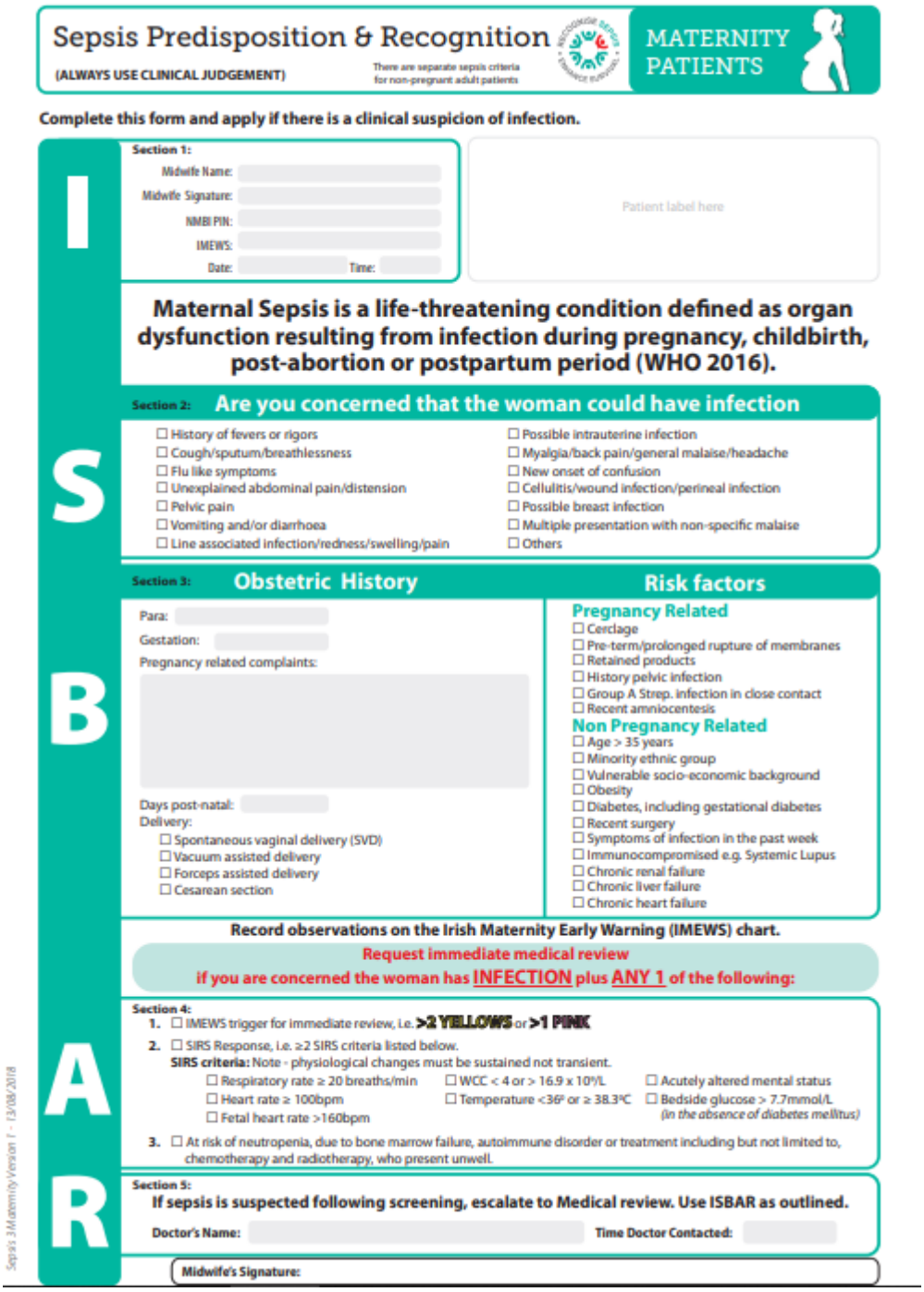
Antenatal Sepsis



Sepsis Predisposition & Recognition

(ALWAYS USE CLINICAL JUDGEMENT)

There are separate sepsis criteria for non-pregnant adult patients

MATERNITY PATIENTS

Complete this form and apply if there is a clinical suspicion of infection.

I

Section 1:

Midwife Name:

Midwife Signature:

NMBI PIN:

IMEWS:

Date: Time:

Patient label here

Maternal Sepsis is a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion or postpartum period (WHO 2016).

S

Section 2: Are you concerned that the woman could have infection

- ☐ History of fevers or rigors
- ☐ Cough/sputum/breathlessness
- ☐ Flu like symptoms
- ☐ Unexplained abdominal pain/distension
- ☐ Pelvic pain
- ☐ Vomiting and/or diarrhoea
- ☐ Line associated infection/redness/swelling/pain
- ☐ Possible intrauterine infection
- ☐ Myalgia/back pain/general malaise/headache
- ☐ New onset of confusion
- ☐ Cellulitis/wound infection/perineal infection
- ☐ Possible breast infection
- ☐ Multiple presentation with non-specific malaise
- ☐ Others

B

Section 3: Obstetric History

Para:

Gestation:

Pregnancy related complaints:

Days post-natal:

Delivery:

- ☐ Spontaneous vaginal delivery (SVD)
- ☐ Vacuum assisted delivery
- ☐ Forceps assisted delivery
- ☐ Cesarean section

Risk factors

Pregnancy Related

- ☐ Cerclage
- ☐ Pre-term/prolonged rupture of membranes
- ☐ Retained products
- ☐ History pelvic infection
- ☐ Group A Strep. infection in close contact
- ☐ Recent amniocentesis

Non Pregnancy Related

- ☐ Age > 35 years
- ☐ Minority ethnic group
- ☐ Vulnerable socio-economic background
- ☐ Obesity
- ☐ Diabetes, including gestational diabetes
- ☐ Recent surgery
- ☐ Symptoms of infection in the past week
- ☐ Immunocompromised e.g. Systemic Lupus
- ☐ Chronic renal failure
- ☐ Chronic liver failure
- ☐ Chronic heart failure

Record observations on the Irish Maternity Early Warning (IMEWS) chart.

Request immediate medical review

if you are concerned the woman has INFECTION plus ANY 1 of the following:

A

Section 4:

1. ☐ IMEWS trigger for immediate review, i.e. **>2 YELLOWS** or **>1 PINK**
2. ☐ SIRS Response, i.e. ≥2 SIRS criteria listed below.

SIRS criteria: Note - physiological changes must be sustained not transient.

- ☐ Respiratory rate ≥ 20 breaths/min
- ☐ Heart rate ≥ 100bpm
- ☐ Fetal heart rate >160bpm
- ☐ WCC < 4 or > 16.9 x 10^9/L
- ☐ Temperature <36° or ≥ 38.3°C
- ☐ Acutely altered mental status
- ☐ Bedside glucose > 7.7mmol/L *(in the absence of diabetes mellitus)*

3. ☐ At risk of neutropenia, due to bone marrow failure, autoimmune disorder or treatment including but not limited to, chemotherapy and radiotherapy, who present unwell.

R

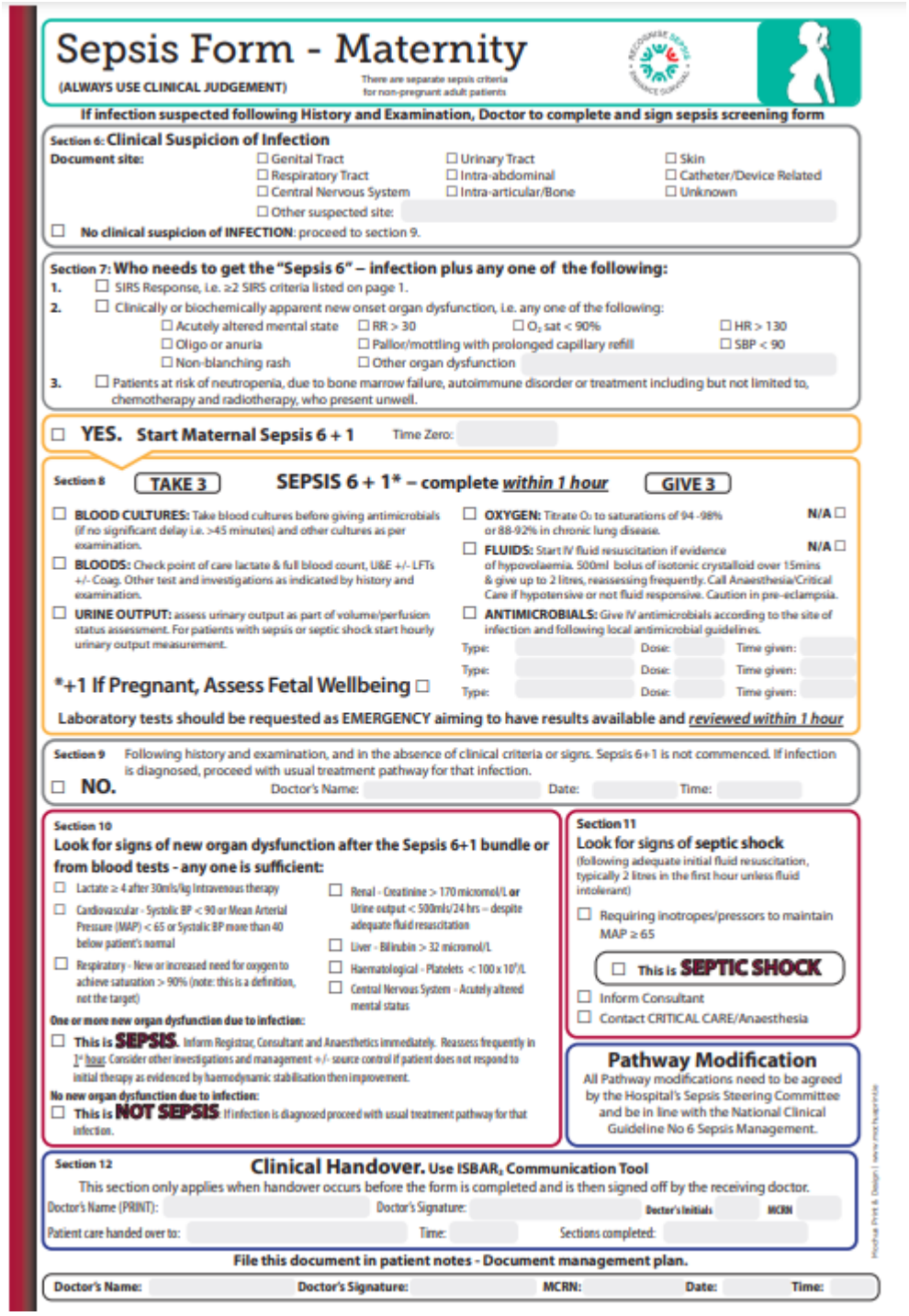
Section 5:

If sepsis is suspected following screening, escalate to Medical review. Use ISBAR as outlined.

Doctor's Name: **Time Doctor Contacted:**

Midwife's Signature:

Sepsis 3 Maternity Version 1 - 13/08/2018



Sepsis Form - Maternity

(ALWAYS USE CLINICAL JUDGEMENT)

There are separate sepsis criteria for non-pregnant adult patients

If infection suspected following History and Examination, Doctor to complete and sign sepsis screening form

Section 6: Clinical Suspicion of Infection

Document site:

☐ Genital Tract ☐ Urinary Tract ☐ Skin
☐ Respiratory Tract ☐ Intra-abdominal ☐ Catheter/Device Related
☐ Central Nervous System ☐ Intra-articular/Bone ☐ Unknown
☐ Other suspected site:

☐ **No clinical suspicion of INFECTION**: proceed to section 9.

Section 7: Who needs to get the "Sepsis 6" – infection plus any one of the following:

1. ☐ SIRS Response, i.e. ≥2 SIRS criteria listed on page 1.
2. ☐ Clinically or biochemically apparent new onset organ dysfunction, i.e. any one of the following:
   ☐ Acutely altered mental state ☐ RR > 30 ☐ O_2 sat < 90% ☐ HR > 130
   ☐ Oligo or anuria ☐ Pallor/mottling with prolonged capillary refill ☐ SBP < 90
   ☐ Non-blanching rash ☐ Other organ dysfunction
3. ☐ Patients at risk of neutropenia, due to bone marrow failure, autoimmune disorder or treatment including but not limited to, chemotherapy and radiotherapy, who present unwell.

☐ **YES. Start Maternal Sepsis 6 + 1** Time Zero:

Section 8 **TAKE 3** **SEPSIS 6 + 1* – complete *within 1 hour*** **GIVE 3**

☐ **BLOOD CULTURES:** Take blood cultures before giving antimicrobials (if no significant delay i.e. >45 minutes) and other cultures as per examination.

☐ **BLOODS:** Check point of care lactate & full blood count, U&E +/- LFTs +/- Coag. Other test and investigations as indicated by history and examination.

☐ **URINE OUTPUT:** assess urinary output as part of volume/perfusion status assessment. For patients with sepsis or septic shock start hourly urinary output measurement.

*+1 If Pregnant, Assess Fetal Wellbeing ☐

☐ **OXYGEN:** Titrate O_2 to saturations of 94 -98% or 88-92% in chronic lung disease. N/A ☐

☐ **FLUIDS:** Start IV fluid resuscitation if evidence of hypovolaemia. 500ml bolus of isotonic crystalloid over 15mins & give up to 2 litres, reassessing frequently. Call Anaesthesia/Critical Care if hypotensive or not fluid responsive. Caution in pre-eclampsia. N/A ☐

☐ **ANTIMICROBIALS:** Give IV antimicrobials according to the site of infection and following local antimicrobial guidelines.

Type: Dose: Time given:
Type: Dose: Time given:
Type: Dose: Time given:

Laboratory tests should be requested as EMERGENCY aiming to have results available and *reviewed within 1 hour*

Section 9 Following history and examination, and in the absence of clinical criteria or signs. Sepsis 6+1 is not commenced. If infection is diagnosed, proceed with usual treatment pathway for that infection.

☐ **NO.** Doctor's Name: Date: Time:

Section 10

Look for signs of new organ dysfunction after the Sepsis 6+1 bundle or from blood tests - any one is sufficient:

☐ Lactate ≥ 4 after 30mls/kg Intravenous therapy
☐ Cardiovascular - Systolic BP < 90 or Mean Arterial Pressure (MAP) < 65 or Systolic BP more than 40 below patient's normal
☐ Respiratory - New or increased need for oxygen to achieve saturation > 90% (note: this is a definition, not the target)
☐ Renal - Creatinine > 170 micromol/L **or** Urine output < 500mls/24 hrs – despite adequate fluid resuscitation
☐ Liver - Bilirubin > 32 micromol/L
☐ Haematological - Platelets < 100 x 10^9/L
☐ Central Nervous System - Acutely altered mental status

One or more new organ dysfunction due to infection:

☐ **This is SEPSIS.** Inform Registrar, Consultant and Anaesthetics immediately. Reassess frequently in 1st hour. Consider other investigations and management +/- source control if patient does not respond to initial therapy as evidenced by haemodynamic stabilisation then improvement.

No new organ dysfunction due to infection:

☐ **This is NOT SEPSIS.** If infection is diagnosed proceed with usual treatment pathway for that infection.

Section 11

Look for signs of septic shock

(following adequate initial fluid resuscitation, typically 2 litres in the first hour unless fluid intolerant)

☐ Requiring inotropes/pressors to maintain MAP ≥ 65

☐ **This is SEPTIC SHOCK**

☐ Inform Consultant
☐ Contact CRITICAL CARE/Anaesthesia

Pathway Modification

All Pathway modifications need to be agreed by the Hospital's Sepsis Steering Committee and be in line with the National Clinical Guideline No 6 Sepsis Management.

Section 12 **Clinical Handover. Use ISBAR$_4$ Communication Tool**

This section only applies when handover occurs before the form is completed and is then signed off by the receiving doctor.

Doctor's Name (PRINT): Doctor's Signature: Doctor's Initials MCRN
Patient care handed over to: Time: Sections completed:

File this document in patient notes - Document management plan.

Doctor's Name: **Doctor's Signature:** **MCRN:** **Date:** **Time:**

Differentials
• Chorioamnionitis • Urinary tract infection • Pneumonia, influenza, COVID-19
Tests to send
Bloods • FBC, CRP, U&E, LFTs, Coag and lactate (if systemically unwell) **Microbiology** • Blood cultures • Urine for C&S • HVS (if PROM) • Sputum for C&S • If viral aetiology suspected, send nose and throat viral swabs (in **red-top** tube containing viral transport medium) for influenza and SARS-CoV-2 PCR.
PAUSE before prescribing
• **Check lab results for history of resistant organisms, e.g. MRSA, ESBL** • **Checks patient's allergy status and stage of pregnancy**
Comments
• **N.B.** Antenatal infections where the source cannot be elucidated (after meticulous clinical evaluation) should be treated as chorioamnionitis until a definitive diagnosis can be made. • **In cases of severe sepsis+septic shock, refer directly to guideline on** severe life-threatening antenatal sepsis **.**

Obstetrics - Severe Life-Threatening Antenatal Sepsis - Source Unclear

Indication

Obstetrics - Severe Life-Threatening Antenatal Sepsis – Source Unclear

Definition of Severe Sepsis: Sepsis plus sepsis-induced organ dysfunction or tissue hypoperfusion

First Line Antimicrobials OR Penicillin Hypersensitivity

N.B. Check lab results for history of resistant organisms, e.g. MRSA, ESBL. ALWAYS contact clinical m icrobiologist for advice.

Meropenem 1g TDS IV

AND

Clindamycin 1.2g QDS IV

N.B. Use meropenem with caution and close clinical monitoring if history of immediate-onset or severe penicillin hypersensitivity – approximately 1% risk of immediate-onset hypersensitivity to meropenem in patients with history of immediate-onset penicillin hypersensitivity.

Obstetrics - Chorioamnionitis / Sepsis - Source Unclear

Indication

Obstetrics - Chorioamnionitis / Sepsis - Source Unclear

First Line Antimicrobials

N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.

Benzylpenicillin 2.4g QDS IV

AND

Gentamicin 5mg/kg once daily IV

AND

Metronidazole 500mg TDS IV

NON-immediate-onset and NON-severe Penicillin Hypersensitivity

N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.

Cef-UR-oxime 1.5g QDS IV

AND

Gentamicin 5mg/kg once daily IV

AND

Metronidazole 500mg TDS IV

IMMEDIATE-onset or SEVERE Penicillin Hypersensitivity

N.B. Ask patient about the nature of their penicillin hypersensitivity .

N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.

N.B. Check lab results for GBS history.

EMPIRIC Vancomycin 25mg/kg loading dose (max 2g), followed by 15mg/kg BD IV

AND

Gentamicin 5mg/kg once daily IV

AND

Metronidazole 500mg TDS IV

If known GBS susceptible to clindamycin, replace vancomycin and metronidazole in regimen above with clindamycin 900mg TDS IV.

Comments

- If the patient does not respond to initial empiric treatment or is severely unwell, contact clinical microbiologist for advice.

Obstetrics - Listeriosis / Septic Miscarriage

Indication
Obstetrics - Listeriosis / Septic Miscarriage
First Line Antimicrobials
N.B. If concern for CNS infection, contact clinical microbiologist for advice. Amoxicillin 2g four hourly IV **AND** Gentamicin 5mg/kg once daily IV **AND** Metronidazole 500mg TDS IV
Penicillin Hypersensitivity
N.B. If concern for CNS infection, contact clinical microbiologist for advice. Vancomycin 25mg/kg loading dose (max 2g), followed by 15mg/kg BD IV **AND** Gentamicin 5mg/kg once daily IV **AND** Metronidazole 500mg TDS IV

Obstetrics - Malaria

Indication
Obstetrics - Malaria - Severe > 2% of red blood cells parasitised or end organ damage
Likely organisms
P. falciparum
Antimalarial Treatment
First Line Therapy for Severe Malaria – All Trimesters: Artesunate IV 2.4mg/kg at 0h, 12h, 24h, then daily **Switch to oral therapy after at least 24 hours of IV therapy, once patient improving and can tolerate oral medication:** Artemether-Lumefantrine (Riamet®) 20mg/120mg, 4 tablets at 0h, 8h, 24h, 36h, 48h and 60h **N.B. Please note the timing of Riamet® doses** relates to time from time zero – see worked example below: • Time Zero = 18.00 on 12/8/19 • Next dose due at 8 hours from time zero = 02.00 on 13/8/19 • Next dose due at 24 hours from time zero = 18.00 on 13/8/19 • Next dose due at 36 hours from time zero = 06.00 on 14/8/19 • Next dose due at 48 hours from time zero = 18.00 on 14/8/19 • Next dose due at 60 hours from time zero = 06.00 on 15/8/19 • It will take 60 hours total (2.5 days) for administration of full course. **N.B. Contact Pharmacy Department prior to discharge** to ensure continuity of supply as Riamet® is not readily available in the community. **OR** Quinine Sulphate 600mg TDS PO to complete total of 7 days **PLUS** start Clindamycin 450mg TDS PO for 7 days.
Comments
Malaria is a medical emergency. Always discuss with ID team or clinical microbiologist. Diagnostic tests: Send EDTA blood (FBC bottle) to haematology laboratory for malaria antigen test and malaria blood film (contact haematology scientist on call if out of hours) Send repeat 12 - 24 hours later if initial test is negative. Admit patient medically if P. falciparum suspected or confirmed. Start treatment after laboratory confirmation except in severe disease with strong clinical suspicion. Patients who have taken malaria chemoprophylaxis should not receive the same drug for treatment. Please see HPSC Clinical Guidelines on the Management of Suspected Malaria for further information, available at www.hpsc.ie . Always document travel history for the past 12 months – countries and locations visited, travel dates, prophylaxis taken, prior history of malaria and co-morbidities. Malaria prophylaxis is not 100% effective and having taken prophylaxis does not rule out the possibility of malaria infection. The incubation period may be from 8 days up to 1 year.

Obstetrics - Meningitis

Indication

Obstetrics - Meningitis

First Line Antimicrobials

Cef-TRI-axone 2g BD IV (administer first)

AND

Amoxicillin 2g 4 hourly IV (administer second)

AND

Vancomycin 25mg/kg loading dose (max 2g), followed by 15mg/kg BD IV

AND

Consider dexamethasone phosphate 0.15mg/kg (max 10mg per dose) QDS IV for 4 days - discuss with senior obstetrician.

Penicillin Hypersensitivity

Meropenem 2g TDS IV

AND

Vancomycin 25mg/kg loading dose (max 2g), followed by 15mg/kg BD IV

AND

Consider dexamethasone phosphate 0.15mg/kg (max 10mg per dose) QDS IV for 4 days - discuss with senior obstetrician.

N.B. Use meropenem with caution and close clinical monitoring if history of immediate-onset or severe penicillin hypersensitivity – approximately 1% risk of immediate-onset hypersensitivity to meropenem in patients with history of immediate-onset penicillin hypersensitivity.

Comments

Microbiological Investigations:

- Blood cultures
- EDTA blood sample for PCR
- CSF
- Throat swab to detect carriage of N. meningitidis

Duration

Duration depends on causative organism:

- Neisseria meningitidis : Minimum 7 days
- Haemophilus influenzae : Minimum 10 days
- Streptococcus pneumoniae : Minimum 14 days
- Listeria spp.: Minimum 21 days

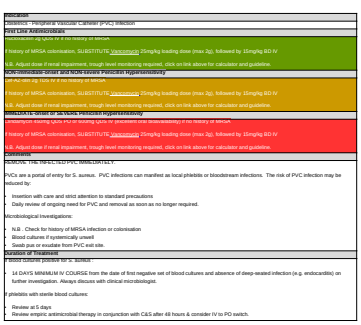
Indication

Obstetrics - Meningococcal Prophylaxis

Please refer to:

- Meningococcal Prophylaxis for Contacts section of these antimicrobial guidelines
- HPSC Guidelines for the Early Clinical and Public Health Management of Bacterial Meningitis 2012, revised 2016, available from www.hpsc.ie for indications for meningococcal prophylaxis.

Obstetrics - Peripheral Vascular Catheter (PVC) Infection



Obstetrics - Pre-term Pre-labour Rupture of Membranes (PPROM)

Indication

Obstetrics - Pre-term Pre-labour Rupture of Membranes (PPROM)

First Line Antimicrobials

Prophylactic antibiotics recommended if > 20 weeks gestation, clinically well and no evidence of chorioamnionitis or maternal sepsis:

Benzylpenicillin 2.4g QDS IV x 48 hrs (8 doses) **AND** Azithromycin 1g STAT PO

Followed by: Amoxicillin 250mg TDS PO x 5 days

Penicillin Hypersensitivity

Azithromycin 1g STAT PO

Comments

- If the patient has systemic signs of sepsis, then manage as per chorioamnionitis guidelines.
  Microbiological Investigations:
  - HVS for culture
  - Low vaginal swab and rectal swab for Group B Streptococcus
  - First void urine for Chlamydia trachomatis and Neisseria gonorrhoeae
  - Urine for microscopy and culture

Duration

Duration as outlined above. Duration should not extend beyond labour to the post-partum period.

Obstetrics - Respiratory

Indication

Obstetrics - Influenza (Flu)

First Line Antimicrobials OR Penicillin Hypersensitivity

Oseltamivir 75mg BD

Comments

- Pregnant women are at increased risk of severe and complicated influenza, including associated hospitalisation and death, compared to non-pregnant women of reproductive age
- Monitor women carefully for signs of bacterial super-infection (e.g. Group A Streptococcus)
- Please see https://www.hpsc.ie/a-z/respiratory/influenza/seasonalinfluenza/guidance/ for further information and national guidance on the management of influenza in pregnant patients
- For close contacts of confirmed influenza, an individual risk assessment should be made on whether to give oseltamivir prophylaxis .

Duration

5 days

Indication

Obstetrics - Lower Respiratory Tract Infections – Outpatient Treatment

First Line Antimicrobials

Amoxicillin 500mg TDS PO

Penicillin Hypersensitivity

Azithromycin 500mg on day 1, followed by 250mg daily for 4 days.

Take azithromycin at least one hour before or two hours after food.

Duration

5 days

Indication

Obstetrics - Lower Respiratory Tract Infections – Inpatient Treatment

First Line Antimicrobials

Cef-UR-oxime 1.5g QDS IV

AND

Azithromycin 500mg on day 1, followed by 250mg daily for 4 days.

Take azithromycin at least one hour before or two hours after food.

NON-immediate-onset and NON-severe Penicillin Hypersensitivity

Cef-UR-oxime 1.5g QDS IV

AND

Azithromycin 500mg on day 1, followed by 250mg daily for 4 days.

Take azithromycin at least one hour before or two hours after food.

IMMEDIATE-onset or SEVERE Penicillin Hypersensitivity

N.B. Ask patient about the nature of their penicillin hypersensitivity .

Contact clinical microbiologist for advice.

Comments

- Consider adding oseltamivir during the influenza season if the patient has clinical signs or symptoms suggestive of influenza
- Microbiological Investigations:
  - Blood cultures if pyrexial
  - Sputum for C&S
  - Pneumococcal and legionella urinary antigens
  - If viral aetiology suspected, send nose and throat viral swabs (in **red-top** tube containing viral transport medium) for influenza and SARS-CoV-2 PCR.
  - Rule out TB if suspected

Duration

7 days (5 days for azithromycin)

Obstetrics - Tonsillitis

Indication
Obstetrics - Tonsillitis (Bacterial)
First Line Antimicrobials
Phenoxymethylpenicillin 666mg QDS PO
NON-immediate-onset and NON-severe Penicillin Hypersensitivity
Cef-AL-exin 500mg TDS PO
IMMEDIATE-onset or SEVERE Penicillin Hypersensitivity
Azithromycin 500mg on day 1, followed by 250mg daily for 4 days. Take azithromycin at least one hour before or two hours after food.
Comments
The majority of sore throats are viral; most patients do not benefit from antibiotics.
Duration
5 days. Depending on clinical response, duration can be extended to 10 days (except for azithromycin, for which 5 days is the total course). If scarlet fever is suspected or confirmed, it is advisable to treat for 10 days duration (except for azithromycin, for which 5 days is the total course).

Obstetrics - Urinary Tract Infections

Indication
Obstetrics - Urinary Tract Infection - Asymptomatic Bacteriuria or Cystitis
First Line Antimicrobials
N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice. Nitrofurantoin 50mg QDS PO (if < 36 weeks gestation) **OR** Cef-AL-exin 500mg TDS PO (if > 36 weeks gestation)
NON-immediate-onset and NON-severe Penicillin Hypersensitivity
N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice. Nitrofurantoin 50mg QDS PO (if < 36 weeks gestation) **OR** Cef-AL-exin 500mg TDS PO (if > 36 weeks gestation)
IMMEDIATE-onset or SEVERE Penicillin Hypersensitivity
N.B. Ask patient about the nature of their penicillin hypersensitivity . **N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.** Nitrofurantoin 50mg QDS PO (if < 36 weeks gestation) **OR** Fosfomycin 3g STAT PO (if > 36 weeks gestation)
Comments
• Avoid nitrofurantoin if > 36 weeks gestation or if delivery is imminent. • If pyelonephritis / systemic infection suspected, refer to the guideline on pyelonephritis / systemic infection . Nitrofurantoin, cef-AL-exin and oral fosfomycin are not appropriate treatment options for pyelonephritis / systemic infection. • Always review empiric therapy after 48 hours in conjunction with C&S results. • A repeat urine sample must be sent after treatment is complete.
Duration
7 days


Indication
Obstetrics - Urinary Tract Infection – Pyelonephritis
First Line Antimicrobials
N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.
Cef-TRI-axone 2g daily IV (if no history of ESBL)
+/- if severe
Gentamicin 5mg/kg once daily IV
NON-immediate-onset and NON-severe Penicillin Hypersensitivity
N.B. Check lab results for history of resistant organisms, e.g. ESBL. If present, contact clinical microbiologist for advice.
Cef-TRI-axone 2g daily IV (if no history of ESBL)
+/- if severe
Gentamicin 5mg/kg once daily IV
IMMEDIATE-onset or SEVERE Penicillin Hypersensitivity
N.B. Ask patient about the nature of their penicillin hypersensitivity .
N.B. Check lab results for history of resistant organisms, e.g. ESBL.
N.B. Check lab results for GBS history.
Contact clinical microbiologist for advice.
Comments
Always review empiric therapy after 48 hours in conjunction with C&S results.
Duration
10 – 14 days

Obstetrics - Varicella Zoster Virus (VZV) Post Exposure Prophylaxis

Indication
Obstetrics - Varicella Zoster Virus (VZV) Post Exposure Prophylaxis
First Line Prophylaxis
See Irish Immunisation Guidelines, Varicella chapter, 2022

Obstetrics - Vulvovaginal Candidiasis

Indication
Obstetrics - Vulvovaginal Candidiasis
First Line Antimicrobials
Clotrimazole 500mg vaginal pessary at night for up to 7 nights Clotrimazole 1% or 2% cream may also be used topically 2 to 3 times daily.
Comments
Please discuss with clinical microbiologist if patient has PPROM. Please contact clinical microbiologist for advice if patient has recurrent candidiasis.