SUPPORTING NOTES FOR IN-PERSON MANDATORY TRAINING SLIDES

Slide 2:

- Cert available for Face to Face HSELanD presentation / programme

Slide 3:

- NCG No. 26 applies to all adult patients including pregnant women and women in the postnatal period up to 42 days, in the acute hospital sector
- A National Sepsis Report is published annually based on the HIPE dataset. Refer to the National Sepsis Programme website to access most recent report https://www2.healthservice.hse.ie/organisation/sepsis/clinical-resources/

Slide 4:

- Surviving Sepsis Campaign Guidelines adopted by National Sepsis Team in 2016 (SSC - Surviving Sepsis Campaign Guidelines updated in 2021. However, during Covid 2021 – 2023, the National Sepsis Team was redeployed).
- In 2024 the Surviving Sepsis Campaign guideline changes (2021) were reviewed and literature search with HSE library. Changes finalised and rapid update of National Clinical Guideline completed in August 2025. Guideline launch on Sept 1st 2025 with 5 key changes.

Slide 6:

- 1 in 5 patients will die from sepsis
- 1 in 3 will die from septic shock.
- National sepsis report 2024 …..updated on HSE website each year. National Sepsis Report 2024

Slide 8:

- The body's normal immune response to infection has been highlighted.
- With sepsis, the immune response continues and becomes dysregulated causing systemic inflammatory response, vasodilation, capillary leak, impaired clotting and organ dysfunction.

Slide 9:

- Pathophysiology of sepsis. A schematic outline of the critical switch from infection to sepsis. There is an exaggerated host immune cell response stimulating the complement system (a cascade of proteins that enhance the immune response) and collaterally damaging the endothelium and microvasculature leading to new onset organ dysfunction, multi organ failure and death if untreated. This is when a patient with a suspected or confirmed infection starts to display signs and symptoms of sepsis (red flags). Early recognition and treatment is required for optimal patient outcomes. Sepsis is a time dependent medical emergency.
- **ARDS** - acute respiratory distress syndrome
- **EWS** - early warning score
- **SOFA -** sequential organ failure assessment.

Slide 10:

- **Respiratory Rate**: Raised respiratory rate can often be the first sign of deterioration in a patient's condition.
- **Mental status**: Sepsis can cause confusion, drowsiness, slurred speech, unresponsiveness, agitation, aggression (often in younger patients) or a change in behaviour.
- **Temperature**: **N.B – Immunocompromised and older persons may not have an adequate immune response to produce a fever**Therefore, we do NOT wait for pyrexia to take blood cultures. Patients can have hyper, hypo or normal temperature.
- **Kidneys:** Sepsis can lead to acute kidney injury (organ dysfunction) and results in decrease or absence of urine output
- **Pain:** Severe unexplained pain or discomfort may be a symptom of sepsis

Slide 12:

- It is important to listen to the patient and/or their family if they have concerns that their condition is deteriorating. Consider the soft signs for older adults – change in behaviour, hypoactive, less communicative, not eating, not dressing etc.

Slide 13:

- Front page is for sepsis screening, back page is for treatment (Sepsis 6).

Slide 15:

- Using the sepsis form supports clinicians to identify symptomatic or high-risk patients who require an earlier medical review to decide whether the Sepsis 6 OR Sepsis 6+1 treatment bundles are required.
- The sepsis form does not supersede ***clinical judgement***.
- EMEWS chart has not yet been updated to reflect red / amber flag change.

Slide 17:

- When escalating to medical team, it is important to communicate 'Concern' about the patient, that Time Zero has commenced as well as red / amber flags triggered
- Medical review will be completed during that hour from Time Zero.

Slide 19:

- **For a patient who presents in shock where no information is available to rule in or out infection, this needs to be treated as possible septic shock and needs antimicrobials within 1 hour (follow the red flag pathway).**
- **RED FLAG**: If any one Red flag present, this is **Probable Sepsis** and immediate action is required, Inform senior decision-maker and complete the sepsis bundle within 60 minutes of Time Zero.
- **AMBER FLAG:** If ≥ 2 SIRS are present plus ≥ 1 comorbidities, the patient meets the criteria for **possible sepsis**. 3-hour window to review blood tests and other investigations to determine infective versus non infective cause of illness. If no evidence of infection, patient does not require antimicrobials at this time. If infection is confirmed, give antimicrobials within 3 hours of Time

Zero. If infection AND organ dysfunction are evident, antimicrobials are given ASAP and you no longer have a 3-hour window for same as this is evidence of sepsis.

- **EXITING THE PATHWAY**: The sepsis pathway may also be exited for a patient with amber flags if, following medical review, infection is deemed not likely to be the cause of the illness following clinical exam and the patient is treated as per their diagnosis. The patient should continue to be monitored and rescreened for sepsis if concern for infection and triggers recurs.
- **NB: The patient may start on the amber pathway but, if deteriorates, can move to the red pathway**

Slide 19:

- The MBRRACE (Mothers and Babies Reducing Risk through Audit and Confidential Enquiries) report ,October 2024, identifies several groups of women who are at a higher risk of mortality from sepsis. MBRRACE-UK Maternal MAIN Report 2024 V2.0 ONLINE.pdf
- High risk groups as outlined in NCG No. 26
- Need to consider Acutely altered mental status if there is new or worsening confusion, drowsiness, slurred speech, unresponsiveness, agitation, aggression or a change in normal behaviour.
- Be alert for mottled pale skin with prolonged capillary refill time, non-blanching rash or jaundice is present

Slide 21:

- The only other way to exit the pathway is if it is not deemed appropriate

Slide 23:

- Blood cultures x 2 recommended by SSCG 2018 and NCG No. 26 as best practice. 50% Blood culture positivity rate only in sepsis. Increased blood culture volume increases likelihood of positive culture result (at least 10mls each per aerobic and anaerobic bottles).
- Consider additional cultures as indicated and maternity specific cultures e.g. High Vaginal Swab (HVS).

Slide 25:

- Caution with fluid resuscitation bolus volume used in pre-eclampsia.
- Consider microbiology review early if patient not responding to treatment.
- Not all patients will need antimicrobials. Patients with **probable sepsis** should receive antimicrobials within one hour.
- Patients with **possible sepsis** should have all bloods taken in the first hour and then reviewed and antimicrobials should be given within 3 hours if there is evidence of infection. If there is no evidence of infection, tick the box “This patient does not require antimicrobials at this time”.
- Not everyone needs antimicrobials and therefore, a system to identify probable vs possible sepsis may avoid the requirement to give antimicrobials to all patients in the first hour and therefore reduce risk of antimicrobial resistance.

- Regarding the tick box "Patient already on appropriate antimicrobials" consider reviewing culture and sensitives i.e. urine/sputum sent to the lab and speaking to the consultant microbiologist.

Slide 26:

- This slide clarifies that all elements of the sepsis 6 should be completed within 1 hour EXCEPT for antimicrobials. Red flag (probable sepsis or septic shock) – antimicrobials immediately or within 1 hour. Amber flag (possible sepsis) – antimicrobials within 3 hours if infection confirmed or strongly suspected following rapid investigation of cause of illness.

Slide 27:

- The Surviving Sepsis Campaign 2021 recommends balanced crystalloids over normal saline for fluid resuscitation in sepsis, as recent evidence shows they can reduce major adverse kidney events (MAKE) and in-hospital mortality.
- Normal saline has a high chloride content (154 mmol/L) and the lack of buffer can lead to hyperchloremic metabolic acidosis, vasoconstriction of renal vessels, and possible impairment in renal function in some settings.
- Balanced crystalloids reduce the chloride load by substituting in acetate, lactate, gluconate, or other buffers, making their electrolyte composition more physiologic.

Slide 28:

If **probable** or **possible** sepsis is suspected, the senior decision maker must be informed:

- If the patient is not responding clinically to treatment
- If the patient is critically ill and complex
- If the patient is pregnant or post-partum and diagnosed with sepsis

Other specialist involvement may also be needed, such as that of a consultant microbiologist or anaesthesiologist or interventional radiologist(source control)

Slide 28:

- Table of new onset organ dysfunction above is used as a tool in the clinical setting / at patient's bedside. Presence of ≥1 organ dysfunction following completion of Sepsis 6 is evidence of organ dysfunction. N.B – Initial lactate ≥2 should have a repeat point of care lactate taken to assess the patient's response to fluid resuscitation
- SOFA score generally used by ICU to determine organ failure. (Table on slides is useful for clinicians at the patient's bedside).

Slide 28:

- HIPE = Hospital In-Patient Enquiry system. Every chart is coded on discharge for all treatments, diagnoses. International Classification of Diseases 10AM (ICD 12th edition) published in January 2024. Coding is based on the medical diagnoses in patients' charts. Useful guidance in the FAQs on HSE website.

- Urosepsis, respiratory sepsis, biliary sepsis, uterine sepsis etc will all be coded by HIPE as infection only.
- In order to have a sepsis diagnosis coded by HIPE, there must be documentation of the infection + sepsis should be documented as per von table above ie **UTI and sepsis** or **sepsis secondary to UTI** etc

Slide 31:

- Activity based funding (ABF) is an approach (and new funding model being implemented over the next few years to enhance the costing and pricing of hospital service) which seeks to incentivise providers to be as efficient as possible by funding them for the activity that they are asked to deliver, rather than funding them by way of block budgets regardless of activity levels.
- In the hospital scenario above, prices are set for a combination of diagnoses and procedures which occur in a patient episode based on the actual cost of the care provided, with the complexity of care factored into the cost, as more complex care involves more staff, more time, more medical and surgical supplies, etc.

Slide 33:

- Informing pt of diagnosis is very important.
- Several patient partners report being told by GPs that they had sepsis in hospital.
- A sepsis diagnosis may help to explain tiredness, fatigue, muscle weakness, clouded thinking, memory loss, anxiety, difficulty concentrating or difficulty sleeping on discharge.
- **A previous sepsis diagnosis increases the patient's risk of redeveloping sepsis within 1 year of a previous sepsis diagnosis.**

Slide 37:

- **Question 1**.Yes, Niamh has suspected infection (leg wound and swollen, painful calf) and sepsis triggers (looks sick, elevated EMEWS)
- **Question 2**. Rosa should start the sepsis form, identify and document the sepsis triggers and time zero (13.30) before escalating to ED SHO for immediate medical review and inform the nurse in charge. She should then proceed to assess Niamh for the presence of red or amber flags to identify probable or possible sepsis. Rosa should retriage Niamh to a MTS Cat 2 (additional sepsis trigger) based on Niamh's clinical deterioration.

Slide 38:

- On sepsis screening Rosa identifies that Niamh has no red flags but has an amber flag due to presence of 2 SIRS (RR and HR) and a co morbidity (DM) which indicates possible sepsis.

Slide 39:

- Dr Smyth reviews Niamh immediately and completes a full patient assessment, takes a medical history and screens for red and amber flags. Both Dr Smyth and

Rosa agree that Niamh has amber flag for possible sepsis with suspected cellulitis of right lower leg and proceeds to immediately start the sepsis 6.

- They discuss the possible differential diagnosis of DVT and Dr Smyth orders a doppler ultrasound, d-dimer levels and measurement of both calves.
- Dr Smyth completes the sepsis screening section of the sepsis form, documents the patient assessment in the clinical notes and informs the ED registrar who agrees the plan of care for Niamh.

Slide 40:

- **Sepsis 6 commenced immediately. Take 3**. 2 sets of blood cultures, routine bloods including a Point of care (POC) lactate and commences an intake and output chart to monitor Niamh's urinary output. Initial POC Lactate **2.4mmols/L**. **Give 3-** CSL 500mls IV fluid bolus prescribed and given over 15 minutes. SpO_2 95% in room air, supplemental oxygen not required at this time.
- Repeat lactate taken after the 1stbolus of fluids = 2.1 mmol/L which is still elevated but reducing. Suggest administering another fluid bolus following clinical assessment of response to fluid bolus i.e. are there still signs of tissue hypoperfusion.
- Blood results sent urgently and results available by 16.00hrs – infection markers raised with evidence of new onset organ dysfunction (platelets 68). Doppler ultrasound out ruled DVT and D dimers normal.
- Broad spectrum empiric antimicrobials administered immediately (within 3 hrs of time zero) following review of test results by Dr Smyth.

  Question:
- **What should the diagnosis be?** Cellulitis of right lower leg with sepsis (new onset organ dysfunction indicated by platelets < 100)

Slide 43:

- Sepsis diagnosis is based on the platelets of 68 x 10^9/L as evidence of organ dysfunction.

Slide 46:

- **Question 1**. Tom should be screened for sepsis as Aoife suspects that Tom may be developing a chest infection due to new cough and increased RR.
- **Question 2.** Tom has triggers for sepsis screening (looks sick and family/clinical concern)
- **Question 3**. Aoife should start the sepsis screening tool, identify and document the sepsis triggers, time zero, date and her name and NMBI pin on the form and escalate patient care immediately to the orthopaedic SHO. Aoife should also inform the in charge nurse and continue to assess Tom for red or amber flags to identify probable or possible sepsis.

Slide 47:

- **Images** – sepsis form with documented sepsis screening triggers. Aoife completes the sepsis screen and identifies and documents that Tom is high risk for sepsis due to recent chemotherapy and risk of neutropenia (red flag).
- Completed ISBAR for escalation of patient care. Communication should emphasise Concern for patient, infection, recent chemotherapy, red flag and time that **time zero** commenced with 1 hr to deliver sepsis 6.

Slide 47:

- Dr Molloy reviews Tom immediately and completes a patient history and medical assessment. He suspects Tom has a LRTI and a red flag on sepsis screening indicating probable sepsis.
- Both Dr Molloy and Aoife agree that all elements of the Sepsis 6 need to be administered within 1 hour of Time Zero (15.00). Dr Molloy completes the sepsis screening tool and informs the medical and surgical reg on call of Tom's probable sepsis diagnosis and increasing INEWS 7 (RR, SpO_2, HR, BP) and discuss and agree the plan of care.
- **Take 3 and Give 3 completed within 1 hour of time zero.** IV fluid bolus 500mls CSL prescribed and administered over 30 mins for increasing INEWS, POC lactate of 2.9 mmols/L, delayed CRT and NPU x 8hrs. Broad spectrum empiric antimicrobials administered IV.

Slide 50:

- Tom required further fluid bolus x 2 due to signs of persistent hypoperfusion and low urinary output.
- A portable CXR identified a left basal pneumonia.
- Dr Smyth informed Tom's oncology team of his condition and requested Microbiology team review.
- Aoife continued to monitor Tom's vital signs closely for response to treatment.
- Blood results identified a new organ dysfunction as Tom's creatinine was raised to 195 micromole/L with oliguria.

Slide 52:

- Dr Smyth documented a diagnosis of left basal pneumonia with sepsis in Tom's clinical notes.
- Organ dysfunction = creatinine of 195micromole/L with oliguria

Slide 54:

- **Q1.** Grace is clinically concerned for Kaitlyn as she is triggering for 2 yellows on IMEWS and is feeling unwell.
- Grace has identified that Kaitlyn has a possible uterine infection based on the foul-smelling bloody discharge and recognises that Katelyn has likely sepsis triggers.

- She should start a sepsis form, document her findings (triggers and time zero) and escalate patient care to the Obs/Gyn SHO using the ISBAR tool.

Slide 55:

- IMEWS completed and sepsis form started with sepsis triggers identified.
- SM Grace requests an immediate medical review for Katelyn using the ISBAR communication tool, reporting that Katelyn has possible infection, sepsis triggers and that time zero has commenced and requires an immediate medical review.
- Grace inform the CMM 2 and proceeds to complete a sepsis screen for Katelyn. 2 SIRs (HR and RR) are identified and Katelyn also has risk factors indicating possible sepsis.

Slide 56:

- Katelyn is reviewed by Dr Helen, Obs/Gyn SHO, who takes a patient history, completes a medical assessment and identifies a probable genital tract infection.
- Helen also identifies that Kaitlyn has not passed urine for the past 12 hours which indicates a new organ dysfunction (red flag) and probable sepsis. She updates Grace on her findings and they agree that the Sepsis 6 needs to be implemented within 1 hour.
- She inserts 2 wide bore cannulas and takes blood cultures, requests a vaginal swab & urine for C&S, blood tests **including POC lactate (2.6mmol/L)** and starts an intake and output chart.
- She prescribes a bolus of IV balanced crystalloids 500mLs/15mins as Katelyn has signs of hypoperfusion and prescribes broad-spectrum antimicrobials. Grace administers both within 1 hr of time zero (10.00).
- Helen completes the sepsis form and informs the Obs/Gyn Reg of Katelyn's condition and they agree a plan of care.

Slide 59:

- Dr Helen documents sepsis secondary to a genital tract infection. Organ dysfunction = repeat lactate 2.2mmol/L and decreased urinary output.