











The APT–Sepsis Programme

Working together to actively
prevent and treat maternal sepsis





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SECTION ONE

Introduction

This section introduces maternal infection, maternal sepsis and the APT-Sepsis Programme



Maternal Infection and Sepsis

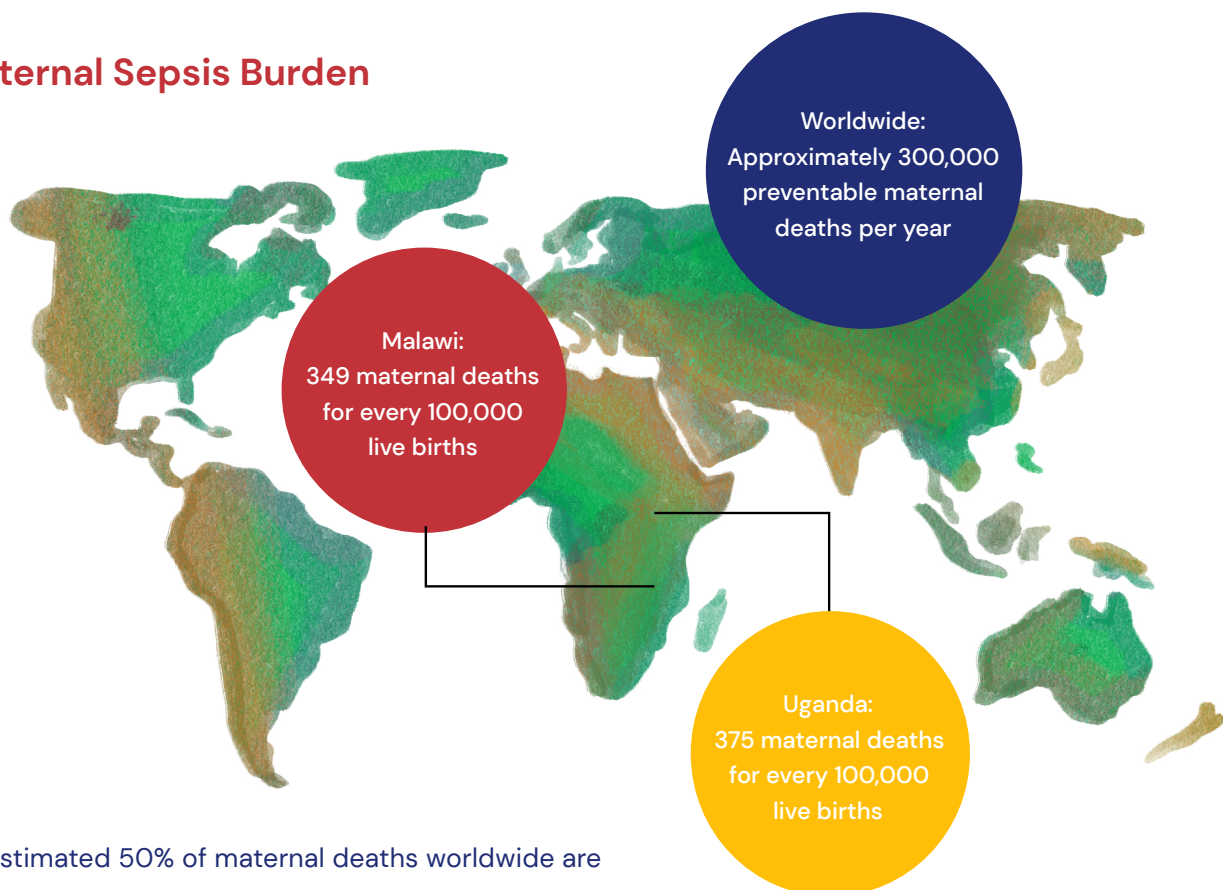
Maternal infections can occur at any point during pregnancy, delivery and postpartum. If not recognised and treated, these infections can develop into maternal sepsis: a life-threatening condition where the body's response to infection can cause damage, organ failure and death.

Despite sepsis being treatable with the right care, and very often preventable altogether, maternal sepsis is one of the leading causes of death in pregnant and postpartum women worldwide. Studies suggest infection plays an important role in more than half of all maternal deaths. In addition to the women who die from sepsis, many are made severely ill and face life-long health problems. The babies born to women who are severely unwell from sepsis can also have life-long health problems as a result.

The burden of this problem is highest in low- and middle-income countries: sepsis is the second leading cause of maternal death in Malawi and the first leading cause of maternal death in Uganda.¹⁻³ These findings are similar to those observed across most low- and middle-income settings: surgical site infections after caesarean section are more common than in high-income countries (11.7% in low- and middle-income countries compared to 1.8% in Europe).⁴⁻⁵ Furthermore, it has been estimated that 11% of maternal mortality in low- and middle-income countries is due to unclean delivery, leading to infection.⁴

If we want to reduce maternal mortality and ensure mothers and their babies have a safe and positive pregnancy, birth and postpartum period, then we must urgently tackle these high rates of maternal infection and sepsis.

Maternal Sepsis Burden



An estimated 50% of maternal deaths worldwide are infection related, with the largest burden in low-middle income settings.

Patient Stories



Hannah Nyirenda, 24 years old, Zomba, Malawi

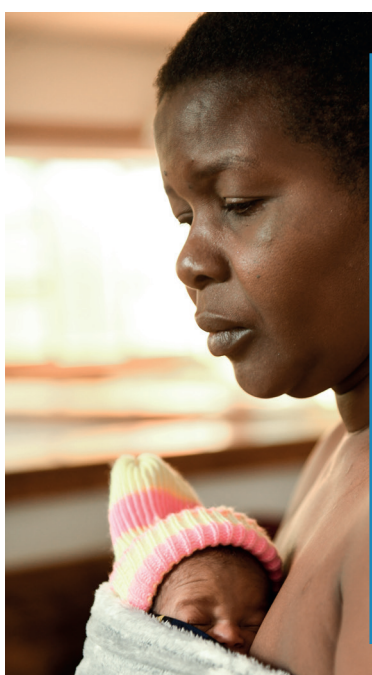
Hannah suffered from an infected surgical site after caesarean section. Although treatment was available and her infection was recognised early, it might have been prevented altogether with improved staff hand hygiene and safe clinical practices around the time of delivery.

"After my caesarean section, I was starting to feel better but the midwife noticed my wound was not smelling right. It had become infected and I needed to take some tablets to help the healing. The midwife and doctor at the hospital kept checking my wound and soon it was starting to heal and look much better. I am grateful for the antibiotics, I would not have wanted things to get worse than they did."

Alice Okello, 26 years old, Fort Portal, Uganda

Alice had pneumonia late in pregnancy that was diagnosed quickly after attending hospital, allowing prompt treatment and a good outcome.

"I was so sick, I could barely stand. When I arrived to the hospital, the midwife said it was very serious. I was scared but started to feel better with the medicine after a couple of days. I was told that it was an infection in my chest and that the medicines saved my life. Thankfully, my pregnancy went well after my recovery."



Patience Manda, 34 years old, Blantyre, Malawi

Patience was very unwell at the end of her pregnancy with signs of sepsis. Unfortunately, her babies were also affected and one passed away from their illness.

"I was told I had two babies but that I was very unwell when I went into hospital due to my fevers. I was transferred to the central hospital where I was told I had an infection and that my life was at risk. The infection was in my abdomen and infected my babies also. After the surgery, I had to be treated for many days with antibiotics and my babies were in a special room as they were so small. I lost one to the infection, I still think about that day and wish things were different. It was a very sad time."

The APT-Sepsis Programme

Maternal sepsis has many different causes, and all can lead to life-threatening illness: its prevention and management rely on having several different solutions working at multiple levels within a healthcare facility. The APT-Sepsis Programme is a collection of evidence-based resources, supported by specially designed training sessions and local champions to **Actively Prevent** and **Treat** maternal **Sepsis**. It aims to reduce the mortality and severe illness in women and their babies caused by maternal sepsis.

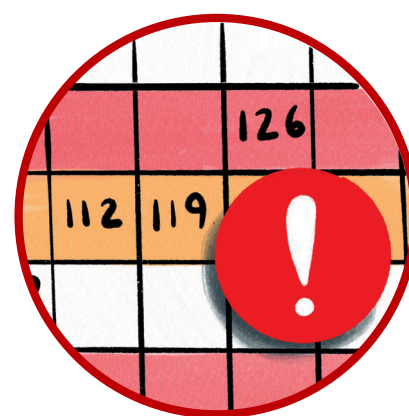
The programme is focused on three central goals. We must work together and meet these goals to reduce deaths from maternal sepsis.



Goal 1:
Hand hygiene at
every moment

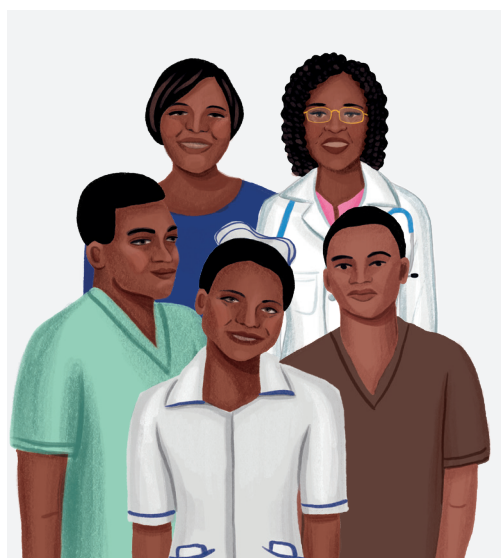


Goal 2:
Prevent and treat infection
using best practice

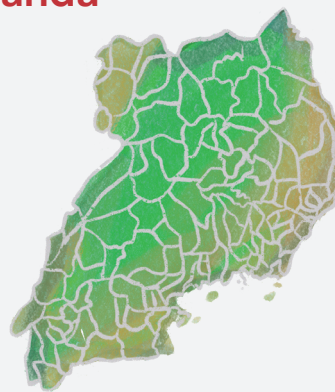


Goal 3:
Suspect sepsis,
start FAST-M

APT-Sepsis Champions



Champions are key in making the APT-Sepsis Programme happen. They are specially trained healthcare staff, working together as a team, to ensure that their healthcare facility reaches the APT-Sepsis Programme's three central goals: champions ensure that the APT-Sepsis Programme is delivered in a reliable and effective way. The APT-Sepsis champions will work with the central APT-Sepsis hub team and other healthcare facilities delivering the APT-Sepsis Programme, forming a support network (the Champion Network). Cooperation and teamwork are vital: infection prevention and treatment is every healthcare provider's responsibility, and everyone looking after pregnant and recently pregnant women can help save lives.

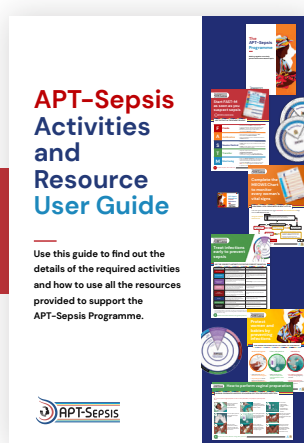
Malawi**Uganda**

Measuring the Impact of the APT-Sepsis Programme

As with any new programme of care, it is important that evidence is established to determine if it is effective in achieving its aim. The APT-Sepsis Programme includes a package of evidence-based resources. To see if these resources improve the outcomes of maternal sepsis when used together, a large research trial (a multi-centre cluster randomised controlled trial) is being conducted across Malawi and Uganda, with 30 facilities in each country. Your healthcare facility is taking part in the trial and will be delivering the APT-Sepsis Programme.



See the APT-Sepsis Activities and Resource User Guide for more information about the design of the trial.



The APT-Sepsis Programme Manual

This manual is designed as a guide to the APT-Sepsis Programme. It contains the information needed to deliver the APT-Sepsis Programme's core training modules. Whilst the manual is designed to support APT-Sepsis champions, it contains information suitable for all healthcare providers that work within your facility. Please share this information and discuss what you have learnt as an APT-Sepsis champion with other members of staff working in your healthcare facility: working together we can actively prevent and treat maternal sepsis.





Testimonials

The APT-Sepsis Programme has been developed in close collaboration with the Ministries of Health in Malawi and Uganda. The teaching materials and ward-based tools included in the programme are aligned with both Ministries of Health and the World Health Organization's (WHO) recommendations to support best clinical practice.



Malawi Ministry of Health Testimonial

Current maternal mortality ratio is still very high. Maternal sepsis is one of the leading direct causes of maternal death. It is the hope of Ministry of Health that this implementation science study will greatly help reduce death from sepsis. This will contribute massively to improve women and child health, hence helping families live a productive life.

Owen Musopole

Malawi Ministry of Health Quality Management Department

Uganda Ministry of Health Testimonial

APT-Sepsis encourages infection prevention and control practices in maternity and theatre settings and there is a clear way of identifying, and treating maternal sepsis. The programme will support managing maternal sepsis, and hence a better outcome for the mothers.

Hannah Kemiyondo

Midwife and Uganda Ministry of Health Trainer



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SECTION TWO

How Bacterial Infections and Sepsis Develop

This section outlines how the body responds to infection

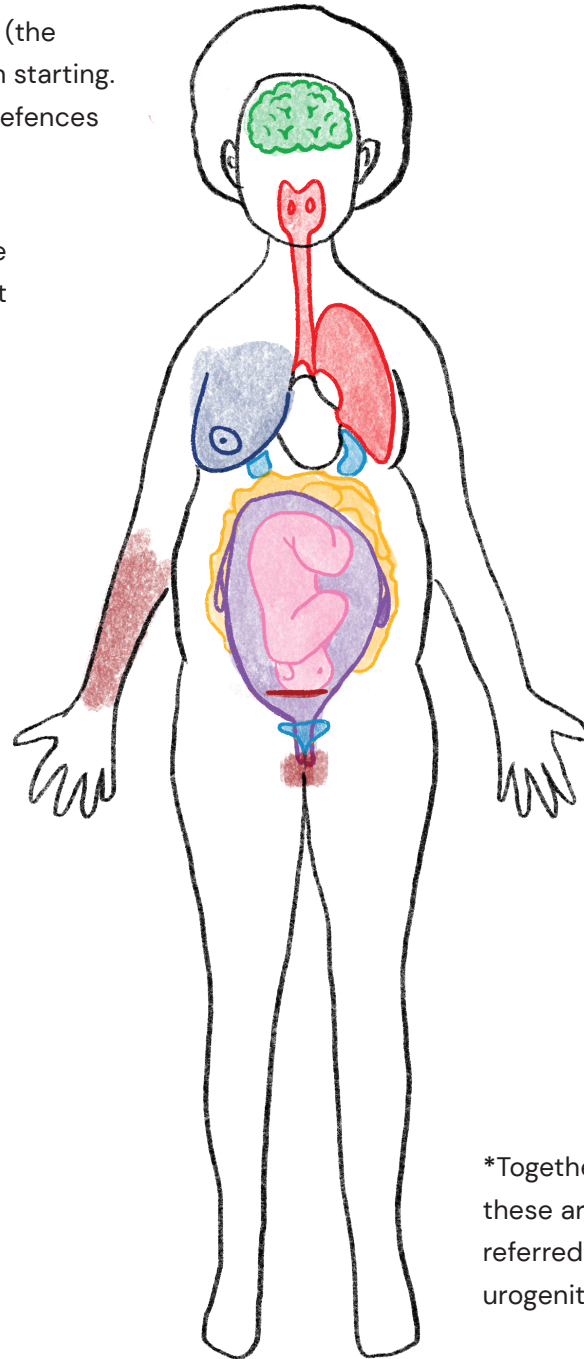


How and where bacterial infections develop

We come into contact with bacteria every day, but our bodies have good defences to prevent infection. From physical barriers, like our skin, to special cells inside our body (the immune system), these normally stop infections from starting. Sometimes, however, bacteria can overcome these defences and cause infection.

Bacterial infections can occur almost anywhere in the body. Common sites in pregnant or recently pregnant women often include entry points to the body:

- **The respiratory tract***
(including pneumonia)
- **The urinary tract***
(including cystitis and pyelonephritis)
- **The genital tract***
(including chorioamnionitis during pregnancy, endometritis after giving birth)
- **Post-abortion complications**
(including ascending bacterial infections)
- **The skin**
(including cellulitis at infected cannula sites, surgical sites and perineal wounds)
- **The breast**
(including mastitis whilst lactating and breast-feeding)
- **The brain and neurological system**
(including meningitis, encephalitis)
- **The abdomen**
(including post-caesarean section intra-abdominal infection, but also infection of the biliary tract and gastrointestinal tract)



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

► Note

Clinical experience is important to help diagnose infections: if a patient has a fever, has foul-smelling vaginal discharge, is producing pus from a wound or has pain, it could indicate that a bacterial infection is present. Always seek help if you think a patient might have an infection if you are not trained personally to diagnose infections. Also remember that a pregnant and recently pregnant woman could have an infection that is not related to their pregnancy.

The difference between infection and sepsis:

Infection is the invasion of micro-organisms into the body. Bacteria, viruses, fungi and parasites can all cause infections: here we focus on bacteria as these are very common and the leading cause of sepsis.

When the body is responding to a bacterial infection, the immune system produces chemical signals in the tissue and the blood to recruit the body's defences. This can lead to local changes, such as the production of **pus, redness, swelling, pain** and **warmth**, and also whole-body changes, such as **fever and shivering**. These are all signs of infection.

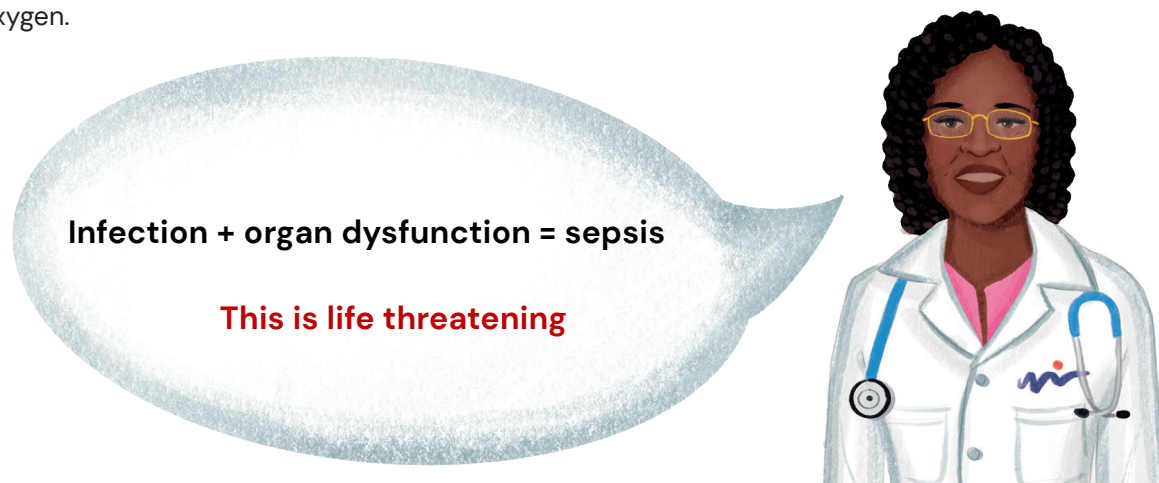


Signs of infection to look out for include:

- A high temperature
- A fast heart rate of the woman or fetus
- A low blood pressure
- A fast respiratory rate
- Pain or pus from a wound
- Foul smelling vaginal discharge
- Abdominal pain
- Hot, red, painful skin
- Feeling generally unwell

Vital signs other than body temperature can also change when there is an infection. A **high heart rate, fast breathing** or a **drop in blood pressure** are changes to look out for that might indicate an infection. This is because, as the body reacts to infection, it will try to compensate. If blood investigations are available, a white cell blood count higher or lower than the normal range could also indicate an infection, as the body's immune system reacts to the infection.

When infections get worse, patients can develop sepsis. Sepsis is where the body's response to infection, recruiting many of its defences, becomes overwhelming. The signals in the blood lead to blood vessels becoming wider and more leaky, requiring the heart to beat faster and harder to deliver enough oxygen to the body's tissues. If this becomes too much, the body will start to fail: **signs that the body is failing include fast breathing, confusion and low blood pressure**. If you were to take a blood test and check for lactate (lactic acid) it might be raised, which is a signal that the body's tissue and organs are not receiving enough oxygen.



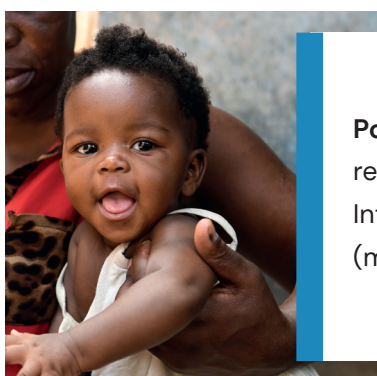
Hopefully, an infection will have been recognised and treated before these signs develop: **if a patient is showing any signs of sepsis, treatment should be started immediately as a medical emergency**. The details of how to recognise and manage sepsis are covered in detail later in this manual.

Why are pregnant and recently pregnant women at risk of bacterial infection?



During pregnancy, women can be at an increased risk of bacterial infection for a number of reasons. For example, gestational diabetes can develop, causing poor glucose control and a higher risk of developing a bacterial infection. Anatomical pressure on the respiratory system and the urinary tract, due to the increasing size of the uterus, can also make bacterial infection more common.

During labour, the body goes through a lot of physiological strain, regardless of whether the delivery is vaginal or by caesarean section. Performing vaginal examinations more often than necessary can introduce infection to the genital tract, as can prolonged rupture of the membranes. Invasive procedures, such as caesarean section, can also introduce bacteria, which is why it is important to perform surgery under aseptic conditions with sterilised equipment.



Post-partum, infections can also develop. For example, women can have retained products of conception after childbirth, miscarriage or abortion. Infection can also develop in episiotomy wounds and tears, or in the breast (mastitis) due to breast-feeding.

Infection with HIV or malaria can make bacterial infection in pregnancy more likely. Cases involving more than one infection can be complex, and advice from senior clinicians is usually required.

► Note

Comorbidities, such as diabetes, obesity and anaemia, can also make infection more likely during pregnancy: always be aware of medical comorbidities.

SECTION THREE

Our Central Goals

This section details the three central goals of the APT–Sepsis Programme



Our Central Goals

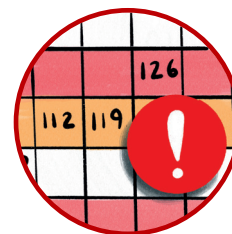
The APT-Sepsis Programme is designed to support healthcare providers in achieving three central goals, which aim to prevent women and babies dying or being harmed by maternal infection and sepsis. These central goals are:



Goal 1:
Hand hygiene at
every moment



Goal 2:
Prevent and treat infection
using best practice



Goal 3:
Suspect sepsis,
start FAST-M

This section focuses on the evidence for these central goals: **why** are they a key part of actively preventing and treating maternal sepsis? Other sections of this manual explain **what** is required for the delivery of the APT-Sepsis Programme and **how** its resources can be used to achieve each of these central goals.

*By working together as a team,
we can achieve the three central
goals of the APT-Sepsis
Programme and save lives.*

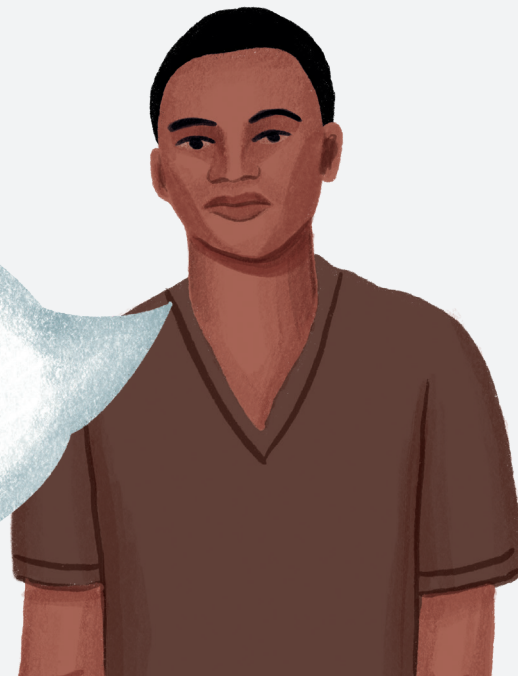




Goal 1: Hand hygiene at every moment

The first central goal focuses on ensuring that hand hygiene is performed at the right times and in the right way when caring for women and their babies, to prevent spreading infection.

Did you know, germs such as bacteria can survive on your hands for up to three hours? Think about how many patients and colleagues you see in three hours...hand hygiene at every moment can help limit the spread of bacteria and stop sepsis.



Why are clean hands important?

Hand hygiene is a simple, effective solution to prevent healthcare-associated infections, preventing the transmission of infection between healthcare workers and patients.⁶ The WHO estimate that as many as 50% of avoidable healthcare-associated infections can be prevented by appropriate hand hygiene.⁷ Hand hygiene is considered the main building block for all other infection prevention and control interventions.

How did we decide which hand hygiene strategies to include?

Handwashing and the use of alcohol-based handrub are the recommended methods for hand hygiene. The WHO recommends alcohol-based handrub as the “gold standard” for hand hygiene in healthcare facilities in most circumstances.^{7, 8}

The WHO Multimodal Hand Hygiene Improvement Strategy (MHHIS) has been shown in research studies to be easy to implement,¹¹ effective at preventing infections,^{9,12} and sustainable in producing lasting change in healthcare staff hand hygiene habits.^{9, 10}

The WHO approach is incorporated into the APT-Sepsis Programme to achieve its first central goal. The resources include WHO hand hygiene reminders for the workplace, adapted for the maternity setting.

How do we know we can improve hand hygiene through these strategies in Malawi and Uganda?

A pilot study, conducted across three hospitals in Malawi in 2018, found hand hygiene compliance increased from less than 10% at baseline to greater than 80% after the introduction of the strategies recommended in the APT-Sepsis Programme.

In Uganda, MHHIS has been adopted within the National infection prevention and control (IPC) mentorship programme, with an increase in handrub access after local production (54.4% to 74% in six supported sites).





Goal 2: Prevent and treat infection using best practice

The second central goal focuses on ensuring that evidence-based best practices in everyday care are followed to prevent infections developing. It also focuses on how to treat them correctly when they occur.



Did you know, there are lots of ways to prevent infection! For example, infections in pregnancy can be prevented by preparing the skin and preparation the vagina before surgery, avoiding unnecessary procedures during childbirth and giving antibiotics in certain circumstances.

Why is infection prevention and treatment important?

Infection prevention includes all measures that aim to stop infection developing: it is the most efficient and safe way to reduce morbidity and mortality from infection. If an infection occurs despite best efforts to avoid it, effective treatment is essential to prevent it from developing into sepsis.

How did we decide which infection prevention and treatment strategies to recommend?

The WHO carefully assessed all the evidence available throughout the literature and provided 20 recommendations for the key actions required, covering care in labour, caesarean section and antibiotic guidance. Each of the recommendations are incorporated into the APT-Sepsis Programme, including those relating to the care provided at the time of caesarean section and the use of appropriate antibiotic prophylaxis, are evidence based.¹¹

How do we know we can improve infection prevention and treatment through these strategies in Malawi and Uganda?

The WHO only recommend the key actions that are known to be effective. Implementing these actions has been tested previously in feasibility studies in Malawi. During this work, which focused on appropriate antibiotic prophylaxis and the care provided at the time of caesarean section, improved practice was found in the three hospitals in Malawi in which the feasibility studies were conducted.



Goal 3: Suspect sepsis, start FAST-M

The third central goal focuses on checking vital signs regularly and always considering whether a patient's clinical deterioration could be due to sepsis. It focuses on delivering the FAST-M approach to sepsis – a decision tool that helps identify suspected sepsis and a treatment bundle of care that should be started immediately to treat sepsis when it is suspected.



Did you know, every second counts with sepsis! You must be aware of how to recognise sepsis and start FAST-M as soon as possible: quick action in sepsis saves lives.

Why is recognition and management of maternal sepsis important?

A woman can quickly become unwell and die if maternal sepsis is not recognised and treated. Using the tools and strategies incorporated in the APT-Sepsis Programme, healthcare providers will be able to recognise that a woman is becoming unwell and start the appropriate management quickly, to prevent deterioration and death wherever possible.

How did we decide which recognition and management strategies to recommend?

The strategies recommended to achieve APT-Sepsis Programme's third central goal were carefully developed based on all the evidence available and expert advice from practitioners in sub-Saharan Africa and across the world.¹² This led to the development of an adapted Modified Early Obstetric Warning Score (MEOWS) Chart, FAST-M Decision Tool and FAST-M Treatment Bundle of care.¹⁴ This bundle is aligned with other international

quality improvement approaches for sepsis, but optimised for the maternal population and low-resource settings.^{13, 14} It focuses on delivering timely Fluids, Antibiotics, Source of infection control, Transfer (if higher-level care required) and continued Monitoring: **FAST-M**.

How do we know these strategies improve recognition and management of maternal sepsis in Malawi and Uganda?

The FAST-M bundle was trialled across 15 healthcare facilities in Malawi, and the facilities demonstrated improvements in the detection and management of maternal sepsis.¹⁵ The percentage of women with a complete set of vital sign observations increased from 0% at baseline to 77.4%, and the percentage of those with suspected sepsis who received antibiotics within one hour of recognition rose from 13.3% to 64.0%.



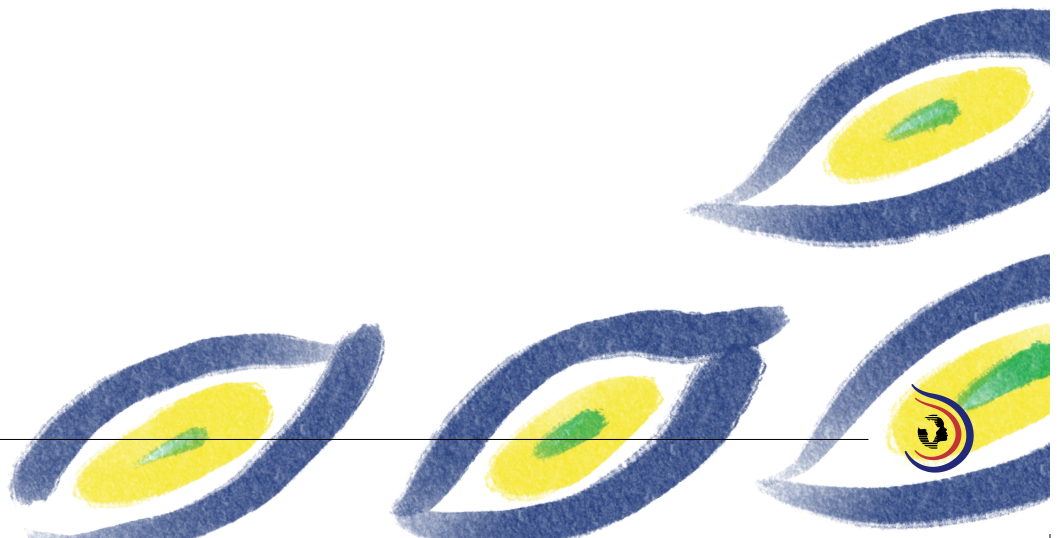
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SECTION FOUR

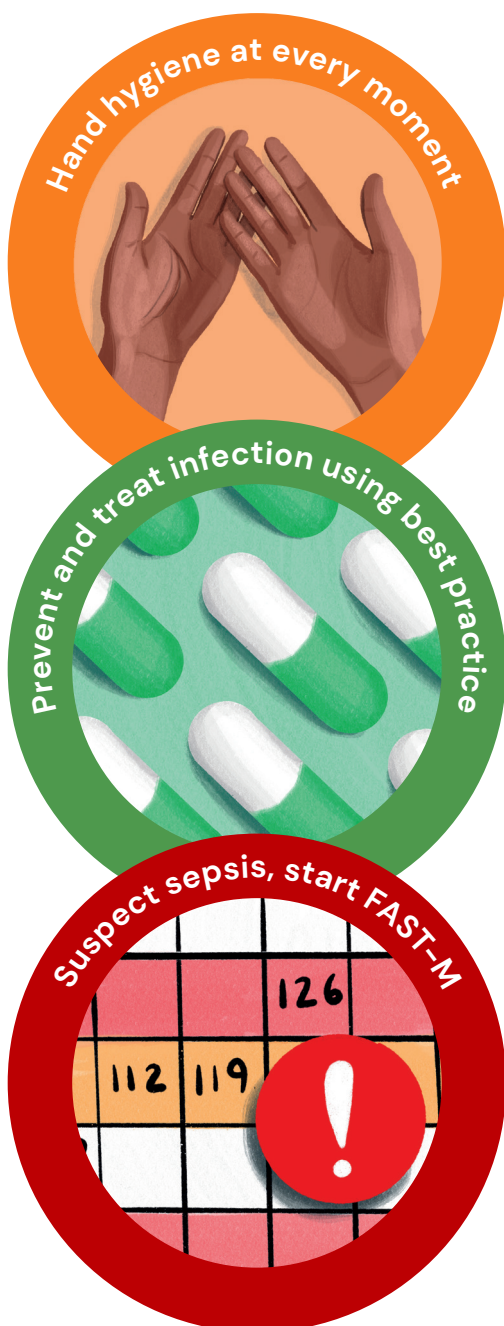
Achieving Our Goals Through the APT-Sepsis Programme

This section discusses how the APT-Sepsis Programme has been designed with the central goals in mind



The Chain of Prevention

The APT-Sepsis Programme includes a number of specially designed resources that are purposefully built to support one another. Their combined aim is to reduce disease (morbidity) and death (mortality) from maternal sepsis by targeting healthcare providers' behaviours and practice. The best way to reduce the number of deaths from maternal sepsis is to achieve the three APT-Sepsis goals. These three central goals are designed to protect women and their babies through a chain of prevention.



Goal 1: Hand hygiene at every moment

Hand hygiene is the cornerstone of infection prevention. Improving hand hygiene reduces the chance of infections spreading and therefore it reduces sepsis developing.

Goal 2: Prevent and treat infection using best practice

In addition to hand hygiene, there are many forms of best practice that can be used to prevent and treat infections. Appropriate antibiotic prophylaxis and safe, specialised care at the time of caesarean section are two areas of focus of the APT-Sepsis Programme, reducing the chance of infections developing and leading to sepsis.

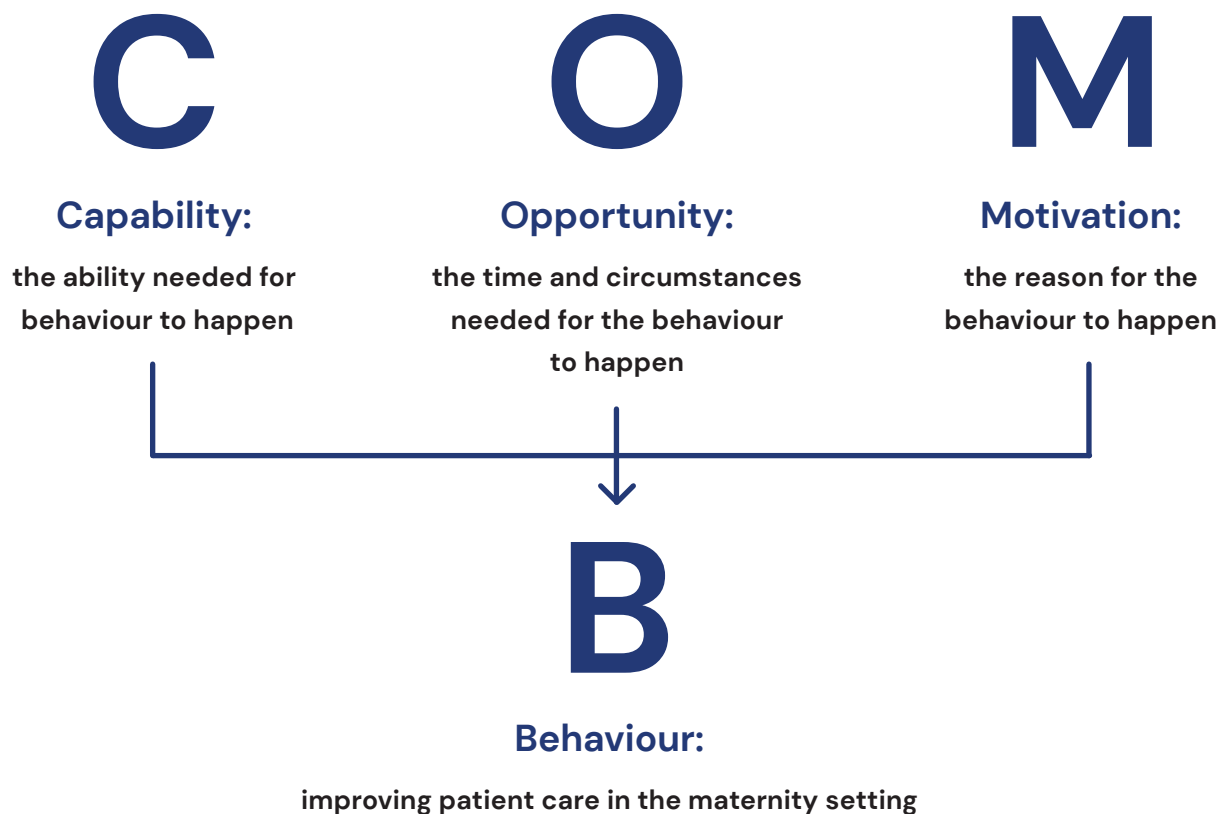
Goal 3: Suspect sepsis, start FAST-M

The final step to preventing deaths and disability from sepsis is to recognise sepsis quickly and act with urgency. Whilst the first two goals reduce the number of infections, they cannot prevent every single case: monitoring vital signs and being alert to abnormal findings is essential to diagnose suspected sepsis and act fast.

Behaviour Change Theory

To achieve its central goals, the APT-Sepsis Programme will need healthcare providers to improve their clinical practice. This is complex and will require changes to be made in the way that people carry out their roles, as well as the way teams work together. These changes in clinical practice are known as 'behaviour changes'.

When introducing a behaviour change, it is common to use a model to help make the change. The model used by the APT-Sepsis Programme to achieve its three core goals is the COM-B system.¹⁶ The COM-B system of behaviour change draws on the concept that there must be the capability (C), an opportunity (O) and a motivation (M) for behaviour to change (B) to happen.



► Note

The APT-Sepsis Programme aims to change the clinical practice (a behaviour) of healthcare providers. In order to achieve this, the package of resources available to help support each core goal of the APT-Sepsis Programme is designed to strengthen a healthcare provider's capability, opportunity, and motivation.

On the following page:

We show an example of how the COM-B system of behaviour change can be used to improve the clinical practice of hand hygiene.



Capability:

- 1 This healthcare provider recently attended the APT-Sepsis Programme's training
- 2 This WHO handwashing poster describes how to handwash in detail

Opportunity:

- 3 This hand hygiene station is well maintained and ready to use
- 4 Soap (or a dispenser of handrub, which would not require water) is readily available

Motivation:

- 5 This APT-Sepsis champion is observing the good clinical practice and ready to sign-off the healthcare provider as competent at hand hygiene, providing a certificate of continued professional development



Behaviour: hand hygiene at every moment

The APT-Sepsis Programme resources available to achieve our goals:

To change the behaviours needed to achieve the three central goals of the APT-Sepsis Programme, different resources have been designed to maximise the capability, opportunity and motivation required to improve care.

Teaching materials

Teaching materials specifically designed to achieve each of the APT-Sepsis Programme's central goals are available and take a number of forms; presentation slides, flip charts, videos and practical session scripts. They include the educational content and are designed to be used alongside and support in-person teaching.

Ward-based tools

Ward-based tools contain information to support day-to-day clinical practice. These include posters, the APT-Sepsis Pocket Reference, the Gestation Wheel and Antibiotic Guide and paper-based tools for vital sign monitoring (the MEOWS Chart, FAST-M Decision Tool and FAST-M Treatment Bundle).

Equipment

Equipment can support behaviour change, often through providing the opportunity to improve and deliver best clinical practice. These include handrub, training equipment and the equipment needed to record vital signs.

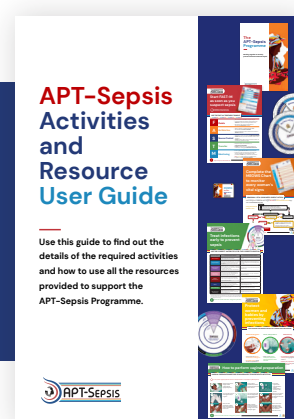
The Champion Network

The Champion Network allows for local facility coaching, mentorship and teaching. The APT-Sepsis champions facilitate local support and peer-to-peer learning, as well as between-facility problem solving and development. These activities support the APT-Sepsis Programme in achieving the three central goals through capability and motivation.

Motivational materials

A collection of motivational materials will also be available to each facility's team of APT-Sepsis champions, to build community morale and engagement. These include certificates of training competency for healthcare providers and a local performance dashboard that will be able to present facility-level performance.

See the APT-Sepsis Activities and Resource User Guide for more information.



The APT-Sepsis Programme's three core goals and COM-B



Each of the APT-Sepsis Programme's three central goals can be achieved, but to do this we need to change clinical practices (behaviours).

C Capability	Training to understand infection and sepsis and how to achieve the three APT-Sepsis Goals Slides, Flip Charts, Videos, Practical / Simulation Scripts Ward-based reminders and prompts containing Instruction Posters, APT-Sepsis Pocket Reference, Gestation Wheel		
O Opportunity	Ward-based reminders Posters, APT-Sepsis Pocket Reference Equipment Hand hygiene stations, soap, handrub, ultraviolet (UV) light boxes, UV handrub	Ward-based reminders Posters, APT-Sepsis Pocket Reference, Gestation Wheel Equipment Model pelvis for vaginal preparation practical	Ward-based reminders Posters, APT-Sepsis Pocket Reference, MEOWS Chart, FAST-M Decision Tool, FAST-M Treatment Bundle Equipment Equipment needed for recording vital signs
M Motivation	Peer-to-peer learning and support Networking of champions within and between healthcare facilities Recognition and feedback Certificates of training competency, performance dashboards		
B Behaviour	Goal 1 Hand hygiene at every moment	Goal 2 Prevent and treat infection using best practice	Goal 3 Suspect sepsis, start FAST-M

References

16. Michie S, Atkins L, West R. The behaviour change wheel: a guide to designing interventions. Silverback Publishing, London. 2014. Available at: www.behaviourchangewheel.com.

SECTION FIVE

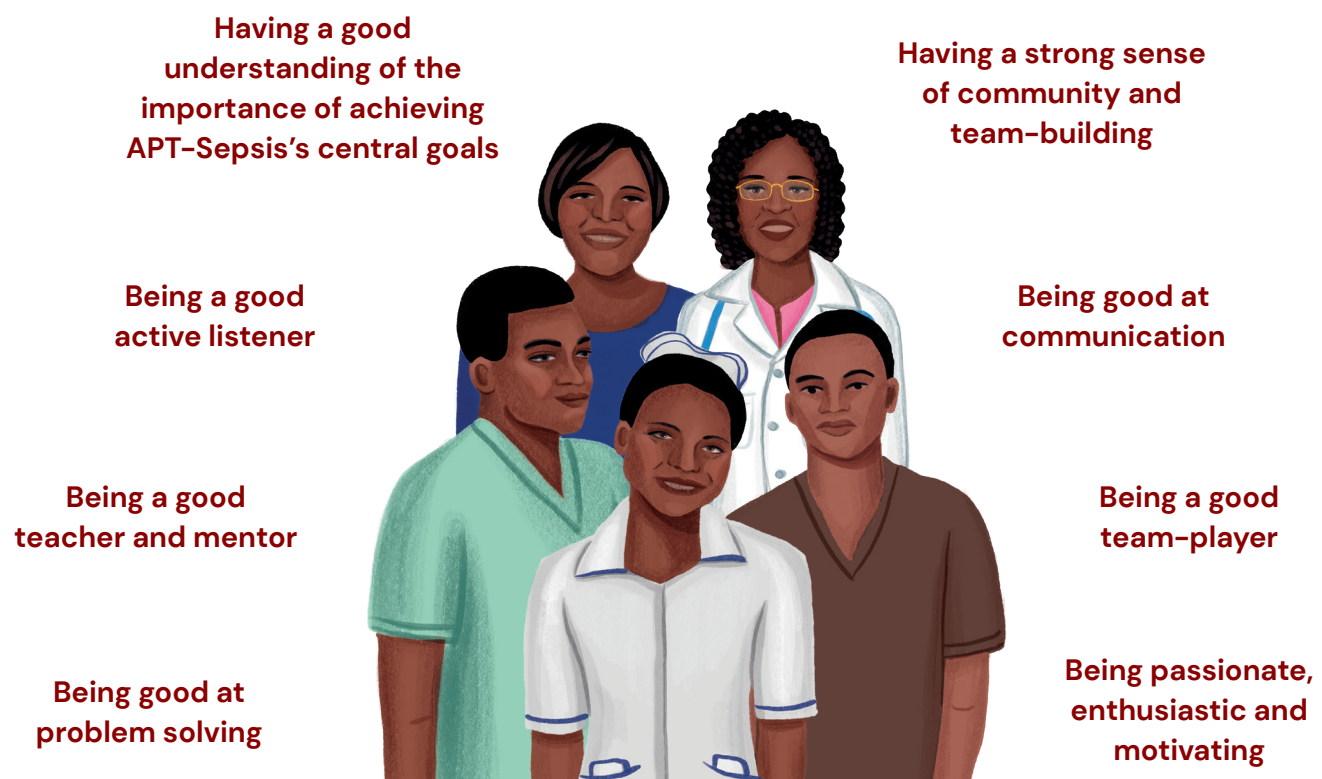
Being an APT-Sepsis Champion

This section describes how to be a
good APT-Sepsis champion



Characteristics of an APT-Sepsis champion

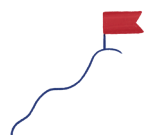
Shortly after your facility is selected to delivery the APT-Sepsis Programme, the senior management at your facility will identify a team of APT-Sepsis champions to support implementation of the programme. Champions should be knowledgeable, good team-players and capable of teaching, leadership and mentorship. They must also be active, enthusiastic and passionate to help patients.



Qualities of an APT-Sepsis champion

Every individual APT-Sepsis champion might not have all of these attributes, but it is important that, within a facility, the team of APT-Sepsis champions have these skills and attributes as a collective strength. Champions will have the opportunity to build upon and improve their strengths throughout the delivery of the APT-Sepsis Programme, through interaction with their team of champions and the Champion Network. There will also be opportunity for new APT-Sepsis champions to be identified throughout the APT-Sepsis Programme, allowing them to join the local APT-Sepsis champion team.

Championing, coaching, communicating and community-building: how we will work together.



Championing

This refers to advocating for the values of the APT-Sepsis Programme's goals and delivering best clinical practice.

The first step of championing is to lead by example, following the guides that have been implemented: championing encourages others to follow these values. Championing also helps us recognise the barriers to behaviour change that exist and therefore it helps us to recognise what is preventing the APT-Sepsis Programme from achieving its goals. Being a good champion will encourage your colleagues to think proactively and constructively about how best to overcome these barriers.



Coaching

Coaching means to help people to achieve their full potential through an individualised, approachable and non-judgemental way.

After the APT-Sepsis Programme facility training, some healthcare providers and support staff might need further sessions to help solidify their learning – this is a form of coaching. In addition, new members of staff will start working at each facility during the APT-Sepsis Programme and will require training to catch up on the learning they missed prior to starting. It is the responsibility of the APT-Sepsis champions to ensure all new staff receive this training.

As a champion, you need to ensure that all healthcare providers in your facility continue to feel comfortable with the content of the APT-Sepsis Programme.



Communicating

APT-Sepsis champions are responsible for supporting and maintaining a strong link of communication between the central APT-Sepsis hub team and the healthcare providers at their facility.

It is essential that communication is maintained in both directions. For example, there might be important messages from the central APT-Sepsis hub team that need to be shared with all healthcare providers quickly and reliably. In the opposite direction (from your facility to central hub team), there might be feedback from your colleagues that the central APT-Sepsis hub team would benefit from knowing.



Community-building

APT-Sepsis champions are vital to building community at two important levels.

In the facility: a motivated spirit of collaboration within your healthcare facility. This can be achieved through coaching sessions, local feedback, problem-solving and other facility-based activities designed to motivate and build morale.

The second level is the between-facility community: a community spirit between the champion groups from different facilities. This will be facilitated through the Champion Network WhatsApp group, central training, and Champion Network newsletters. These will feature case studies of how specific facilities have achieved success and overcome challenges, promoting peer-to-peer learning and problem solving between facilities.

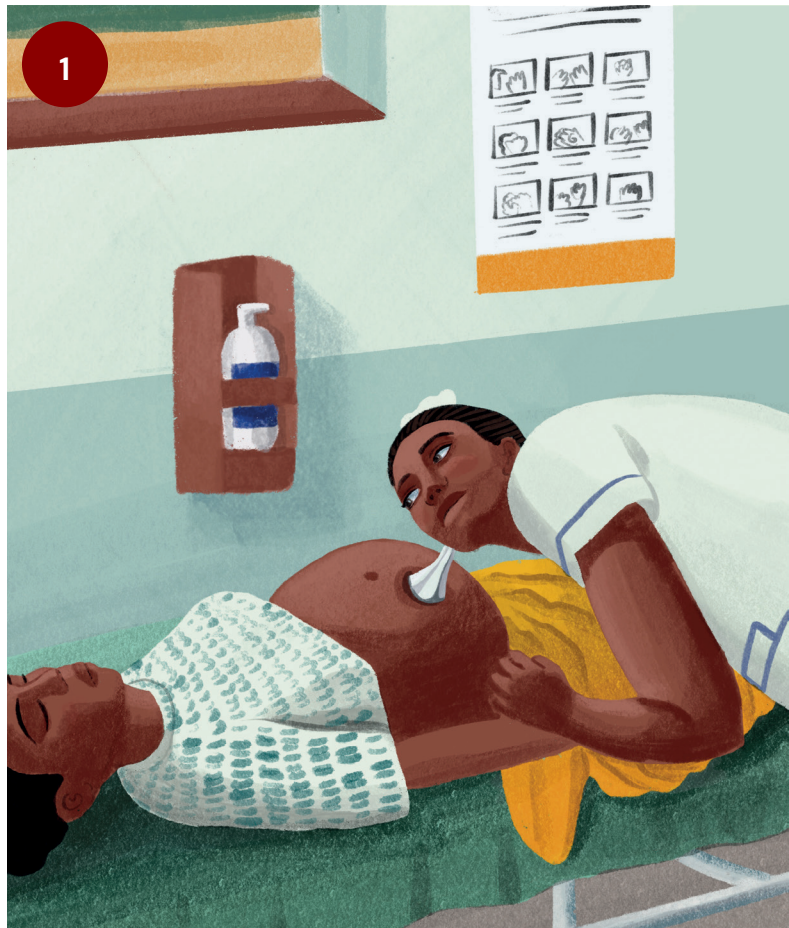


Multi-group champion team

Ideally there should be at least one champion from each of the following groups within each facility:

- Midwives (at different levels of training)
- Clinicians
- Medical / Clinical Officers
- Nursing assistant / auxiliary nurses
- Patient attendants (if employed locally)
- Cleaners and janitors
- Laboratory technicians
- Pharmacists
- Anaesthetists and theatre staff / assistants
- Facility managers

A multi-group team will ensure representation of the entire workforce who are involved in the journey of the patient throughout their hospital admission. This makes it easier to communicate between healthcare workers throughout your facility. It will also bring together strengths from a variety of roles.





1

Antenatal care

The midwife performed good hand hygiene before listening for a fetal heartbeat, using handrub that is easily available in the clinical area. She will use handrub again after she is finished, considering all the 5 moments for hand hygiene in the maternity setting.

2

Admission (in labour)

The healthcare providers attending to the patient both have clean hands, prior to examining her. They prevent infection through appropriate aseptic examination technique. They are also using a MEOWS Chart to record the vital signs and look for deterioration.

3

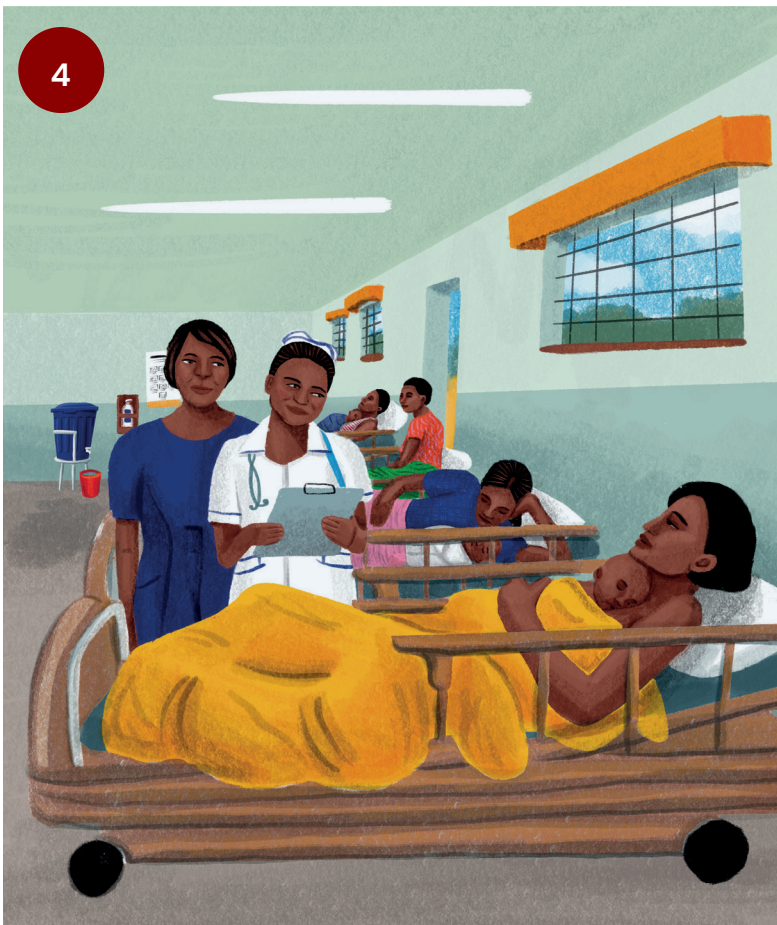
Theatre for caesarean section (if indicated)

The theatre staff all scrubbed carefully for theatre to minimise risk of infection. An aseptic non-touch technique was used when inserting the catheter, reducing the chance of infection. Prophylactic antibiotics were given to the patient prior to caesarean section and both vaginal preparation and abdominal preparation were performed.

4

Post-surgery recovery

The whole team – the midwives, clinicians, caretakers, pharmacists – continue to perform good hand hygiene throughout admission. The MEOWS Chart continues to be used and the clinical team ensure they check surgical wounds for signs of infection, including episiotomy wounds and tears.



SECTION SIX

Training Opportunities in the APT-Sepsis Programme

This section outlines the training provided for APT-Sepsis champions and healthcare providers during the APT-Sepsis Programme



Phases of Training

There are three phases of training within the APT-Sepsis Programme:

1

The APT-Sepsis champion training event

This will occur in the month before the APT-Sepsis Programme's facility training. District and hospital management teams and APT-Sepsis champions from each facility will receive detailed training in the implementation and benefits of the APT-Sepsis Programme.

2

The APT-Sepsis Programme's facility training

This is main point of training for the majority of healthcare providers at your facility. It will take place at your facility and will be co-delivered by your facility's APT-Sepsis champions and members of the central APT-Sepsis hub team.

3

Continued champion-led training sessions

This will occur throughout the remainder of the APT-Sepsis Programme's delivery, to provide on-going training to new staff starting at the facility and refresher training as needed.

1 APT-Sepsis champion training event

Once champions have been selected by senior management at each facility they will be invited to attend an APT-Sepsis champion training event in a centralised location.

- District Health Officers

The people that will be invited to the APT-Sepsis champion training event include:

- District Medical Officers
- District Nursing Officers
- Senior hospital management
- Locally determined APT-Sepsis champions
- Focal Infection Prevention and Control (IPC) staff

The APT-Sepsis champion training event will last three and a half days, including two days of receiving APT-Sepsis Programme's core training modules (outlined later when describing the APT-Sepsis Programme facility training).

There are three main purposes to the APT-Sepsis champion training event. These are:

1. To impart the knowledge required to deliver the APT-Sepsis Programme and achieve its three central goals, and ensure that all facility managerial staff and APT-Sepsis champions have a strong understanding of how to implement all resources available.
2. For the central APT-Sepsis hub team to meet the APT-Sepsis champions that have been established at each facility, who will lead the implementation of the APT-Sepsis Programme and ensure quality practice is promoted and sustained.
3. To allow senior managers and APT-Sepsis champions at each facility to form a community, allowing them to share ideas and experiences with other facilities throughout the duration of the APT-Sepsis Programme, and beyond.

After two days of teaching focusing on the APT-Sepsis Programme core training modules, the APT-Sepsis champion training event will cover the responsibilities specific to the APT-Sepsis champions, focusing on championship, coaching, communication and community-building.



② APT-Sepsis Programme facility training

All healthcare providers that work with maternity patients will receive the APT-Sepsis Programme facility training. The training will last for two days for each individual attending the training. To ensure as many staff as possible receive the training, it will be delivered twice over the course of a week at each facility. The training will include classroom-style sessions, interactive workshops, videos and practical demonstrations. Attendance for each core module of teaching will be signed off and a certificate for complete attendance awarded.

The APT-Sepsis Programme facility training will involve the co-delivery of five training modules by the local team of APT-Sepsis champions and members of the central APT-Sepsis hub team.

For clinical healthcare providers, the five core training modules are: 1) Hand hygiene at every moment, 2a) Prevent infection using best practice, 2b) Treat infection using best practice, 3a) Suspect sepsis, start FAST-M and 3b) The FAST-M Treatment Bundle.

For non-clinical support staff, the five core training modules will be slightly modified to cover relevant material: 1a) Hand hygiene at every moment, 1b) Promoting good hand hygiene in all clinical settings, 2c) How to recognise infection, 3a) Suspect sepsis, start FAST-M and 3c) MEOWS Chart practical.

③ Champion-led facility training

At each facility, it is expected that the team of APT-Sepsis champions will continue to deliver the core modules of the APT-Sepsis Programme to both clinical and non-clinical staff: this allows for the full package of training to be delivered on a rolling basis to all new healthcare providers and support staff. Certificates of attendance will be provided for new staff, and completed once all five core training modules have been received. The champion-led facility training also allows for staff that need extra learning support to receive refresher sessions as required throughout the duration of the APT-Sepsis Programme.

Timetable

		Clinical healthcare providers	Non-clinical support staff
Day 1	AM	Module 1a: Hand hygiene at every moment	Module 1a: Hand hygiene at every moment
	PM	Module 2a: Prevent infection using best practice	Module 1b: Promoting good hand hygiene in all clinical settings
		Module 2b: Treat infection using best practice	Module 2c: How to recognise infection
Day 2	AM	Module 3a: Suspect sepsis, start FAST-M	Module 3a: Suspect sepsis, start FAST-M
	PM	Module 3b: The FAST-M Treatment Bundle	Module 3c: MEOWS Chart practical



SECTION SEVEN

Goal 1: Hand hygiene at every moment

This section describes how to achieve the first
central goal of the APT-Sepsis Programme





Training objectives helping us to achieve hand hygiene at every moment:

- Learn **why** to perform hand hygiene
- Learn **when** to perform hand hygiene
- Learn **how** to perform hand hygiene

Resources

available to achieve Goal 1: Hand hygiene at every moment

Teaching materials:

- Module 1a slides
- Module 1a flip chart
- Hand hygiene at every moment video
- Hand hygiene practical script

Ward-based tools:

- WHO hand hygiene posters
- APT-Sepsis Pocket Reference

Equipment:

- Ultraviolet (UV) lotion and UV light box
- Hand hygiene stations (+ soap / towels)
- Alcohol-based handrub

Teaching materials and content

The majority of the training content will be delivered by the local APT-Sepsis champions and members of the central APT-Sepsis hub team as Module 1a (Hand hygiene at every moment) of the APT-Sepsis Programme facility training, delivered to all healthcare providers and support staff. The teaching materials will also be available to the champions for further training opportunities throughout the duration of the APT-Sepsis Programme (continued champion-led training sessions).

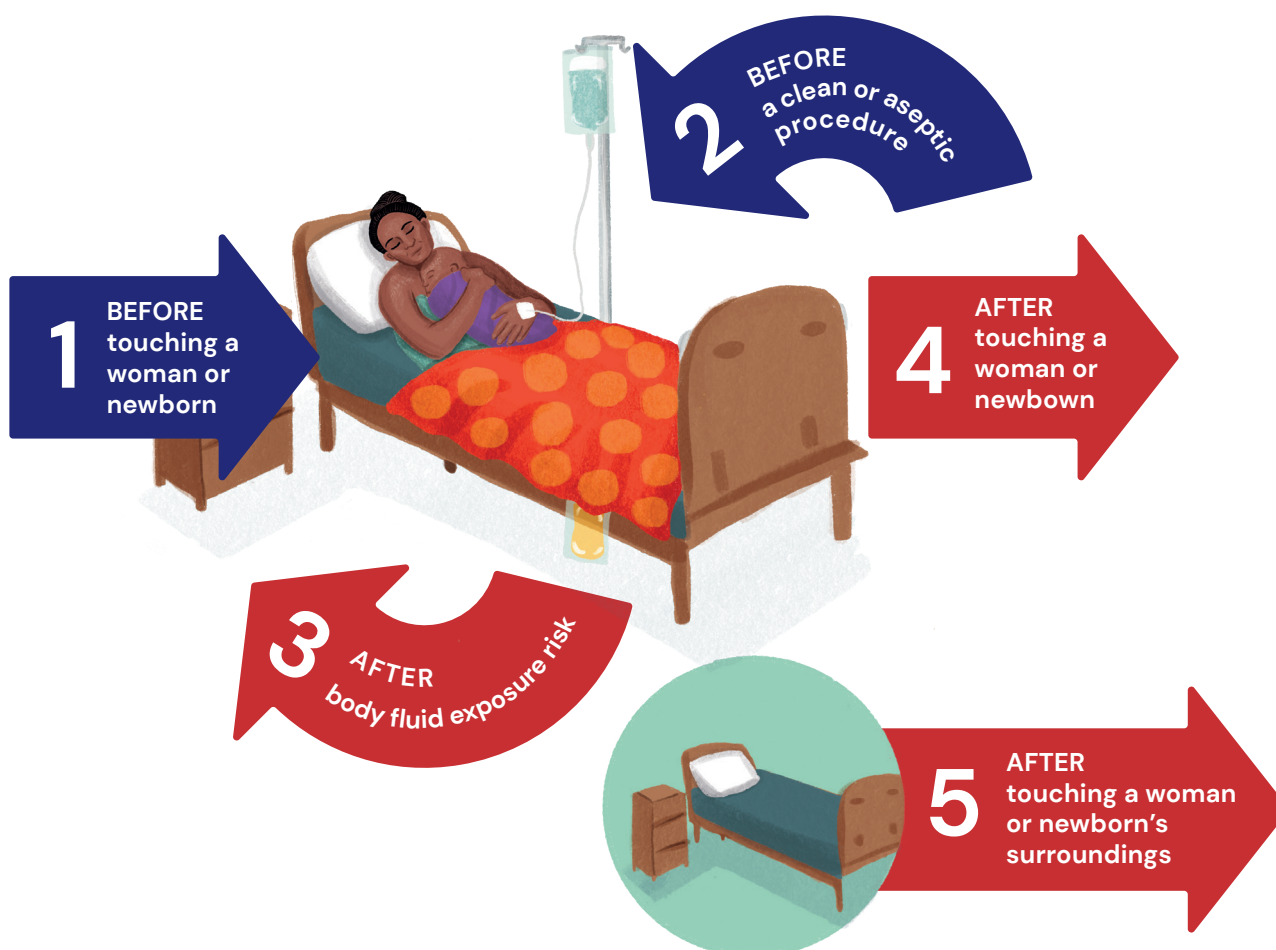
The Module 1a slides (PowerPoint), Module 1a flip charts (available in A4) and the 'Hand hygiene at every moment' video (available online and on a USB)

contain the key training messages, discussing why hand hygiene is important, when to perform hand hygiene and how to perform hand hygiene.

Hand hygiene at every moment is also supported by Module 1b, for non-clinical support staff: Promoting good hand hygiene in all clinical settings. This module is setting-specific and will involve a workspace tour, establishing how best to improve hand hygiene across the facility's many clinical areas.

The five moments for hand hygiene

The first part of Module 1a will cover when to perform hand hygiene. The WHO has established five key moments for hand hygiene during each interaction with a patient:



How to perform hand hygiene:

Hand hygiene can be performed using either 1) soap and water or 2) alcohol-based handrub. Both methods have their strengths and weaknesses and are appropriate in different situations. As a general rule, handrub with an alcohol-based formulation is preferred if hands are not visibly soiled, as it is faster, more effective, and better tolerated by your hands than washing with soap and water.

► Note

When should handwashing take place instead of using handrub?

Washing your hands with soap and water should be used rather than handrub if:



Your hands are visibly soiled



You are treating a woman or newborn with diarrhoea



After your personal use of the toilet



Steps to hand hygiene:

There are seven main steps to hand hygiene after applying soap and water or handrub. They include specific motions designed to remove pathogens (such as bacteria) from all areas of the hands. The motions are the same whether you use soap and water or handrub:

Soap and water – follow red path



Wet your hands with water and apply enough soap to cover all hand surfaces



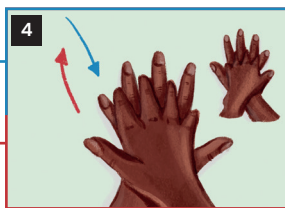
Handrub – follow blue path



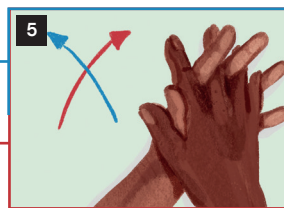
Apply a palmful of handrub to your cupped hand: enough to cover all hand surfaces



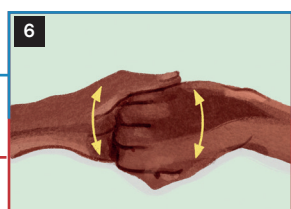
Rub your hands palm to palm



Rub your right palm over the back of your left hand with interlaced fingers and vice versa



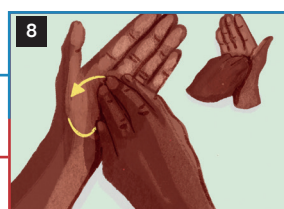
Rub your hands back and forth, palm to palm with fingers interlaced



Hook the backs of your fingers in the opposite palm, with fingers interlocked, and rub



Rotationally rub your left thumb clasped in your right palm and vice versa



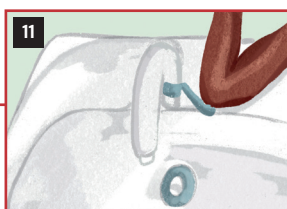
Rotationally rub fingertips clockwise and anticlockwise with clasped fingers of right hand in left palm and vice versa



Rub each of your wrists with the opposite hand



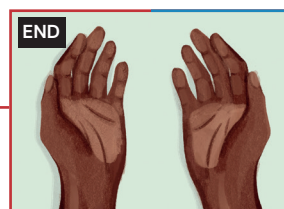
Rinse your hands with water



Turn off the tap



Dry your hands thoroughly with a single-use towel



Handwashing should take 40-60 seconds and using handrub 20-30 seconds. Once dry, your hands are safe.

Hand Hygiene practical

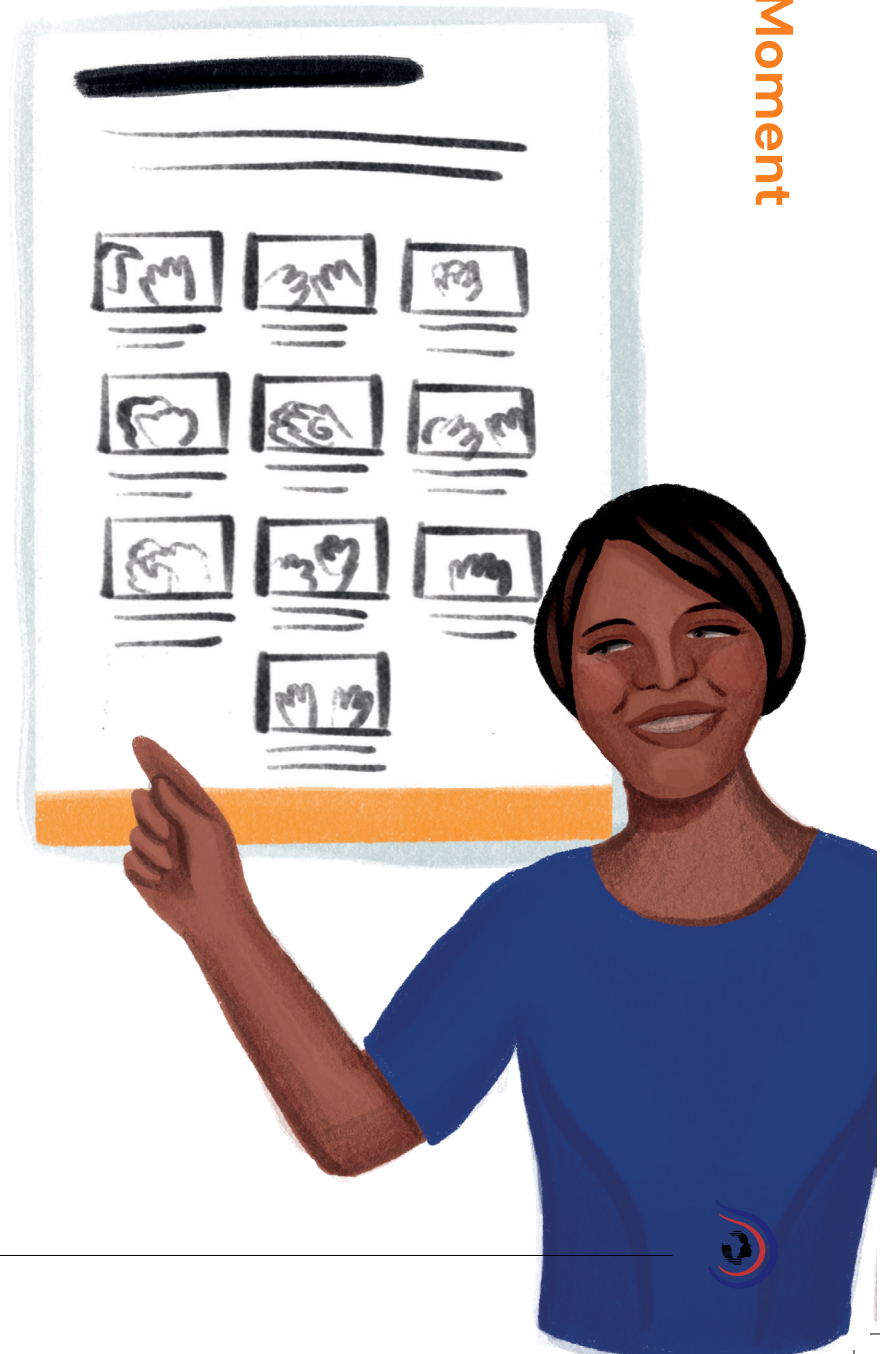
This activity offers staff the opportunity to practice their hand hygiene techniques during the APT-Sepsis Programme facility training:

- 1 First, a special lotion that lights up under ultraviolet (UV) light is applied to the hands, like using handrub.
- 2 Using UV light, it is possible to see where has been missed – highlighting areas for extra care in the future when using handrub.
- 3 Next, the UV lotion is washed off the hands using soap and water.
- 4 Finally, the UV light can be used again to see if there is any lotion left on the hands after handwashing.

All healthcare providers and support staff will have the opportunity to participate in the practical during the APT-Sepsis Programme facility training. Once successful, they will be signed off as competent in hand hygiene. A UV light box will be available at each facility for the duration of the APT-Sepsis Programme, and champions are encouraged to use these for their continued champion-led training sessions.

Ward-based tools

The main ward-based tools reminding healthcare providers to have clean hands at every moment are the WHO hand hygiene posters. These will need to be displayed in prominent and strategic places throughout the clinical working environment to prompt staff to perform hand hygiene and remind them of the steps. APT-Sepsis champions will be responsible for positioning the posters and making sure they stay in place for the duration of the programme, replacing the posters if they get torn or faded.



Equipment

Ultraviolet (UV) light box and UV lotion

These will be used during initial APT-Sepsis Programme facility training, with competency sign-off and certification, and then left at the facility to be used by the APT-Sepsis champions for ongoing / refresher training needed.

Alcohol-based handrub and hand hygiene stations

The WHO recommends handrub should consist of 96% ethanol or 99.8% isopropyl alcohol, together with hydrogen peroxide 3% and glycerol 98%. Alcohol-based handrub which meets the WHO requirements will be supplied to all facilities.

Hand hygiene stations will be required for the hand hygiene practical activity, but also in clinical areas for handwashing day-to-day. These will need to be sources / produced locally. The clinical areas of each facility will be assessed by the champions at the beginning of the APT-Sepsis Programme to establish if any additional hand washing stations are needed to meet the WHO's recommended ratio of one hand hygiene station per 10 patient beds.



SECTION EIGHT

Goal 2: Prevent and Treat Infection Using Best Practice

This section describes how to achieve the second central goal of the APT-Sepsis Programme



Training objectives helping us prevent and treat infection using best practice:

- To **improve the use** of antibiotic prophylaxis
- To **improve care** around caesarean section
- To **ensure correct treatment** is given when an infection is suspected or confirmed

Resources

available to achieve Goal 2: Prevent and treat infection using best practice

Teaching materials:

- Modules 2a, 2b and 2c slides
- Modules 2a, 2b and 2c flip charts
- Prevent infection using best practice video
- Treat infection using best practice video
- Vaginal preparation practical script

Ward-based tools:

- Prevent infection poster
- Treat infection poster
- Vaginal preparation poster
- APT-Sepsis Pocket Reference
- Gestation Wheel and Antibiotic Guide

Equipment:

- Model pelvises, swabs, bottle of water, forceps, gloves and handrub for vaginal preparation practical

Teaching materials and content

The majority of the training content will be delivered by the local APT-Sepsis champions and members of the central APT-Sepsis team during the APT-Sepsis Programme facility training. The teaching materials will also be available to champions for further training opportunities throughout the duration of the APT-Sepsis Programme. The training modules covering the prevention and treatment of infection using best practice for clinical healthcare providers are Modules 2a and 2b. Non-clinical support staff will

have alternative training, covering how to recognise infection and escalate concern to clinical staff (Module 2c).

The slides (Powerpoint) and flip charts for Modules 2a, 2b and 2c and two videos (available online and on a USB) contain the key training messages, discussing the importance of infection prevention and treatment.

Infection prevention practices included in the APT-Sepsis Programme can be divided into safe clinical practices and antibiotic prophylaxis.

Safe clinical practices:

The WHO has made several recommendations to help improve maternity care through safe clinical practices around the time of birth. These should be used in combination with the resources supporting the goal of hand hygiene at every moment. In particular, the APT-Sepsis Programme is focusing on the following four recommendations to improve care around childbirth:



Vaginal preparation

For caesarean section, routine vaginal preparation **MUST** be performed using either chlorhexidine or povidone-iodine solution. Aqueous-based solutions are preferred as they cause less mucosal irritation.



Skin cleansing

For caesarean section, the abdominal skin **MUST** also be prepared with alcohol-based chlorhexidine or povidone-iodine solution.

Vaginal Preparation

Vaginal preparation prior to caesarean section is recommended by the WHO to prevent infection. The process involves preparation the vagina using a surgical swab soaked in povidone-iodine or chlorhexidine solution for 30 seconds prior to caesarean section.

This is important as a caesarean section leaves two wounds, one in the skin and one in the uterus. We all know how important cleaning the skin is to prevent infection of a wound to the skin, but cleaning the vagina prior to caesarean section is also critical to reduce the bacteria in the vagina. Vaginal preparation reduces the risk of Endomyometritis by 50%.



Shaving

It is **NOT** recommended to routinely shave the pubic area for vaginal birth or caesarean section.



Limit examinations

LIMIT routine vaginal assessments in the first active stage of labour to **NO MORE THAN** every four hours, unless there is a clinical indication to do so.

Most facilities will not be familiar with this practice as it is not routinely carried out in most countries despite WHO recommendations. As such, the APT-Sepsis Programme facility training will provide the opportunity to learn about this practice, covering why it prevents infection and how / when to perform it.

The training will include a practical learning activity using a model pelvis to allow staff to become confident in the technique and obtain competency sign-off. APT-Sepsis champions will have ongoing access to the model pelvis to provide for the facility's training needs.





You should explain to the patient what vaginal preparation involves and why you wish to do it before you begin. You should have her verbal consent to perform the procedure. Ensure that the patient has appropriate privacy.

► Note

Do not perform vaginal preparation if there is a face presentation, cord prolapse or placenta praevia.



Vaginal preparation takes place in the operating theatre, before the start of the caesarean section (CS). You will perform vaginal preparation after the spinal anaesthetic has been administered and a catheter has been inserted. There should not be more than a few minutes between vaginal preparation and the start of the operation. Vaginal preparation happens before the abdominal skin is prepared.



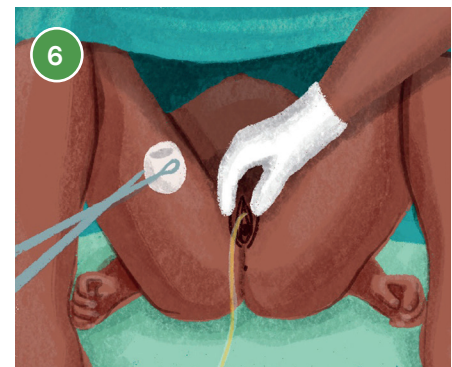
Prepare your equipment: you will need a gauze swab and a sponge holder / forceps from the CS set. These should be sterile and can be removed from the CS pack with the permission and knowledge of the scrub staff. The swab and sponge holder you use should be included in the swab and instrument count for the procedure. Prepare a dish with the cleaning solution you will be using; either chlorhexidine or povidone-iodine.



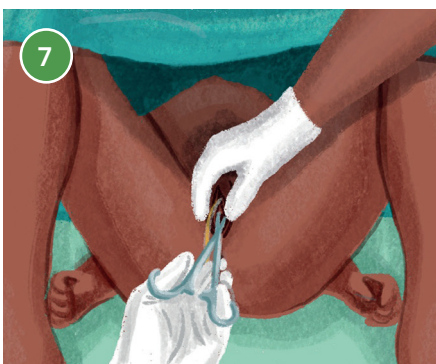
Put on an apron, perform hand hygiene and put on surgical gloves.



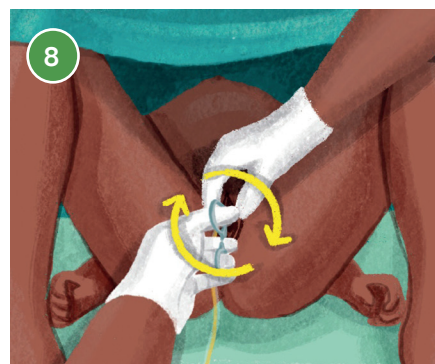
Pick up the gauze swab with the sponge holder, soak the gauze swab in cleaning solution.



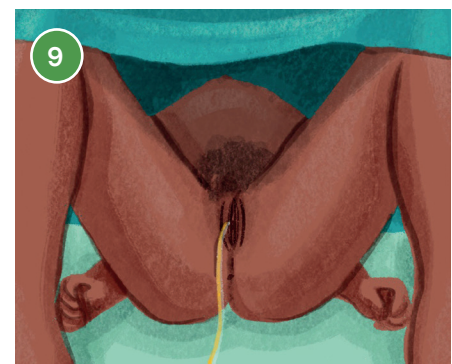
With one of your gloved hands, gently spread the labia apart and open the vagina.



With your other gloved hand, carefully insert the forceps and gauze to reach the level of the cervix.



Gently rotate the forceps and gauze for 30 seconds, ensuring coverage of the cervix and upper vagina.



Remove the forceps and dispose of the gauze appropriately (remember to include in the swab and instrument count): the patient is now ready to proceed with abdominal skin preparation and draping.

Antibiotic Prophylaxis:

The use of prophylactic antibiotics helps to improve the body's defence against infection. Module 2a includes training on the evidence-based indications for antibiotic prophylaxis and the best regimens to use. These are recommendations by the WHO and the Ministry of Health which we must follow. These regimens are carefully chosen to balance between effective prophylaxis and reducing the chance of developing antibiotic drug resistance if we use antibiotics too often.



The prophylactic use of antibiotics in pregnancy and childbirth has been shown to reduce infections and improve outcomes: it is the use of antibiotics to prevent infection, rather than to treat infection. The WHO have made the following recommendations on when prophylactic antibiotics **MUST** be used.

Times to use prophylaxis – as per WHO guidelines

- ✓ Emergency or elective caesarean section, 15–60 minutes prior to skin incision
- ✓ Manual removal of the placenta
- ✓ Operative vaginal birth (i.e. vacuum or forceps)
- ✓ When there is a 3rd / 4th degree tear
- ✓ Preterm pre-labour rupture of membranes
- ✓ Confirmed Group B Streptococcus (GBS) colonisation
- ✓ Incomplete abortion or miscarriage surgery (MVA / EVAC / D&C)



It is important that prophylactic antibiotics are used only as recommended. This is because over-use of prophylactic antibiotics can lead to antimicrobial resistance. This is an important problem in many settings and can result in future treatment of infection and sepsis being ineffective. The WHO have made the following recommendations on when antibiotics should **NOT** be used.

Times NOT to use prophylaxis – as per WHO guidelines

- ✗ Preterm labour (<37 weeks) with intact amniotic membranes
- ✗ Uncomplicated vaginal birth
- ✗ Meconium-stained amniotic fluid
- ✗ Episiotomy

▶ Note

Another important way to prevent Antibiotic resistance developing is to ensure that the **correct** prophylaxis is given for the **correct** reason for the **correct** amount of time: giving prophylaxis for longer than necessary can be harmful in the future. These will depend on national guidelines and will be discussed in detail at the in-person APT-Sepsis Programme facility training.



How to treat infections correctly

It is important to understand the most common causes of infection during the antenatal, intrapartum and postpartum periods (including following abortion or miscarriage). If we understand the potential sites of infection, we can look out for symptoms and signs of infection, treat these promptly and avoid the downward spiral to maternal sepsis. We can also appreciate how to prevent infections from occurring in these locations in the first place.

Once there is a clinical suspicion that a woman has an infection, she should be assessed by a healthcare provider with the correct skills to do so. History and physical examination will give more clues as to the source of the infection and an appropriate treatment should be commenced (covered by Module 2b for clinical staff). These recommendations are from the WHO and Ministry of Health and tell us which drugs to use.

Type of infection	Treatment of severe infection	Treatment of non severe Infection
LRTI / Pneumonia	Ceftriaxone 2g IV OD, plus erythromycin 500mg PO QDS if an atypical pneumonia is suspected for 5 days	Amoxicillin 500mg-1g PO TDS or erythromycin 500mg PO QDS for 5 days
UTI / Pyelonephritis	Ceftriaxone 1g IV OD, plus a one-off dose of gentamicin 5mg/kg IV if haemodynamically unstable, until afebrile for 24 hours: then cefixime 200mg PO BD or amoxicillin 1g PO TDS for 10-14 days total	Cephalexin 500mg PO QDS or amoxicillin 500mg PO TDS or ciprofloxacin 500mg PO BD or nitrofurantoin 100mg PO QDS for 5-7 days
Chorioamnionitis / Endometritis	Gentamicin 5mg/kg IV as a one-off dose plus ampicillin 2g IV QDS or benzylpenicillin 2 MU IV QDS for 14 days (endometritis) or until delivery (chorioamnionitis). For caesarean section / fever >48 hours, add metronidazole	Amoxicillin 500mg PO TDS plus metronidazole 500mg PO TDS (endometritis only)
Post-Abortion Complications	Ceftriaxone 2g IV OD plus metronidazole 500mg IV TDS for at least 48 hours: then doxycycline 100mg PO BD plus metronidazole 400mg PO TDS for 7 days total	Doxycycline 100mg PO BD for 7 days plus a one-off dose of metronidazole 800mg PO
Cellulitis / Wound Infection	Ceftriaxone 1g IV OD for 3 days: then: cloxacillin 500mg PO QDS or doxycycline 100mg BD PO for 7-10 days total For perineal or superficial caesarian section wound infections, add metronidazole 400mg PO TDS	Amoxicillin 500mg PO TDS plus metronidazole 400mg PO TDS (endometritis only)
Mastitis	Ceftriaxone 1g IV OD until clinical improvement: then cloxacillin 500mg PO QDS or cefalexin 500mg PO QDS or amoxicillin 500mg PO TDS for 7 days total	Cloxacillin 500mg PO QDS or cefalexin 500mg PO QDS or amoxicillin 500mg PO TDS for 7 days
Bacterial Meningitis	Ceftriaxone 2g IV BD for 10-14 days	Not applicable: always treat as severe infection
Maternal Sepsis of Unknown Origin	Ceftriaxone 2g IV OD, plus a one-off dose of gentamicin 5mg/kg IV if haemodynamically unstable, plus metronidazole 500mg IV TDS	Not applicable: always treat as severe infection

- If the recommended antibiotics are not available, or your patient is not clinically improving after 48 hours, seek medical advice from a senior clinical decision-maker.
- These recommendations are based upon the antimicrobial guidelines from the Ministries of Health in Malawi and Uganda and may change: please consider up-to-date guidance accordingly.

Ward-based tools

The main ward-based tools supporting the prevention and treatment of infection using best practice will be the posters, the APT-Sepsis Pocket Reference and the Gestation Wheel and Antibiotic Guide. The posters will inform and remind about safe practice, antibiotic treatment regimens and vaginal preparation. The APT-Sepsis Pocket Reference, a pocket-sized series of notes that can be easily carried whilst working clinically, will cover similar topics, and also antibiotic prophylaxis. Finally, the Gestation Wheel and Antibiotic Guide will contain treatment regimens for different types of infection as an easy reference whilst working with pregnant and recently pregnant women. Together, these tools will ensure that the necessary information to provide quality infection prevention and treatment in pregnancy and childbirth are always readily available.

Equipment

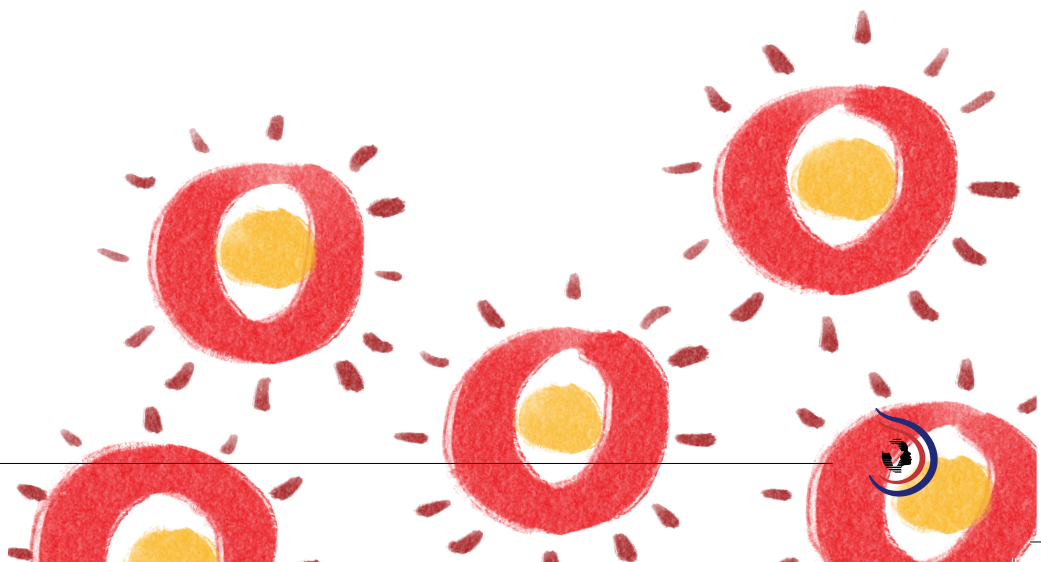
The equipment needed to support the prevention and treatment of infection using best practice is the model pelvises required for the vaginal preparation practical session and the swabs, forceps, sterile gloves and handrub required for the procedure. The vaginal preparation practical will not only teach this practice but also allow healthcare providers to practice the process of vaginal preparation with competency sign-off and certification. The champion will have access to a model pelvis for the duration of the programme to train new staff and to provide refresher training, as necessary.

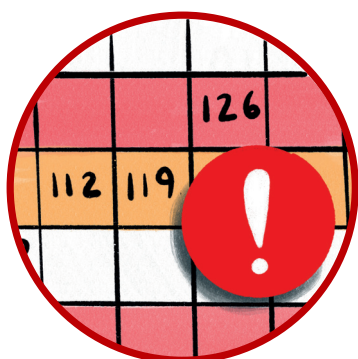


SECTION NINE

Goal 3: Suspect Sepsis, Start FAST-M

This section describes how to achieve the third central goal of the APT-Sepsis Programme





Training objectives helping us to suspect sepsis and start FAST-M:

- To improve skills and knowledge on **rapid recognition** of suspected maternal sepsis
- To improve skills on and knowledge on **correct and urgent treatment** of maternal sepsis

Resources

available to achieve Goal 3: timely sepsis recognition and management

Teaching materials:

- Module 3a and Module 3b slides
- Module 3a and Module 3b flip charts
- FAST-M suite of videos
- MEOWS Chart practical scripts
- Sepsis simulation scripts

Ward based tools list:

- MEOWS Chart
- FAST-M Decision Tool
- FAST-M Treatment Bundle
- Suspect sepsis, start FAST-M poster
- FAST-M Treatment Bundle Poster
- APT-Sepsis Pocket Reference
- Gestational wheel

Equipment:

- Equipment for recording vital signs
- BP Machine
- Thermometers
- Timer
- Fetoscope

Teaching materials and content:

The teaching materials will allow healthcare providers to receive training on the FAST-M approach, learning how to take and record vital signs (the MEOWS Chart) and act quickly to recognise and treat sepsis (FAST-M). Sessions for clinical healthcare providers and non-clinical support staff will be run in parallel, depending on training needs (Modules 3a and 3b for clinical healthcare providers, Modules 3a and 3c for non-clinical support staff).

The teaching materials supporting timely sepsis recognition and management will be slides (PowerPoint), flip charts (available in A4) and four videos, all containing the same core training messages. As with the resources designed to support clean hands at every moment and the prevention and treatment of infection using best practice, these will be available to APT-Sepsis champions for the duration of the APT-Sepsis Programme.

Improve the timely recognition of maternal sepsis

Maternal sepsis is a life-threatening condition resulting from infection during pregnancy, child-birth, post-abortion, or postpartum period: the source of infection can be anywhere in the body, but common sites of infection include the lungs, the urogenital tract, wounds and the central nervous system. When sepsis has developed, dysregulation of the host's response to infection (an overdrive of the body's defence system) leads to a number of changes in how the body is regulated. These changes can be fatal if not recognised and treated early and can also cause long term health problems, such as brain damage and chronic kidney disease.

The MEOWS Chart

To help document and compare observations of vital signs, a chart has been created to record the observations for each patient: the Modified Early Obstetric Warning System Chart (MEOWS Chart). This includes the record of respiratory rate, temperature, heart rate, systolic and diastolic blood pressure, urine output, mental state and general appearance (appearing well / unwell) and, through a colour-coding system, highlights any observations which are worryingly high or low.

Note

- The MEOWS Chart must be used for all admissions
- Vital signs must be entered on the MEOWS Chart at least once every day, and more frequently if the patient is unwell.

First, record the patient's details, the date, the time and your initials.

Carry out the patient's vital signs and write them onto the chart in the relevant box.

Count the number of red and yellow flags and put the number in the box at the bottom of the column.

Action must be taken immediately if the patient has any red flag or two or more yellow flags, using the FAST-M Decision Tool.

1 Patient details section (Name, Date, Time, Initials)

2 Vital signs section (Respiratory rate, Temperature, Heart rate, Systolic blood pressure, Diastolic blood pressure, Urine output, Mental state, General appearance)

3 Summary section (TOTAL YELLOW FLAGS, TOTAL RED FLAGS, FAST-M Decision Tool)

4 FAST-M Decision Tool section



Changing vital signs can be an early warning that a woman is starting to become unwell. It is therefore essential that observations of vital signs are taken and recorded for all patients on a regular basis (at least every twenty-four hours), even if they are feeling stable and appear well. Performing regular observations will save lives by detecting sepsis early.

In sepsis, vital signs can change in the following ways:

	26	28	30	30
21				

The **respiratory rate** can rise as the body needs more oxygen and also uses the lungs to control the body's pH (acid) balance. A rising respiratory rate can be an early sign of infection. In very late disease the respiratory rate can fall as the body is shutting down.

		38.3	38.9
36.8	37.8		

The **temperature** can rise in infection and sepsis, but can also fall lower than normal (below 36 degrees Celsius) in 'cold' sepsis.

			128
	102	118	
89			

The **heart rate** can rise as the body fights infection and sepsis, delivering more blood to the organs that need support. In very late disease the heart rate can fall as the body is shutting down.

120	115		
		92	
			74

The **blood pressure** in infection and sepsis can sometimes remain normal but starts to fall in sepsis as the patient goes into septic 'shock'. A low blood pressure must be managed quickly with fluids, as it is a sign that the body is unable to keep up with demand.

	✓			
		✓		
			✓	✓

The **urine output** can decrease, or even stop, in sepsis as the blood pressure falls and the kidneys do not receive enough support.

✓	✓		
		✓	✓

When the **brain** does not receive enough blood due to low blood pressure, or when bacteria affect the brain or nervous system, patients can have an altered mental state.

✓			
	✓	✓	✓

If a woman looks generally **unwell**, sometimes the problem can be hard to pinpoint: it is important to think whether this can be caused by sepsis.

Vital sign **RED** and **YELLOW** flags: when to be concerned

Abnormal values for the vital signs can be a sign of sepsis: the MEOWS Chart makes sure vital sign observations 'trigger' urgent action. If a patient has any red flags or two or more yellow flags on the MEOWS Chart for a set of observations, the next step is to ensure an urgent review by a clinical decision-maker.

Vital signs	Yellow flags (abnormal vital signs but not as severe as red flags):	Red flags (very abnormal vital signs):
Respiratory rate:	21–24 breaths each minute	25 or more and 10 or less breaths each minutes
Temperature:	38 or more and 35.9 or less degrees Celsius	–
Heart rate:	100–119 or 40–49 beats each minute	120 or more and 39 or less beats each minute
Systolic blood pressure:	140–159* or 90–99 mmHg	160 or more* and 89 or less mmHg
Diastolic blood pressure:	90–109 mmHg	110 or more* and 39 or less mmHg
Hours since last passed urine:	12–18 hours	18 hours or less
Urine output:	–	Less than 0.5ml/kg/hr
Observe the patient:	The patient looks unwell	The patient is not alert

*Although sepsis does not cause a high blood pressure, it still requires urgent attention

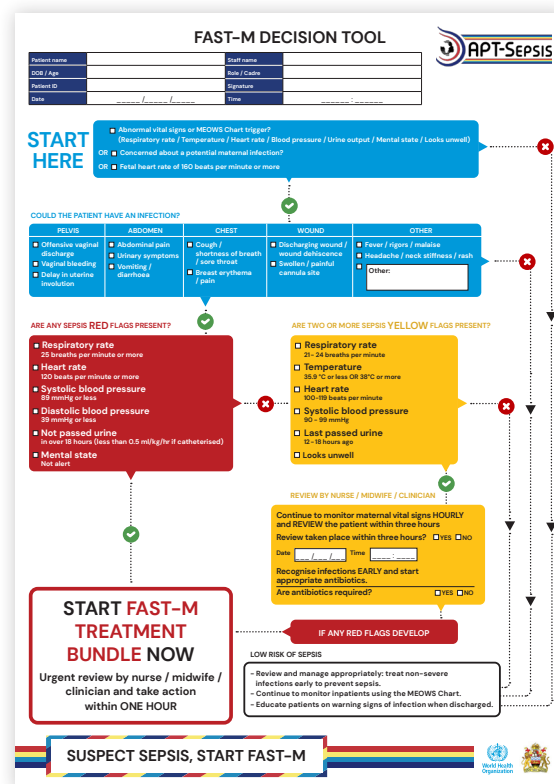


The FAST-M Decision Tool

The FAST-M Decision Tool helps determine if the woman has suspected sepsis and what action should be taken. It should be used when you have found any of the following:

- 1 Abnormal vital signs scoring **ANY RED OR TWO OR MORE YELLOW** flags on the MEOWS Chart.
- 2 You have a concern that your patient might have an infection based on her clinical signs and symptoms.
- 3 The fetal heart rate is equal to or greater than 160 beats per minute.

If one of the above is present, you should start using the FAST-M Decision Tool immediately.



Other Clinical Conditions

The triggering of **ANY RED** flags or **TWO OR MORE YELLOW** flags, caused by abnormal vital signs, followed by an urgent review by a clinical decision-maker can lead to early detection of maternal sepsis: early diagnosis and treatment of sepsis can save lives. However, it is important to remember that vital signs can change for a number of reasons, not only maternal sepsis (such as haemorrhage or pre-eclampsia). Therefore, taking a thorough history and performing a detailed examination is important. **RED** and **YELLOW** flags are important whatever the cause: the early detection of life-threatening causes of abnormal vital signs other than sepsis is a further benefit of the APT-Sepsis Programme.

Note

Conditions other than sepsis can trigger **RED** and **YELLOW** flags on the MEOWS Chart. If there are no signs of infection, consider these conditions as differential diagnoses:



Haemorrhage

Pulmonary embolism

Heart failure

Pre-eclampsia

Hypoglycaemia

Management of suspected maternal sepsis:

If after urgent clinical review and use of the FAST-M Decision Tool a patient is thought to have sepsis, the FAST-M Treatment Bundle of care should be activated. The FAST-M Treatment Bundle is a collection of treatments and actions used to manage suspected sepsis, designed to reduce morbidity and mortality. The FAST-M Treatment Bundle ensures that all components of the bundle are received by the patient reliably.

FAST-M stands for **F**luids, **A**ntibiotics, **S**ource of infection (identification and control), **T**ransfer (to a higher-level healthcare facility if needed) and enhanced **M**onitoring (MEOWS Chart monitoring increased to every 30 minutes until stabilised and fully assessed). Each of these five components make up the FAST-M treatment bundle of care. These treatments and actions should happen within one hour of triggering an urgent review, or as soon as possible: in patients with sepsis, there is an increased risk of death for every hour of delay.¹⁹

FAST-M DECISION TOOL

START HERE

Assessment and history using the FAST-M Decision Tool

FAST-M TREATMENT BUNDLE

F **FLUIDS** (resuscitate in pre-arrest, arrest ongoing and heart failure)

A **ANTIBIOTICS**

S **SOURCE** control (identify and treat the source of infection)

T **TRANSFER** if required (to a different hospital or location that can provide a higher level of care)

M **MONITORING** (MEOWS Chart if not already started and repeat observations every 30 minutes until observations decided by the nurse / midwife / clinician performing the bundle)

SUSPECT SEPSIS, START FAST-M



Note

The following **MUST** be completed within an hour.

Assessment and history using the FAST-M Decision Tool

F

Give **FLUIDS**

A

Give **ANTIBIOTICS**

S

Establish and control the **SOURCE** of infection

T

TRANSFER if required

M

Enhance **MONITORING**

Although it is important the FAST-M Treatment Bundle is delivered urgently in sepsis, sometimes the clinical situation is not simple: for example, fluids can cause pulmonary oedema in cases of heart failure or pre-eclampsia. In these cases, if unsure what to do, it is important to speak to a senior clinician for advice.



Components of the FAST-M Treatment Bundle

F	FLUIDS (caution in pre-eclampsia, severe anaemia and pulmonary oedema)				
	Date	___/___/___	Time started	___:___	Initials
	Details / reason not completed				Give 500 ml crystalloid immediately. Repeat 500 ml boluses to a maximum of 30 ml/kg if hypotension persists

Fluids are life-saving in sepsis. The body's reaction to infection in sepsis leads to many of the blood vessels dilating and a drop in blood pressure. Fluids are supportive: they do not cure sepsis but can significantly improve outcomes. Improving perfusion throughout the body with fluids has many benefits: it means more oxygen delivery to the brain, less strain on the heart and less damage to the kidneys to name a few.

When sepsis is suspected, 500ml of a crystalloid fluid (for example, 0.9% sodium chloride) should be given as a bolus and the blood pressure monitored immediately after. 500ml boluses should be repeated if hypotension persists.

Giving lots of fluid fast can be dangerous in some circumstances so caution should be taken:

In pre-eclampsia

Too much fluid can be dangerous as it can cause pulmonary oedema

In severe anaemia

Fluid can dilute the blood even further: whilst fluid can maintain the blood pressure it must be recognised that an urgent blood transfusion is also needed to correct the woman's anaemia

In heart failure

Too much fluid can lead to pulmonary oedema: maintaining blood pressure is essential but be cautious about giving multiple boluses of fluid

A	ANTIBIOTICS				
	Date	___/___/___	Time started	___:___	Initials
	Details / reason not completed				Give antibiotics. See below for guidance

Whilst fluids are essential for support in sepsis, antibiotics are the key treatment

Urgent administration of antibiotics is essential in suspected sepsis: the risk of death increases the longer treatment is delayed

When first diagnosed with sepsis, it is sensible to start treatment for sepsis of unknown source, whilst you continue your assessment to establish the source: the treatment of sepsis of unknown source is deliberately broad to cover most causes

Note: Treatment for sepsis of unknown source is recommended as ceftriaxone 2g IV OD and metronidazole 500mg IV TDS (or 400mg PO TDS) with additional gentamicin 5mg/kg IV as a one-off dose if the patient has a high heart rate or low blood pressure (haemodynamically unstable).

S	SOURCE control (identify and treat the source of infection)				
	Date	___/___/___	Time considered	___:___	Initials
	Details / reason not completed				Identify and control the source. See below for guidance

After starting urgent treatment for sepsis of unknown source, the source of the infection can be more carefully considered

Some antibiotics do not penetrate every part of the body, and therefore to not always reach the infection

Remember, the antibiotics are in the blood: they do not reach deep into abscesses and sometimes need to be at a high dose to cross into the blood-brain-barrier

In addition, some antibiotics cannot cross from the gut to the blood and vice versa: for example, colitis caused by *Clostridium difficile* cannot be treated by vancomycin IV as it does not get into the gastrointestinal tract

T	TRANSFER if required (to a different hospital or location that can provide a higher level of care)				
	Date & time considered	___/___/___	___:___	Initials	Transport required <input type="checkbox"/> YES <input type="checkbox"/> NO
	Date & time requested	___/___/___	___:___	Initials	<input type="checkbox"/> N/A
	Date & time patient left facility	___/___/___	___:___	Initials	<input type="checkbox"/> N/A
	Destination				
	Reason for any delay				

Sometimes a woman will need a higher level of care that can be provided in your department or healthcare facility

It is important to consider early on whether she should be referred to a different ward or healthcare facility to receive the correct care, including surgery, intensive care and high dependency unit support

This assessment should not be a one-off: reassess whether your patients need transfer with every clinical review

M	MONITORING (start MEOWS Chart if not already started and repeat observations every 30 minutes, until otherwise decided by the nurse / midwife / clinician performing the review)		
	Date & time monitoring commenced:	___/___/___	___:___
	Maternal / fetal monitoring should include:	<ul style="list-style-type: none"> Respiratory rate Temperature Heart rate Blood pressure Urine output Mental state Fetal heart rate 	
	Neonatal monitoring and review commenced:	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	

Patients with suspected sepsis should continue to be monitored on a regular basis, at least until they start to improve

We recommend patients being managed with the FAST-M Treatment Bundle are monitored at least every 30 minutes, until a clinical decision-maker (nurse, midwife, clinician) decides otherwise

Once improving, the monitoring can be spaced out appropriately until it is safe to return to normal daily monitoring (for example, every 2 hours for 8 hours, then every 8 hours for 24 hours)



Ward-based tools

The main ward-based tools available to support timely sepsis recognition and management will be the documents needed to measure vital signs on the wards (the MEOWS Chart) and deliver FAST-M: the FAST-M Decision Tool and FAST-M Treatment Bundle. All will be available in colour, as well as a black and white version to allow for local printing.

Two FAST-M posters will also be available throughout the delivery of the APT-Sepsis Programme, providing wall-based guides for the recognition and management of maternal sepsis.

Equipment

The equipment needed to support timely sepsis recognition and management are those required for taking vital signs: a vital sign set includes a stethoscope, a digital or manual sphygmomanometer, a digital thermometer (either for the skin or axilla) and a phone / watch able to measure seconds. Clocks should also be available on the wards if possible to help establish the time that has passed since a patient has been triggered for urgent assessment. There should also be a reliable supply of batteries.



SECTION 10

Glossary

APT-Sepsis	Active Prevention and Treatment of Maternal Sepsis
BD	Twice daily
COM-B	Capability, Opportunity, Motivation, Behaviour
CS	Caesarean section
FAST-M	Fluids, Antibiotics, Source, Transfer, Monitoring
g	Grams
IPC	Infection Prevention and Control
IV	Intravenously
MEOWS	Modified Early Obstetric Warning Score
Mg	Milligrams
MHHIS	Multimodal Hand Hygiene Improvement
OD	Once a day
PO	Orally
STAT	Immediately
QDS	4 times a day
TDS	3 times a day
USB	Universal Serial Bus
UV	Ultraviolet
WHO	World Health Organization



[illegible]



For more APT-Sepsis Programme resources,
visit www.apt-sepsis.org



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.

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