Simulation Scenario

Title	Acute asthma	**Version**	1.4
Target Audience	FY doctors & student nurses (and optionally paramedic)	**Run time**	10 -15 mins
Authors	Paul Redman, Udesh Naidoo, Paul Wilder, Mark Loughrey	**Last review**	4/7/18
Faculty comments	Paramedic at start of scenario to issue briefing	**Necessity**	Desirable

Brief Summary

A 48 year old asthmatic patient has become more breathless over the past 3 hours. This is a common life-threatening disease process that foundation doctors should be able to initially recognise and manage.

Educational Rationale

In the UK there are more than 1000 deaths each year from asthma (approximately 3 every day)[1]. It is estimated that up to 90% of these deaths are preventable. Healthcare professionals must be able to recognise the signs of life-threatening and near-fatal asthma. They should be able to implement immediate treatments and know when to refer to critical care. FY2 trainees should be able to work within and lead a team to safely assess and treat asthmatic patients in a timely manner.

Learning Objectives: Nurse

- ABCDE assessment and initial management of patient with life-threatening asthma

Learning Objectives: Doctor

- ABCDE assessment and initial management of patient with life-threatening asthma
- Early recognition of progression to life-threatening / near-fatal asthma
- Appropriate call for help and concise transfer of information

(+/- assisting critical care team)

- Demonstrate leadership and MDT team-working skills

No	CURRICULUM MAPPING	This scenario
1	Acts professionally	✓
2	Delivers patient-centred care and maintains trust	✓
3	Behaves in accordance with ethical and legal requirements	✓
4	Keeps practice up to date through learning and teaching	✓
5	Demonstrates engagement in career planning	
6	Communicates clearly in a variety of settings	✓
7	Works effectively as a team member	✓
8	Demonstrates leadership skills	✓
9	Recognises, assesses and initiates management of the acutely ill patient	✓
10	Recognises, assesses and manages patients with long term conditions	✓
11	Obtains history, performs clinical examination, formulates differential diagnosis and management plan	✓
12	Request relevant investigations and acts upon results	✓
13	Prescribes safely	✓
14	Performs procedures safely	✓
15	Is trained and manages cardiac and respiratory arrest	(✓)
16	Demonstrates understanding of the principles of health promotion and illness prevention	✓
17	Manages palliative and end of life care	
18	Recognises and works within limits of personal competence	✓
19	Makes patient safety a priority in clinical practice	✓
20	Contributes to quality improvement	

Candidate Briefing: Nurse

Setting	Emergency department resus bay

You have been called to a resus bay to meet the Paramedic who has brought in a 48 year old patient who has difficulty breathing.

His wife is following but is at least 15 minutes away.

Please assess this patient, together with the doctor.

Candidate Briefing: Doctor

Setting	Emergency department resus bay

You have been called to a resus bay to meet the Paramedic who has brought in a 48 year old patient who has difficulty breathing.

Please assess this patient, together with the nurse.

Your registrar is with another complicated patient at the other end of the department but is available by phone.

Paramedic Briefing

You have arrived at resus with John Goode, a 48 year old patient. He is short of breath with difficulty breathing and wheezing.

You are worried about him but have so far only used nebulised salbutamol. He could hardly talk to you on the way in. His wife is following but at least 15 minutes away.

Please give a handover to the hospital clinical team.

Technical set-up

Setting	Emergency department resus bay		
Simulator	High fidelity manikin / actor		
Gender	Male	Age	48

Initial monitor parameters

RR	O2 sats	Pulse (HR)	BP	ECG rhythm
24	**92% on air**	**130**	**120/60**	**Sinus tachycardia**
Cap Refill Time	**Blood glucose**	**Temp.**		
2s	**4.9**	**37.5**		

Initial patient set-up

Airway	**Obstruction**	**Airway adjunct**
	No	No

Breathing	**Chest sounds**	**O2 supply**
	Wheezy	air

Circulation	**Heart sounds**	**Cannula**	**BP cuff**	**Peripheries / pulses**
	Normal	No	Present	Warm / present

Disability	**Eyelids**	**Pupils**	**AVPU/GCS**
	Open	Equal & reactive	A / 14

Exposure	**Posture**	**Moulage**	**Bowel sounds**
	Sitting up at 45 degrees	None	Normal

Specific equipment / prop requirements

- Manikin: On ED bed, IV Access
- Stocked airway trolley (Specifically: Airway adjuncts (OPA, NPA))
- O2 and selection of masks incl. NRB mask
- Nebulisers
- Peak expiratory flow rate meter
- Monitoring equipment (SpO2, ECG, BP cuff)
- Syringes, flushes, IV fluid and giving sets, IV cannula
- Blood bottles, culture bottles
- Sputum culture bottle
- Observation chart, medical note paper, drug chart
- Stocked crash trolley
- Mock-up anaesthetic equipment/drugs

Medications

- Simulated drugs (Salbutamol, Ipratropium, Steroids, Aminophylline, Magnesium Sulphate, Antibiotics as per local guidelines)

Facilitator Briefing

Intravenous hydrocortisone (200mg) as too SOB for prednisolone
Initiate iv antibiotics for community acquired LRTI
The doctor should consider iv magnesium sulphate and aminophylline. If this fails they need to escalate for further advice on ITU management.

After treatment the patient needs IV potassium and MADU if treated successfully with respiratory team review. May request ITU / Critical Care review as the patient was previously intubated.

Telephone advice

- You will be sitting in the control room for the duration
- Answer all calls as "switchboard" in the first instance to allow for realistic delay.

How to run with candidates from only one discipline

- Initial paramedic briefing can be either read out or acted by the facilitator / sim tech (who then goes back into control room)
- Scenario can be run 'as is' with just doctors or nurses, if necessary

Patient Briefing

Setting	Emergency department resus bay
Name	John Goode
Age	48
Gender	Male

What has happened to you?

You attended A&E with breathlessness, coughing green sputum and a low grade temperature. You have become progressively wheezy over last 48 hours. Today your breathing has been getting worse for the last 3 hours and you have used your entire remaining purple inhaler and run out of salbutamol nebulisers.

How you should role-play

You are initially very short of breath and can only speak in short sentences. You quickly deteriorate and manage to only speak single words at a time. If prompted by the faculty, you will become exhausted and drowsy.

Your background

PAST MEDICAL HISTORY

- Asthma – one previous admission needing intubation and admission to ITU

MEDICATION

- Regular Seretide and Spiriva, with breakthrough salbutamol nebs at home
- NKDA

SOCIAL HISTORY

- You work as a vet
- Quit smoking 2 weeks ago

Scenario flowchart

INITIAL SETTINGS

A: Clear, speaking in short sentences
B: RR 24, sats 94% on 6L O2, widespread wheeze
C: HR 130, BP 120/60, CRT 2sec
D: Eyes open, PEARL 3mm
E: No rash, temp 37.5C

EXPECTED ACTIONS

- ABCDE assessment
- O2 via facemask
- ECG, sats & NIBP monitoring
- Recognise acute severe asthma

DETERIORATION

A: Clear, saying occasional words, not sentences
B: RR 45, sats 90% on air / 96% on 15L O2, widespread wheeze
C: HR 140, BP 115/60, CRT 2 sec
D: Eyes open, PEARL 3mm
E: Unchanged

EXPECTED ACTIONS

- ABCDE assessment
- Nebulisers on oxygen
- Iv hydrocortisone
- Recognise acute severe asthma
- Rx BTS Guidelines
  - Salbutamol
  - Ipratropium
  - Steroids

FURTHER DETERIORATION

A: Clear, speaking in single words
B: RR 48, sats 90% on 15L O2, widespread wheeze
C: HR 140, BP 90/50, CRT 2 sec
D: Drowsy and eyes closing
E: Unchanged

RESULTS

INITIAL ABG (on 6L O2)

pH	7.30
pO2	18.2
pCO2	5.4
BE	+2
Lact	1.8

CXR: ?focal consolidation

ECG: Sinus tachycardia

ABG (on 15L O2)

pH	7.32
pO2	20.0
pCO2	4.5
BE	+1.8
Lact	1.7

BLOODS: WBC 10, others also normal

EXPECTED OUTCOME

- Recognition of progressive deterioration and features of life-threatening asthma
- Get history and initiate management
- Continue BTS Guideline treatment: Consider Magnesium Sulphate and/or Aminophylline if not already given.
- Contact critical care team

LOW DIFFICULTY

- Medical Registrar arrives early, ensures magnesium given, aminophylline prescribed
- Patient improves

NORMAL DIFFICULTY

• Seniors not present initially
• Reassess, give Magnesium, discuss and then start Aminophylline. Continue Salbutamol
• Discuss with Critical Care and follow their advice

HIGH DIFFICULTY

• Deterioration – near-fatal asthma:
• Give all BTS drugs.

A: Clear
B: RR 50, Silent chest, SpO2 85%
C: HR 140, Sinus tachycardia
D: Eyes half closed, not speaking

• ITU team arrives: assist with intubation
• Tension Pneumothorax develops, hard to bag, SpO2 81%, HR 160 ST, BP 80/50
• Improves with needle decompression.

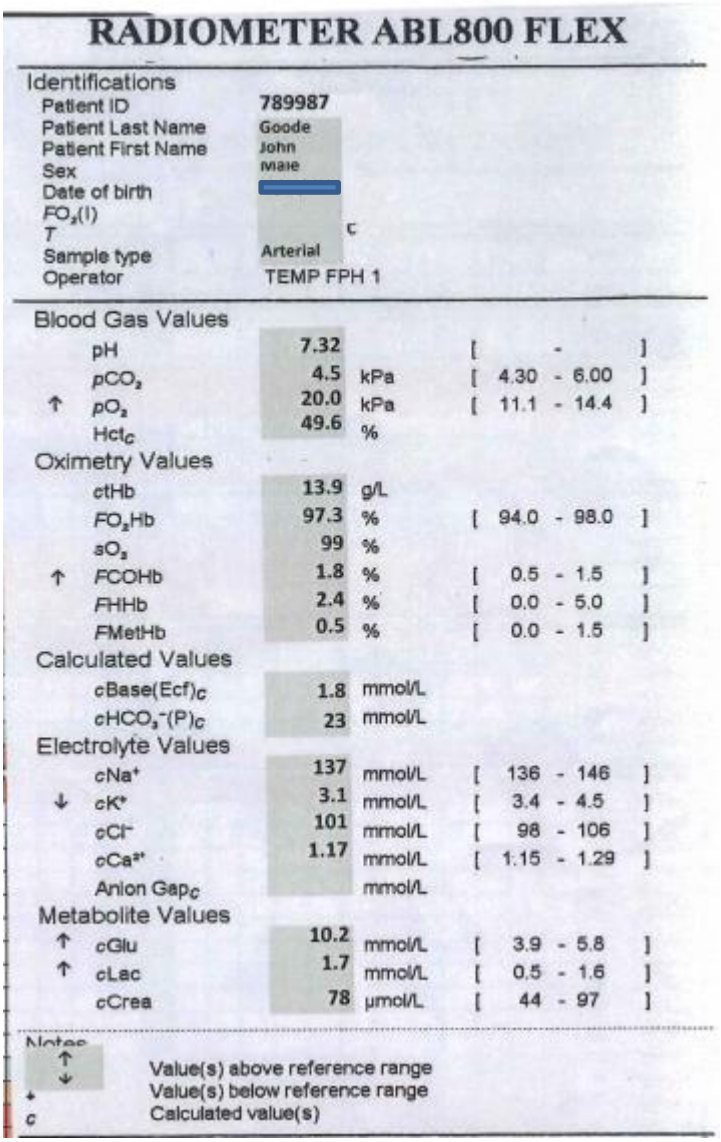
RESOLUTION

Scenario end with appropriate senior team members, plans made, notes written and accompany patient to appropriate bed

References

1. Asthma UK. https://www.asthma.org.uk/advice/understanding-asthma/faqs/ (Accessed on 25/6/18)
2. British Guideline on the Management of Asthma, a National Clinical Guideline available at: https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2016/
3. BTS quick reference guide available at: https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-quick-reference-guide-2016/

Clinical props



RADIOMETER ABL800 FLEX

Identifications			
Patient ID	789987		
Patient Last Name	Goode		
Patient First Name	John		
Sex	Male		
Date of birth	[redacted]		
$FO_2(I)$			
T	c		
Sample type	Arterial		
Operator	TEMP FPH 1		

Blood Gas Values				
	pH	7.32		[-]
	pCO_2	4.5	kPa	[4.30 - 6.00]
↑	pO_2	20.0	kPa	[11.1 - 14.4]
	Hct_c	49.6	%	
Oximetry Values				
	ctHb	13.9	g/L	
	FO_2Hb	97.3	%	[94.0 - 98.0]
	sO_2	99	%	
↑	FCOHb	1.8	%	[0.5 - 1.5]
	FHHb	2.4	%	[0.0 - 5.0]
	FMetHb	0.5	%	[0.0 - 1.5]
Calculated Values				
	$cBase(Ecf)_c$	1.8	mmol/L	
	$cHCO_3^-(P)_c$	23	mmol/L	
Electrolyte Values				
	cNa^+	137	mmol/L	[136 - 146]
↓	cK^+	3.1	mmol/L	[3.4 - 4.5]
	cCl^-	101	mmol/L	[98 - 106]
	cCa^{2+}	1.17	mmol/L	[1.15 - 1.29]
	$Anion\ Gap_c$		mmol/L	
Metabolite Values				
↑	cGlu	10.2	mmol/L	[3.9 - 5.8]
↑	cLac	1.7	mmol/L	[0.5 - 1.6]
	cCrea	78	µmol/L	[44 - 97]

Notes

↑ Value(s) above reference range
↓ Value(s) below reference range
c Calculated value(s)

RADIOMETER ABL800 FLEX

Identifications

Patient ID	789987
Patient Last Name	Goode
Patient First Name	John
Sex	Male
Date of birth	[redacted]
$FO_2(I)$	
T	C
Sample type	Arterial
Operator	TEMP FPH 1

Blood Gas Values

	pH	7.30		[-]
	pCO_2	5.4	kPa	[4.30 - 6.00]
↑	pO_2	18.2	kPa	[11.1 - 14.4]
	Hct_c	50.2	%	

Oximetry Values

	ctHb	14.2	g/L	
	FO_2Hb	97.0	%	[94.0 - 98.0]
	sO_2	95	%	
↑	FCOHb	2.0	%	[0.5 - 1.5]
	FHHb	2.3	%	[0.0 - 5.0]
	FMetHb	0.6	%	[0.0 - 1.5]

Calculated Values

	$cBase(Ecf)_c$	2.1	mmol/L
	$cHCO_3^-(P)_c$	22	mmol/L

Electrolyte Values

	cNa^+	138	mmol/L	[136 - 146]
	cK^+	3.6	mmol/L	[3.4 - 4.5]
	cCl^-	102	mmol/L	[98 - 106]
	cCa^{2+}	1.19	mmol/L	[1.15 - 1.29]
	Anion Gap_c		mmol/L	

Metabolite Values

↑	cGlu	9.4	mmol/L	[3.9 - 5.8]
↑	cLac	1.8	mmol/L	[0.5 - 1.6]
	cCrea	75	µmol/L	[44 - 97]

Notes

↑	Value(s) above reference range
↓	Value(s) below reference range
c	Calculated value(s)

NEWS - OBSERVATION CHART

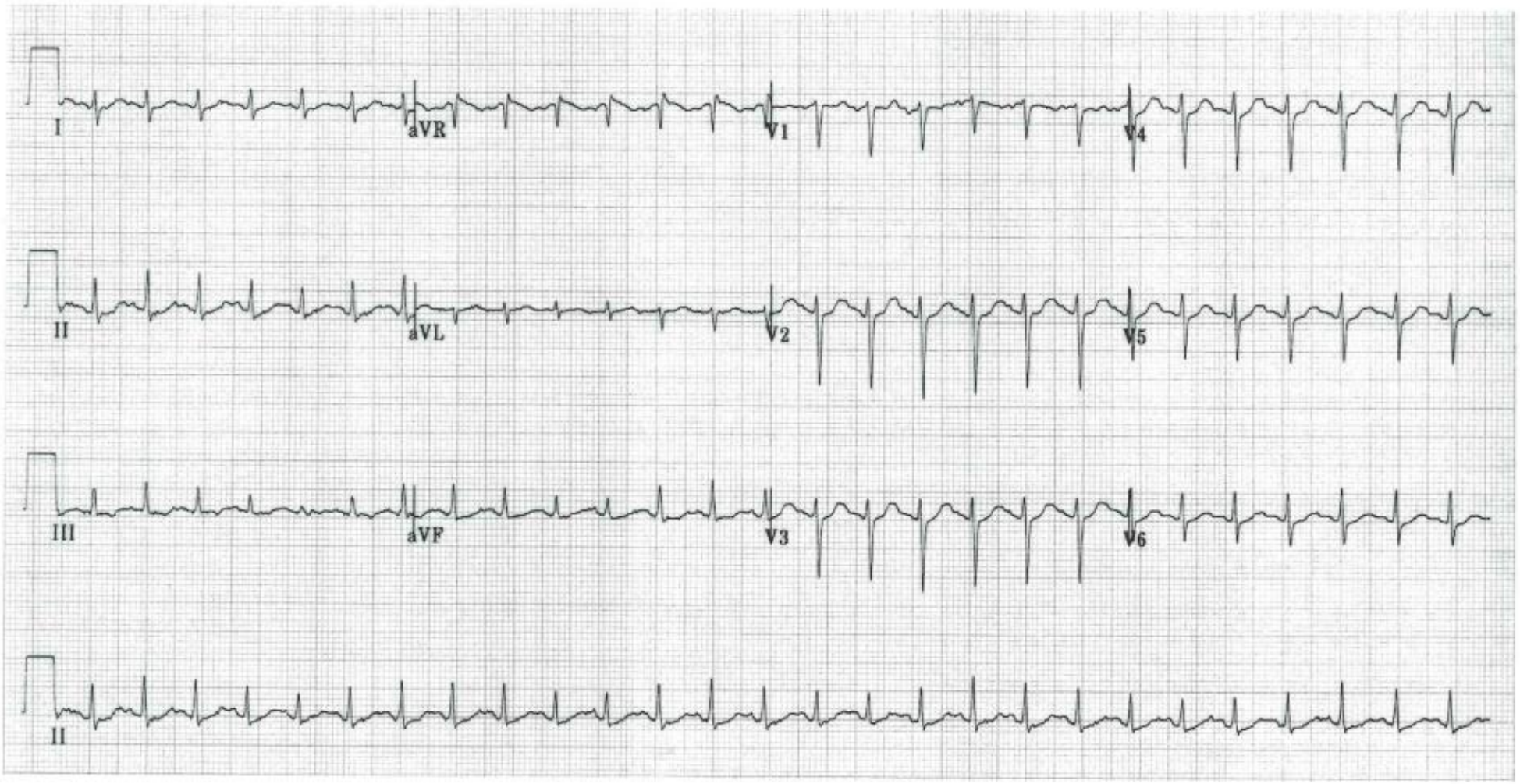
Surname: Goode | First name: John

Hospital number: 12345 | D.O.B: 1. 1. 1971 | Date of admission: Today

NHS Frimley Health NHS Foundation Trust

		DATE / TIME		DATE / TIME
A+B Respirations Breaths/min	≥25	24	3	≥25
	21–24		2	21–24
	18–20			18–20
	15–17			15–17
	12–14			12–14
	9–11		1	9–11
	≤8		3	≤8
A+B SpO2 Scale 1 Oxygen saturation (%)	≥96			≥96
	94–95		1	94–95
	92–93	92	2	92–93
	≤91		3	≤91
SpO2 Scale 2† Oxygen saturation (%) Use Scale 2 if target range is 88–92%, eg in hypercapnic respiratory failure † ONLY use Scale 2 under the direction of a qualified clinician	≥97 on O²		3	≥97 on O²
	95–96 on O_2		2	95–96 on O_2
	93–94 on O_2		1	93–94 on O_2
	≥93 on air			≥93 on air
	88–92			88–92
	86–87		1	86–87
	84–85		2	84–85
	≤83%		3	≤83%
Air or oxygen?	A=Air	A		A=Air
	O2 L/min		2	O2 L/min
	Device			Device
C Blood pressure mmHg Score uses systolic BP only	≥220			≥220
	201–219			201–219
	181–200			181–200
	161–180			161–180
	141–160			141–160
	121–140	120		121–140
	111–120	↑		111–120
	101–110	↑	1	101–110
	91–100	↑	2	91–100
	81–90	↑	3	81–90
	71–80	↑		71–80
	61–70	↓		61–70
	51–60	60		51–60
	≤50			≤50
C Pulse Beats/min	≥131	130	3	≥131
	121–130		2	121–130
	111–120			111–120
	101–110		1	101–110
	91–100			91–100
	81–90			81–90
	71–80			71–80
	61–70			61–70
	51–60			51–60
	41–50		1	41–50
	31–40		3	31–40
	≤30			≤30
D Consciousness Score for NEW onset of confusion (no score if chronic)	Alert	A		Alert
	Confusion		3	Confusion
	V			V
	P			P
	U			U
E Temperature °C	≥39.1°		2	≥39.1°
	38.1–39.0°	37.5	1	38.1–39.0°
	37.1–38.0°	•		37.1–38.0°
	36.1–37.0°			36.1–37.0°
	35.1–36.0°		1	35.1–36.0°
	≤35.0°		3	≤35.0°
NEWS TOTAL		7		TOTAL
Monitoring frequency				Monitoring
Pain score				Pain score
Initials				Initials

Version: 201807_004 Product Code:


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

Frimley Park Hospital NHS
NHS Foundation Trust

Hospital Number: 789987 NHS Number:	

Title: Mr Sex: M DoB: Age: 43 Yrs Surname: GOODE First name: John Address: Postcode: Tel (H): Tel (M): Employer / Educ. Est: N/A Religion: Language:	NOK: Address: Relationship: Tel (H): Tel (M): NOK: Address: Relationship: Tel (H): Tel (M):

Source of Referral: Ambulance Date of Arrival: [redacted] TODAY Time of Arrival: Mode of arrival: Ambulance No of Attendances in past year: 3 Previous Attendance Number: ED-12-051816-1 To be seen in: Resus	GP: Address: Tel No: Fax No:

Speciality Expected: Specialty:	Time referred to specialty: Time seen:	Duty/On-Call Emergency Department Consultant:
Presenting Complaint: Asthma		

Triage Nurse:		Time of Triage	
Presenting Complaint: SOB x 48 hrs		Triage (ESI)	2
History of Presenting Complaint: Known Asthma, Maj SOB		Pain Score	
On Assessment: Wheezy + unable complete sentence		Allergies	None
Previous Medical History: Asthma, ITUx1		Tetanus Status	
Social History:		Triage Treatment	
		Triage Notes	

Temperature		Blood Pressure		Nurse Concern	
Pulse		SP O^2 (Air)		GCS	E V M = /15
Respiratory rate		Pupils (Left)		Pupils (Right)	
Peak Flow	(Pre/Post)	Blood sugar		Weight	
MET SCORE =					

Hosp No.: 789987

Name	Signature	Initials	Position	Speciality	Date	Time

Have you considered the use of a Chaperone when seeing this patient,
Please refer to the Trust and Emergency Department Chaparone Policy.

Chaperone Used? Y / N

Name:_____

Presenting Complaint:

HISTORY: (Please continue on continuation sheets if necessary)

Age >65	
3 Coronary Artery Disease (CAD) Risk Factors: family history, raised cholesterol, diabetes mellitus, hypertension, active smoker	
Known CAD stenosis >50%	
Aspirin use in past 7 days	
Recent (<24 hours) severe angina	
Raised cardiac markers (CK)	
ST deviation >0.5mm	
TIMI Risk Score	

Age >60	
BP >140/90	
Clinical features: Unilat weak (2 pts) Speech only (1 pt)	
Duration: >60 mins (2 pt) 10-59 mins (1 pt) <10 mins (0 pt)	
Diabetic	
ABCD2 Score (max 7)	

Women of Childbearing age? LMP: ..... Pregnant? Y / N

2

Hosp No.: 789987

Past Medical History

☐ Diabetes ☐ AF ☐ Hx Dementia ☐ Hypertension ☐ IHD/Angina
☐ COPD ☐ Arthritis ☐ Epilepsy ☐ Asthma ☐ Pacemaker

(Please tick relevant conditions if present)

Drugs

Is the patient on anti-cancer medication? YES/NO If yes, what?
Please contact Lead Chemo Nurse on bleep 277

Allergies

Drug	Reaction	Date

3

Hosp No.: 789987

Systematic Enquiry:

Family History

Social History

Alcohol: .....units/week Smoking:

Occupation: Retired: Yes /No

Lives in: House / Flat / Bungalow / WCF / Residential Home / Nursing Home/ Barracks

Surrey / Hampshire / Berkshire/ Other/ Not known

Usually able to go out: Yes / No Lives alone: Yes / No Stairs: Yes / No

Mobility: ☐ Independent ☐ Stick ☐ Frame ☐ Wheelchair

Services: ☐ MOW ☐ Bathing services ☐ District Nurse ☐ Day Centre ☐ Day Hospital

Carer/s: ☐ None ☐ Spouse ☐ Other family ☐ Friend/ Neighbour ☐ OD ☐ BD ☐ TDS ☐ QDS

Drives: Yes / No

Has memory deficit been present for 6 months or more? ☐ Yes ☐ No

AMT (N/A)

☐ Age ☐ Recognition of two persons ☐ Time (to nearest hour) ☐ Date of Birth
☐ Address for recall ☐ WW2 ☐ Year ☐ Present monarch
☐ Location ☐ Count backwards 20 - 1

Score ...../10

If Score 7 or below commence dementia CQUIN ☐ Yes ☐ No

4

Hosp No.: 789987

EXAMINATION

Jaundiced Anaemic Cyanosed Clubbed Lymphadenopathy

Temp ..... Cap Blood Glucose.....

General Impression:

Cardiovascular

HR ..... reg / irreg BP sitting .....

BP lying..... BP Standing ..... (Remember >2 mins for Postural BPs)

HS..... Murmur? Y N Carotid Bruit? Y N

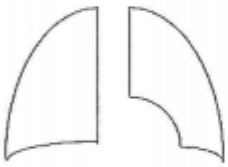
JVP ..... Oedema .....

Respiratory

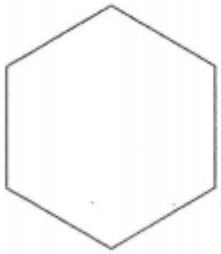
RR ..... Sats on Air ..... Sats on .....% 0_2 .....

Current PEFR..... Best PEFR ..... Predicted PEFR .....

Percussion / Auscultation



Abdominal



Ascites? Y / N

PR

PV

5

Hosp No.: 789987

Neurological

GCS: E ..... V ..... M ..../15

Pupils: .....

Cranial Nerves: (Not Assessed - tick here:)

Abnormalities:

Peripheral Nerves: (Not Assessed - tick here:)

		Power			Reflexes		Tone	
		Right	Left		Right	Left	Right	Left
Shoulders	abd (c5,6)							
	add (c5,6,7)							
Elbow	flex (c5,6)			Biceps (c5,6)				
	ext (c7,8)			Triceps (c7,8)				
Wrists	flex (c6,7,8)			Supinator (c6)				
	ext (c7,8)							
Hips	flex (l1,2,3)							
	ext (l5,s1,2)							
	abd (l4,5,s1)							
	add (l2,3,4)							
Knees	flex (l4,5,s1,2)			Knee (l2-4)				
	ext (l2,3,4)							
Ankles	flex (l4,5,s1,2)			Ankle (s1,2)				
	ext (s1,2)			Plantar (l5-s2)				

Cerebellar Signs:

Nystagmus .....

Finger/Nose .....

Heel/shin .....

Romberg's test .....

Gait .....

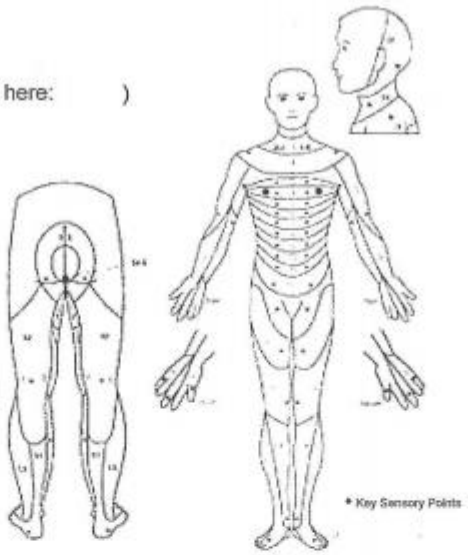
Dysdiadokoinesis .....

Dysarthria .....

6

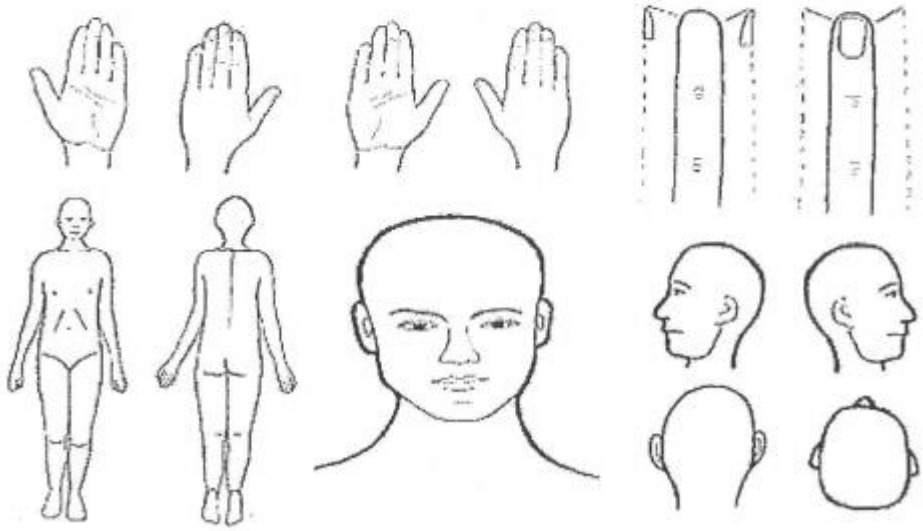
Hosp No.: 789987

Sensation
(Not Assessed - tick here:)



Anal sensation? Y N

Other examination findings / comments:



7

Hosp No.: 789987

Initial Impressions / Differential Diagnosis:

Investigations:

Radiology: ☐CXR ☐ AXR ☐CT Head ☐Other.....

Results:

Bloods: ☐FBC ☐Coag / INR ☐ESR
☐U&Es ☐ LFTs ☐Bone ☐ CRP
☐Other .....

Results:

Hb		MCV		Na		Bili		AST		Chol	
WCC		B12		K		Alk P		GGT		HDL	
Neut		Folate		Ur		ALT		Amylase		TG	
Plt		PT		Creat		Alb		CK		LDL	
ESR		APTT		Glucose		PO4		Trop (1)		TSH	
		INR		CRP		Cor Ca		Trop (2)		FT4	

Others:

☐ECG ☐Urine ☐ βHCG ☐ ABG ☐ Other .....

Results:

8

Hosp No.: 789987

Management Plan:

Discharge? Y / N
Refer? Speciality .....
Admit CDU? (consider VTE prophylaxis)
Decision time .....

VTE Risk? Please assess on separate risk assessment sheet
Have you started VTE prophylaxis? Y N
If not - reasons:

MRSA Status:

C. Diff status:

Met Calls Y N

For CPR? Y N
Orange sticker? Y N

Senior Review: Name: ..... Designation: .....

Time ..... Date ..... Signature .....

Frimley Health NHS
NHS Foundation Trust

Frimley Park Hospital

First Name(s): John Surname: Goode Hospital Number: 789987 NHS Number: Date of Birth:	Ward	Date chart started	Chart number of
	Consultant	Doctor bleep number	Date of admission TODAY

Date weighed	Weight (kg)	Height (M)	Surface area (M^2)	Ideal Body Weight (IBW)	Body Mass Index (BMI)	Diet

Allergies (write 'none known' and sign if none known). This section must be completed before medication is given.

Drug/substance	Details of reaction
NKDA	

This patient also has the following additional charts (complete and tick relevant box (es))

IV heparin infusion chart		Chemotherapy chart		Medicines reconciliation	
PCA		Epidural			

Reminder: Prescriptions must be rewritten not amended
Unclear prescriptions will be challenged

Communication for doctors. Messages must be actioned within 24 hours.

Date		Sign and Bleep No.	Actioned sign and date

Smoking		Alcohol	
Is the patient a smoker	Yes / No	Audit C score	
Is NRT currently in use	Yes / No	Full Audit score (if undertaken)	
		Withdrawal medication required	

Is patient self medicating: Yes / No

Level 1 / 2 / 3

Date chart rewritten ___/___/___

TTO written ___/___/___

Needs: Large print ☐ PMR card ☐

10-12-01 NHSBSA Product Code FPH3159 036538

Prevention of Venous Thromboembolism in Acutely ill Adult Medical Patients (non-obstetric)

Additional Risk Factors for VTE
- Trauma (major or lower extremity)
- Immobility or paresis
- Malignancy
- Cancer therapy (hormonal, chemotherapy or radiotherapy)
- Previous VTE
- Sepsis
- Pregnancy and the postpartum period (6 weeks post delivery) - see separate guidelines
- Oestrogen-containing oral contraception or hormone replacement therapy
- Selective oestrogen receptor modulators
- Certain medical conditions (Heart or respiratory failure, inflammatory bowel disease, Nephrotic syndrome, Myeloproliferative disorders, Paroxysmal nocturnal haemoglobinuria, Previous ischaemic stroke, Rheumatic disease, Acute MI (in last 12 weeks))
- Obesity (BMI>30kg/m²)
- Central venous catheterisation
- Inherited or acquired thrombophilia

Consider all patients for VTE prophylaxis
Does the patient have:
- Immobility expected to last >72 hours plus an Additional Risk Factor for VTE

Or
- Severe Congestive Cardiac Failure (+/-Risk Factors)
- Severe Respiratory disease alone (+/-Risk Factors)

No → No pharmaceutical thromboprophylaxis required. Continue to review status during stay.

Yes → Does the patient have any Contraindications to heparins?

Yes → TEDS (Unless patient has Contraindications to TEDS) Consider alternative pharmacological agent. Continue until heparins no longer contraindicated or no longer needed.

No → Dalteparin 5000 units s/c once daily.

*Use of Dalteparin beyond 14 days is unlicensed, but represents best practice supported by the Trust where indicated.

Contraindications to Heparins
- Allergy to heparin or Dalteparin or another low-molecular weight heparin
- Uncorrected bleeding disorder
- Active bleeding or potential bleeding lesions
- History of hypersensitivity to heparins or heparin induced thrombocytopenia
- Within two weeks of acute stroke (haemorrhagic or ischaemic)
- INR>1.5
- Patients receiving therapeutic warfarin
- Thrombocytopenia (Platelets< 100 x 10⁹/L
- Oesophageal Varices
- Active Peptic Ulcer disease
- Severe liver disease
- Recent neurosurgery/spinal surgery/eye surgery
- Severe hypertension (BP > 200 sys or 120 dias)
- Acute bacterial endocarditis

Contraindications to TEDS
- Gross oedema
- Leg deformity
- Peripheral vascular disease
- Peripheral neuropathy

Dosing for patients with renal impairment (medical and surgical)

Creatinine clearance 10-20 mL/minute use 50% of the recommended dose of dalteparin

Creatinine clearance < 10 mL/minute do not use LMWH - use unfractionated heparin 5000 units s/c bd.

For patients whose weight is within the normal population mean, eGFR may be considered to approximate creatinine clearance. For patients extremes of body weight creatinine clearance must be calculated using Cockroft Gault equation. (Calculator available on intranet/antibiotic guidelines)

Maximum dosing for patients with extreme body weights (medical and surgical)

	<50Kg	50-100Kg	100-150Kg	>150Kg
Dalteparin S/C	2500 units daily	5000 units daily	5000 units BD	7500 units BD

Prevention of Venous Thromboembolism in Adult Surgical Patients

Assess each patient for their risk of VTE based on the type of surgery and any Additional Risk Factors for VTE (see medical flowchart). Reassess risks of VTE and bleeding within 24 hours of admission and whenever clinical situation changes. See separate departmental guidelines for obstetric patients.

High Risk
Vascular surgery or major general surgery with Additional Risk Factor VTE.
Major orthopaedic surgery (THR, TKR, HFS)
Major open urological surgery

Medium Risk
Vascular surgery or major general surgery without Additional Risk Factor for VTE.
Minor surgery with Additional Risk Factor for VTE.

Low Risk
Minor surgery (<30 mins) without Additional Risk Factor for VTE.
Transurethral urological surgery

TEDS (unless contraindicated)

Does the patient have any Contraindications to Heparins?

No → Yes

Yes → TEDS (unless contraindicated) eIPC (Intermittent Pneumatic Compression) Consider alternative pharmacological agent. Continue until heparins no longer contraindicated or no longer needed.

Patients undergoing lumbar puncture or having an epidural or spinal anaesthesia - risk of spinal haematoma
Patients may be prescribed Dalteparin up to 5000 units s/c once daily no less than 12 hours prior to insertion or removal of epidural catheter. Or
Heparin 5000 units s/c (frequency according to risk level) no less than 4 hours prior to insertion or removal of epidural catheter.
Please refer to the Trust guidelines on Epidural/Spinal Anaesthesia and Anticoagulation.
If in doubt consult the relevant surgeon or anaesthetist.
Rivaroxaban: Epidural catheter removal or insertion should be at least 18 hours after last dose of Rivaroxaban. Next dose given at least 6 hours after removal. **Withold rivaroxaban for at least 24 hours after traumatic venous puncture.**

High Risk
Dalteparin 5000 units s/c once daily + TEDS (if not contraindicated).
Or
Dalteparin 2500 units s/c 1 to 2 hours before surgery, then dalteparin 2500 units s/c 8 to 12 hours later followed by dalteparin 5000 units s/c once daily + TEDS (if not contraindicated).

Major Abdominal or Pelvic Cancer Surgery Continue dalteparin for a minimum of 28 days after surgery.

Major Orthopaedic Surgery - all patients to receive foot or calf pumps

Elective THR Rivaroxaban 10mg once daily for 35 days. If contraindications (inc. creatinine clearance less than 30ml/min) consider dalteparin as above for 35 days post op. Patients on warfarin to receive dalteparin until warfarin restarted and in therapeutic range post-op.

Elective TKR Rivaroxaban 10mg once daily for 14 days. If contraindications (inc. creatinine clearance less than 30ml/min) consider dalteparin as above for 35 days post op. Patients on warfarin to receive dalteparin until warfarin restarted and in therapeutic range post-op.

Rivaroxaban is prescribed at 2200hrs if the surgery took place that day before 1600hrs (the time patient enters recovery) and at 0600hrs the following day for patients having surgery completed after 1600hrs.

All Other Major Orthopaedic Surgery (non-spinal)
For patients at high risk of VTE undergoing foot, ankle, shoulder, hand or spinal surgery please seek senior opinion.

Medium Risk
Dalteparin 2500 units s/c once daily + TEDS (if not contraindicated)

Administration and monitoring of Dalteparin

Routine doses should be administered at 1800
All patients receiving Dalteparin should have their platelet count checked on the day prophylaxis is commenced.
Patients exposed to any heparin in the last 100 days require a baseline platelet count and a second check 24 hours after the first dose.
Platelet counts should be performed every 2 - 4 days from day 4 to day 14 then regularly thereafter.
If platelet count falls by 50% or more and if the patient develops new thrombosis or skin allergy at injection site between day 4 and 14 discuss with Haematologist (Heparin Induced Thrombocytopenia)

Written by: Trust VTE Committee. Version: 6 July 2012

RISK ASSESSMENT RECORD SHEET FOR VENOUS THROMBOEMBOLISM (VTE)

- Please use in conjunction with Trust guidelines overleaf
- Please see separate Trust guidelines for obstetric patients

Thrombosis Risk	Patient Related	Procedure Related	Initial Assessment __/__/__	Assessment at 24 hours __/__/__	Assessment on __/__/__	Assessment on __/__/__
High	Previous VTE					
	Immobility expected to last >72 hours					
	Malignancy					
	Acute or chronic lung disease					
	Acute or chronic inflammatory disease					
	Chronic heart failure					
	Lower limb paralysis (excluding acute stroke)					
	Acute infectious disease, e.g. pneumonia					
	BMI >30kg/m2					
	Inherited or acquired thrombophilia					
	Pregnancy or less than 6 weeks post partum					
		Hip or Knee replacement				
		Hip fracture				
		Other major orthopaedic surgery				
		Surgical procedure lasting >30mins with additional VTE risk factor(s)				
Medium	Oestrogen containing oral contraception or HRT					
	Selective oestrogen receptor modulators					
	Age > 60					
	Dehydration					
	Varicose veins with phlebitis					
		Minor surgical procedure with additional VTE risk factor(s)				
		Surgical procedure lasting >30mins with no additional VTE risk factors				
		Plaster cast immobilisation of lower limb				
Low	None of above	None of above				
Bleeding Risk/ Contraindications	**Patient Related**	**Procedure Related**				
	Haemophilia or other known bleeding disorder					
	Thrombocytopenia (Platelets < 100 x 10^9/L)					
	Within two weeks of acute stroke (haemorrhagic or ischaemic)					
	Severe hypertension (BP > 200 systolic or 120 diastolic)					
	Severe liver disease					
	Oesophageal Varices					
	Active Peptic Ulcer disease					
	Active bleeding or potential bleeding lesions					
	Major bleeding risk, existing anticoagulant therapy					
	Severe renal disease					
		Neurosurgery, spinal surgery or eye surgery				
		Other procedure with high bleeding risk				
		Lumber puncture/spinal/epidural in previous 4 hours or anticipated in next 12 hours				
Risk assessment performed by						
Signature						
Copy of Patient Information Leaflet given to patient			Yes / No			

ONCE ONLY DRUGS AND PREMEDICATION.

Date	Time	Drug	Dose	Route	Prescriber Sig. GMC no.	Batch number (vaccines only)	Time given	Sig.	Pharm.

DRUGS ADMINISTERED UNDER MIDWIFERY EXEMPTION AND PATIENT GROUP DIRECTIONS.

Date	Time	Drug	Dose	Route	Batch number (vaccines and blood products only)	Print name	Sig.

REASONS FOR DRUGS NOT ADMINISTERED AND ACTIONS TAKEN.

Date	Time	Drug (s)	Nurses signature	Reason(s) for non administration and action(s) taken

FOR DRUGS NOT ADMINISTERED ENTER THE APPROPRIATE CODE IN THE ADMINISTRATION BOX AND SIGN

1 NIL BY MOUTH
2 REFUSED
3 UNABLE (NEEDS

REGULAR PRESCRIPTIONS

MONTH/YEAR
↓ DATE
↓ TIMES

OXYGEN	Circle target saturation Adjust flow rate to maintain specified oxygen saturation	Target oxygen saturation 88 to 92% 94 to 98%	0800 1200
PRESCRIBERS SIGNATURE	DATE		1800
Home Oxygen Indicated: YES / NO Referral to Respiratory Nurse for HOOF Date:		Other: ____________	2200
Nurse to intial against time to confirm oxygen is being administered and meeting specified target. Flow rate is to be documented to the left of the column, i.e.		2L | Sign	Device

PHARMACOLOGICAL VTE PROPHYLAXIS/TREATMENT INCLUDING NOACS	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

MECHANICAL VTE PROPHYLAXIS	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

WARFARIN AND OTHER COUMARIN ANTICOAGULANTS			TIME	INR
PRESCRIBERS SIGNATURE GMC No.			DATE STARTED	DOSE (mg)
INDICATION	DURATION	TARGET INR	PLEASE TICK APPROPRIATE STATUS ☐ NEW ☐ PREADMISSION	PRESCRIBERS SIGNATURE
PHARMACY POD H POD W	BOOK PROVIDED ON: BY:	DATE COUNSELLED: BY:	TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	GIVEN BY

DRUG (Approved Name)	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

DRUG (Approved Name)	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

DRUG (Approved Name)	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

DRUG (Approved Name)	DOSE	ROUTE	
PRESCRIBERS SIGNATURE GMC No.	START	REVIEW	STOP
INDICATION AND SPECIAL INSTRUCTIONS		Please tick appropriate status ☐ NEW ☐ PRE AD ☐ CHANGE	
PHARMACY POD H POD W		TO CONTINUE ON DISCHARGE ☐ YES ☐ NO	

WHEN REQUIRED MEDICATION

DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								
DRUG (Approved name)			Date								
DOSE	ROUTE	FREQUENCY	Time								
PRESCRIBER'S SIGNATURE	GMC No.	DATE	Dose								
INDICATION AND SPECIAL INSTRUCTIONS	☐ NEW ☐ PRE AD		Route								
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE	☐ YES ☐ NO	Given by								

Reminder: Prescribe on regular prescription and state "see variable prescription"

Insulins - variable dosing

DRUG (Approved name)		ROUTE S/C	SIG ⇨ / TIMES	MONTH/YEAR ⇨ DATE (Units / Sig)
PRESCRIBERS SIGNATURE	GMC No.	START / STOP	Breakfast	
DEVICE	Please tick appropriate status ☐ NEW ☐ PRE AD		Lunch	
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE ☐ YES ☐ NO		Dinner	
			Night	

DRUG (Approved name)		ROUTE S/C		
PRESCRIBERS SIGNATURE	GMC No.	START / STOP	Breakfast	
DEVICE	Please tick appropriate status ☐ NEW ☐ PRE AD		Lunch	
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE ☐ YES ☐ NO		Dinner	
			Night	

DRUG (Approved name)		ROUTE S/C		
PRESCRIBERS SIGNATURE	GMC No.	START / STOP	Breakfast	
DEVICE	Please tick appropriate status ☐ NEW ☐ PRE AD		Lunch	
PHARMACY POD H POD W	TO CONTINUE ON DISCHARGE ☐ YES ☐ NO		Dinner	
			Night	

WHEN REQUIRED INSULINS

DRUG (Approved name)			Date							
DOSE (UNITS)	ROUTE S/C	FREQUENCY	Time							
PRESCRIBERS SIGNATURE GMC No.		DATE	DOSE (in Units)							
INDICATION AND SPECIAL INSTRUCTIONS			Route							
PHARMACY			Given by							
DRUG (Approved name)			Date							
DOSE (UNITS)	ROUTE S/C	FREQUENCY	Time							
PRESCRIBERS SIGNATURE GMC No.		DATE	DOSE (in Units)							
INDICATION AND SPECIAL INSTRUCTIONS			Route							
PHARMACY			Given by							
DRUG (Approved name)			Date							
DOSE (UNITS)	ROUTE S/C	FREQUENCY	Time							
PRESCRIBERS SIGNATURE GMC No.		DATE	DOSE (in Units)							
INDICATION AND SPECIAL INSTRUCTIONS			Route							
PHARMACY			Given by							

Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig	Units	Sig

INSULIN SLIDING SCALE

Human soluble insulin (Actrapid)

50 UNITS in 50mL sodium chloride 0.9% IV INFUSION

Date															
Time															
Given by															
Checked by															

BLOOD GLUCOSE RESULT	INSULIN DOSE TO BE GIVEN (UNITS/HOUR)
PRESCRIBERS SIGNATURE GMC No.	DATE

BLOOD GLUCOSE RESULT	INSULIN DOSE TO BE GIVEN (UNITS/HOUR)
PRESCRIBERS SIGNATURE GMC No.	DATE

BLOOD GLUCOSE RESULT	INSULIN DOSE TO BE GIVEN (UNITS/HOUR)
PRESCRIBERS SIGNATURE GMC No.	DATE

ANTIMICROBIAL PRESCRIPTIONS ONLY

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

DRUG (Approved name)		DOSE	ROUTE
PRESCRIBER'S SIGNATURE	GMC No.	INDICATION (MANDATORY)	

START	48 HOUR REVIEW	2ND REVIEW DATE / TIME	3RD REVIEW DATE / TIME	STOP
REVIEWED BY ⇨				

PHARMACY
POD H POD W

DATE ⇨ TIMES

MRSA Status	New	Previous Admission

C. Diff Status	New	Previous Admission

ONCE DAILY GENTAMICIN PRESCRIPTION
Use gentamicin calculator or intranet to calculate dose.
Level must be taken 6 to 14 hours after the first dose has been given.

Specify Dosing Regime 5mg/kg 3mg/kg Other

Indication:_____

Date to be given	Time to be given	Dose (mg)	Prescribers signature GMC No.	Date of sig.	Start time of infusion	Given by: (sign)	Date and Time blood level taken	sign:	Gentamicin Levels mg/l

General Guidance

- All antimicrobial prescriptions MUST follow the Trust's Antimicrobial Policies or MUST have been agreed by Microbiology. See full up to date policy on intranet.
- **INDICATION, STOP AND REVIEW DATES MUST BE RECORDED ON THE CHART.**
- CURB 65 score **MUST** be recorded for all community acquired pneumonia.
- Check previous relevant microbiology results before prescribing antibiotics and check new microbiology results daily. If a patient is not responding to treatment seek advice from a consultant microbiologist.
- Doses need to be adjusted to suit patient's age, size and renal function. To calculate creatinine clearance use calculator on intranet and see dose adjustments for antibiotics.
- All IV regimes MUST be reviewed at 48 hours and switched to oral if appropriate.

IV SWITCH GUIDELINES

If YES to all, consider change to ORAL	If YES to any, remain on IV
Patient able to swallow and tolerate oral fluids?	Oral route compromised?
Temperature settling and < 38°C for at least 48hrs?	Continuing serious sepsis?
Heart rate <100bpm for last 12hrs? (no unexplained tachycardia)	Febrile with neutropenia?
WCC between 4-12x10^9/L?	Specific indication / deep seated infection. (Meningitis, endocarditis, encephalitis, osteomylitis, neutropenia, cystic fibrosis, septicaemia, haematology/ immunocompromised pts, continuing sepsis, other severe infections as discussed with microbiology.) Seek microbiology advice if unsure.
Oral formulation available?	
Others markers: BP stable Respiratory rate <20 breaths/min CRP returning to normal and less than 100 (adult)	
Absence of mental confusion (when representing symptoms of infection)	No oral formulation available (seek microbiology advice on alternative)

NOTE: DRUGS MUST NOT BE ADDED TO BLOOD PRODUCTS

Does the patient require CMV negative blood? (Indicate as appropriate) **Yes / No?**
Does the patient need irradiated blood? (Indicate as appropriate) **Yes / No?**

Name: _____
Hospital Number: _____
NHS Number: _____
Date of Birth: _____

BLOOD PRODUCTS TO BE ADMINISTERED (INCLUDING INTRAVENOUS IMMUNOGLOBULINS)

Date and Time to be administered	Blood product	Total volume	Route	Drugs required to cover infusion (must be prescribed on once only section of chart)	Duration / rate of infusion	Signature GMC No.	Batch number/Unit number (Attach sticker)	Start time / stop time	Given by/ checked by		Did patient experience adverse reaction? (Yes/No) ◄
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No
											Yes / No

Complete label attached to blood product. Detach and return bottom portion via the pink wallet (if available, if not please post to Blood bank)/

◄IF THE PATIENT EXPERIENCES TRANSFUSION RELATED PROBLEMS THESE MUST BE CONTEMPORANEOUSLY RECORDED IN THE PATIENT'S MEDICAL NOTES, AND A TRANSFUSION REACTION FORM AND INCIDENT FORM COMPLETED.

DRUGS TO BE ADMINISTERED BY INTRAVENOUS / SUBCUTANEOUS INFUSION

Date	Time	Infusion solution	Drugs to be added	Total volume	Route	Complete either or ∪ Rate	∪ Duration of infusion	Signature GMC No.	Start time/stop time	Given by/ checked by	Pharm.