INPATIENT SEPSIS TOOLKIT:

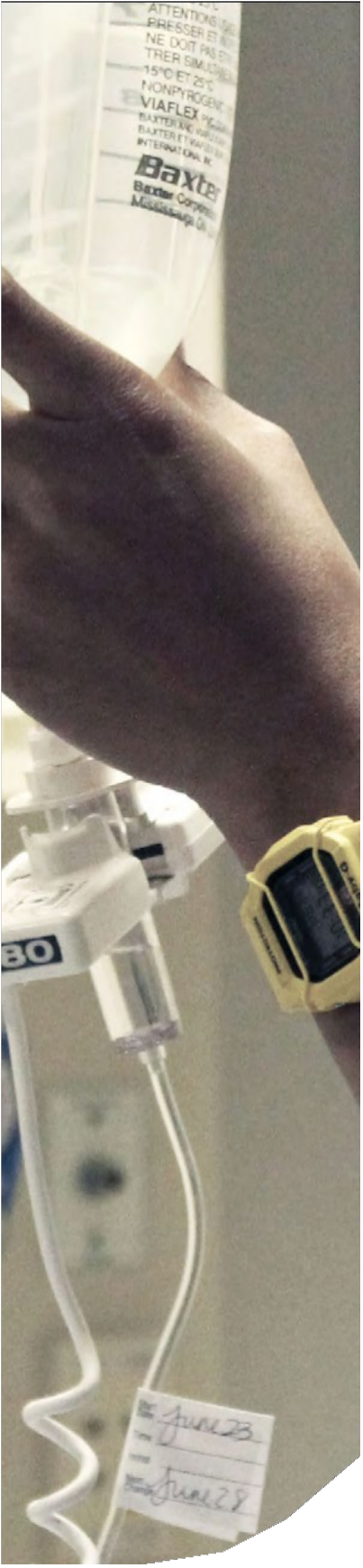
Speed is Life

2022 Update

BC Sepsis Network
BC PATIENT SAFETY & QUALITY COUNCIL

BC PATIENT SAFETY & QUALITY COUNCIL
Working Together. Accelerating Improvement.

Table of Contents



About the Speed is Life Toolkit

This Toolkit aims to provide BC inpatient hospital wards with information, resources, and tools to successfully initiate, implement, and spread best practices for sepsis in adult populations across BC. There are three key components to recognizing and responding to sepsis for inpatients:

1. Timely recognition of early infection.
2. Early treatment with antibiotics and intravenous fluids if required.
3. Appropriate escalation to high-acuity or ICU care.

In 2014, teams from inpatient units in seven hospitals across BC took part in a pilot project to improve sepsis recognition and treatment. Led by the Sepsis Clinical and Quality Lead from the BC Patient Safety & Quality Council, the Sepsis Inpatient Pilot Project began in early 2015. Throughout the project, teams tested screening tools, prescriber order sets, and measurement tools. The Pilot Project culminated in a full day meeting in November 2015 where teams compared data and provided feedback on the testing and validation of these tools. The BC Inpatient Sepsis Improvement Toolkit was created as a resource to help other teams around the province build from this experience and implement best practices in sepsis care for inpatients across BC. This toolkit takes into account recommendations from the most recent version of the Surviving Sepsis Campaign Guidelines 2021[10].

This toolkit is designed for multidisciplinary teams and clinical leaders working in inpatient wards who want to be able to recognize the signs and symptoms of sepsis early and treat it effectively. While knowledge of quality improvement science is helpful when undertaking any change, the toolkit was developed for those without formal training in quality improvement or change management techniques.

This Toolkit includes evidence-based and locally tested tools and resources to:

1. Support clinicians with knowledge and tools for sepsis identification, management, treatment, and escalation of care for adult populations;
2. Reduce avoidable sepsis related morbidity, mortality, and costs; and
3. Improve the quality and safety of care for patients with sepsis.

The resources and tools contained in this toolkit are not exhaustive and sites are encouraged to adapt and build on these resources to suit their local context.

The Rationale for Improving Sepsis Care on Inpatient Wards

Why Is This Important?

Sepsis occurs when the body's inflammatory response to infection injures its own tissues and organs.[1] It is a serious, life-threatening condition that can arise in any patient, in any clinical setting. In Canada, more than 30,000 patients are hospitalized every year because of sepsis and 30% of these patients die from related complications.[2] Patients that do recover from sepsis are more likely to suffer from long-term physical, psychological, and cognitive disabilities.[3]

Sepsis carries a high risk of morbidity and mortality, and yet once sepsis is identified, it has been reported that adequate initial therapy is initiated for fewer than 42% of patients.[1, 4, 5, 6, 7] Prompt recognition and timely management of patients with sepsis in hospital is critical. Evidence suggests delayed treatment is associated with higher mortality rates, significant morbidity, and high costs to the health care system.[1,8] Patients experiencing sepsis often need intensive care and have in-hospital stays nine days longer than an average patient.[2]

In BC hospitals, preventable delays in recognizing and managing sepsis in hospitalized patients can occur due to many different factors. The most common causes of delay are included in the toolbox below.

Toolbox:

- Common causes of delay in recognizing and treating sepsis on BC hospital wards.

Defining Sepsis

New Definitions

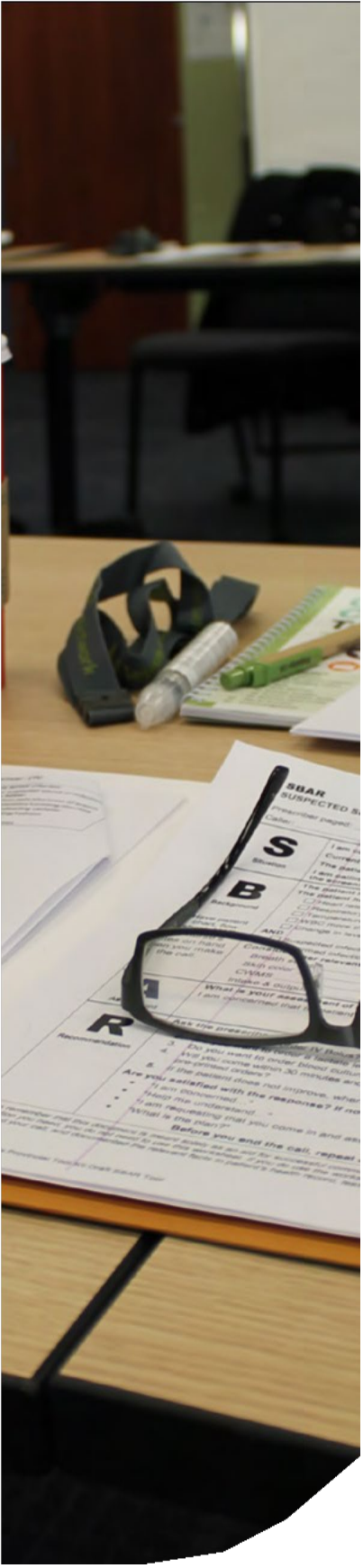
In February 2016, the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) were published in JAMA. The Sepsis-3 task force redefined the definitions of sepsis and septic shock (removing severe sepsis from the definitions) – see table below. The purpose of this work was to improve the clarity of the definitions not only for clinical care of patients but also for epidemiology, quality improvement and research.

New Definition	
Sepsis (replacing severe sepsis)	Life-threatening organ dysfunction caused by a dysregulated host response to infection.
Septic Shock	A subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone.

In April 2016, the BCPSQC prepared a special communication on the consensus definitions for sepsis and septic shock to assist clinicians in understanding some of the key changes. For more information and to understand how the new definitions pertain to our work in BC, read the BC Sepsis Network Special Communication in the Toolbox below.

Toolbox:

- Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)
- BC Sepsis Network Special Communication on the Sepsis-3 Definitions



Getting Started

Connect With Others on a Similar Path

Changing practice is not easy. Learning what has worked well from other teams' experiences and tapping into expert knowledge can help avoid common challenges and pitfalls. Teams can find support through the BC Sepsis Network where you can connect and learn alongside others working to reduce sepsis mortality and morbidity in all areas of the province. Their vision is to 'Stop Unnecessary Sepsis Deaths. Best Care. *No Matter Where*.'

Toolbox:

- Join the BC Sepsis Network

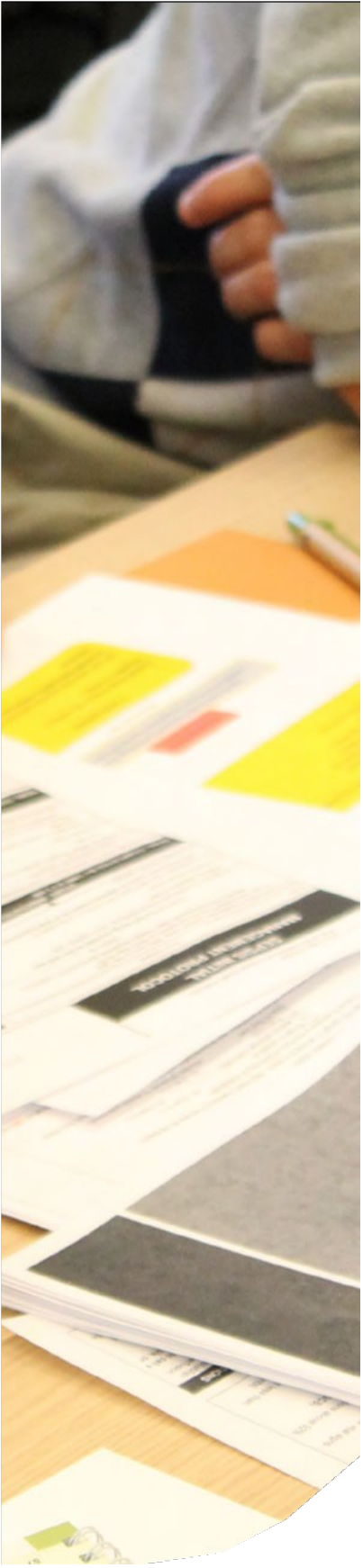
Build a Sepsis Improvement Team

Don't try and go it alone! Get some help by forming a team of people – you'll be more likely to be successful and sustain your change efforts. Diversity is key: include people with different skill sets, knowledge areas, and perspectives. You'll want to include content experts, local leaders, and those whose work might be affected by the changes you'll make. Include patient representatives for their unique and valuable insight. Don't forget to recruit a project sponsor: someone with executive authority who can provide approval for changes, facilitate access to resources, and help overcome barriers. Work with your team to agree on meeting schedules, communication, timelines, actions, and roles and responsibilities.

Beyond your core team, think about your stakeholders: those people or groups you'll need to engage in the project, those who need to be aware of it, and those who need to be involved to help you achieve success. A written stakeholder engagement plan and early communication with them will help you stay on track. Involving a diversity of staff and patients often increases the quality of the new processes or tools, and helps staff become champions of the changes they've helped to create.

Toolbox:

- Plan for Engaging Stakeholders
- Request Patient Representatives to Join Your Improvement Team



Setting an Aim

What Are We Trying to Accomplish?

A written plan for your project - will provide your team with a shared clarity of purpose and expected outcomes, initial ideas for change, ways to measure progress towards goals, and a place to record team roles and responsibilities. Think about your purpose: a good aim statement should be specific and include a target and a time frame. An example might be:

'By October 15th, Surgical Ward 3B will correctly identify and treat hospital-acquired infections 95% of the time'.

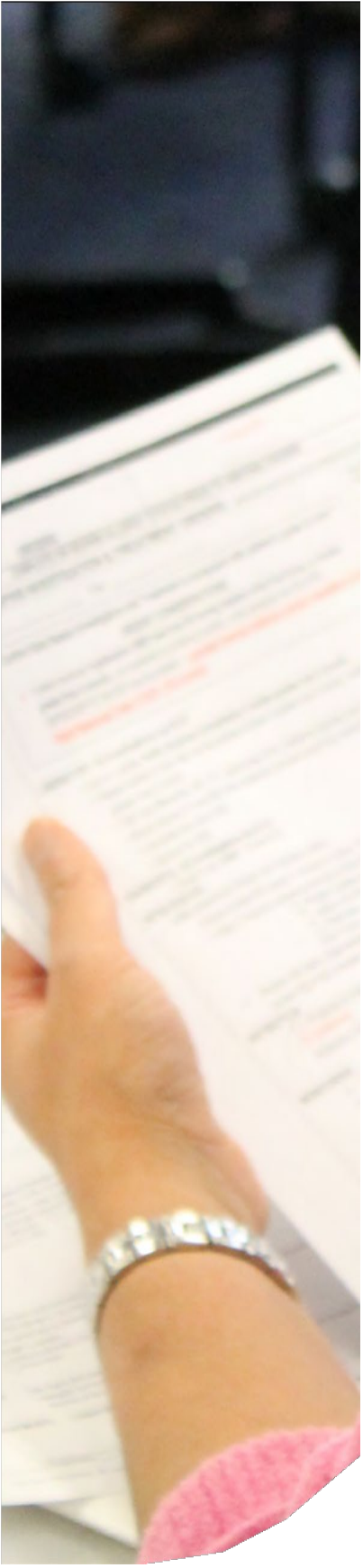
Toolbox:

- Inpatient Sepsis Improvement Plan

Defining Your Scope and Preparing for Action

Consider the scope of what you are trying to achieve – will you begin on one hospital ward and spread to others? Can you look at similar change projects that were successful and mimic their implementation plan? Are there related projects to build from, specific populations to target first, or constraints such as policies or guidelines that need to be followed? Are there staffing or financial resources to tap into?

How will the changes you are implementing affect existing processes or workflows in your organization, such as early warning scores (i.e., MEWS), internal medicine consults, Critical Care Outreach Teams (CCOT), Rapid Response Teams (RRT), or other pathways to escalate the care to a high acuity unit, ICU, or transfer to another facility? Will these pathways need to be included as part of your change processes?



Measuring Your Progress

Measuring Inpatient Sepsis Care

As your team begins to test new tools and processes for recognizing and treating sepsis, a good measurement strategy will help you monitor and evaluate your progress.

Consider starting with some baseline measurement. How often are the signs of sepsis being recognized? Are there reports of missed identification sepsis cases? Do they receive treatment that is recognized as best practice? Is there appropriate escalation of care when required? Knowing where you are starting from will make it easier to determine where and when you are seeing improvement after intervention. Collect data as close to real time as possible and display important variables in a run chart over time. Review data frequently with your team.

Continue collecting data throughout your interventions and changes. Data will help you know how close you are getting to your aim, to learn what is and is not working, to visualize the impact of your changes, and to share your progress with others. Track patient outcomes and consider gathering feedback from staff who are making changes to their workflow and practices.

Looking for patients that were 'missed' is an important part of your quality review and will help you discover processes that need improvement. Consider conducting a time-limited chart audit to look for patients that had sepsis criteria that went unrecognized. Look for patients that deteriorated and required consult or transfer to an intensive care unit that may have benefited from earlier recognition. The toolbox includes a quality review tool to help you stay organized in investigating missed cases of sepsis.

Toolbox:

- Sepsis Cases Data Collection Tool and Definitions
- Missed Case/Incomplete Treatment Quality Review
- Inpatient Sepsis Improvement Staff Survey Tool

Clinical Tools

Screening and Order Sets

We have provided a number of clinical tools to support BC inpatient wards to embed best practices for improving sepsis screening, care, and treatment for both adult and pediatric populations (in regular and clinical teaching units). We encourage you to use these templates and adapt them, through testing, to fit your local context, workflow, and the needs of your patients.

Toolbox:
Clinical tools for adult populations

- Adult Inpatient Sepsis Screening Tool
- Adult Inpatient Sepsis Screening Tool for Clinical Teaching Units
- Adult Early Sepsis Investigation and Treatment Orders
- Sepsis 48-hour Management Plan

"The greatest benefit of using [the inpatient sepsis screening tool and early investigation and treatment orders] is improving patient outcome. Patients who were identified early as being septic using an easy straightforward screening tool, could then receive standard investigation and treatment through a standard order set. We found that when physicians did not use the order set, there were gaps in investigation and treatment. Having an order set helps give standard and consistent sepsis care."

– Feedback from BC Inpatient Sepsis Pilot Project Member

Clinical Tools (continued)

Lactate Testing

Establishing processes for timely lactate testing is important to support identification and management of the deteriorating patient. Ideally, organizations would implement an automatic reporting system for lactate when the lactate level falls outside of a given range. High serum lactate levels are strongly associated with increased mortality in septic patients. Accessing results for formal serum lactate levels may take considerable time in most hospitals. Point of care testing may be available through the ICU or emergency department and could be considered as an alternative process to provide quick access to lactate results.

Communicating Clinical Information Effectively

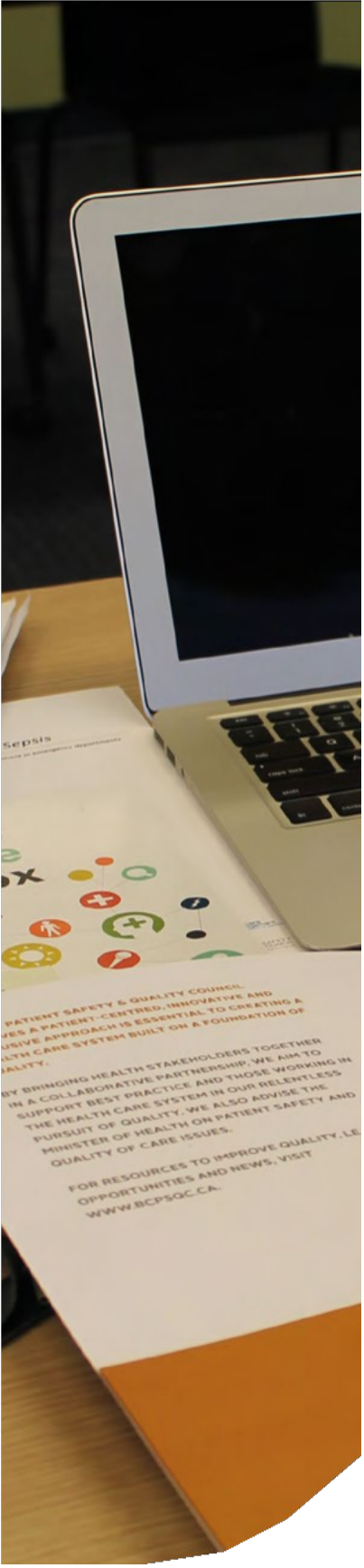
Strong teamwork can reduce adverse events and lead to higher-quality care. Given that communication is the most common factor implicated in adverse events that lead to patient harm, we've included a tool to help you communicate your patient's septic condition to other providers. SBAR (Situation, Background, Assessment, Recommendation) provides a structured and standardized approach for effectively communicating critical information in a way that ensures the message is clear, concise, and complete.

Toolbox:

- Inpatient Sepsis SBAR Tool

"What was most effective for nursing was handing out the small lanyard after the education session, having the Screening Tool printed in color and laminated all over the unit. Our operations director (director of nursing) also emailed the nursing staff and commended the nurses on their recognition of early sepsis and contacting the physician immediately."

– Feedback from BC Inpatient Sepsis Workgroup member after 15-month pilot



Resources for Engagement and Implementation

Engaging Others in Change

Culture is 'the way we do things around here'. It refers to the shared attitudes, beliefs, and patterns of behavior that are ingrained in the way your organization functions. We know that a positive culture is associated with better outcomes for patients and a better experience for providers.[9] Sometimes, teams who are trying to initiative changes come up against culture as a barrier – and it can be incredibly difficult to shift.

We offer several resources to help you enhance communication skills, engage staff in quality improvement, foster innovation and creativity in your team, and shift your organization's culture to one that is receptive to change.

Toolbox:

- Culture Improvement Resources
- Resources to help your team generate creative ideas for change

Implementing and Testing Changes

The 'Plan, Do, Study, Act' (PDSA) cycle provides staff with a simple, structured approach to test, learn, adapt, and improve. New ideas should be tested with a PDSA cycle before they are fully implemented. Consider testing a new sepsis screening tool on a small scale, for example: with one care provider, or just on one ward, or for a small subset of patients. Scale up when you become confident that the change is causing an improvement. PDSA cycles are also a good way for identifying whether or not a tool will work in all conditions, when it won't work, and whether it affects other parts of your system.

Toolbox:

- Tools and Methods to Move from Ideas to Implementation

Sepsis Education

Education is important to initiate a clinical practice change and is also vital to help sustain and spread the change over time. An initial step is to identify the learning needs of different audiences and to tailor education to meet these needs. The strategy will vary in each facility and among professions.

At a minimum, awareness training (key sepsis messages and orientation to the sepsis pathway) for all nursing and medical staff in direct contact with patients is essential. More detailed training can be provided for direct providers and for those teams involved in escalation of care (eg. Outreach teams, ICU, internal medicine, rapid response teams). Evaluation of the education events can be accomplished using site-specific standard pre- and post-education evaluation processes.

Toolbox:

- Inpatient Sepsis Lanyard Card

"In order for patients to receive timely care for sepsis, it is very important for nurses to be educated in early sepsis identification…spending the time to educate nursing at the onset of this project will promote better sepsis competence and better patient outcomes."

– Feedback from BC Inpatient Sepsis Workgroup member after 15-month pilot

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Common Causes of Delay in Recognizing and Treating Sepsis on BC Hospital Wards

From September 2014 to November 2015, seven BC inpatient hospital wards participated in a pilot project to test out tools and processes to increase prompt recognition and management of sepsis. Feedback from this pilot and other studies indicate delays are most commonly related to the causes below.

Engage your staff or team in a discussion: What resonates most with their experiences in your unit? Where might you focus on making changes?

Early Recognition

- Lack of knowledge of sepsis risk factors, signs, symptoms (nursing / physician/ allied health)
- Observations performed infrequently in certain patients which means difficulty in identifying deterioration / signs of sepsis
- Sepsis screening processes
- Rationalize that fever is disease related, not sepsis OR it can't be sepsis as there is not fever
- Staff (nursing / physicians / allied health) do not give high priority to watching for sepsis due to workload and/or lack of knowledge that sepsis is a medical emergency
- Failure to communicate sepsis risk/symptoms in clinical handover between staff or from ED to ward
- Not testing lactate when appropriate to do so
- Stuck in a particular diagnosis and sepsis not considered

Sepsis treatment and management

- No formal process to notify physician of potential sepsis
- No formal escalation process for sepsis
- Wait for investigations/specimens and/or results before escalation to physician or higher level of care
- For surgical patients, surgical teams in OR and unable to respond
- Long delay between call and after-hours physician assessment
- Multiple teams looking after patient – confusion as to who to inform/seek advice
- Basic resuscitation not happening whilst awaiting arrival of physician or escalation of care team (RRT, CCOT, Internal Medicine, ICU)
- Physician not familiar with sepsis pathway or bundle of care
- Fluid resuscitation volume/time for administration not standard
- Staff (nurses/physicians) don't know what/how to give a rapid bolus (fluid challenge)
- Limited understanding of antibiotic prescribing choices/regimes in sepsis or give favored antibiotics
- Wait for results of tests/investigations before commencing/changing antibiotics
- Prescription of antibiotics (writing up) and communication of same with nursing staff
- Nurses don't consider antibiotics as urgent treatment
- Antimicrobial stewardship impacts on antibiotic choices and availability
- Antibiotics given as a slow infusion
- Equipment and resources for sepsis not centralized or available i.e. blood culture bottles, IV set up
- Lack of monitoring of observations and urine output in patients post interventions and sepsis diagnosis

Delays in escalation of care

- Senior physician not sought by resident physician for initial treatment if needed
- Lack of monitoring of observations and urine output in patients post interventions and sepsis diagnosis
- In smaller sites, difficulty escalating care to specialist physician or to another site
- Difficulty with ambulance transfer to another site if needed

Plan for Engaging Stakeholders

Who do we need to engage to make our improvement strategy successful?

Who do we need to engage?	How can we engage with them?	What are we asking them to commit to?

Inpatient Sepsis Improvement Plan

Organization or site:	
Executive sponsor:	Team lead(s):
Team members:	
What are we trying to accomplish?	
Aim statement - What will improve? By when? By how much?	
How will we know that a change is an improvement?	
Measures - What can we track to show us how we are doing?	
What changes can we make that will result in improvement?	
Change ideas - What changes can we test to improve care for patients with sepsis?	
How will we manage our efforts to improve sepsis care?	
Roles and Responsibilities of team members	
Name:	Role/Responsibility
Key dates:	
Plan to incorporate the voice of our patients:	

Sepsis Cases Data Collection Tool

Patient sticker (optional for follow-up)	Facility: Ward: Admitting Diagnosis: Presumed source of infection:	Identified:	Missed*:

If patient was missed, please fill out missed case/incomplete treatment quality review tool

Time 2/5 SIRS criteria met	Time:	Date:
	☐ HR greater than 90/min ☐ WBC greater than 12.0 or less than 4.0 x 10 /L ☐ Temp greater or equal to 38°C or less than 36°C	☐ RR greater than 20/min ☐ Change in LOC
Blood pressure	BP at initiation of PPO =	
	Did systolic BP ever drop below 90mmHg or MAP greater than 65 mmHg? ☐ Yes ☐ No Time:	
Time of recognition of sepsis/ initiation of sepsis PPO	Time: Date:	☐ N/A or PPO not Filled out
Physician response	Time called: Time responded: Time arrived at bedside:	Date: Date: Date:
	Alternative diagnosis made (not sepsis)	☐ Yes ☐ No Dx:
Outreach team called?	Time called: Time arrived at bedside:	Date: Date:
Sepsis bloodwork and lactate measurement	Initial lactate value =	
	Time ordered: Time collected:	Date: Date:
Blood cultures	Prior to antibiotic administration?	☐ Yes ☐ No
	Time ordered: Time collected:	Date: Date:
	Source of Infection? (Were cultures positive? Where?):	
Initial fluid administration	☐ Yes ☐ No	If yes, volume ordered =
	Time:	Date:
Initiation of antibiotics	☐ Yes Which antibiotic was ordered:_____	☐ No
	Time ordered: Time administered:	Date: Date:
Descriptor of Patient Outcome (Discharge, improved, morbidity, ICU, death)		

Sepsis Cases Data Collection Tool (Definitions)

The early identification and treatment of sepsis saves lives. This audit tool is an optional resource for pilot sites for the BC Sepsis Inpatient Pilot project. It is intended for local quality improvement purposes, and we encourage you to adapt to meet your site's needs.

1. **Date:** all dates are in **DD/MM/YYYY** format.
2. **Times:** all times are in **HH:MM** 24-hour clock format.
3. **Patient identifier:** optional unique patient identifier to enable follow-up.
4. **Facility:** facility name.
5. **Ward:** unit/ward name.
6. **Presumed source of infection:** record the presumed source of infection.
7. **Time 2/5 of systematic inflammatory response syndrome (SIRS) criteria met:** record the time when 2 of the 5 SIRS criteria were met: heart rate greater than 90/min, respiratory rate greater than 20/min, temperature greater or equal to 38°C or less than 36°C, WBC greater than 12.0 or less than 4.0 x 10/L or change in the level of consciousness. Also indicate which of the SIRS criteria were met.
8. **Blood pressure:** record the blood pressure at the initiation of the PPO. Also record whether the systolic blood pressure ever dropped below 90mmHg or MAP less than 65mmHg.

   MAP, or mean arterial pressure, is defined as the average pressure in a patient's arteries during one cardiac cycle. It is considered a better indicator of perfusion to vital organs than systolic blood pressure (SBP). True MAP can only be determined by invasive monitoring and complex calculations; however, it can also be calculated using a formula of the SBP and the diastolic blood pressure (DBP) [11]

   $$MAP = \frac{SBP + 2\,(DBP)}{3}$$

   For example, if a patient's blood pressure is 83 mm Hg/50 mm Hg

   $$MAP = \frac{83 + 2\,(50)}{3}$$

   MAP = 61 mm HG
9. **Time of recognition of sepsis:** record date and time of initiation of PPO.
10. **Physician response:** record physician call, response and arrival dates and times.
11. **Sepsis blood work and lactate measurement:** record whether or not blood work was taken. If yes, record the initial lactate value and the date and time it was ordered and collected.
12. **Blood cultures:** record whether or not a blood culture was taken prior to antibiotic administration and the date and time ordered and collected.
13. **Initial fluid administration:** record if fluid was administered. If yes, record volume ordered, date and time.
14. **Initiation of antibiotics:** record if antibiotics were administered and the date and time when they were ordered and administered.

Missed Case/Incomplete Treatment Quality Review Tool

The early identification and treatment of sepsis saves lives. To better understand cases that were missed or had incomplete treatment, the following checklist has been created to help with the quality review process (check all factors that apply). This checklist is intended for local quality improvement purposes, and we encourage you to adapt to meet your site's needs.

Patient Sticker (optional for follow-up)	Facility: Ward: Ward Discharge Disposition:

Task factors	☐ Time/resource pressures ☐ Screening tool and protocol not available, known, or accessible ☐ Information required to make care decisions not available ☐ Vital signs/SIRS were not screened adequately ☐ Signs/symptoms of infection not identified ☐ Other _____
Patient characteristics	☐ Patient age/comorbidities ☐ Language/culture barrier ☐ Other _____
Care team factors	☐ Inappropriate education, experience, training, and skill level ☐ Not suitable workload and/or skill mix ☐ Other _____
Organizational factors	☐ Variability in clinical approach ☐ Culture (such as people did not feel comfortable speaking up) ☐ Communication factor_____ ☐ Other _____
Protocol factors	☐ Screening tool not used ☐ Protocol not used ☐ Protocol partially completed/inaccurate ☐ IV fluids not initiated ☐ Delay in IV fluid initiation ☐ Repeat fluids not administered/insufficient fluids administered ☐ Blood cultures not ordered (2 sets) ☐ Delay in blood culture order ☐ Delay in blood cultures collection ☐ Lactate not ordered ☐ Delay in lactate order ☐ Lactate draw not timely ☐ Repeat lactate not ordered ☐ Delay in order of repeat lactate ☐ Delay in draw of repeat lactate ☐ Blood pressure not monitored ☐ Low systolic blood pressure not identified/managed ☐ Delay in antibiotic administration ☐ Incorrect antibiotic administered ☐ Other _____
Comments:	

Inpatient Sepsis Improvement Staff Survey Tool

Site: Unit/Ward:

The *Inpatient Sepsis Screening Tool* is easy to understand.

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

The *Inpatient Sepsis Screening Tool* is helping me to identify sepsis.

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

***Inpatient Sepsis Screening Tool* comments/suggested changes:**

The *Early Investigation & Treatment Orders* are easy to understand.

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

The *Early Investigation & Treatment Orders* are helping me to identify and treat sepsis.

☐ Strongly Agree ☐ Agree ☐ Disagree ☐ Strongly Disagree

***Early Investigation & Treatment Orders* comments/suggested changes:**

Adult Inpatient Sepsis Screening Tool

Does the patient have any TWO of the following?

- ☐ Heart rate greater than 90/min
- ☐ Respiratory rate greater than 20 breaths/min
- ☐ Temperature greater than or equal to 38°C or less than 36°C WBC
- ☐ greater than 12.0 or less than 4.0 x 10^9/L
- ☐ Altered mental status

↓ AND

Does the patient have a confirmed or suspected source of infection, or any of the symptoms below?

- ☐ Cough/sputum/chest pain/shortness of breath
- ☐ Abdominal pain/distension/vomiting/diarrhea
- ☐ Dysuria/frequency/indwelling catheter
- ☐ Skin or joint (pain/swelling/redness)
- ☐ Central line present
- ☐ Mottled skin, cold extremities

↓ Yes

PATIENT MAY HAVE NEW INFECTION/SEPSIS

Call physician & report assessment & findings. Discuss initiation of Early Sepsis Investigation and Treatment Orders.

Key Interventions:

1. Lab and diagnostics including lactate measurement
2. IV fluids
3. Antibiotics
4. Monitor

↓

Does the patient have a SBP less than 90 mmHg and/or MAP less than 65 mmHg and/or a lactate greater than 2.0 mmol/L?

Call most responsible physician and inform them the patient may have SEPSIS and possible SEPTIC SHOCK and needs IMMEDIATE ASSESSMENT.

Consider escalation of care (internal medicine consult/critical care or rapid response outreach team/critical care consult /transfer ICU)

Adult Inpatient Sepsis Screening Tool for Clinical Teaching Units

Does the patient have any TWO of the following Systemic Inflammatory Response Syndrome (SIRS) criteria?

- Heart rate greater than 90 beats/min
- Respiratory rate greater than 20 breaths/min
- Temperature greater than or equal to 38°C or less than 36°C
- WBC greater than 12.0 or less than 4.0 x 10^9/L
- Altered mental status

Does the patient have a confirmed or suspected source of infection or any of the symptoms below?

- Cough/sputum/chest pain/shortness of breath
- Abdominal pain/distension/vomiting/ diarrhea
- Dysuria/frequency/indwelling catheter
- Skin or joint pain/swelling/redness
- Central line present
- Mottled skin, cold extremities

PATIENT MAY HAVE NEW INFECTION/SEPSIS

Initial triage assessment (by phone or in person)

- Is activation of Early Sepsis Investigation and Treatment Orders consistent with the patient's goals of care (e.g., comfort care only)?
- Should the Early Sepsis Investigation and Treatment Orders be activated (by phone) before the physician can examine the patient?
- **Note:** Patient may have sepsis/septic shock if they have a SBP less than 90 mmHg, and/or MAP less than 65 mmHg, and/or a lactate greater than 2.0 mmol/L
- If any of the above are positive, requires IMMEDIATE BEDSIDE ASSESSMENT
    - Investigations
    - Antibiotics
    - IV fluids

Complete Assessment (in person within 30 minutes)

- Is continuation of Early Sepsis Investigation and Treatment Orders indicated?
- Are any changes to the Early Sepsis Investigation and Treatment Orders required?

Reassessment of Diagnosis & Treatment Plan

- Review results of investigations and reassess diagnosis. Are further investigations required?
- Review response to IV fluids. Are additional IV fluids required?
- Review antibiotic(s) including dose/frequency/duration
- Is consultation required (e.g., ICU, ID, Respirology GI, General Surgery)? Consider ICU consultation if sepsis/septic shock is present
- Is source control required?

Adult Early Sepsis Investigation and Treatment Orders (SAMPLE ONLY)

ORDERS	***DRAFT*** ADDRESSOGRAPH

COMPLETE OR REVIEW ALLERGY STATUS PRIOR TO WRITING ORDERS

EARLY SEPSIS INVESTIGATION & TREATMENT ORDERS: (items with check boxes must be selected to be ordered)

Date:	Time:	

**** Confirm Early Sepsis Investigation and Treatment is congruent with patient's goals of care ****

Time Processed
RN/LPN Initials
Comments

URGENT CONSIDERATIONS

Patient may have sepsis/septic shock if they have a SBP less than 90 mmHg and/or MAP less than 65 mmHg, and/or lactate greater than 2 mmol/L

Call most responsible physician and inform him/her the patient has SEPSIS and possible SEPTIC SHOCK and needs IMMEDIATE ASSESSMENT.

Consider escalation of care
(Internal medicine consult / Escalation of care / Rapid Response Team / ICU consult)

LABORATORY: All investigations are STAT

- Serum Lactate. *Notify physician immediately if lactate greater than 2 mmol/L*
- Repeat lactate 2 hours after the first lactate is drawn if greater than 2 mmol/L. Notify physician of results if greater than 2 mmol/L
- CBC and differential, INR, PTT, electrolytes, BUN, creatinine, glucose, liver function tests, lipase, troponin
- Blood cultures X 2 sets BEFORE antibiotics (include culture from central line, if present)
- Urinalysis and urine C&S
- Sputum for C&S

DIAGNOSTIC: All investigations are STAT

- Chest X-ray *AND* 12 lead ECG

INTRAVENOUS:

Initial intravenous infusion and hydration orders:
Ensure at least #20 gauge IV access is in place. May insert a second IV access as necessary.

- Start IV bolus:
  - ☐ Ringer's Lactate at _____ mL (max 2 L)
  - ☐ Sodium chloride 0.9% (NS) _____ mL (max 2 L)
  - ☐ Plasmalyte _____ mL (max 2 L)

Give IV fluid over _____ minutes (physician to assess post-bolus)

- Repeat vital signs, chest auscultation and documentation prior to and after completion of each fluid bolus, contact MD if any changes in vital signs or clinical status

ANTIBIOTICS:

☐ Physician to initiate appropriate antibiotic therapy within three hours of sepsis identification, if deemed appropriate (see reverse for guidelines)

Antibiotics Orders:

MONITORING:

- Vital Signs and oxygen saturation Q1H X 6H, then Q4H X 12H
- Glasgow Coma Score (GCS) Q1H X 6H
- Monitor urine output if able – May insert a foley catheter as necessary.
- Call MD if any deterioration of vital signs or u/o less than 25 cc/hr (non-dialysis patients)
- Call MD and ICU Outreach team if:
  1. Resp Rate less than 10 or greater than 30
  2. O2 Sat less than 90
  3. Heart rate less than 40 or greater than 140
  4. Systolic BP less than 90 mmHg
  5. Sudden change in LOC
  6. Urine output less than 100 ml in 4 hours

_____	_____	_____
Prescriber's Signature	Printed Name	College ID

Adult Early Sepsis Investigation and Treatment Orders (SAMPLE ONLY)

LOCAL CAUTIONS OR ALERTS GO HERE ALLERGY/INTOLERANCE STATUS INFORMATION		
DATE AND TIME	**EARLY SEPSIS INVESTIGATION AND TREATMENT ORDERS** *(Items with check boxes must be selected to be ordered)*	
	MEDICATIONS:	STAT Antibiotic therapy (If blood cultures delayed by more than 30 minutes, give antibiotics) Reassess after 24 hours based on culture results
	Sepsis any site:	☐ vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** piperacillin-tazobactam 3.375 g IV STAT then Q6H x 24 hours ☐ if beta-lactam allergy with a previously documented anaphylactic reaction: vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** meropenem 500 mg IV STAT then Q6H x 24 hours
	CNS:	☐ vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** ceftriaxone 2 g IV STAT then Q12H x 24 hours ☐ if penicillin or cephalosporin allergy with a previously documented anaphylactic reaction: vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** meropenem 2 g IV STAT then Q8H x 24 hours ☐ if over age 50 or immunosuppressed, add ampicillin 2 g IV STAT then Q4H x 24 hours ☐ if over age 50 or immunosuppressed, AND beta-lactam allergy with a previously documented anaphylactic reaction: add cotrimoxazole 0.3 mL/kg = _____ mL IV STAT then Q6H x 24 hours (each mL contains sulfamethoxazole 80 mg and trimethoprim 16 mg)
	GI or GU source:	☐ piperacillin-tazobactam 3.375 g IV STAT then Q6H x 24 hours
	Skin and Soft Tissue source:	☐ vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours
	Febrile Neutropenia:	☐ vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** cefepime 2 g IV STAT then Q8H x 24 hours ☐ if beta-lactam allergy with a previously documented anaphylactic reaction or ESBL: vancomycin 25 mg/kg (to nearest 250 mg) = _____ mg IV STAT, then vancomycin 15 mg/kg (to nearest 250 mg) = _____ mg Q12H x 24 hours **AND** meropenem 500 mg IV STAT then Q6H x 24 hours
	Community Acquired Pneumonia (CAP):	☐ ceftriaxone 2 g IV STAT then Q24H x 24 hours **AND** azithromycin 500 mg IV STAT then Q24H x 24 hours ☐ if beta-lactam allergy with a previously documented anaphylactic reaction: moxifloxacin 400 mg IV STAT then Q24H x 24 hours
	Other:	
		Prescriber's Signature / Printed Name
		College ID / Pager

Sepsis 48-hour Management Plan

This document is intended for patients who have been recognized as having a new infection and potentially septic and have started on the Early Sepsis Investigation and Treatment Orders. The Sepsis 48 Hour Management Plan aims to guide clinical staff using a step-by-step process which ensures that the patient monitoring and treatment is appropriate.

Time	Action	Criteria	
0-2 hours	Communication	Attending physician informed that patient has activated Early Investigation and Treatment Orders	☐
		Clinical handover must inform the receiving team that the patient was treated with Sepsis Orders	☐
	Monitor and reassess	Monitor and reassess for sepsis deterioration which may include one or more of the following: • Respiratory rate greater than 22 breaths/min • Systolic blood pressure less than100 mmHg • Decreased or no improvement in level of consciousness • Urine output less than 0.5mL/kg/hr • No improvement in serum lactate level	☐
		If deteriorating, consider internal medicine consult/critical care outreach team/critical care consult /transfer ICU	☐
		If improving, continue observations every 30 minutes for 2 hours, then hourly for 4 hours	☐
	Sepsis screen	Head to toe assessment for infection source and initiate investigations which may include:	
		• Diagnostic imaging	☐
		• Urine microscopy/culture	☐
		• Sputum for culture	☐
		• Feces for C. difficile if diarrhea	☐
		• Wound swab for culture	☐
		• Nasopharyngeal swabs	☐
		• Lumbar puncture (if indicated)	☐
	Antibiotics	Appropriate antibiotic prescribing	☐
		Prescribe antibiotics in the medication chart and indicate the appropriate time for dosing	☐
	IV Fluids	Prescribe IV fluids as appropriate. Monitor hemodynamic observations	☐

Sepsis 48-hour Management Plan (continued)

Time	Action	Criteria	
2-24 hours	Continue monitoring	Monitor and reassess for sepsis deterioration which may include one or more of the following: • Respiratory rate greater than 22 breaths/min • Systolic blood pressure less than 100 mmHg • Decreased or no improvement in level of consciousness • Urine output less than 0.5mL/kg/hr • No improvement in serum lactate level	☐
		If deteriorating, consider internal medicine consult/critical care outreach/critical care consult /transfer ICU	☐
		If improving, continue observations every 30 minutes for 2 hours, then hourly for 4 hours	☐
	Repeat lactate	Lactate level 2-4 hours post recognition _____mmol/L **Date:** **Time:**	☐
		Lactate level 6-8 hours post recognition _____mmol/L **Date:** **Time:**	☐
	Fluid resuscitation	Check preliminary blood work	☐
		If patient is neutropenic, review antibiotics and change if needed	☐
24-48 hours	Reassess	Repeat bloodwork as indicated	☐
		Review results of tests and investigations • Discuss with attending physician and treat accordingly • Cease antibiotics if appropriate • Continue monitoring for deterioration including urine output	☐
		Confirm diagnosis and document source of sepsis in medical record	☐

Inpatient Sepsis SBAR Communication Tool

Prescriber paged:
Caller:
Time:

S — Situation

I am calling about: (patient's name and location)
Current diagnosis: _____
The patient's code status is: _____
I am calling because this patient has met the screening criteria for possible sepsis
Indicate if urgent: ☐ Yes ☐No **If urgent, has CCOT been called/consulted?** ☐ Yes ☐No

B — Background

The patient is in the hospital because:
The patient has met the following (2) screening criteria:

- ☐ Heart Rate greater than 90/min
- ☐ Respiratory rate greater than 20/min
- ☐ Temperature 38 ^{O}C or more *OR* less than 36 ^{O}C
- ☐ WBC greater than 12.0 or less than 4.0 x 109/L
- ☐ Altered mental status

AND

- ☐ Suspected infection _____
- ☐ Confirmed infection _____

Consider other relevant clinical information:
Breath sounds _____
Skin colour _____
CWMS _____
Intake & Output _____

Patient Current status:
Heart Rate:
RR:
T:
BP:
O2 Sat:
WBC:
Last C&S done:

Have patient chart, flow sheet, MAR, Sepsis Orders, and nurses' notes on hand when you make the call.

A — Assessment

What is your assessment of the situation?
I am concerned that the patient possibly has sepsis

R — Recommendation

Ask the prescriber:

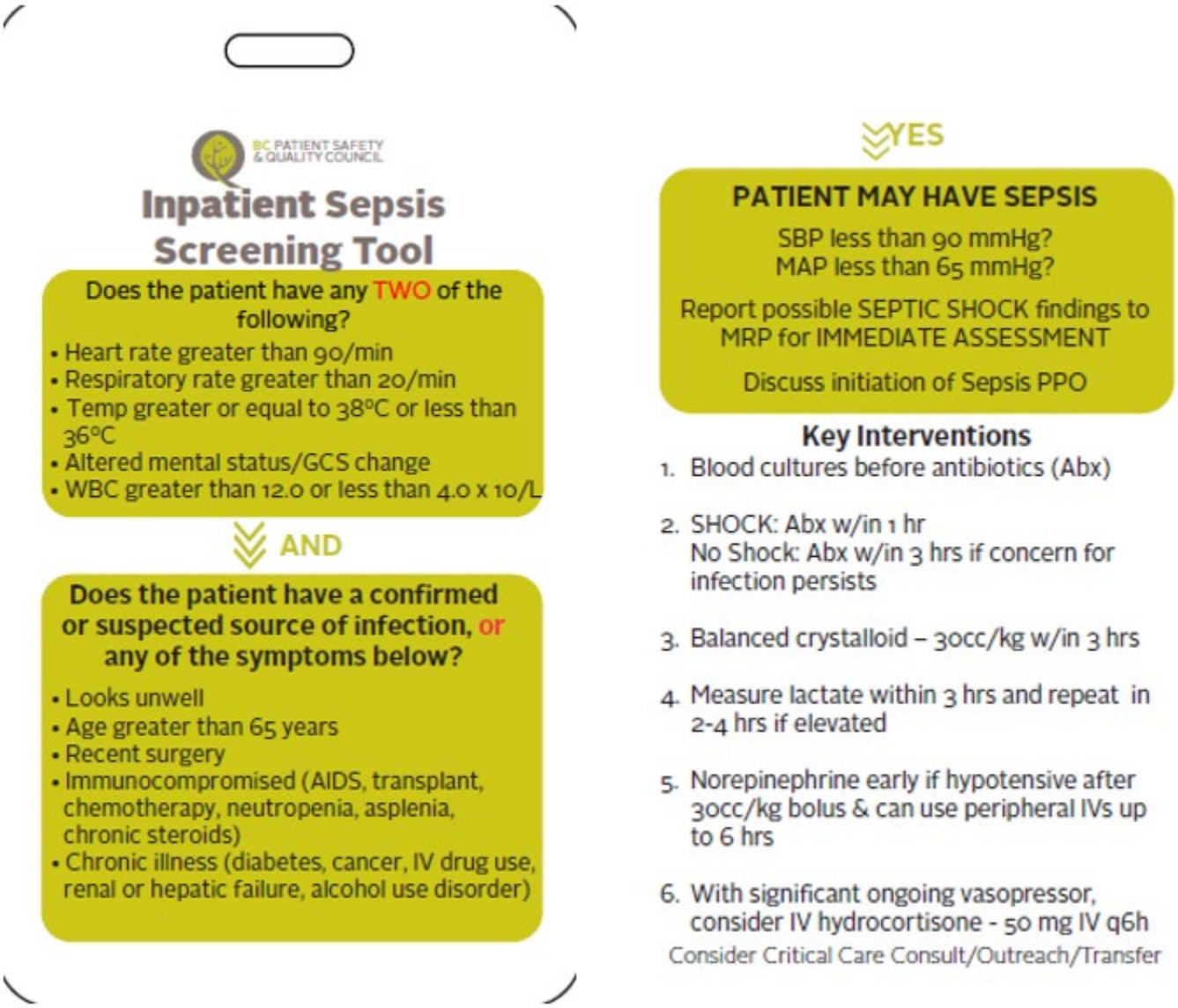
1. Do you want to order IV Bolus?
2. Do you want to order a lactate level?
3. Do you want to order blood cultures?
4. Do you want to order IV antibiotics?
5. Will you come within 30 minutes and assess the patient and complete the Inpatient Sepsis Orders?
6. If the patient does not improve, when should I call you again?

Are you satisfied with the response? If not - Say so

- "I am concerned"
- "Help me understand"
- "I am requesting that you come in and assess the patient"
- "What is the plan?"

Before you end the call, repeat all orders back to the prescriber!

Inpatient Sepsis Screening Tool



Print Instructions:

1. Send Inpatient Sepsis Lanyard Card to a printing service. (On pg. 28 & 29 of this toolkit.)
2. The cards are sized 6.35cm X 12cm and should be printed on thicker cardstock paper (50lb - 100lb) or plastic and in colour.
3. Ask your printer to punch a hole at the top of the card (large enough to thread your lanyard clip).

*Ask for a test proof from your printer before producing multiple copies.
**You may also want to inquire about lamination services.

BC PATIENT SAFETY & QUALITY COUNCIL

Inpatient Sepsis Screening Tool

Does the patient have any TWO of the following?

- Heart rate greater than 90/min
- Respiratory rate greater than 20/min
- Temp greater or equal to 38°C or less than 36°C
- Altered mental status/GCS change
- WBC greater than 12.0 or less than 4.0 x 10/L

AND

Does the patient have a confirmed or suspected source of infection, or any of the symptoms below?

- Looks unwell
- Age greater than 65 years
- Recent surgery
- Immunocompromised (AIDS, transplant, chemotherapy, neutropenia, asplenia, chronic steroids)
- Chronic illness (diabetes, cancer, IV drug use, renal or hepatic failure, alcohol use disorder)

YES

PATIENT MAY HAVE SEPSIS

SBP less than 90 mmHg?
MAP less than 65 mmHg?

Report possible SEPTIC SHOCK findings to MRP for IMMEDIATE ASSESSMENT

Discuss initiation of Sepsis PPO

Key Interventions

1. Blood cultures before antibiotics (Abx)

2. SHOCK: Abx w/in 1 hr
   No Shock: Abx w/in 3 hrs if concern for infection persists

3. Balanced crystalloid – 30cc/kg w/in 3 hrs

4. Measure lactate within 3 hrs and repeat in 2-4 hrs if elevated

5. Norepinephrine early if hypotensive after 30cc/kg bolus & can use peripheral IVs up to 6 hrs

6. With significant ongoing vasopressor, consider IV hydrocortisone - 50 mg IV q6h

Consider Critical Care Consult/Outreach/Transfer