| Maternal Sepsis Protocol | |
|---|---|
| **Type:** Protocol | **HDSS Certification Standard** |
| **Issued by:** Hutt Maternity PPG Group/MQSP Capital, Coast | **Version:** 1.2 as District wide |
| **Applicable to:** Te Whatu Ora - Capital, Coast and Hutt Valley<br>Women's Health Service | **Contact person:** CHOD Obstetrics Hutt Valley/MQSP Coordinator Capital, Coast |
| **Document Owner:** MQSP Coordinators | **Senior Document Owner:** Director of Midwifery |

## Policy

Sepsis is a life-threatening systemic condition that appears to be increasing in pregnant or recently postpartum women/people.

Clinical detection can be difficult and may result in increased morbidity and mortality via delays in the continuum of care or inappropriate treatment. Sepsis requires a low index of suspicion in all pregnant or postpartum women/people presenting with a wide range of symptoms.

This protocol aims to decrease the preventable sequelae through early detection and appropriate treatment.

## Scope

For the purposes of this document, staff will refer to:
All staff within Te Whatu Ora – Health New Zealand Capital, Coast and Hutt Valley. This includes staff not working in direct contact with patients/consumers. Staff are taken to include anyone engaged in working at Capital, Coast and Hutt Valley objectives. This may include but is not limited to:

- Employees
- Agency workers
- Self-employed workers
- Volunteers
- Consultants
- Third party service providers
- Students

**Includes** all providers of care (acute and critical care services) to pregnant or recently postpartum women/people.
**Excludes:** Postpartum >6 weeks / 42 days postpartum and non-pregnant women/people.

## Definitions

| | |
|---|---|
| Sepsis | Acute organ dysfunction caused by a dysregulated host response to infection. |
| Septic shock | A subset of sepsis with persisting hypotension requiring vasopressors to maintain MABP ≥65 mm Hg and having a serum lactate level >2 mmol/L despite adequate volume resuscitation. |

## Protocol Content and Guidelines:

**Maternal Sepsis Kit:** Capital, Coast and Hutt Valley uses the Sepsis 6+2 principle. This describes three initial assessments and treatments, and two considerations that are bundled into a Maternity Sepsis Kit to decrease delays from human factors, kits are located at facilities across the district:

- Wellington Regional Hospital:
  - *Maternal Sepsis Trolleys:* Birthing Suite (opposite pyxis room), Ward 4 North (main pyxis room)
  - *Maternal Sepsis Box:* Women's Health Assessment Service (WHAS)
- Kenepuru Hospital: Maternity Unit (medication room)
- Kāpiti Health Centre: Paraparaumu Birthing Unit (storage room)
- Hutt Hospital: *Maternal Sepsis Boxes*
  - Birthing Suite (emergency bay)
  - Maternity Ward (medication room)
  - Maternity Assessment Unit (MAU)

**Sepsis Pathway:**
The maternal sepsis pathway is designed to assist in early recognition and treatment of sepsis. The form includes clinical diagnosis, treatment with IV fluids and antibiotics and appropriate inter-disciplinary referral. This is specifically targeted to the acute presentation; the district encourages a multi-disciplinary approach particularly if there is a protracted clinical situation

**Consider Using The Sepsis Pathway If:**
The Maternal Sepsis Pathway should be considered for women/people presenting with ***any of the following and currently pregnant or within six weeks of completion of pregnancy:***

- Temperature ≥38 or <36 (low temp may be at risk of worse outcome)
- Altered mental state, confusion, disorientation.
- Respiratory rate ≥25
- Heart rate ≥100
- Systolic Blood Pressure ≤90
- New onset of pain

Using the pathway does not mean they definitely have sepsis but will aid in the investigation, treatment and decision making.

| SEPSIS 6+2 | | |
|---|---|---|
| **Take 3** | **Give 3** | **Consider 2** |
| Take appropriate cultures (e.g. vaginal swab, MSU, blood)<br><br>Measure Lactate<br><br>Measure Urine Output = fluid balance (not routine catheterisation) | Give oxygen if required<br><br>Give IV fluid challenge<br><br>Give IV Antibiotics | Assess fetal state, consider birth or evacuation of retained products<br><br>Consider VTE prophylaxis |

| Primary Patient Assessment | |
|---|---|
| **1. Recognise Sepsis** | • Consider sepsis if patient has signs and symptoms of acute organ dysfunction AND likely infection as the cause<br>• Commence documentation on sepsis pathway<br>• Urgently complete a full set of vitals and record on MEWS Chart, generate MEWS Score and follow escalation pathway.<br>  ○ Follow MEWs escalation pathway for involvement of Senior Medical staff |
| **2. Investigations** | • Establish large bore IV access<br>• Urgent bloods including:<br>  ○ Venous lactate (blood gas tube or green top tube)<br>  ○ 2 sets of blood culture (each set = 1 aerobic (blue cap) bottle and 1 anaerobic (purple cap) bottle (see instructions on pathway)<br>  ○ Full Blood Count<br>  ○ Electrolytes, Urea, Creatinine<br>  ○ C Reactive Protein (CRP)<br>  ○ Liver function tests<br>  ○ Coagulation studies<br>• Collect other cultures as appropriate (not to delay antibiotics)<br>• Consider venous blood gas if abnormal RR or O2 saturations<br>• Repeat lactate after fluid bolus ensure improving |
| **3. Initial Management** | **1. Maintain Airway**<br>• Administer oxygen if required to maintain oxygen saturations >94%<br>**2. Fluid Resuscitation**<br>• Administer 500ml STAT crystalloid (can repeat up to 30ml/kg)<br>  ○ Aim Systolic BP >90mmHg, if inadequate response notify ICU<br>  ○ Monitor for fluid overload<br>• Fluid balance (strict output measures). Consider IDC, if may have septic shock/decreased consciousness<br>**3. Intravenous Antibiotics**<br>• Administer within 60 minutes of presentation<br>• Sepsis with source not apparent. Empiric options are;<br>  ○ Ceftriaxone 2g IV, q24h<br>**<u>Special considerations</u>**<br>• Severe Penicillin Allergy<br>  ○ Change to Meropenem 1g IV, q8h<br>• MDRO-colonised<br>  ○ Colonised with ESBL change to Meropenem 1g IV, q8h<br>  ○ Colonised with MRSA change to Meropenem 1g IV, q8h **AND** Vancomycin 25-30mg/kg IV Loading Dose<br>• Critically Unwell<br>  ○ Ceftriazone 2g IV, q24h **AND** Gentamicin 7mg/kg Ideal body Weight (IBW) IV STAT Dose<br>• Critically Unwell and Penicillin Allergy/MDRO-colonised<br>  ○ Meropenem 1g IV q 8h **AND** Gentamicin 7mg/kg IBW IV STAT Dose |

| Secondary Assessment and Management | |
|---|---|
| **4. History** | 1. History and examination to elicit source of sepsis<br>○ Serial vital signs to be recorded on MEWS chart<br>○ Accurate fluid balance (hourly urine measure)<br>○ Early recourse to interpreting or disability services if required |
| **5. Fetal assessment** | 2. Fetal assessment<br>○ CTG<br>○ Ultrasound scan |
| **6. Monitor** | 3. Review response / signs of deterioration<br>4. Follow-up investigations<br>○ Lactate >2, Bilirubin >20, Platelets <150 or worsening results are of particular concern<br>5. Blood pressure response to IV fluids, aim for:<br>○ Systolic BP >90mmHg<br>○ AND/OR Mean Arterial BP >70mmHg<br>– If not improving discuss with ICU<br>6. Renal function review<br>○ Cr >90 or urine output <80ml / 4h indicates renal dysfunction<br>7. RR and Glasgow Coma Scale (GCS)<br>○ Continued tachypnoea or altered level of consciousness indicate deterioration. Discuss with ICU. |
| **7. Consider** | 8. VTE Prevention<br>○ Prophylactic low-molecular-weight heparin (LMWH) should be strongly considered<br>9. Need for source control e.g. birth or evacuation of retained products of conception<br>10. Discuss with ICU team if at secondary assessment there is:<br>○ Systolic blood pressure < 90mmHg<br>○ Reduced level of consciousness despite resuscitation<br>○ Respiratory rate >25 per minute<br>○ Worsening blood results or Lactate >2mmol/L<br>○ Or concerned woman/person critically ill at any time |

## Inadequate Response or Signs of Deterioration

If there is an **inadequate response to initial management** or **signs of deterioration** are present this should be recognised as having an increased risk of serious morbidity and outcomes. Senior involvement and multidisciplinary assessment is essential and the following management steps may be considered.

- Initiate 777/111 as per site specific protocol (also consider the need to add neonatal emergency)
- Involve Patient At Risk (PAR) Service where available
- Transfer to most appropriate location if not already/Intensive Care Unit
- Liaise with Infectious Disease team regarding empiric antibiotic choice, risk of resistant organisms and alternative source of infection

| Birth considerations |
|---|
| • Early involvement of the obstetric/duty anaesthetist should be routine in cases of obstetric sepsis, specifically if anaesthesia is likely to be required for delivery or postpartum transfer to theatre.<br>• There exists concern for neuraxial anaesthesia in the setting of sepsis due to the potential for serious infectious complications, this needs to be balanced on a case-by-case basis against the option of general anaesthesia.<br>• Extrauterine sepsis should be treated with a view to prolonging a preterm pregnancy. It may be reasonable to consider birth at term to simplify maternal resuscitation.<br>• Intrauterine sepsis should be strongly suspected with fetal tachycardia, uterine tenderness, offensive discharge, ruptured membranes or recent intrauterine procedure.<br>• Expediting birth should be considered if intrauterine sepsis is suspected. A second SMO should be contacted to support decisions at very early gestation. |

## References:

Singer M, Deutchman CS, Seymour CW et.al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016;315(8):801-810.

Bowyer L, Robinson HL, Barrett H, Crozier TM, Giles M, Idel I, Lowe S, Lust K, Marnoch CA, Morton MR, Said J. SOMANZ guidelines for the investigation and management sepsis in pregnancy. Aust N Z J Obstet Gynaecol. 2017: 10.1111/ajo.12646

MMWG. Maternal Morbidity Working Group Annual Report; 1 September 2016 to 31 August 2017. https://www.hqsc.govt.nz/assets/MMWG/PR/2018-MMWG-annual-report-final.pdf Accessed 05/09/2018

## Related Documents:

- Maternal Sepsis Pathway Hutt Valley (MATF148)
- Maternal Sepsis Pathway Capital, Coast (ID 1.104116)
- Maternity Early Warning System Vital Signs Chart (MEWS) (Wellington ID 1.104302; Kenepuru Maternity ID 1.104300; Paraparaumu Maternity ID 1.104301; Hutt Hospital)
- Thromboprophylaxis and Anticoagulation Management during Pregnancy Hutt Valley (MATY125)
- Obstetrics VTE Risk Assessment Guideline Form Capital, Coast (ID 1.102655)
- Maternal Sepsis Poster Te Whatu Ora – Capital, Coast and Hutt Valley (ID 1.104117)

## Informed Consent:

The right of a consumer to make an informed choice and give informed consent, including the right to refuse medical treatment, is enshrined in law and in the Code of Health and Disability Consumers' Rights in New Zealand. This means that a person can choose to decline treatment, referral to another practitioner, or transfer of clinical responsibility. If this occurs follow the process map on page 18 of the Referral Guidelines (Ministry of Health, 2012).

## Tangata Whenua Statement:

The Women's Health Service recognises the rights and responsibilities of Māori as tangata whenua and Treaty Partners. This allows and acknowledges the importance of cultural diversity in all aspects of our care and practice in Aotearoa New Zealand.

As stated in Te Pae Amorangi (Hutt Valley Māori Health Strategy) 2018-2027, Te Whatu Ora Capital, Coast and Hutt Valley as a Crown agency is committed to our role in maintaining active relationships with iwi, under Te Tiriti o Waitangi. This strategy recognises the established principles of Partnership, Participation and Protection and recognises steps towards the reviewed interpretation of Te Tiriti principles to date (from the Wai 2575 claim into health). These are tino rangatiratanga, equity, active protection, partnership and options.

Attention in particular is drawn to:

- **Article one – Kāwanatanga**: actively engaging and working alongside with local iwi through the Hutt Valley Māori Health Unit
- **Article two – Tino Rangatiratanga**: Self-autonomy, self-determination; the responsibility to enable Māori to exercise their authority over their own health, determinants and definition of health
- **Article three – Ōritetanga**: equal health outcomes of peoples; ensuring that policy, guidelines or programmes do not further perpetuate any inequity
- **Article four (the 'oral clause') – Wairuatanga**: spirituality; thriving as Māori and the importance of health providers understanding health in te ao Māori (the Māori world), acknowledging the interconnectedness and inter-relationship of all living and non-living things.

## Appendices

Appendix 1: Maternal Sepsis Box

Appendix 2: Maternal Sepsis Trolley

Appendix 3: Antibiotics in Pregnancy and Breastfeeding

Appendix 4: Maternal Sepsis Pathway - Capital, Coast

Appendix 5: Maternal Sepsis Pathway Hutt Valley

## Appendix 1 - Maternal Sepsis Box

**Attach 'FIRST EXPIRY' sticker on box / Check monthly for expiries**

| | |
|---|---|
| **1. Documentation** | |
| 1 | Maternity Sepsis Pathway |
| 1 | Maternity Vital Signs Chart (MEWS) |
| 1 | Fluid balance |
| 1 | Laboratory form and bag |
| 1 | Blood bank form and bag |
| 1 | Medication chart (adult) |

| | |
|---|---|
| **2. IV Access** | |
| 1 | IV starter kit |
| 1 | Tourniquet |
| 2 | IV cannula 18g *(pref. closed IV catheter system)* |
| 2 | IV cannula 16g |
| 1 | Alcohol swabs |
| 1 | Gauze pack |
| 1 | Lignocaine inj. 5ml |
| 1 | Syringe with needle 1ml |
| 2 | Luer locks/bung |
| 1 | Roll tape |

| | |
|---|---|
| **3. Take 2 sets Blood cultures & baseline bloods:** | |
| 2 | Vacutainer butterfly with transfer device *(for peripheral venepuncture blood cultures set)* |
| 1 | Vacutainer blood transfer device *(for cannula blood culture set and tube collection)* |
| 1 | Permanent marker pen |
| 3 | Alcohol swabs |
| 4 | Blood culture bottles x 2 sets *(each set = 1 aerobic (blue cap) bottle and 1 anaerobic (purple cap) bottles* |
| 1 | Blue top blood collection tube (Coags) |
| 1 | Yellow top blood collection tube (Urea, Electrolyte, Creatinine, LFT, CRP) |
| 1 | Green top blood collection tube (Venous lactate) |
| 1 | Purple top blood collection tube (Full Blood Count) |
| 1 | Pink top blood collection tube (Group and Hold) |

| | |
|---|---|
| **4. Give High flow Oxygen** | |
| 1 | Rebreather mask |
| 1 | Oxygen tubing |

| | |
|---|---|
| **5. Give IV antibiotics: 'CHECK FOR ALLERGY' sticker over sealed bag** | |
| 2 | IV Solution set |
| 2 | Syringe 20ml |
| 2 | Drawing up needles (red top) |
| 3 | Sodium chloride 0.9% (posiflush) 10ml |
| 1 vial | Ceftriaxone 2g IV ***add to*** water for Injection 20ml |
| 1 vial | Meropenem 1g IV ***add to*** water for injection 20ml |

| |
|---|
| **6. Give a fluid challenge:** |

| | |
|---|---|
| 2 | Sodium chloride 0.9% 1000ml |
| 1 | Pressure infuser cuff |

| **7. Measure Urine output: AVOID IDC unless septic shock. Measure voids.** | |
|---|---|
| 1 | Toilet pan to collect urine in toilet |
| 1 | Catheterisation pack |
| 1 | Foley catheter size 12 |
| 1 | Lubricating jelly |
| 1 | Chlorhexidine and Cetrimide irrigation solution 30ml |
| 1 | Syringe 10ml |
| 1 | Water for injection 10ml |
| 1 | Urine drainage bag (hourly output) |

## Appendix 2 - Maternal Sepsis Trolley

| **Top of Trolley** | |
|---|---|
| 1 | Maternal Sepsis Pathway |
| 1 | Maternal Vital Signs chart (MEWS) |
| 1 | Fluid Balance chart |
| 1 | Laboratory form and bag |
| 1 | Blood bank form |
| 1 | Medication chart (adult) |

| **First Drawer** | |
|---|---|
| 2 | IV starter kits |
| | |
| 1 | Tourniquet |
| 4 | Alcohol swabs |
| 2 | IV connectors |
| 2 | Luer locks |
| 1 | Roll tape |
| | |
| 2 | IV cannula 18g (closed IV catheter system) |
| 2 | IV cannula 16g |
| 1 | 1ml syringe |
| 1 | 1% Lignocaine 5ml |
| 2 | IV extension set |
| | |
| 2 | Sodium chloride Posiflush 10ml |
| 2 | Aerobic blood culture bottles |
| 2 | Anaerobic blood culture bottles |
| | |
| 2 | Vacutainer butterfly with blood transfer device |
| | |
| 1 | Blue top blood collection tube |
| 1 | Yellow top blood collection tube |
| 1 | Purple top blood collection tube |
| 1 | Pink top blood collection tube |
| 1 | Green top blood collection tube |
| 2 | Blunt fill needles |
| | |
| 1 | Blood lactate syringe |
| | |
| 2 | Gauze swabs |
| 1 | Vacutainer Leur-Lok access blood transfer device (blue) |
| 1 | Vacutainer blood transfer device (pink) |
| | |
| 2 | 20ml syringes |
| 1 | Permanent marker pen |

| **Second Drawer** | |
|---|---|
| 1 | Ceftriaxone 2g IV ***with*** |

| | |
|---|---|
| 1 | Water for injection 20ml |
| | |
| 1 | Meropenem 1g IV ***with*** |
| 1 | Water for injection 20ml |
| | |
| 2 | IV solution sets (with ports) |
| 1 | Pressure cuff |
| | |
| 2 | Medicine added labels |
| 4 | Blunt fill needles |
| | |
| 2 | 20ml syringes |
| 2 | Sodium chloride Posiflush 10ml |
| | |
| 1 | Oxygen mask (non-rebreather) |

| **Bottom of Trolley** | |
|---|---|
| 2 | Sodium chloride 0.9% 1000ml |
| | |
| 1 | Hourly urine bag |
| 1 | Catheterisation pack |
| 1 | Foley catheter size 12 |
| 1 | Lubricating jelly |
| 1 | Chlorhexidine and Centrimide irrigation solution 30ml |
| 1 | 10ml syringe |
| 1 | Water for injection 10 ml |

## Appendix 3 – Antibiotics in pregnancy and breastfeeding

The tables below are intended to assist the prescriber in determining the level of risk of a specific antimicrobial when prescribed for suspected sepsis in pregnancy or breastfeeding. In all instances the below information should be interpreted in the context of the pregnant woman/person and benefits balanced with risks.

For latest information check the following database:
www.tga.gov.au/prescribing-medicines-pregnancy-database

| **Pregnancy Risk Summary** | | |
|---|---|---|
| **Drug** | **Category** | **Risk Summary** |
| Ceftriaxone | B1 | No detectable teratogenic risk, considered low risk |
| Gentamicin | D (but frequently used in sepsis) | Human data suggests low risk. Benefit outweighs risk in sepsis. |
| Meropenem | B2 | Limited human data – animal data suggests low risk |
| Vancomycin | B2 | Considered low risk. |

| **Breastfeeding Risk Summary** | | |
|---|---|---|
| Whenever antibiotics are prescribed to a breast-feeding person, the infant should be monitored for any adverse effects such as rash or gastrointestinal disturbance. | | |
| **Drug** | **Recommendation** | **Additional Notes** |
| Ceftriaxone | Compatible | Excreted into breast milk in low concentrations. |
| Gentamicin | Compatible | Excreted into breast milk in low concentrations. |
| Meropenem | Limited human data – probably compatible | Excreted into breast milk, until additional data available monitor infants for more common adverse effects in adults (headache, gastrointestinal, anaemia, rash). |
| Vancomycin | Compatible | Excreted into breast milk in low concentrations. |

## Appendix 4 – Maternal Sepsis Pathway Capital, Coast ID 1.104116

# Maternal Sepsis Pathway

For suspected bacterial infection in pregnant or recently pregnant woman (<42 days post)

Capital, Coast

Te Whatu Ora
Health New Zealand

Surname: ..... NHI: .....
First Names: .....
Date of Birth: ...../...../..... Sex: .....
PLACE PATIENT ID HERE

| | | | |
|---|---|---|---|
| **1** **RECOGNISE SEPSIS** Know the signs | ☐ Temp ≥ 38 or ≤ 36°C shivering, fever or very cold | ☐ Heart rate ≥ 100 beats /min: high heart rate | *Time/date* |
| | ☐ Altered mental state or behaviour, confusion or disorientation | ☐ Systolic BP < 90mmHg: clammy or sweaty skin | |
| | ☐ Respiratory rate ≥ 25breaths/min, short of breath | ☐ New onset of pain | |
| **COMMENCE MATERNITY VITAL SIGNS CHART (MEWS)** | | | |

| | | | |
|---|---|---|---|
| **2** **INVESTIGATE** | *Time* | ☐ Secure IV access x 2 (18G/16G) | *Actioned by* |
| | | Take 2 sets of blood cultures *see instructions pg 2* | |
| | | Take blood tests<br>☐ Coagulations studies (blue tube)<br>☐ Electrolytes ☐ Urea ☐ Creatinine ☐ CRP ☐ LFT (yellow tube)<br>☐ Venous lactate (blood gas tube)<br>☐ Full blood count (purple tube)<br>☐ Group and hold (pink tube)<br>☐ Venous blood gas: if abnormal RR or $O_2$ saturations (if not already taken) | |

| | | | |
|---|---|---|---|
| **3** **TREAT** Antibiotics Fluids Oxygen | | Give IV Antibiotics: as soon as cultures are taken | |
| | *Time* | CHECK for ALLERGY and MDRO RISK see ANTIBIOTIC GUIDELINE OVERLEAF | |
| | | Name/doses of antibiotics to give *(prescribe on medication chart)*:<br>☐ Ceftriaxone 2g IV q24h<br>OR<br>Penicillin Allergy:<br>☐ Meropenem 1g IV q8h<br>OR ***(see further antibiotics considerations page 2)*** | *Actioned by* |
| | | ☐ Give IV fluid challenge: 500ml Crystalloid (can repeat up to 30ml/kg)<br>☐ Administer oxygen if required to maintain oxygen saturations >94%<br>Measure urine output = Strict Fluid Balance<br>☐ Consider IDC, if may have septic shock/decreased consciousness<br>☐ Measure urine output hourly ☐ Consider swabs/MSU/sputum | |

| | | | | |
|---|---|---|---|---|
| **4** **CONSIDER** | *Time* | ▪ Assess fetal state<br>▪ Consider delivery or evacuation of retained products of conception | ☐ CTG<br>☐ Ultrasound | *Actioned by* |
| | | ☐ Consider VTE risk – thrombo prophylaxis.<br>☐ Consider need for milk expression and antibiotics in breastmilk (see policy for advice) | | |

| | | |
|---|---|---|
| **5** **ASSESS SEVERITY /ASSESS RESPONSE** | Severe sepsis indicated by one or more of the following - CONSIDER ICU REVIEW | |
| | ☐ Systolic BP < 90mmHg or 40mmHg from baseline<br>☐ New confusion or drowsiness<br>☐ Supplemental oxygen ≥ 2L/min to maintain sats > 90% | ☐ Lactate > 2mmol/L<br>☐ Decreased urine output < 80ml/4hr, Creatinine > 90<br>☐ Platelets < 150<br>☐ Bilirubin > 35 |
| | ICU review requested by (date/time): | |

ID: 1.104116 / Issued October 2022 / Review date October 2027

| 6 REFER | INADEQUATE RESPONSE OR SIGNS OF DETERIORATION | | |
|---|---|---|---|
| | If there is an inadequate response to initial management or signs of deterioration are present this should be recognised as having an increased risk of mortality.<br>Beware the woman who initially responds to resuscitation and then deteriorates. | | |
| | *Time* | • Initiate 777<br>Obstetric and medical emergency (also consider neonatal emergency) | *Actioned by* |
| | | • Involve Patient At Risk (PAR) Service on-call nurse<br>Phone 027 567 4356 (#6785) | |
| | | • Transfer to Intensive Care Unit charge nurse manager<br>Phone 021 199 8098 | |
| | | • Liaise with Infectious Diseases (on call) | |
| | • Influenza suspected<br>- Consider addition of Oseltamivir 75mg BD<br>• Group A Streptococcus toxic shock syndrome suspected<br>- Add Clindamycin 600mg IV q8h<br>- Consider IVIG 1-2g/kg IV (Liaise with haematology specialist, up to two total doses in first 72 hours) | | |

## ADDITIONAL NOTES

### BLOOD CULTURES

The woman does not need to have a fever ≥ 38◦ C to be able to take blood cultures.
For best results ensure the following:

- Two sets of blood cultures are required from two separate sites: peripheral venepuncture (preferred) or cannula (new insertion only)
- aerobic (blue cap) bottle followed by anaerobic (purple cap) bottles
- Bottles do not have a defined sample volume, which can result in overfilling causing inaccurate results. Use supplied marker pen to highlight top of the broth medium on each bottle, and mark 8mls above for accurate fill
- Asepsis is critical to the process of blood cultures – ensure skin and bottle tops are cleaned and dry before taking blood sample
- Transfer as soon as possible to laboratory – mark as urgent.

### ANTIBIOTICS - CHECK FOR ALLERGY

| Sepsis with source not apparent:<br>• Ceftriaxone 2g IV q24H | Special considerations: | |
|---|---|---|
| | High Risk Penicillin Allergy | Meropenem 1g IV q8h |
| | MDRO-colonised<br>• Colonised with ESBL<br>• Colonised with MRSA | Meropenem 1g IV q8h<br>ADD Vancomycin (as per PML/empiric dosing guidelines) |
| | Critically Unwell | Ceftriaxone 2g IV q24h AND Gentamicin 7mg/kg IBW IV STAT Dose |
| | Critically Unwell and Penicillin Allergy/MDRO-colonised | Meropenem 1 g IV q8h ADD Vancomycin (as per PML/empiric dosing guidelines) |

The use of meropenem requires discussion with the ID Service within 24 hours of starting.
For further considerations please discuss with ID Service

### DELIVERY CONSIDERATIONS

- Early involvement of the obstetric anaesthetist should be routine in cases of obstetric sepsis, specifically if anaesthesia is likely to be required for delivery or postpartum transfer to theatre.
  There exists concern for neuraxial anaesthesia in the setting of sepsis due to the potential for serious infectious complications, this needs to be balanced on a case-by-case basis against the option of general anaesthesia.
- Extrauterine sepsis should be treated with a view to prolonging preterm pregnancies. It may be reasonable to consider delivery at term to simplify maternal resuscitation.
- Intrauterine sepsis should be strongly suspected with fetal tachycardia, uterine tenderness, offensive discharge, ruptured membranes or recent intrauterine procedure.
- Delivery should be considered if intrauterine sepsis is suspected. Consideration should be taken as to the severity of maternal infection and gestational age of the fetus.

## Appendix 5 – Maternal Sepsis Pathway Hutt Valley MATF148

# Maternal Sepsis pathway

For suspected bacterial infection in pregnant or recently pregnant people (<42 days post)

Hutt Valley

Surname: ..... NHI: .....
First Names: .....
Date of Birth: ...../...../..... Sex: .....
PLACE PATIENT ID HERE

Te Whatu Ora Health New Zealand Capital, Coast and Hutt Valley

**1 RECOGNISE SEPSIS** — Know the signs

| | | Time/date |
|---|---|---|
| ☐ Temp ≥ 38 or ≤ 36°C shivering, fever or very cold | ☐ Heart rate ≥ 100 beats /min: high heart rate | |
| ☐ Altered mental state or behaviour, confusion or | ☐ Systolic BP < 90mmHg: clammy or sweaty skin | |
| ☐ Respiratory rate ≥ 25breaths/min, short of breath | ☐ New onset of pain | |

**COMMENCE MATERNITY VITAL SIGNS CHART (MEWS)**

**2 INVESTIGATE**

| Time | | Actioned by |
|---|---|---|
| | ☐ Secure IV access x 2 (large bore) | |
| | **Take 2 sets of blood cultures** *see instructions pg 2 and on pack* | |
| | **Take blood tests**<br>☐ Coagulations studies (blue tube)<br>☐ Electrolytes ☐ Urea ☐ Creatinine ☐ CRP ☐ LFT (yellow tube)<br>☐ Venous lactate (green tube)<br>☐ Full blood count (purple tube)<br>☐ Group and hold (pink tube)<br>☐ Arterial blood gas: if abnormal RR or $O_2$ saturations (Dr to do) | |

**3 TREAT** — Antibiotics, Fluids, Oxygen

Give IV Antibiotics: as soon as cultures are taken

Time: CHECK for ALLERGY and MDRO RISK see ANTIBIOTIC GUIDELINE OVERLEAF

Name/doses of antibiotics to give *(prescribe on medication chart)*: — Actioned by

☐ Ceftriaxone 2g IV q24h

**OR**

Penicillin Allergy:

☐ Meropenem 1g IV q8h

**OR *(see further antibiotics considerations page 2)***

☐ Give IV fluid challenge: 500ml Crystalloid (can repeat up to 30ml/kg)

☐ Give high flow oxygen via rebreather mask

**Measure urine output = Strict Fluid Balance**

☐ Consider IDC, if may have septic shock/decreased consciousness

☐ Measure urine output hourly ☐ Consider swabs/MSU/sputum

**4 CONSIDER**

| Time | | | Actioned by |
|---|---|---|---|
| | • Assess fetal state<br>• Expedite birth or evacuation of retained products of conception | ☐ CTG ☐ Ultrasound | |
| | ☐ **Consider VTE risk – thrombo prophylaxis (MATY125)**<br>☐ **Consider need for milk expression and antibiotics in breastmilk (see policy for advice)** | | |

**5 ASSESS SEVERITY /ASSESS RESPONSE**

Severe sepsis indicated by one or more of the following - CONSIDER ICU REVIEW

| | |
|---|---|
| ☐ Systolic BP < 90mmHg or 40mmHg from baseline | ☐ Lactate > 2mmol/L |
| ☐ New confusion or drowsiness | ☐ Decreased urine output < 80ml/4hr, Creatinine > 90 |
| ☐ Supplemental oxygen ≥ 2L/min to maintain sats > 90% | ☐ Platelets < 150 |
| | ☐ Bilirubin > 35 |

**ICU review requested by (date/time):**

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| 6 REFER | INADEQUATE RESPONSE OR SIGNS OF DETERIORATION | | |
|---|---|---|---|
| | If there is an **inadequate response to initial management or signs of deterioration** are present this should be recognised as having an increased risk of mortality.<br>**Beware the woman/person who initially responds to resuscitation and then deteriorates.** | | |
| | *Time* | • **Initiate 777**<br>**Maternal collapse (also consider neonatal emergency)** | *Actioned by* |
| | | • **Involve** Patient At Risk (PAR) Service on-call nurse<br>Phone #9185 or Page 495 | |
| | | • **Transfer** to Intensive Care Unit – Acceptance by ICU SMO<br>For ICU Nurse Coordinator – call via operator | |
| | | • **Liaise** with Infectious Diseases (on call) | |
| | • Influenza suspected<br>- Consider addition of Oseltamivir 75mg BD<br>• Group A Streptococcus toxic shock syndrome suspected<br>- Add Clindamycin 600mg IV q8h<br>- Consider IVIG 1-2g/kg IV (Liaise with haematology specialist, up to two total doses in first 72 hours) | | |

## ADDITIONAL NOTES

### BLOOD CULTURES

The woman/person does not need to have a fever ≥ 38◦ C to be able to take blood cultures. For best results ensure the following:

- Two sets of blood cultures are required from two separate sites: peripheral venepuncture (preferred) or cannula (new insertion only)
- Aerobic (blue cap) bottle followed by anaerobic (purple cap) bottles
- Bottles do not have a defined sample volume, which can result in overfilling causing inaccurate results. Use supplied marker pen to highlight top of the broth medium on each bottle, and mark 8mls above for accurate fill
- Asepsis is critical to the process of blood cultures – ensure skin and bottle tops are cleaned and dry before taking blood sample
- Transfer as soon as possible to laboratory – **mark as urgent.**

### ANTIBIOTICS - CHECK FOR ALLERGY

| | Special considerations: | |
|---|---|---|
| **Sepsis with source not apparent:**<br>• **Ceftriaxone 2g IV q24H** | **High Risk Penicillin Allergy** | **Meropenem 1g IV q8h** |
| | **MDRO-colonised**<br>• Colonised with ESBL<br>• Colonised with MRSA | Meropenem 1g IV q8h<br>**ADD** Vancomycin (as per PML/empiric dosing guidelines) |
| | **Critically Unwell** | Ceftriaxone 2g IV q24h **AND** Gentamicin 7mg/kg IBW IV STAT Dose |
| | **Critically Unwell and Penicillin Allergy/MDRO-colonised** | Meropenem 1 g IV q8h **ADD** Vancomycin (as per PML/empiric dosing guidelines) |

The use of meropenem requires discussion with the ID Service **within 24 hours of starting.**
For further considerations please discuss with ID Service

### BIRTH CONSIDERATIONS

- Early involvement of the duty anaesthetist should be routine in cases of obstetric sepsis, specifically if anaesthesia is likely to be required for delivery or postpartum transfer to theatre.
  There exists concern for neuraxial anaesthesia in the setting of sepsis due to the potential for serious infectious complications, this needs to be balanced on a case-by-case basis against the option of general anaesthesia.
- Extrauterine sepsis should be treated with a view to prolonging preterm pregnancies. It may be reasonable to consider birth at term to simplify maternal resuscitation.
- Intrauterine sepsis should be strongly suspected with fetal tachycardia, uterine tenderness, offensive discharge, ruptured membranes or recent intrauterine procedure.
- Expediting birth should be considered if intrauterine sepsis is suspected. Consideration should be taken as to the severity of maternal infection and gestational age of the fetus.