during treatment and for at least 6 months after stopping; patient should avoid exposure to UV light (including sunlight) and use sunscreen and emollient (including lip balm) preparations from the start of treatment.

With topical use

Patients should be warned that some redness and skin peeling can occur initially but settles with time. If undue irritation occurs, the frequency of application should be reduced or treatment suspended until the reaction subsides; if irritation persists, discontinue treatment. Several months of treatment may be needed to achieve an optimal response and the treatment should be continued until no new lesions develop.

If sun exposure is unavoidable, an appropriate sunscreen or protective clothing should be used.

With oral use

Patients and carers should be told how to recognise signs and symptoms of psychiatric disorders such as depression, anxiety, and rarely suicidal thoughts.

Drug Monitoring Item

ID TDM004

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 71-year-old woman is admitted with severe community-acquired pneumonia. She has had a cough productive of thick green sputum for 2 days.

Examination
Temperature 38.4C, RR 24/min
Coarse crepitations at the right lung base

Investigations
Chest X-ray shows right lower lobe pneumonia.

Treatment with co-amoxiclav 1.2 g IV 8-hrly is initiated.

Question
Select the *most appropriate* monitoring option to assess the beneficial effects of this prescription in the *first three days of treatment*.
(*mark them with a tick*)

Drug Monitoring Item

ID TDM004

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 71-year-old woman is admitted with severe community-acquired pneumonia. She has had a cough productive of thick green sputum for 2 days.

Examination
Temperature 38.4C, RR 24/min
Coarse crepitations at the right lung base

Investigations
Chest X-ray shows right lower lobe pneumonia.

Treatment with co-amoxiclav 1.2 g IV 8-hrly is initiated.

Question
Select the *most appropriate* monitoring option to assess the beneficial effects of this prescription in the *first three days of treatment*.
(*mark them with a tick*)

Feedback Session Discussion Point

- BNF usually does not inform you how to monitor for **beneficial** effects

Drug Monitoring Item

ID TDM004

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 71-year-old woman is admitted with severe community-acquired pneumonia. She has had a cough productive of thick green sputum for 2 days.

Examination
Temperature 38.4C, RR 24/min
Coarse crepitations at the right lung base

Investigations
Chest X-ray shows right lower lobe pneumonia.

Treatment with co-amoxiclav 1.2 g IV 8-hrly is initiated.

Question
Select the *most appropriate* monitoring option to assess the beneficial effects of this prescription in the *first three days of treatment*.
(*mark them with a tick*)

MONITORING OPTIONS

A	Blood pressure	☐
B	Chest X-ray appearance	☐
C	Disappearance of basal crackles	☐
D	Respiratory rate	✓
E	Sputum colour	☐

Answer box

Option A Justification

Blood pressure may be low in event of severe sepsis, but in the short term a better reflection of fluid resuscitation (or inotropic support) rather than antibiotics

Option B Justification

The chest X-ray appearance is unlikely to resolve in the early stages of treatment

Option C Justification

The auscultatory finding of basal crackles at the base of the lung will take several days to resolve.

Option D Justification

Successful treatment of the pneumonia will improve gas exchange and any hypoxia and reduce the respiratory rate.

Option E Justification

Sputum colour is a poor guide to the success of treatment for pneumonia.

Drug Monitoring Item

ID TDM028

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation

A 25-year-old woman attends her diabetes review. She has been asymptomatic, and her capillary blood glucose diary was reviewed. **PMH.** Type I diabetes mellitus. **DH.** Insulin aspart 6 units with meals, insulin glargine 8 units at night.

Her night-time insulin glargine dose has been increased to 10 units.

Question

Select the *most important* monitoring option that is required for this change in dosing.
(*mark it with a tick*)

MONITORING OPTIONS

A	HbA1c	
B	Pre-afternoon meal capillary blood glucose	
C	Pre-bedtime capillary blood glucose	
D	Pre-breakfast capillary blood glucose	x
E	Pre-evening meal capillary blood glucose	

Answer box

Option A Justification

Option B Justification

Option C Justification

Option D Justification

Option E Justification

Drug Monitoring Item

ID	TDM013 am

This question item is worth **2 marks**

You may use the BNF at any time

Case presentation
A 10-year-old boy attends paediatric rheumatology clinic. In addition to his methotrexate and folic acid, he has been prescribed adjunctive treatment with oral corticosteroids (30 mg prednisolone orally daily).

Question
Select the *most appropriate* monitoring option that is required for his prednisolone
(*mark it with a tick*)

MONITORING OPTIONS

A	Visual fields	
B	Serum calcium	
C	Growth chart	✓
D	cholesterol	
E	Serum sodium	

Answer box

Option A	Justification
Option B	Justification
Option C	Justification
To prevent unexpected growth retardation	
Option D	Justification
Option E	Justification

Drug Monitoring Item | ID | TDM017 | This question item is worth **2 marks** | You may use the BNF at any time

Case presentation
A 68-year old man attends the Emergency Department with shortness of breath and swelling of both legs of gradual onset for the last 4 days. **PMH**. Severe heart failure, myocardial infarction and coronary artery bypass grafting 5 years ago. **DH.** Aspirin 75mg orally daily, ramipril 10mg orally daily, bisoprolol 10mg orally daily, furosemide 40mg orally twice a day, spironolactone 25mg orally daily.

Examination
BP 136/88 mmHg, pulse 68/min regular
ECG sinus rhythm, no ischaemia
JVP raised at 4cm, peripheral oedema to knees
Weight 86kg
Urinary catheter output in last hour 80 ml

Investigations
Na^+ 139 mmol/L (137–144), K^+ 4.6 mmol/L (3.5–4.9), eGFR 78 mL/min (previously >90)
CXR – pulmonary oedema

He has been given furosemide 80mg intravenously, and has been started on an intravenous infusion of GTN, initially at 1mg/hr.

Question
Select the *most appropriate* monitoring option to guide the rate of GTN infusion
(*mark it with a tick*)

MONITORING OPTIONS

A	Blood pressure	x
B	eGFR	☐
C	Serum potassium	☐
D	Urine output	☐
E	Weight	☐

Answer box

Option A Justification

Blood pressure (and pulse) is an important guide to titrating IV GTN minute-to-minute/hour-to-hour

Option B Justification

eGFR will be important longer term, particularly with ongoing intravenous diuretic treatment

Option C Justification

Serum potassium will be important longer term, particularly with ongoing intravenous diuretic treatment

Option D Justification

Urine output will be important to the overall assessment of changes of fluid balance, but does not change immediate GTN dosing.

Option E Justification

Daily weights will be important to the overall assessment of changes of fluid balance day-to-day

Resources summary

1. **Online practice papers** (https://prescribingsafetyassessment.ac.uk)
2. All **lectures, SPEs**
3. **Workshops 1-4**
4. **Fluids and calculations workbooks** on QM+
1. **Email me** queries as needed (v.kapil@qmul.ac.uk)