1. Answer **ALL** parts (a) to (d).

BM is an inpatient following recent surgery. Their hospital medical notes are as follows:

Patient: Hospital number: DoB: Gender: Address:	BM 776778 14/05/1954 F 25 Shrublands, Flatplace
<u>Day 1</u> Allergies: Weight:	Penicillin 64kg
Occupation: Alcohol: Smoking status:	Retired teacher Nil Non-smoker
MHx:	Osteoarthritis (1995)
DHx:	Morphine sulphate modified release tablets – 10mg BD Morphine sulphate 10mg/5mL solution – 2.5mL QDS PRN Ibuprofen 400mg TDS Paracetamol 1g QDS Zacin® 0.025% cream QDS

Plan: Elective admission for knee replacement (left) due to severe osteoarthritis of the knee impairing mobilisation and causing severe pain.

Operation to take place this afternoon.

Plan for immediate post-op pain relief – Morphine sulphate PCA (dose = 1mg, up to every 5 minutes).

Oral step-down analgesia plan from day 3: Paracetamol 1g QDS, Naproxen 500g BD, Morphine modified release 15mg BD, Gabapentin 300mg TDS

Patient for VTE prophylaxis - dalteparin 5000 units OD

T. Halliday Dr Halliday Bleep-0989

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Day 2 – AM ward round

Operation successfully completed, patient back on the ward. Patient sleeping and nursing staff report patient has been very drowsy and nauseous, sick x1.

Patient to have full set of bloods today, no new blood tests to review.

Overnight patient complained of pain around cannula site. **OE:** Area red, warm to touch and inflamed.

Area marked to monitor spread. Cannula removed and swab taken. New cannula in other hand for PCA. Start antibiotics – Clarithromycin 500mg BD for 7 days.

T. Halliday Dr Halliday Bleep-0989

Day 3 – on-call junior doctor - call from microbiology

Patient confirmed MRSA positive. Switch antibiotic to - vancomycin 1g BD, daily review.

B Chilvers Dr Chilvers Bleep-0345

Monitoring: Reference Day	⁷ 1 - Day 2 Monday	- Day 3 - Da	y 4 - range	Friday Satı	urday Sunday
Patient obs	ervations	(TPR chart)			
Temperature (°C Pulse	(BPM) 60 (mL/Hr)	37.5	138/82 38 64	140/85 37.9 67	139/80 68
Stool Type 1-7	-	Small	19 average	e Small type	
Pain (3 0-10) 6 on	Туре 4	type 3	2	
			5 4	4 mobilisa	tion
Respiratory 16 13		ate			
Biochemistry a	nd Haemato	ology			
Urea	1.7 – 7.1		175	195	230
Daily 49 Stool Type 1-7 Small type 27 25 19 average Small Small type 3 Pain 3 (0-10) 6 on 5 4 4 mobilisation Respiratory 12-20 16 5 4 4 mobilisation Biochemistry and Haematology 175 195 230 Cr µmol/L 98 Urea 175 195 230 Urea 1.7 - 7.1 6.1 9.2 12.0 25.5 mmol/L ML/min/ 27 24 19 Sodium 134 - 145 141 140 140 mmol/L 40 4.8 5.1 5.7 mmol/L 4.8 5.1 5.7 mmol/L 4.8 5.1 5.7 mmol/L LFT NAD NAD NAD NAD NAD		19			
	141	140 140 140 n	nmol/L		
LFT	4.0 NAD	4.8 5.1 5.7 m r		NAD	NAD
WBC	4-11 x 109/L 8.3		15.9	18.8	18.2
Hb	13.0 – 14.3 18.0 g/dL	13.0	13.0	13.0	
CRP Vancomycin	<10 mg/ 10 – 20	′L 87 22 mg/L	168	183	195

NAD = Nothing abnormal detected

(a) With reference to the medical notes, review, and comment on BM's renal function since admission. Describe potential contributory factors to the current situation and how these could be managed.

Contributory Factors:

- Infection Patient was positive to MRSA (hospital infection)
- Age Pt is 70 yrs old as people age Renal Function decreases
- Drugs: multiple drugs prescribed are excreted renally, affecting kidney function, (also naproxen & ibuprofen are nephrotoxic)

Management of renal impairment causes:

- Infection: Antibiotic patient is receiving Vancomycin
- Age: Adjust Drug dose
- Drugs: Pt renal impairment stage 2 AKI (Check RENAL HANDBOOK) (Adjust doses)
 - Morphine: Reduce to 50% original dose give 7.5 mg according to renal handbook
 - Naproxen: is nephrotoxic can avoid change to gel formulation, benefits due to localised treatment + lower dose in gel form
 - 0
 - Ibuprofen: is nephrotoxic so avoid it if possible.
 - NSAIDs affect bone healing as patient just had knee surgery.
 - Vancomycin: reduce dose to 0.5 1 g for 24-48 h as per renal handbook must be IV, monitor serum levels.
 - Gabapentin Start at low dose and increase dose according to response

Management of respiratory depression:

- Morphine causes respiratory depression: Give Naloxone IM, 200 mg 400 mg,
- Start at low dose and increase dose according to response

(b) With regards to the post-op step down analgesia, critique the appropriateness of the drug therapies for BM. For any issues identified, describe how these should be managed. [25%]

-	According to the pain workshop, NSAIDs are contraindicated in post operative pain treatment if the operation involved bone e.g., hip, knee or pelvis surgery. it affects bone recovery
-	PATIENT IS IN RESPIRATORY DEPRESSION. Give NALOXONE to reverse opiod activity.
-	Hold Opiod until patient is table and respiratorary rate is back up. Monitor RR closely.
if pati	ent becomes stable,
- -	PCA is good for pain but change morphine to FENTANYL as patient is severely renally impared Change ORAL morphine dose to patches. total oral morphine is 30mg daily but needs to be reduced by 50% due to renal impairment according to The

- Renal Handbook.
- Original dose was 30mg daily, reduced to 15mg daily. CHANGE TO Buprenorphine '5' patches.

8. Answer **BOTH** parts.

JH is attending their routine out-patient clinic appointment – they are reviewed by their consultant who makes the following record in their notes:

Patient: JH Hospital number: 642758

DoB: 24/04/1956 Gender: F

Address: 13, Clover, Flatplace

Allergies: NKDA

Weight:62Kg

Occupation: Retired teacher

Alcohol: Nil

Smoking status: Non-smoker

SH: Lives with partner, independent

PMH: Type 1 DM (since childhood) ESRF (secondary to diabetic nephropathy) – on

haemodialysis 3 x a week Hypertension 15 years

DH: Atorvastatin 20mg ON Amlodipine 10mg OM Ramipril 5mg ON Calcium acetate 1-2 tablets with each meal

Erythropoietin injection (Eprex®) 4000IU IV whilst on haemodialysis Lantus® Solostar® insulin 15IU ON NovoRapid® Flexpen® insulin – variable dose TDS with meals

JH 788993 24/04/1956

F 13 Clover Hill, Flatplace

NKDA 62kg

Retired teacher Nil Non-smoker Lives with partner, independent

Type 1 DM (since childhood) ESRF (secondary to diabetic nephropathy) – on

haemodialysis 3 x a week Hypertension 15 years

Atorvastatin 20mg ON Amlodipine 10mg OM Ramipril 5mg ON Calcium acetate 1-2 tablets with each meal

OE:

BP: Temperature: Pulse:

Blood tests:

7 PHA-6020Y

Erythropoietin injection (Eprex®) 4000IU IV whilst on haemodialysis Lantus® Solostar® insulin 15IU ON NovoRapid® Flexpen® insulin – variable dose TDS with meals

129/80 mmHg 36.2 degrees Celsius 66 BPM

HbA1c eGFR: Phosphate: Correctedcalcium: Hb:

Ferritin:

46.4mmol/mol / 6.8% 9 ml/min/1.73m² 1.43 mmol/L (Ref: 0.8-1.45) 1.75mmol/L(Ref:2.1-2.6) 13.5g/dL (Ref: 13.0-18.0)

243 µg/L

Describe and explain any interventions you

(a) Critique JH's current drug therapy. would like to make regarding their treatment.

According to nice guidelines

Antihypertensives

-Amlodipine 10 mg OM -used to manage hypertension, by lowering the blood pressure ,good in patients with renal impairment so (NO CHANGES)

-Ramipril 5mg ON -ACE inhibitor used also to manage hypertension .it also provide renal protection .However this is a ESRF stage which meaning it needs to be carefully monitored due to the risk of hyperkalemia and further renal decline(NO CHANGES)

Atorvastatin 20mg ON -used for cardiovascular risk with patients with diabetes and renal disease(NO CHANGES)

Calcium acetate (1-2 tablets with meal)-used in the management of hyperphosphatemia in ESRF .(CHANGES) The phosphate levels are within the range however the calcium is low which means we have to adjust the dose of calcium acetate or switch to sevelamer which is a different phosphate binder and avoid hypercalcemia but still needs monitoring

Erythropoietin injection (Eprex®) 4000IU IV- (NO CHANGES) - This because for anemia management ,the Hb levels are within range for dialysis patients

Lantuse Solostare insulin 15IU ON NovoRapide Flexpene insulin - (NO CHANGES) HbA1c is well controlled at 46.4mmol/mol

(b) Describe the underlying pathophysiology and potential clinical consequences of the condition(s) you have recommended intervention(s) for in part (a).

2. Answer **ALL** parts (a) to (c).

You have a new patient, CR, admitted to the cardiology ward. Their medical notes and drug chart are as follows:

Patient: Hospital number: DoB: Gender: Address:	CR 0357912 1.1.1954 F Ivy Lane, Flatplace	
PC:	Uncontrolled AF	
HPC:		th uncontrolled AF (picked up when or routine appointment)
PMH:	Epilepsy (since chi	ldhood)
DH:	Carbamazepine M Sodium valproate N	•
Allergies:	NKDA	
OE:		
	BP: Pulse:	150/100 mmHg 120 BPM, irregular
SH: Alcohol: Smoking status:	Retired, active – wa 1-2 Units/week Non-smoker	alks 2-3 miles/day
Diagnosis:	Uncontrolled AF	
Plan:	P 155/95 Pulse 125bpm (irr	egular)

			UE	A Traini	ing Pres	scription	n Char	Numb	er of drug cl	harts in use:	1	
Date	. 5	Surname	Forename	Sex	D/O/B	Hosptial	No. W	eight (kg)	Height (cm)	Surface Area (m ²)	SAM?	
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Question 2 continues...

- (a) With reference to current evidence-based guidelines, critique CR's current drug therapy. Describe and explain any interventions you would like to make regarding her treatment.
 - NICE recommends Beta Blocker has 1st line in uncontrolled AF to control the rate, however this patient is not on any beta blockers so should be preferably started on Bisoprolol 2.5mg OD and titrate according to response
 - Patient is on DOAC which would be good because according to NICE guidelines they recommend anyone with a CHAD score of 2 or more/1 if male to be considered for any anticoagulation (assessment of bleeding risk with ORBIT). Although we don't know the CHAD score because the patient has uncontrolled AF and a high blood pressure, they might qualify but as an intervention CHAD score should be done
 - Digoxin is only appropriate for monotherapy if the patient is living a sedentary lifestyle however this patient is wa;lking 2-3 miles a day which does not classify as sedentary! If monotherapy doesn't work (beta blocker) then digoxin can be used in combination therapy, so digoxin should be replaced with a beta blocker for now.
 - Carbamazipine and Sodium Valporate if appropriate for their current treatment of epilepsy should be on the drug chart, however they are not and should be added ASAP because they run the risk of having seizures etc. SO ADD!
 - Discuss carbamazepine with pt & IM specialist as can exacerbate seizures in myoclonic

3. Answer **ALL** parts (a) to (c).

You have a new patient, HY, admitted yesterday to the cardiology ward. Their medical notes and drug chart are as follows:

Patient: Hospital number: DoB: Gender: Address:	HY 476321 12.10.1941 M 23 Lime Ave, Flatplace
<u>Day 1:</u>	
PC:	Admitted via GP with severe SOB
HPC: Over past	week has become increasingly SOB whilst mobilising. Now needing 4 pillows at night to sleep.
PMH:	Gout (10 years) Hypertension (6 years) Heart failure (2 years)
DH:	Furosemide 40mg om Perindopril 2mg od NKDA Bisoprolol 2.5mg om Allopurinol 200mg od
SH:	Lives in sheltered accommodation
Alcohol: Smoking status:	Nil Non-smoker
OE: Patient shor painful, red, hot toe	t of breath, struggling to speak. Patient also reporting extremely on right foot.
Lungs:	BP: 155/95 mmHg Temperature: 36.2 degrees Celsius Pulse: 78 BPM (regular) Weight: 86kg (normally around 75kg) Bibasal crackles +++
Investigations:	Chest x-ray – pulmonary oedema Echo – EF 30%
Diagnosis:	Acute LVF + acute flare of gout
Plan:	IV furosemide 80mg bd + ibuprofen 400mg tds

A Tsung Bleep 4670

<u>Day 2:</u>

Weight still 86kg, patient still SOB +++

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			UE	A Train	ing Pres	scription	n Chart	Numb	er of drug cl	harts in use:	1
Date	5	Surname	Forename	Sex	D/O/B	Hosptial	No. W	eight (kg)	Height (cm)	Surface Area (m ²)	SAM?
Day	1	Y	н	М	12/10/1941	47632		86 mate / Actual			Yes / No
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PNair		100		1 - 2					2					-
Drug (approv	ved name)	Start date End date	00:00	Ê	$Q = \frac{1}{2}$				5	Q Q	Q - 2			
Perindopril		Day 1	08:00							.j],				
Dose	Route	Frequency	12:00							J. J.	l I			
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indication	2.00	Pharm check	18:00		Î. Î				1		i i			
			22:00	1	RA				1		<u> </u>			
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3 Drug (approv	werd marme)	Start date End date	05-00	(-)	8 - 8	2			ŝ.	ų – 9	(j - j			
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4. Drug (approv	ved name)	Start date End date	00:00	(=)	Q - į				ŝ	ų į	Q - 3	2		-
Allopurinol		Day 1	08:00	1	χ	RA								
Dose	Route	Frequency	12:00											
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indication	30	Pharm check	18:00		1				1					
			22:00	171	ii i				ĵ.		i i			
Prescriber's signa	ture	Supply	00:00											
P Nair		12 22 24		11-12 11-12						19 - 58 38 - 74		:)
5. Drug (approv	ved name)	Start date End date	06:00											
Ibuprofen		Day 1	08:00	1	x	RA			1		l i			
Dose	Route	Frequency	12:00	1	RA									
400mg	PO	TDS	14:00						ĺ.		i i			
Indication		Pharm check	18:00	1	RA							l i		
			22:00	2-0				8	1		8 - S			-
Prescriber's signa	ture	Supply	00:00	1						1	ă î			-
P Nair				30—33	8 <u>9</u> - 1	e			al.	<u>xi xi</u>	83 - 31	o	2	5

(a) With reference to current evidence-based guidelines, critique HY's current drug therapy. Describe and explain any interventions you would like to make regarding their treatment. Your answer should make reference to both acute and chronic management.

Increasing the dose of furosemide to 80 mg BD is appropriate for the pulmonary odeoma. This is appropriate for managing pulmonary odeoma due to the fact that acute LVF provides rapid diuresis.

It is important to monitor the input and output to assess the effectiveness of diuretic therapy and prevent dehydration. It is important to regularly monitor electrolytes, especially potassium and magnesium due to the high risk of hypokalemia with high dose furosemide.

The perindopril 2mg OD is relatively low dose. Increasing the dose will aid a better afterload reduction but it is important to monitor the renal function and blood pressure. I will recommend 2.5mg once daily for 2 weeks then increase to 5 mg once daily, dose to be taken in the morning.

Gout is the first line for the ibuprofen 400mg TDS as it is an NSAID which causes harm to the kidney and exacerbates CVD attacks like heart so as a result you will have to swap the ibuprofen with colchicine 500 mcg QDS for the treatment of gout.

Review the dose of allopurinol for the long term management of gout where it is important to assess their ongoing renal function and uric acid levels

Perinodpril should be swapped with ramipril as it is the first choice drug for hypertension and can be used as an ace inhibitor to treat heart failure.

Titrate the dose of the bisoprolol to 3.75mg once daily for a week then increase to 5mg once daily for 4 weeks, then increase if tolerated to 7.5 mg once daily for 4 weeks, then increase if tolerated to 10mg once daily which is the target dose

Add a mineralocorticoid receptor antagonist so adding spironolactone to improve the outcomes of the ejection fraction.

Talk to the patient about dietary sodium restriction and daily weight monitoring to detect fluid retention early.

4. Answer **ALL** parts (a) to (c).

You have a new patient, KL, admitted in the early hours of this morning to the coronary care unit. Their medical notes and drug chart are as follows:

Patient:	KL
Hospital number:	156709
DoB:	15.7.1965
Gender:	Μ
Address:	2 Salt Road, Flatplace
<u>Day 1</u> 04:00:	
PC:	Admitted via ambulance from home with severe chest pain (aspirin 300mg STAT given by paramedics)
HPC:	Woken up during night with severe central chest pain
PMH:	Hypertension (2 years)
DH:	Amlodipine 10mg od NKDA
SH:	Warehouse manager. Independent.
Alcohol: Smoking status:	30-35 units/week Smokes 15-20/day
OE:	Chest pain 9/10, clammy, anxious +++
Investigations:	BP: 145/95 mmHg Temperature: 36.2 °C Pulse: 88 BPM (regular) Weight: 96kg (BMI 31) ECG: ST-elevation Troponin >50,000
Diagnosis:	STEMI
Plan:	For PPCI
05:30:	PPCI complete – DES inserted into RCA and LAD
•	ain. Patient very tearful – reports increasing low mood over Recently divorced and stress at work.

25			UE	A Train	ing Pres	scription	n Char	t Numb	er of drug o	charts in use:	1
Date	9 8	Surname	Forename	Sex	D/O/B	Hosptial	103	/eight (kg)	Height (cm)	Surface Area (m ²)	SAM?
Day	1	L	к	М	15/07/1965	15670		96 timele / Actual			Yes / No
Wa	ard/ward	change:	Cardiolo	gy		Patient a	address		2 Salt R	d, Flatpla	ce
C0	Consult	100/01/2	Dr A Tsu	ing		31			S		
DRUG S	ENSITIV	ITIES/ALI	ERGIES MUS	T BE EN	TERED. I and da		ies/sens	ilivites you	must wri	te 'NKDA'	and sign
Medi	cine/Sub	stance	Descrip	otion of a	allergy/se			Sign	ature	1.00	Date
či.			NKDA				D	r A Tsun	8	Day	1
6			PRE-M	EDICAT	ION AND	ONCE ON	ILY DRU	JGS		_	
Pharm	Date	Drug (ap	proved name)	Dose	1000 Barrier 100 Barrier 100	ns/ route/ her	Time to be give	Sign	ature	Adminis	tered by Date
7	Day 1	Ticagre	lor	180mg	STAT		5am	DrAT	sung	AB	Day 1
ар 	Day 1	Diamor	phine	2.5mg	STAT IV		5am	DrAT	sung	AB	Day 1
	10.0		ecommended T recommende		oprophyla X		haddaa				
Prescri	bing			Drug o	missions			Prescri	bers		100
• Use app • All prese	proved dru criptions n		ned and dated.		omitted, one ntered into th nouth		nistration	Signature Bleep no. Print name	Dr A 7 4670 Doctor	Sung A Tsung	
prescribe 'X' in the (r or pharn drug admi			 Not required Patient Drug un Vomitin 	refused available	7. No IV ac 9. Contra-ir 8. Other - n be recorded	ndicated eason mus				
prescripti	on, sign a			Self ac	lministrat (S/	AM)		Print name			
dates sho	uld be tra	ansferred to	required. Start new chart. Igs on other	initial in th	nt is suitable he relevant (nurse can w	drug admin	istration	Signature c Bleep no. Print name			
Pharma	icy code	95						Signature			
12		onfirms che ; H = at home	cked/date c; R = relabel; * =	new supply	at discharge			Bleep no. Print name			
Supply: S	= ward sto	ck; T = dispe	nsing, see date an	d quantity;	P = POD, se	e date and q	uantity		Vers	sion 001-19	

			AS R	EQU	RED D	RUGS					
		CHE	CK PAG	BE 1 F	OR ALLE	RGY ST	TATUS				
1. Drug (appro Diamorphine	ved name)	Start date Day 1	Date	Day 1							
Dose 2.5mg	Route IV	Max Frequency	Time	04:45							
Indication		Pharm check	Dose aprop	2.5mg		-					
Prescriber's signa	ture	Supply	en by	GN							
A Tsung 2. Drug (approv	ved name)	Start date	B	.S		-	2	-	<u>e e</u>		_
Ondansetron		Day 1	Date	Day 1			_				
Bose 8mg	Route Po	Max Frequency BD	Time	04:40							
ndication		Pharm check	Dose	8mg Po							-
Prescriber's signa A Tsung-	iture	Supply	Given by Route	GN		-		5	<u></u>		
3. Drug (approv		Start date	Date Gi	Day 1							_
GTN (400mcg Dose	Route SL	Max Frequency PRN	Timo	04:15							-
1-2 sprays	SL	Pharm check	Dose	BOUINC		-					
Indication Prescriber's signature A Tsung-		Supply	Given by Route	SL GN							
4. Drug (approv	ved name)	Start date	Date								
Dose	Route	Max Frequency	Time								
ndication		Pharm check	Pose Bouts						5 6		_
^p rescriber's signa	iture	Supply	Given by R								
5. Drug (appro	ved name)	Start date	Date								
Dose	Route	Max Frequency	Tirne								
ndication	1(0)1	Pharm check	Poorte Boute				2	2			
^o rescriber's signa	dure	Supply	G ven by B	20 AS							

(a) With reference to current evidence-based guidelines, critique KL's current drug therapy. Describe and explain any interventions you would like to make regarding their treatment. Your answer should make reference to both acute and chronic management. [50%]