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28 March 2018

Coroners Prevention Unit
Coroners Court of Victoria

By email: cpuresponses@coronerscourt.vic.gov.au

Dear Sir/Madam

Re: Inquest into the death of Lachlan Black
Your ref: COR 2014 4205

I refer to the recommendations arising from Coroner Carlin's findings into the death of Lachlan Black.

Thank you for your recommendations in relation to Monash Health. Monash Health has considered the matters that you have raised, and responds as set out below.

Recommendation - That Monash Health introduce a policy governing the circumstances in which it is acceptable for clinicians to make verbal orders for antibiotics and providing for mechanisms to ensure the prompt administration of any verbally ordered antibiotics, including charting the order at the first available opportunity.

Monash Health response:

Monash Health has implemented measures to generally improve the charting of antibiotics and to ensure that antibiotics are promptly administered in sepsis cases.

Monash Health has reviewed its "Medication Prescribing and Administration – Resuscitation Situations Procedure" (**attachment 1**) and amended the procedure to specify that a written order for the prescription and administration of antimicrobials for sepsis is required in non-resuscitation situations. In amending the procedure, Monash Health conducted extensive consultation with the Services Director (Emergency Medicine), the Antimicrobial Stewardship Physician, the Chair Resuscitation Committee, the Chair Paediatric Resuscitation Committee, the Director of Pharmacy and the Chair Medication Safety and Therapeutics Committee. The Medication Safety and Therapeutics Committee has also approved the revised procedure and it was endorsed by the Monash Health Clinical Council in February 2018.

In addition to organisation wide review, the Emergency Department has advised staff that verbal orders for medications are only to be accepted in a resuscitation setting. All other orders for medication, including antibiotics, must be made in writing. This change has been discussed at staff forums and meetings.

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The Monash Health "Medication Prescribing – Medication Chart Procedure" (**attachment 2**), addresses the need to check urgent verbal orders for medication and states that a medical officer and/or nurse and/or midwife and/or pharmacist must be informed of any medication decisions requiring immediate action or explanation.

The Monash Health Sepsis Paediatric Assessment and Management Clinical Guideline (**attachment 3**), which was implemented after Lachlan's death, endorses and refers to the state-wide paediatric sepsis guidelines that prioritise early administration of empiric intravenous antibiotic administration in paediatric patients with sepsis.

Monash Health also introduced a Sepsis Pathway (Adult) Procedure (**attachment 4**) subsequent to Lachlan's death. The procedure describes sepsis as a time-critical medical emergency and states that the nurse/midwife must be informed that antibiotics should be administered immediately.

Recommendation – That Monash Health introduce a formal policy governing the care of patients who present to the Emergency Department within 72 hours of a previous presentation requiring that such patients be personally reviewed by an Emergency Department consultant as soon as possible and that there be a concerted re-evaluation of the working diagnosis. In the event that an Emergency Department consultant is not available, the patient should be managed by a senior registrar and reviewed by a second senior registrar.

Monash Health response:

Monash Health is able to implement the above recommendation in full after reviewing and amending its processes governing unplanned representations to the Hospital.

The Hospital Emergency Medical Orientation Manual is currently being revised to ensure that patients representing within 72 hours must be reviewed by a senior doctor. Between 0800 and 2400 hours that review will be undertaken by an Emergency Department Consultant.

Monash Health is amending its staffing levels so that two senior registrars will be available in the Emergency Department at all Monash Health sites between 2400 and 0800 hours. Patients representing within 72 hours between 2400 and 0800 hours will be managed by a senior registrar and reviewed by a second senior registrar. Where clinically indicated, review by the senior registrar on duty on the relevant inpatient ward (i.e. the paediatric ward) is also available between 2400 and 0800.

In addition, the manual specifies that patients representing to the Emergency Department within 7 days should also be reviewed by a senior doctor.

Monash Health will forward your unit a copy of the Hospital Emergency Medical Orientation Manual reflecting these changes once fully implemented.

Monash Health is also creating a universal orientation manual which will provide consistency and continuity across units in relation to unplanned representations to the Hospital.

Monash Health is working with the vendor for its new Electronic Medical Record to ensure that representing patients are flagged on the system and drawn to the attention of Emergency Department staff.

In making the above changes, Monash Health has aimed to address the Coroner's recommendations and work towards systemic improvement in the early recognition and treatment of adult and paediatric patients with sepsis.

Yours sincerely



Andrew Block
Program Medical Director, Acute Medicine, Subacute & Community

Who must comply with this procedure?

Dentists, Enrolled Nurses, Medical Officers, Nurse Practitioners, Optometrists, Pharmacists, Podiatrists, Registered Midwives, Registered Nurses

This procedure applies to:

This procedure is only applicable in resuscitation situations when in the opinion of the prescriber the medicine is needed immediately to prevent serious harm or death and providing a written order would cause an unacceptable delay in treatment.

Precautions

In non-resuscitation situations, including the prescribing and administering of antimicrobials for sepsis, a written order is required, refer to [Medication prescribing medication chart procedure](#) or [Medication prescribing telephone orders procedure](#).

Equipment

- Medication chart
- Intravenous infusion chart

Procedure

1. Order the medicine (prescribers only) by stating:
 - 1.1. Patient's full name
 - 1.2. Medicine name
 - 1.3. Dose
 - 1.4. Route
2. Repeat the medication order back to the prescriber by stating:
 - 2.1. Patient's full name
 - 2.2. Medicine name
 - 2.3. Dose
 - 2.4. Route
3. Check patient identification band and medication allergies on the medication chart, with the patient or in the health record. Consult prescriber if the patient has a documented allergy to the medicine ordered.
4. Obtain medicine from designated location, e.g. bedside locker, trolley, cupboard, safe. Refer to [Obtaining medications procedure](#). For Schedule 8 and 11 medications, documentation in appropriate register is required, refer to [Schedule 8 and Schedule 11 medication management procedure](#).
5. Check expiry date.
6. Check the following details:
 - 6.1. Medicine name
 - 6.2. Medicine dose
 - 6.3. Medicine form
7. If the Registered/Enrolled Nurse or Registered Midwife has not completed all requirements of the Safe Checking and Administration of Medication (SCAM) competency, a second authorised staff member must check the medicine name, dose, form and expiry date.
8. Check the information detailed in steps 4 and 5 of this procedure with a second authorised staff member (including SCAM competent staff) for the following items:
 - 8.1.1. Blood and blood products

- 8.1.2. Injectable potassium (does not include parenteral nutrition solutions, Solution 150[®] and compound sodium lactate (Hartmann's solution)).
9. Confirm medication order with prescriber by stating what is about to be administered. For example, "I'm about to give John Smith 1 mg of intravenous adrenaline".
10. Administer medicine as ordered following confirmation from prescriber. Refer to [Medication administration procedure](#)
11. Prescriber to document the medicine, route and dose on the patient's medication chart as soon as possible after the medication administration using black pen, including the date, time, signature and printed name.
12. Staff who administered the medicine to sign the medication chart as soon as possible after the medication administration.
13. If an adverse medication reaction is identified or suspected refer to the [Allergies and adverse drug Reactions reporting a new reaction procedure](#).

Keywords or tags

Drugs, administer, resus, resuscitation

Document Management**Policy supported:** [Medication Management \(Operational\)](#)**Background document**[Medication Management Medication Administration chapter](#)[Medication Management Medication Prescribing chapter](#)**Executive sponsor:** Chief Medical Officer**Person responsible:** Director of Pharmacy

Medication prescribing medication chart

Who must comply with this procedure?

Dentists, Medical Officers, Nurse Practitioners, Optometrists, Podiatrists

This procedure applies in the following setting:

This procedure is applicable to all Monash Health patients.

Standard Requirements

It is expected that staff are familiar with the relevant procedures and know when to undertake each step.

- Introduce yourself, discuss the procedure with the patient
- Obtain consent. Refer to [Consent to medical treatment procedure](#)
- Check patient identification. Refer to the [Patient identification clinical procedure](#)
- Perform routine hand hygiene. Refer to the [hand hygiene procedure](#).
- Document medication orders in the specific medication chart using black pen, include the date, signature and printed name.

Precautions

Dentists, medical officers, nurse practitioners, authorised optometrists and authorised podiatrists may prescribe medicines in accordance with the *Drugs, Poisons and Controlled Substances Act* and prescriber lists approved by the Minister of Health.

Prescriptions must be for a patient under the care of the authorised prescriber.

Retinoids, prostaglandins, thalidomide and ovulatory stimulants may only be prescribed by a medical officer who holds a warrant to prescribe the medicine or by a medical officer acting in accordance with the directions of a warrant holder.

Cancer chemotherapy medicines can only be prescribed by registrars, fellows or consultants whom are appropriately credentialed, including re-writing of medication charts.

Equipment

- Medication Chart
- Infusion Chart

Procedure

1. Determine a therapeutic need for the medicine.
2. Check all active medication charts including the 'As Required "PRN" Medications' section to ensure the medication is not already prescribed.
3. Determine if the medicine has any prescribing restrictions at Monash Health and obtain appropriate approval if required. Refer to [Medication Traffic Lights Tool](#), [Antimicrobial Management for Adult Patients – Prescribers Tool](#) or a pharmacist to check restrictions.
4. Refer to [Medication Prescribing Tool - Permit and Notification Requirements for Schedule 8 and Schedule 11 Medications Tool](#) if intending to prescribe Schedule 8 or 11 medicines and obtain permits or notify if required.
5. Refer to [Oral Contrast Prescribing and Administration Procedure](#) if intending to prescribe oral contrast.
6. Print all text on the medication charts using black ink.
7. Select appropriate medication chart, noting specific requirements for:
 - 7.1. Insulin Subcutaneous Order and BGL Record – Adult (MRL45)
 - 7.1.1. For use at Monash Medical Centre only
 - 7.1.2. Document 'see insulin chart' in one row of the regular medicines section of the medication chart, if appropriate
 - 7.2. Cytotoxic Prescription & Administration Form (MRL07)/Paediatric Chemotherapy Protocol

(MRI02)

7.2.1. For patients prescribed both parenteral and oral cancer chemotherapy:

7.2.1.1 Prescribe parenteral and intermittent (less than once a day, e.g. weekly) agents on the Cytotoxic Prescription & Administration Form (MRL07) for adults or the Paediatric Chemotherapy Protocol (MRI02) for paediatrics

7.2.1.2 Prescribe daily (or more frequent, e.g. twice a day) agents on the medication chart

7.2.1.3 Document 'see cytotoxic chart' or use purple 'cytotoxic' sticker in one row of the regular medicines section of the medication chart, if appropriate

7.2.2. For patients only prescribed oral cancer chemotherapy:

7.2.1.4 Prescribe on the medication chart

8. Affix the patient's identification label and write the patient's full name on both sides of the medication chart. Three patient identifiers (patient's full name, UR number, date of birth) must be present as a minimum.
9. Write the patient's current weight on the chart. Write the gestational age in weeks for neonates.
10. Number the medication chart. If more than one chart is in use indicate this by writing the appropriate numbers in the space provided. For example, medication chart 1 of 2, 2 of 2.
11. Check with the patient, their health record and their medication chart for any medication allergies and complete and sign the 'Allergies and Adverse Reactions (ADR)' section of the chart.
 - 11.1. Tick the 'Nil Known' box if the patient is not aware of any previous allergies or adverse reactions.
 - 11.2. Tick the 'Unknown' box if the patient is unable to communicate allergy status. For patients who have had an allergy or adverse reaction, document the medication or substance name, the reaction e.g. rash and the date the reaction occurred or approximate time frame e.g. 2 years ago. Refer to [Allergies and Adverse Drug Reactions: Taking and Documenting a History Procedure](#).
 - 11.3. Document 'ADR noted – continue' in the indication section of the medication order and in the patient's health record if a clinical decision to proceed with prescribing a medicine despite a documented ADR, e.g. nausea with antimicrobials.
12. Complete ALL of the following information in the appropriate area of the inpatient medication chart; using only recommended terminology, abbreviations and symbols.
Refer to [Australian Commission on Safety and Quality in Healthcare Recommendations for Terminology, Abbreviations and Symbols used in the Prescribing and Administration of Medicines](#).
 - 12.1. **Date.** This is the date the medication order was written.
 - 12.2. **Medicine name**
 - 12.2.1. Use generic name, except for combination products (excluding antimicrobials), insulins or where significant differences in bioavailability exist between brands (e.g. cyclosporine).
 - 12.2.2. Use generic name for combination antimicrobial products, e.g. amoxicillin + clavulanic acid
 - 12.2.3. If a combination product is not available at Monash Health and the components will be administered as separate medicines, prescribe the components as separate orders on the medication chart.
 - 12.2.4. Use both generic and trade names to clarify an order for medicines with potential for confusion, including oral morphine and oxycodone preparations e.g. Oxycodone SR

tablets (Oxycontin®), Oxycodone immediate release tablets (Endone®).

12.3. **Dose formulation.** Tick the 'Slow release' box if medicine is sustained, modified or controlled release e.g. diltiazem 180 mg SR or carbamazepine CR.

12.4. **Route.** If the doses for different routes of the same medicine are the same then more than one route may be specified in a single order e.g. paracetamol 1g oral/PR qid. If the doses for different routes are not the same then each route must be written on a separate line.

12.5. **Dose.** Specify the maximum daily dose for as required 'prn' medicines when appropriate.

12.6. **Dose calculation** e.g. mg/kg per dose. Prescribe medicine in liquid form as number of microgram, mg or gram except where standard references for the medicine express the dose as mL e.g. Pentavite®, lactulose. Write the dose in mL of the liquid in addition to the dose in microgram/mg/g if the concentration of the formulation is included.

12.7. **Frequency.**

12.7.1. Complete administration times using the 24 hour clock. A nurse, midwife or pharmacist may complete the times if this is not done by the prescriber.

- Topical patches:
 - Prescribe how frequently the patch is to be changed and annotate the application ('ON') and removal ('OFF') times (refer to examples on MRL 00 below):

Example of topical patch that requires specific 'ON' and 'OFF' times

Date	Medication (Print Generic Name)	Tick if Slow Release	ON:		
11/10	Glycerol Trinitrate Patch		0800	TR	TR
Route	Dose	Frequency & NOW enter times	OFF:		
Topical	15mg	24 hours daily	2000	TR	TR
Indication	Pharmacy				
Angina					
Prescriber Signature	Print Your Name	Contact			
H. Potter	H. POTTER	#123			

Example of topical patch that has similar 'ON' and 'OFF' times

Date	Medication (Print Generic Name)	Tick if Slow Release	ON:										
10/10	Buprenorphine Patch		0800										
Route	Dose	Frequency & NOW enter times	OFF:										
Topical	5 microgram/hour	Weekly (Sundays)	0800										
Indication	Pharmacy												
Pain													
Prescriber Signature	Print Your Name	Contact	CHECK										
H. Potter	H. POTTER	#123	SITE										

12.7.2. Order medicine required only on certain days, e.g. weekly or variable day dosing, by writing the days of the week that the medicine is due. Annotate the administration columns of the medication chart to indicate the day(s)/time when the medicine is due and block out the other day(s)/time using crosses (X) when the medicine is not to be given.

- Annotate the day(s)/time when the medicine is due when the medication chart is rewritten
- Review the need to adjust the next date that the medicine is due if a change is made (e.g. dose of medicine changed or change in day of the week a topical patch is due)

12.7.3. Order medicines that require administration at a frequency of greater than six

times a day, e.g. salbutamol in acute asthma, by completing the prescribing section of the chart once and completing the administration times in more than one administration section. Bracket the prescribing section to encompass the corresponding administration sections.

12.7.4. Write the hourly frequency for as required 'prn' medicines.

12.7.5. Verbally inform the nurse/midwife when prescribing a medicine for immediate administration (either once-only order or first dose of a new medicine)

12.8. Duration.

12.8.1. Specify duration of therapy (if known) in the frequency section. Block out the date/time when the medicine is not to be given with a cross (X) and place a line through the administration columns from the intended cessation date onwards.

12.8.2. Rewrite the medication order after the number of days available on the administration section of the medication chart has passed and the medicine is to continue.

12.9. **Indication.** Document indication for all antimicrobials, and other medicines as appropriate. This allows the order to be reviewed in the context of why the medicine was prescribed, reducing the risk of misinterpretation or incorrect doses.

12.10. **Signature.** Sign the order for each medicine that you prescribe. Print your name and contact details (pager or extension number) and profession (if not a medical officer) at least once on the chart if you prescribe several medicines on the same chart.

12.11. **Other details.** Endorse the warrant number (and name of the warrant holder if acting on direction) if applicable. Record the approval number for antimicrobials if applicable.

13. Discontinue a medicine by crossing out the entire order including the dose administration columns and date and sign the chart clearly. Document the reason for discontinuing the medicine on the medication chart and/or in the health record.

14. Change a medicine, dose or frequency by crossing out the entire order as per step 13 and prescribe the new order on a new line.

15. Withholding medicines:

15.1. Annotate the administration section of the medication chart with W (must be circled) on the day(s)/time(s) the medicine is to be withheld.

15.2. Review the medication chart and patient status to determine if the same or a similar medicine is required to be administered via an alternate route or if a different medicine is required to treat the indication.

15.3. Document in the health record and verbally inform the staff involved (medical officer and/or nurse and/or midwife and/or pharmacist) the reason for withholding the medicine and either when it is to be recommenced or when it will be reviewed.

15.4. Document an alternative treatment plan in the health record if it is intended that withholding medicine is permanent.

16. Inform a medical officer and/or nurse and/or midwife and/or pharmacist of any medication decisions requiring immediate action or explanation.

17. Write a new medication chart when a patient is transferred in the following situations:

15.1 To intensive care unit (ICU), adult patients – ICU medical officer prescribes required medicines on the ICU Medication Chart (MRL02)

15.2 From ICU to a public hospital ward, adult patients – medical officer from the receiving

15.3	treating unit prescribes required medicines on new medication chart (MRL00) From ICU to a JMPH private ward, adult patients – ICU medical officer prescribes required medicines on a new medication chart
15.4	To a sub-acute ward, any site – medical officer from receiving treating unit prescribes required medicines on a new medication chart (standard MRL00, or long stay MRL22, as appropriate)
15.5	From a sub-acute ward to an acute ward – medical officer from receiving treating unit prescribes required medicines on a new medication chart (MRL00)
15.6	Existing charts can continue to be used when a patient is transferred between any other wards/sites
18.	Consider writing a new medication chart if there are multiple changes on the existing chart that might make it difficult to read.
19.	If an adverse medication reaction is identified or suspected refer to the Allergies and adverse drug reactions: reporting a new reaction procedure .
Keywords or tags Drugs, prescribe, S8, S11, S100, DDs, DAs	

Document Management
Policy supported: Medication Management (Operational)
Background document: Medication Management
Executive sponsor: Chief Medical Officer
Person responsible: Director of Pharmacy

This Clinical Guideline has been endorsed by the Victorian Paediatric Clinical Network and is to be used for all patients at Monash Children's

Target Population for the Guideline

Patients presenting and/or admitted under Monash Children's across all sites

Target Users of the Guideline

Monash Children's Medical and nursing staff

Clinical Guideline

Monash Health endorses the use of the Sepsis – Assessment and management guideline. This guideline has been adapted for state-wide use with the support of the Victorian Paediatric Clinical Network.

Access is available via this link:

http://www.rch.org.au/clinicalguide/guideline_index/SEPSIS_assessment_and_management/

If the link is not responding use the following reference to search for the clinical guideline [Sepsis – Assessment and management RCH] using an internet search engine.

Linkage to Procedures/Medication Profiles/Implementation Tools

This guideline is associated with the following procedures

- Fever and suspected or confirmed neutropenia
- Clinical Observations -paediatrics

Keywords or tags

Unwell, septic, Shock, Paediatric, Antibiotic, Empirical treatment

Document Management

Unit/Service/Person responsible for document development: Director of Paediatric Emergency Monash Children's

Person accountable for clinical content: Director of Paediatric Emergency Monash Children's

Staff consulted in the development/endorsement of the clinical guideline occurred with: Sepsis working group – Emergency Department, PICU, Paediatric Infectious diseases

Policy supported: [Evidence-Based Clinical Care \(Operational Policy\)](#)

Executive sponsor: Medical Director, Monash Children's

**Who must comply with this procedure?**

All medical, nursing and midwifery staff

This procedure applies in the following setting:

The pathway is intended for the recognition and immediate management of sepsis.

This procedure outlines the following:

1. [Sepsis pathway Adult](#)

Related documents

[Sepsis \(Paediatric\) Clinical Guideline](#)

[Early onset sepsis in the newborn Clinical Guideline](#)

Sepsis Pathway Adult Implementation tool

Acknowledgements

Monash Health wishes to acknowledge the use of the Sepsis Kills toolkit, developed by the NSW Clinical Excellence Commission, in the preparation of this procedure.

Keywords or tags

Unwell, septic, shock, antibiotic, empirical treatment, resuscitation, infection, septicaemia, bacteraemia

Document Management

Policy supported: [Deteriorating Patient recognition and management \(Operational\)](#)

Executive sponsor: Chief Medical Officer

Person responsible: Program Medical Director, Emergency Medicine



SEPSIS PATHWAY INPATIENT ADULT

DOES YOUR PATIENT HAVE RISK FACTORS, SIGNS OR SYMPTOMS OF INFECTION?

- | | |
|--|--|
| <input type="checkbox"/> Critically ill | <input type="checkbox"/> Unexplained organ dysfunction |
| <input type="checkbox"/> Immunocompromised/chronic illness | <input type="checkbox"/> Abdominal pain/distension/peritonism |
| <input type="checkbox"/> Indwelling medical device | <input type="checkbox"/> Cough/sputum/breathlessness |
| <input type="checkbox"/> Recent surgery/invasive procedure | <input type="checkbox"/> New onset of confusion/altered level of consciousness |
| <input type="checkbox"/> History of fever or rigors | <input type="checkbox"/> Neck stiffness/headache |
| <input type="checkbox"/> Re-presentation within 48 hours | <input type="checkbox"/> Wound infection/cellulitis |
| <input type="checkbox"/> Line associated infection/redness/swelling/pain | <input type="checkbox"/> Dysuria/frequency/odour |

Have a higher level of suspicion of sepsis for patients > 65 years

PLUS

Does your patient have two or more YELLOW ZONE observations or additional criteria?

- ☐ Respirations ≥ 25 per minute
- ☐ $\text{SpO}_2 \leq 92\%$
- ☐ Heart rate ≥ 100 per minute
- ☐ Altered LOC or new onset of confusion
- ☐ Temp $\leq 35.5^\circ\text{C}$ or $\geq 38.5^\circ\text{C}$

Obtain a venous blood gas if available

Does your patient have any PURPLE ZONE observations or additional criteria?

- ☐ Lactate $\geq 2\text{mmol/L}$
- ☐ Immunocompromised
- ☐ SBP $\leq 90\text{mmHg}$
- ☐ Base excess < -5.0

Sepsis is likely

- Sepsis is a time-critical medical emergency
- Obtain **immediate** senior clinician review
- Commence treatment as per sepsis pathway



Sepsis Pathway (Adult)



Sepsis is a time-critical medical emergency and requires urgent treatment
The following bundle must be completed within 60 minutes of sepsis recognition:

WITHIN 60 MINUTES

1. Oxygen Maintain SpO2 ≥ 94%

2. Take bloods

- ☐ 2 sets of **blood cultures** – separate sites ☐ Coags ☐ FBE ☐ Glucose
☐ Lactate (**Venous blood gas**) ☐ EUC ☐ LFTs ☐ CRP

Take blood cultures prior to commencing antibiotics provided this does not delay administration.

If unable to obtain blood cultures / IV access: escalate to a senior clinician immediately

3. IV fluid resuscitation

If SBP <90mmHg or Lactate >2 mmol/L: administer IV fluid bolus of at least 500 mL of sodium chloride 0.9%

If no response: repeat up to a maximum of 30mL/kg, unless there are signs of pulmonary oedema.

Caution in pregnancy: maximum 20mL/kg or 2 litres.

If unresponsive to fluid therapy of 30 mL/kg, **early** vasopressor support with noradrenaline via central line is indicated. Metaraminol via peripheral line may be used pending placement of Central Venous Catheter

4. IV Antibiotics

- Inform nurse / midwife to administer antibiotics **immediately**
- If the patient:
 - Has a **penicillin allergy** or is already on antibiotic therapy → discuss with ID service urgently
 - Has renal impairment → review dosage
- Do not delay antibiotic administration for investigations or results**

Community acquired sepsis

Severe sepsis unknown source	flucloxacillin 2 g IV 4 hourly AND gentamicin 7 mg/kg * IV
Pneumonia	ceftriaxone 1 g IV daily; or 12 hourly if severe sepsis requiring ICU AND azithromycin 500 mg daily
Pyelonephritis	gentamicin 4-7 mg/kg* IV, THEN ampicillin 2 g IV 6 hourly
Intra-abdominal infection	gentamicin 4-7 mg/kg*IV, THEN ampicillin 2 g IV 6 hourly, PLUS metronidazole 500 mg IV 12 hourly
Meningitis	ceftriaxone 2 g IV 12 hourly
Cellulitis	flucloxacillin 2 g IV 6 hourly; or 4 hourly if severe sepsis
Febrile neutropenia	piperacillin- tazobactam 4.5g IV 6 hourly For critically ill patients (usually those requiring intensive care support) consider giving the 6 hourly dose of piperacillin-tazobactam as an extended infusion over 3-4 hours PLUS gentamicin 4-7mg/kg* IV

Hospital acquired sepsis:

Severe sepsis unknown source	piperacillin-tazobactam 4.5g IV 6 hourly, THEN vancomycin 25mg/kg/IV
Line associated sepsis	
Pneumonia	
Intra-abdominal infection	

*Gentamicin dosing is based on the ideal body weight. The **gentamicin calculator** takes relevant factors into account to determine dose, including frequency. Refer to **Vancomycin Intravenous (IV) Adult Medication Profile**. There is a theoretical interaction between aminoglycosides and penicillins indicating concurrent administration and mixing of infusions should be avoided. Do NOT delay dosing when time critical administration is necessary

- If no improvement, discuss the patient's condition with the Senior Clinician, Intensive Care may be required
- Discuss management plan with patient and their family/carers
- Does the patient have:
 - An Advance Care Directive; are there any treatment limitations?
 - Goals of care; adapt treatment if applicable