



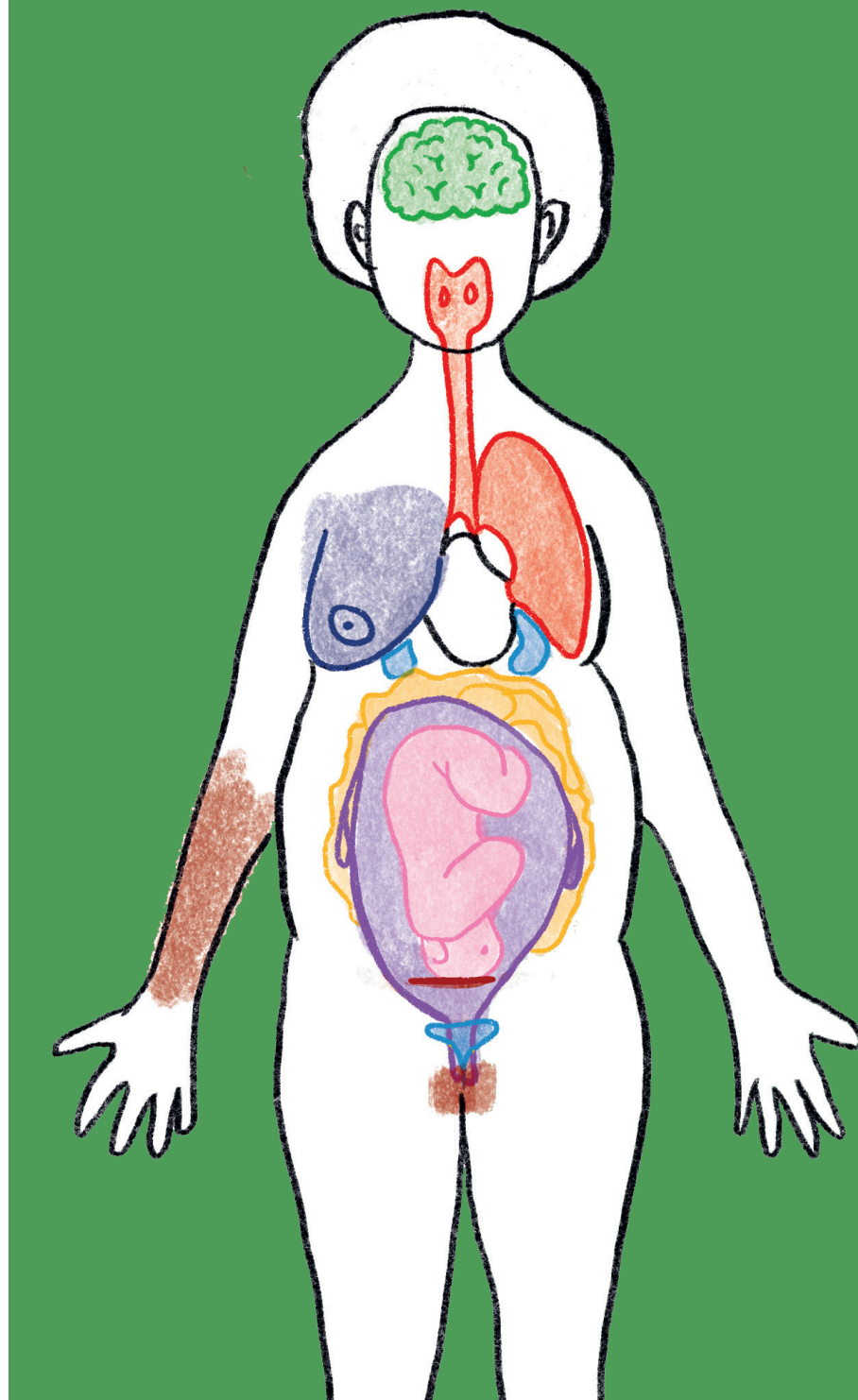
# The APT-Sepsis Programme



**Module 2b:**  
**Treat infection using best practice**



Version 1.0 | 15 SEPT 2023



# Module 2b outline

By the end of this module, you should be able to:

1

Understand how infections develop

2

List the common sources of infection during pregnancy and how to treat them

3

Understand the rationale behind antimicrobial treatments recommended in guidelines

4

Understand the process of targeting antimicrobial treatment





## MODULE 2B: PART ONE

# How infections develop



# How bacterial infection develop

Our body has lots of defences against infection, and most of our contact with bacteria does not lead to infection

Infections happen when pathogens (such as bacteria) are able to overcome these defences and invade the body

Sources of infection are commonly where there are entry points to the body, but infections can occur anywhere

Pregnant and recently pregnant women are particularly susceptible to infection





# How bacterial infection develop

*Can you think of times during the pregnancy journey that women might be particularly at risk of infection?*



# Examples of increased infection risk during pregnancy...

1

## During pregnancy

- Increasing anatomical pressure on the respiratory tract and urinary tract
- Increased risk in anaemia gestational diabetes
- Prolonged rupture of membrane

2

## During labour

- Invasive procedures, including caesarean section, catheterisation and cannulation
- Prolonged labour
- Multiple vaginal examinations

3

## Postpartum

- Retained products of conception
- Infection of the breast tissue (mastitis) when breastfeeding





## MODULE 2B: PART THREE

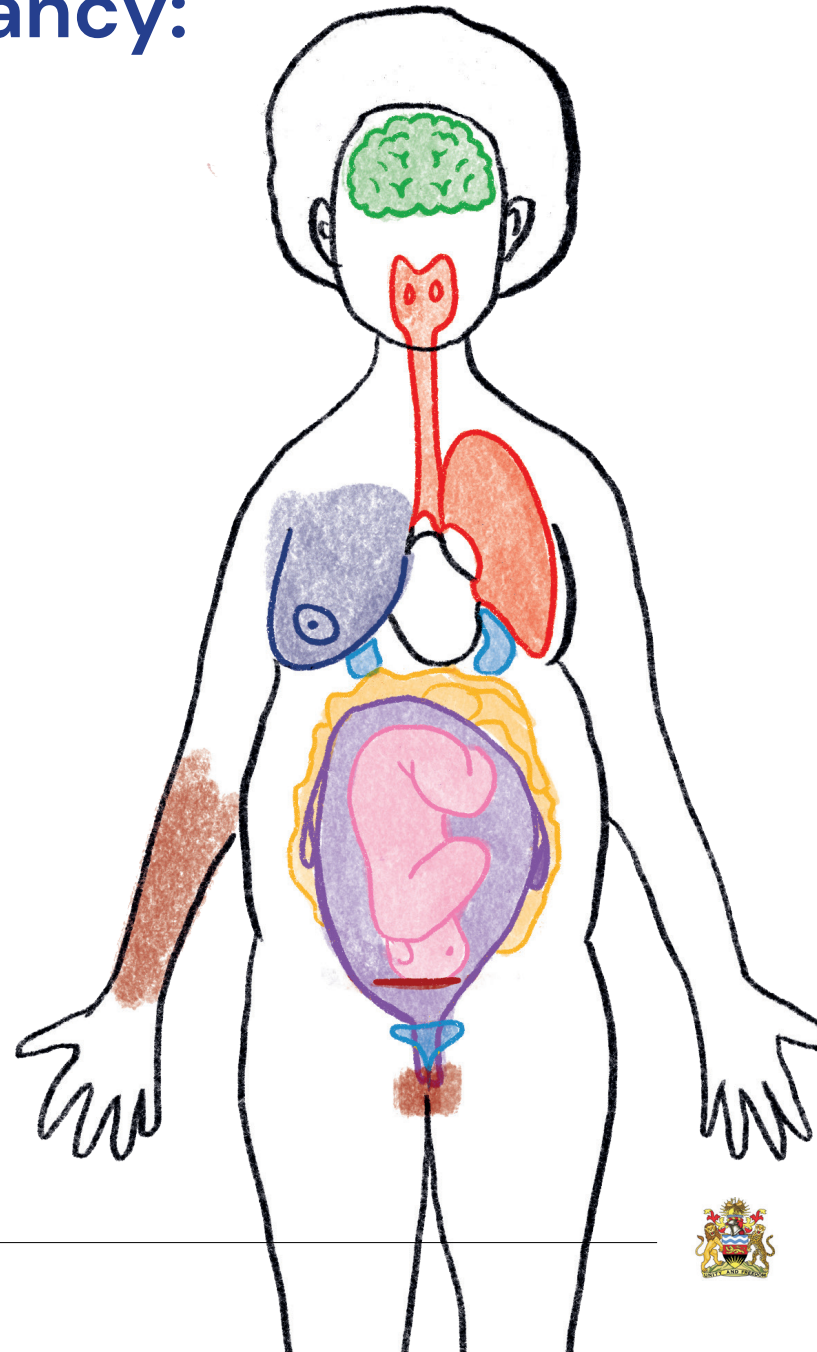
# Common infections and how to treat them



# Common sources of infection during and after pregnancy:

- The respiratory tract
- The urinary tract\*
- The genital tract\*
- Post-abortion complications
- The skin
- The breast
- The brain and neurological system
- The abdomen

\*Together these are often referred to as the urogenital tract



Common infections and how to treat them



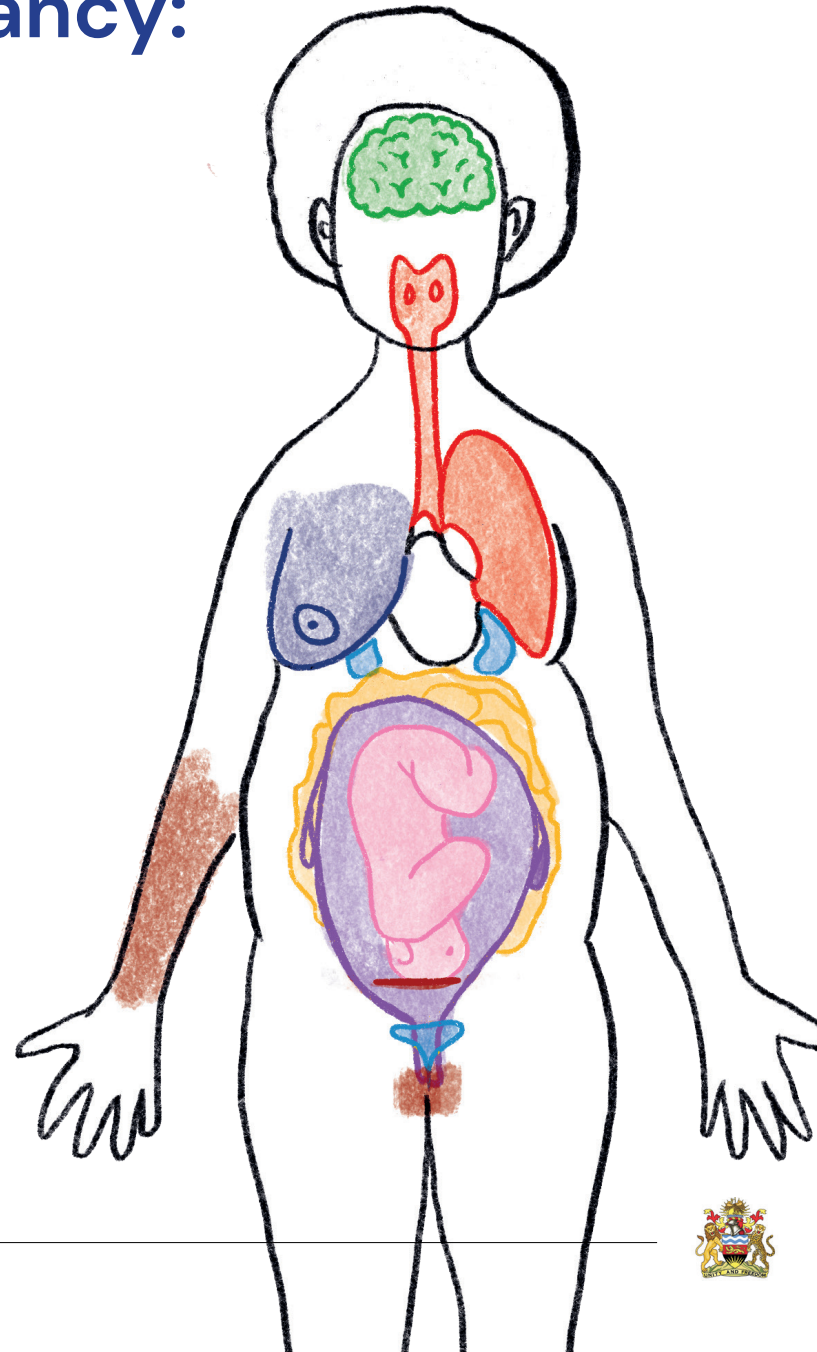
# Common sources of infection during and after pregnancy:

## Common generalised signs and symptoms of infection:

- Fever
- Shaking / rigors
- High respiratory rate
- High heart rate
- Low blood pressure
- Confusion / altered mental state

## Common generalised investigation findings:

- High or low white cell count
- High inflammatory markers





# The respiratory tract:

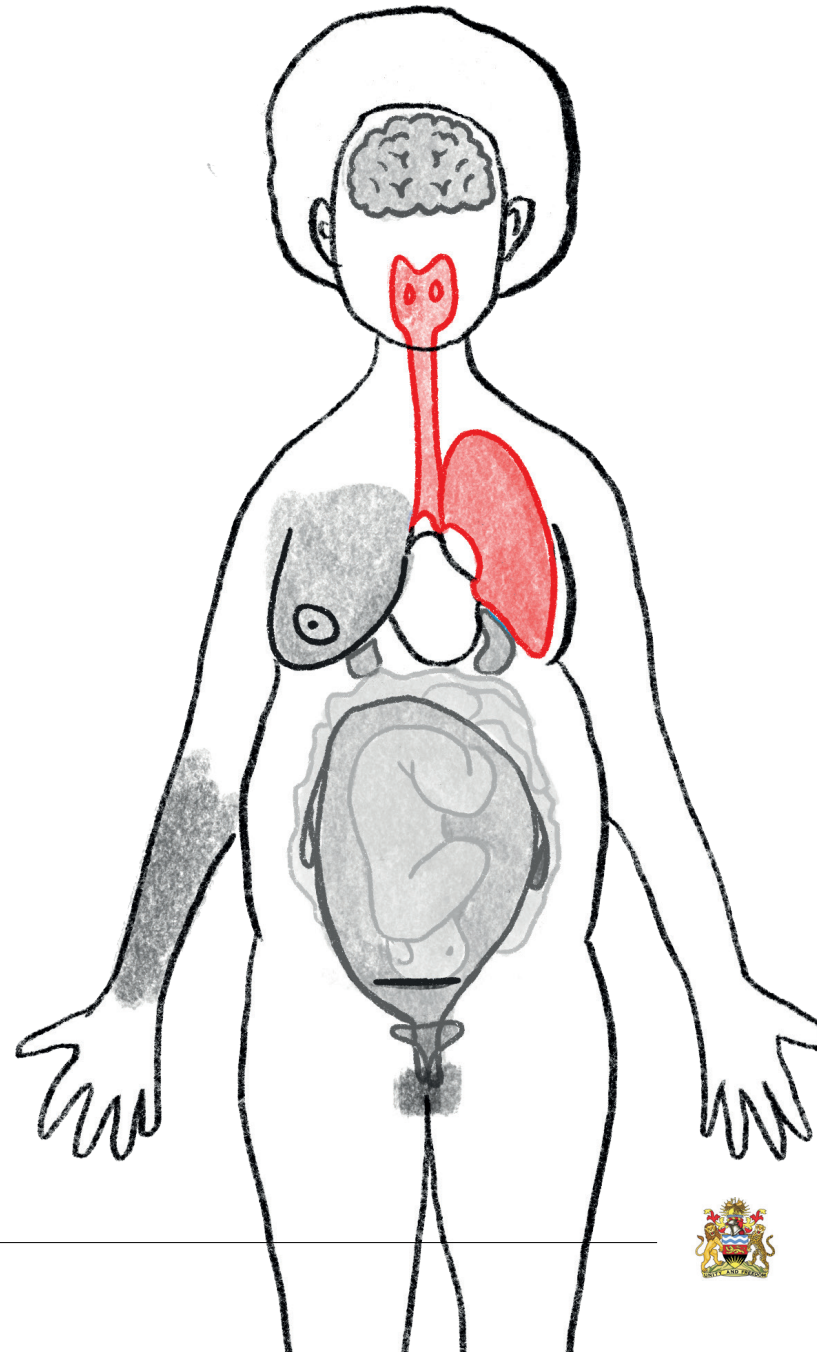
Infections include lower respiratory tract infections (LRTIs) and pneumonia

## Common signs and symptoms:

- Shortness of breath
- Cough (often productive)
- Crackles on auscultation

## Common investigation findings:

- Low oxygen saturations
- Consolidation on chest X-ray





# The urinary tract:

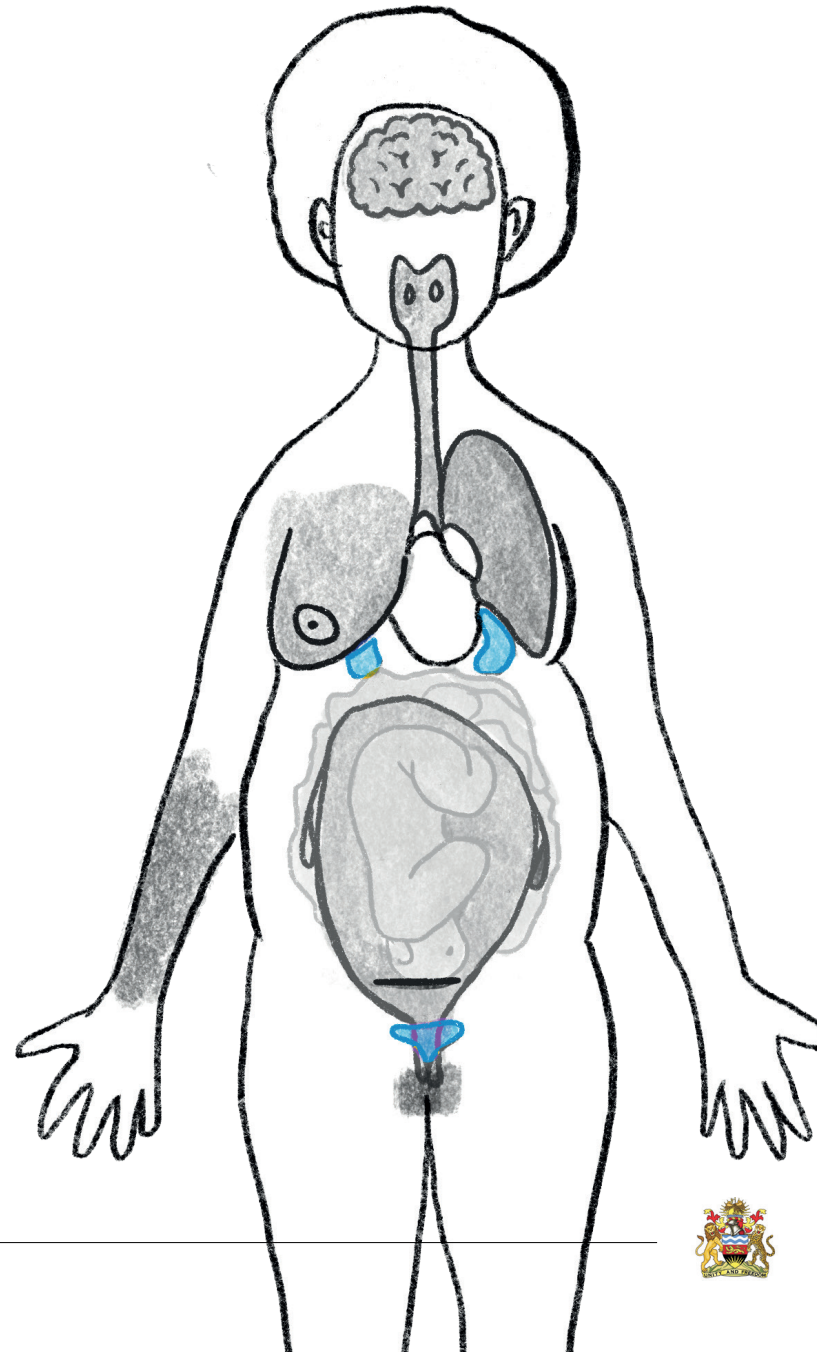
Infections include cystitis and pyelonephritis

## Common signs and symptoms:

- Pain / burning passing urine
- High frequency of passing urine
- Suprapubic tenderness
- Haematuria
- Flank pain on effected side (pyelonephritis)

## Common investigation findings:

- Urine dipstick positive for leucocytes and nitrites

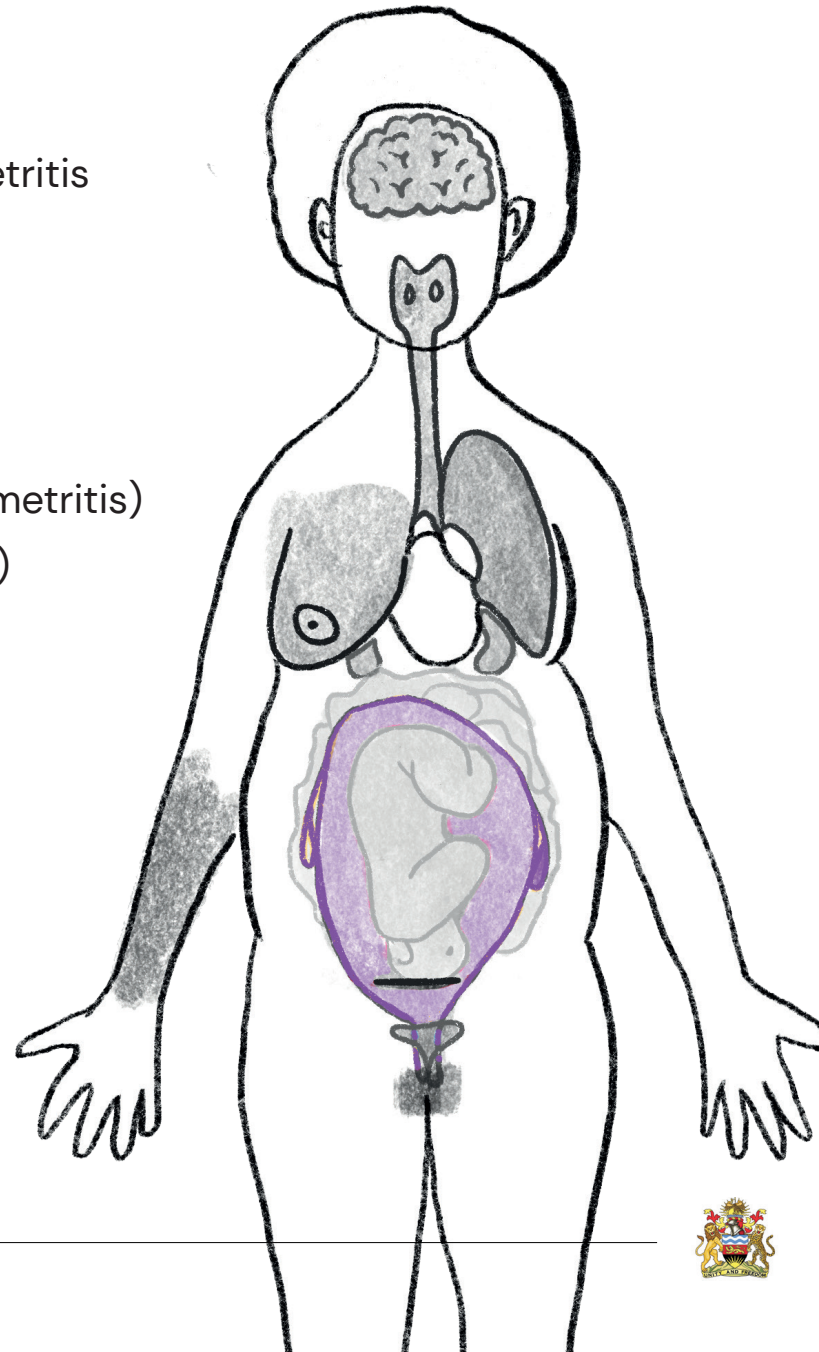


# The genital tract:

Infections include chorioamnionitis and endometritis

## Common signs and symptoms:

- Abdominal pain
- Abdominal swelling (endometritis)
- Abnormal vaginal bleeding / discharge (endometritis)
- Foul smelling amniotic fluid (chorioamnionitis)
- Uterine fundal tenderness

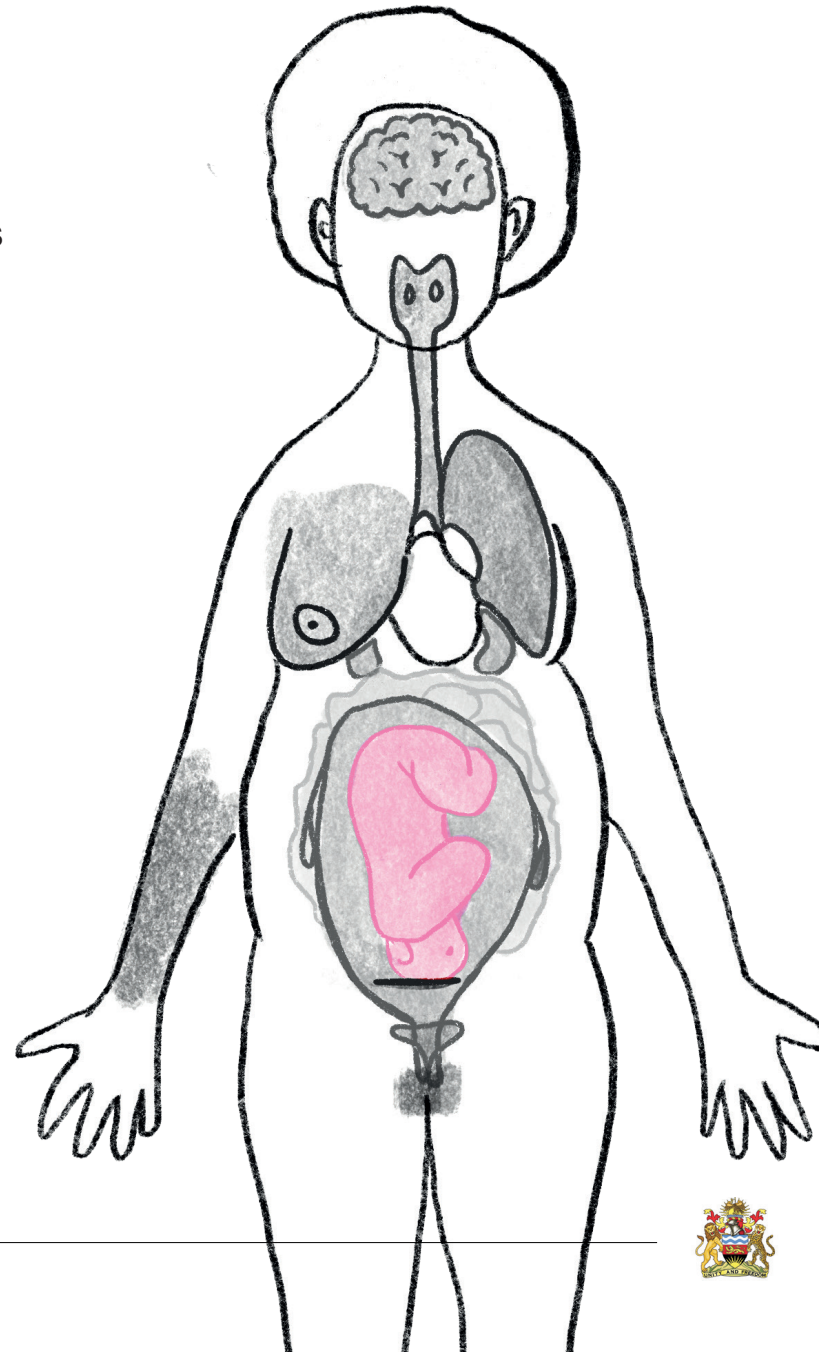


# Post-abortion complications:

Infections include pelvic inflammatory disease, endometritis, oophoritis, parametritis, salpingitis

## Common signs and symptoms:

- Abdominal pain
- Heavy vaginal bleeding
- Foul smelling vaginal discharge
- Nausea or vomiting
- Diarrhoea

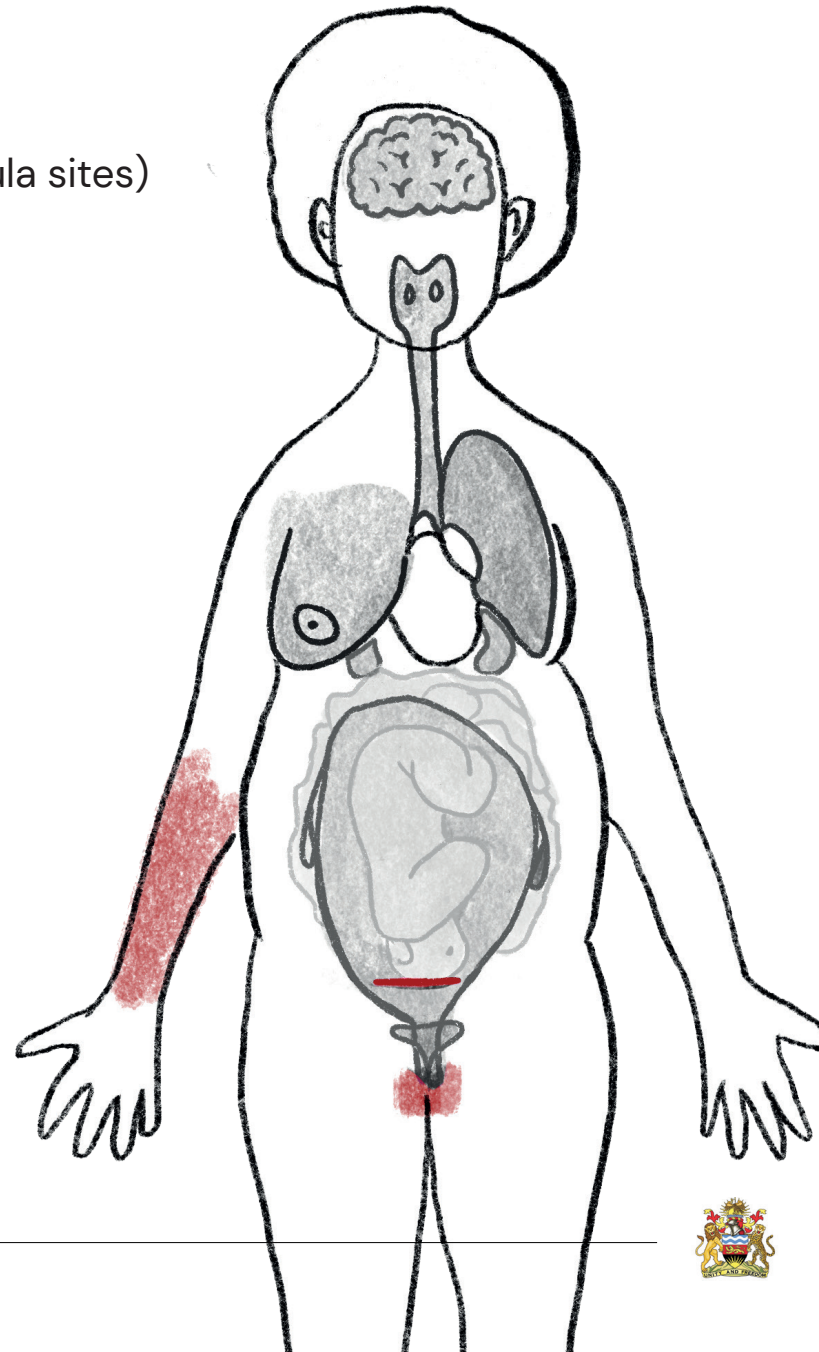


# The skin:

Infections include cellulitis (particularly at cannula sites) and perineal / surgical wounds

## Common signs and symptoms:

- Blanching erythema
- Skin that is hot to touch
- Pain over the infected skin
- Skin swelling
- Pus coming from a wound
- Foul smelling wound
- Poorly healing wound



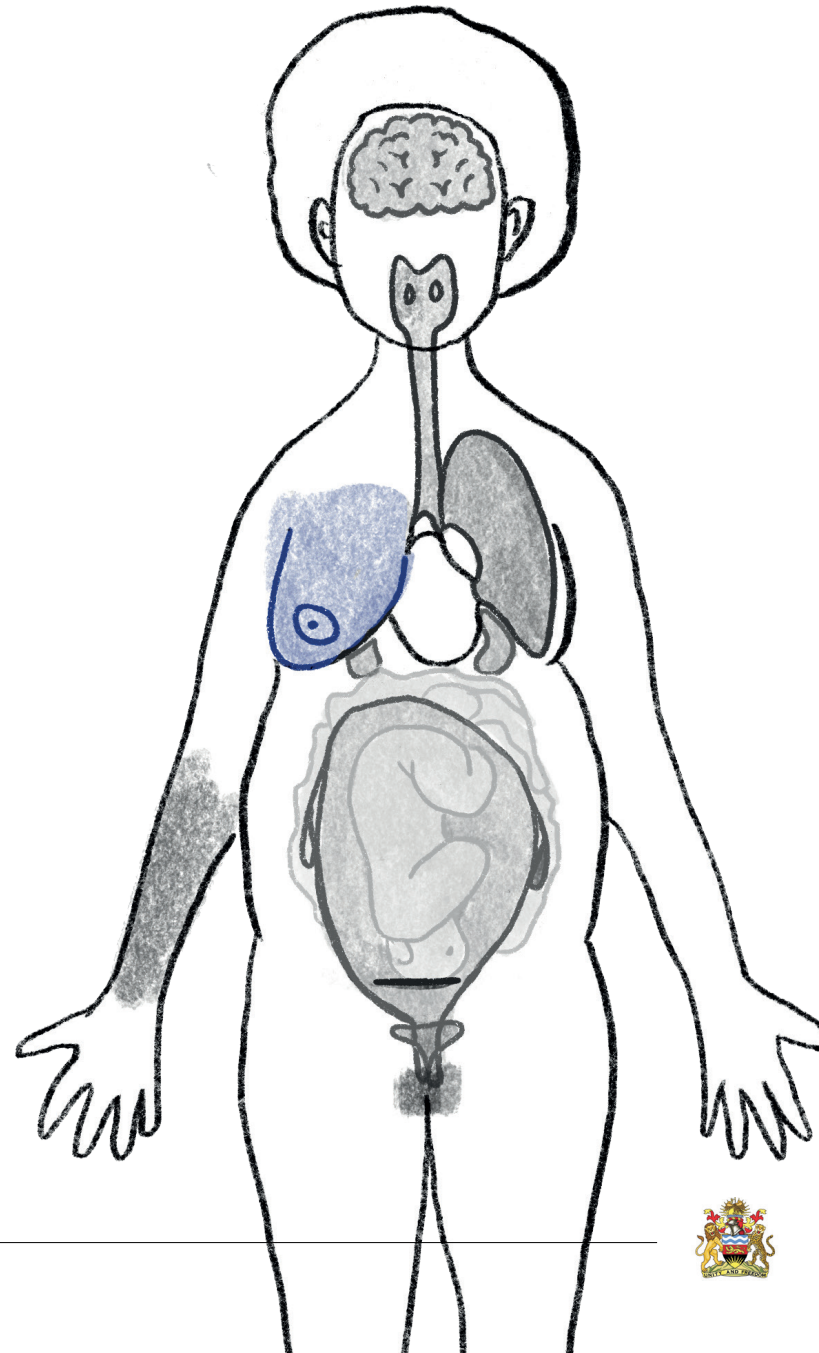


# The breast:

Infections include mastitis

## Common signs and symptoms:

- A red, hot, painful breast
- A new hard breast lump
- Burning sensation (can be either constant or only whilst breastfeeding)
- Discharge from the nipple



# The brain and neurological system:

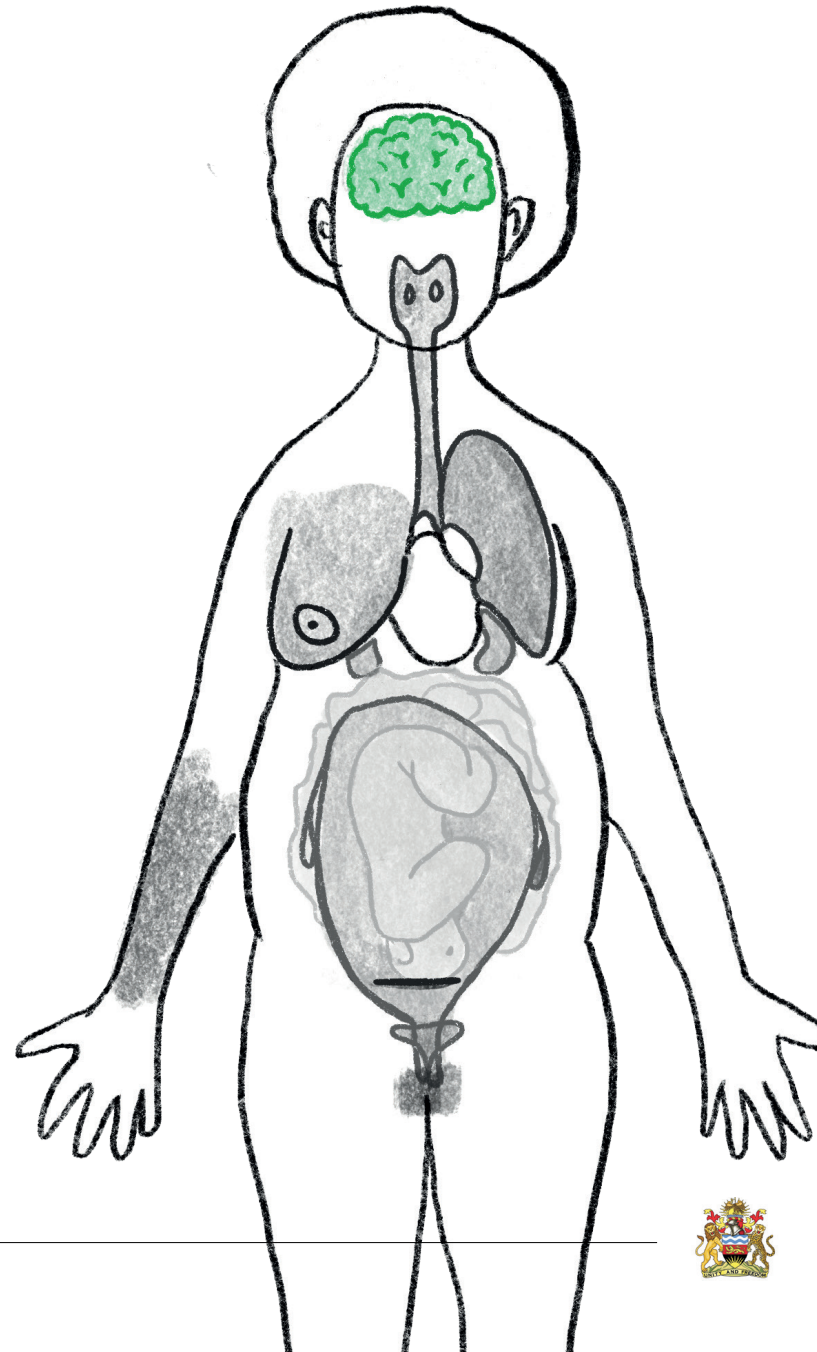
Infections include meningitis and encephalitis

## Common signs and symptoms:

- Headache (meningitis)
- Neck stiffness (meningitis)
- Photophobia (meningitis)
- Confusion (encephalitis)

## Common investigation findings:

- White cells on lumbar puncture





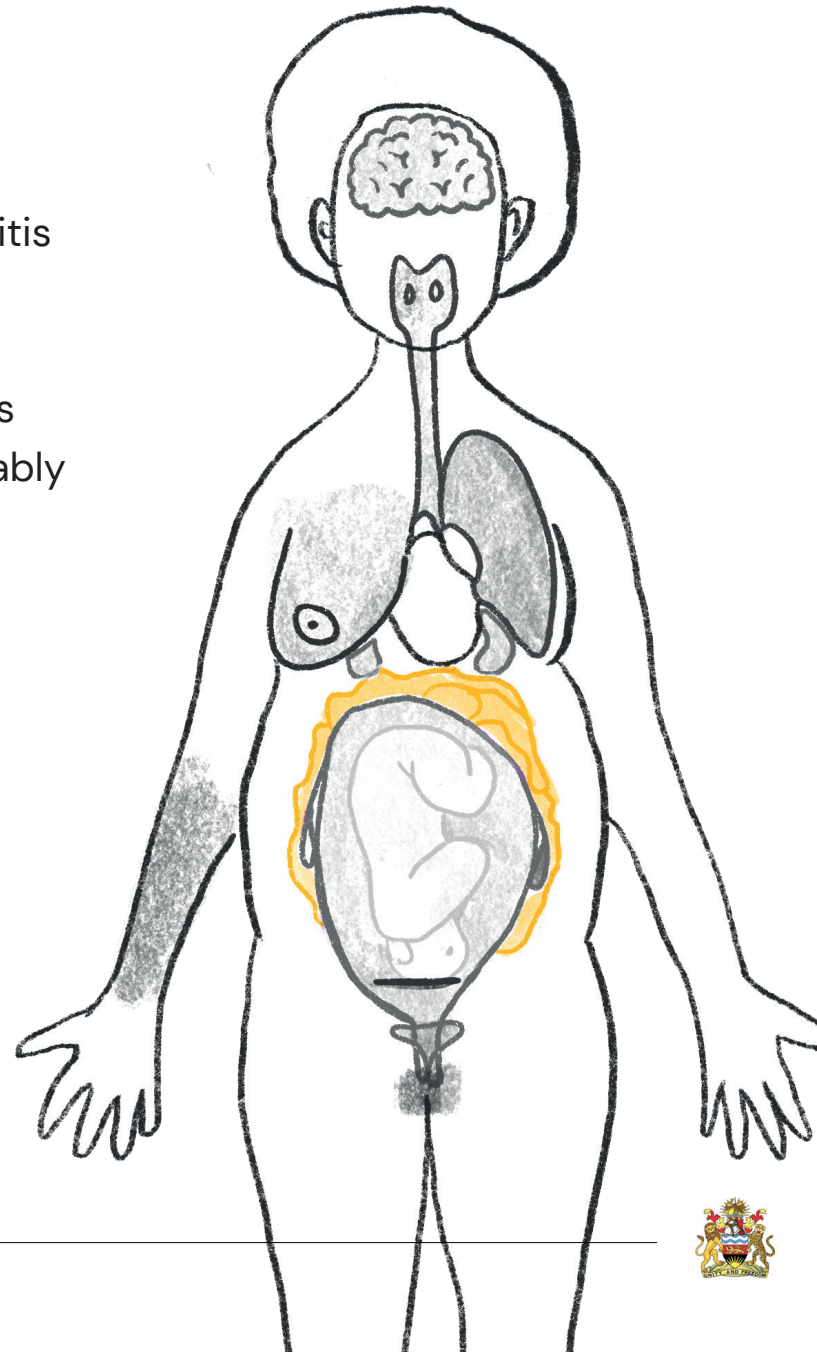
# The abdomen:

Infections include intrabdominal peritonitis (particularly after caesarean section), cholecystitis and gastroenteritis

These are very varied and need careful diagnosis and management, as treatment varies considerably

## Common signs and symptoms:

- Abdominal pain
- Guarding (peritonitis)
- Right upper quadrant pain (cholecystitis)
- Nausea and vomiting
- Diarrhoea (gastroenteritis)





## MODULE 2B: PART FOUR

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# The rationale behind empiric antimicrobial treatment

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# What is empiric antimicrobial treatment?

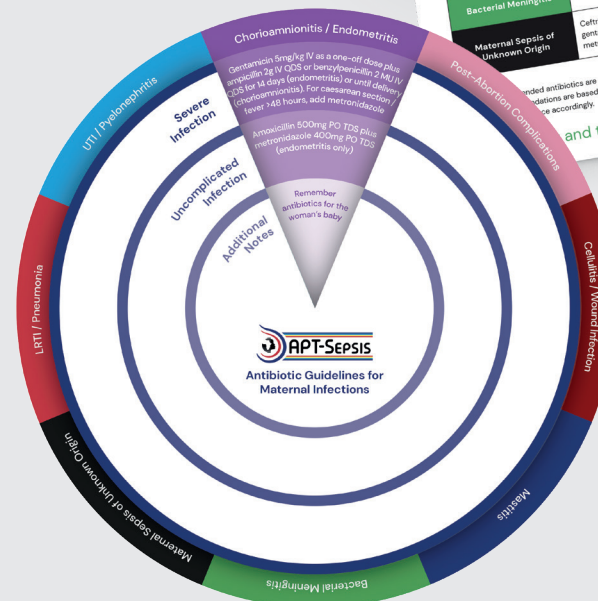
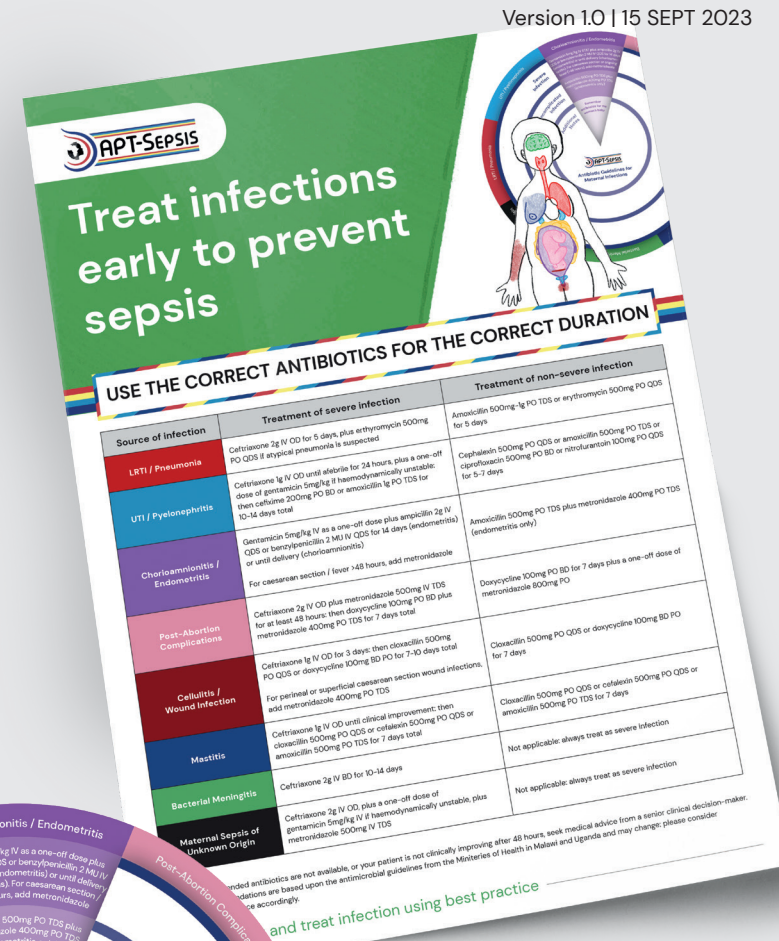
- Empiric antimicrobial treatment is when you start treatment for an infection using your clinical experience
- It is effectively using local evidence to make a 'best guess' on what antimicrobial will be successful at treating an infection
- Empiric antimicrobial treatment for different types of infection are usually recommended regionally or nationally, based on local experience and resistance patterns
- For example, if local data shows that 60% of lower urinary tract infections (cystitis) are caused by bacteria that are resistant to amoxicillin but only 10% are resistant to nitrofurantoin, your local guidelines might suggest nitrofurantoin as your first choice of treatment for cystitis

The rationale behind empiric antimicrobial treatment



# Reminders in the clinical workspace: poster and Gestation Wheel

Empiric guidelines, based on the recommendations from the Ministries of Health in Malawi and Uganda, are available on the ward as a poster and a Gestation Wheel, with antibiotic guidelines for maternal infections



Module 2b: Treat infection using best practice

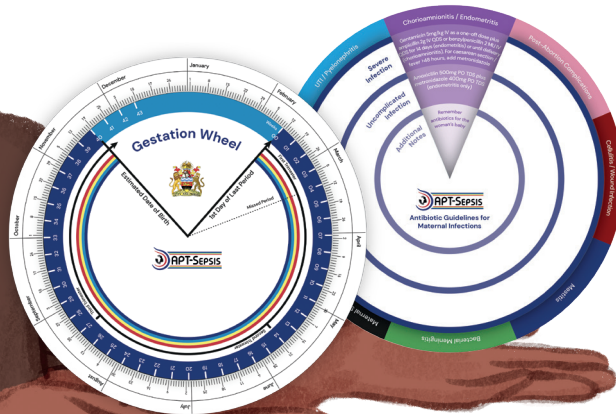




# Gestation Wheel with antibiotic guidelines for maternal infections

*Let's now have a closer look at the Gestation Wheel and how to use it!*

*Always remember to check for updates to local guidelines and recommendations, as these can change according to local rates of resistance and antibiotic availability*





## MODULE 2B: PART FIVE

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# The process of targeting antimicrobial treatment

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# What is targeted antimicrobial treatment?

- Targeted antimicrobial treatment is when you decide treatment based upon results from samples taken directly from the patient
- If you are able to grow or detect the bacteria that is causing a specific infection, you can then identify it (know its species) and test the bacteria's sensitivity against common antibiotics
- Targeted antimicrobial treatment is not always available, as it requires a laboratory with microbiological capacity
- Where it is possible, targeted treatment can help give effective antibiotic treatment and reduce the use of unnecessarily 'broad-cover' antibiotics




# What samples can be used to target antimicrobial treatment?

*Can you think of the types of sample that can be used to target antimicrobial treatment in and around pregnancy?*





# What samples can be used to target antimicrobial treatment?



*Samples can help  
diagnose infection and  
also target treatment!*

## Examples include:

- Sputum samples in pneumonia
- Urine samples in UTI
- Wound samples in surgical site infections
- High vaginal swabs in endometritis
- Blood samples to look for bacteria in the blood
- Fluid samples in abscesses
- Cerebral spinal fluid (CSF) samples in meningitis

# What samples can be used to target antimicrobial treatment?

*Finally, but very importantly,  
if you think a patient has an infection  
you should never wait for sample result  
before starting treatment...*

*...most treatments start with empiric treatment,  
and then become more targeted if and when  
results are available!*



**We have now covered the common sources of infection during and after pregnancy and how to use empiric and targeted antimicrobial treatment**

*Let's see what we remember!*







## Questions about APT-Sepsis?

Please contact your local central APT-Sepsis hub team if you have any questions or suggestions about the APT-Sepsis Programme

### Malawi:

Regina Makuluni: [rmakuluni@mlw.mw](mailto:rmakuluni@mlw.mw)

### Uganda:

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