



Sepsis for Skilled Nursing Facilities (SNFs)

Autumn 2022

Objectives

- Define sepsis.
- Recognize basic sepsis pathophysiology.
- Describe the sepsis bundle.
- Implement sepsis early recognition and treatment protocol.
- Recognize post-sepsis syndrome (PSS).



Sepsis Definition

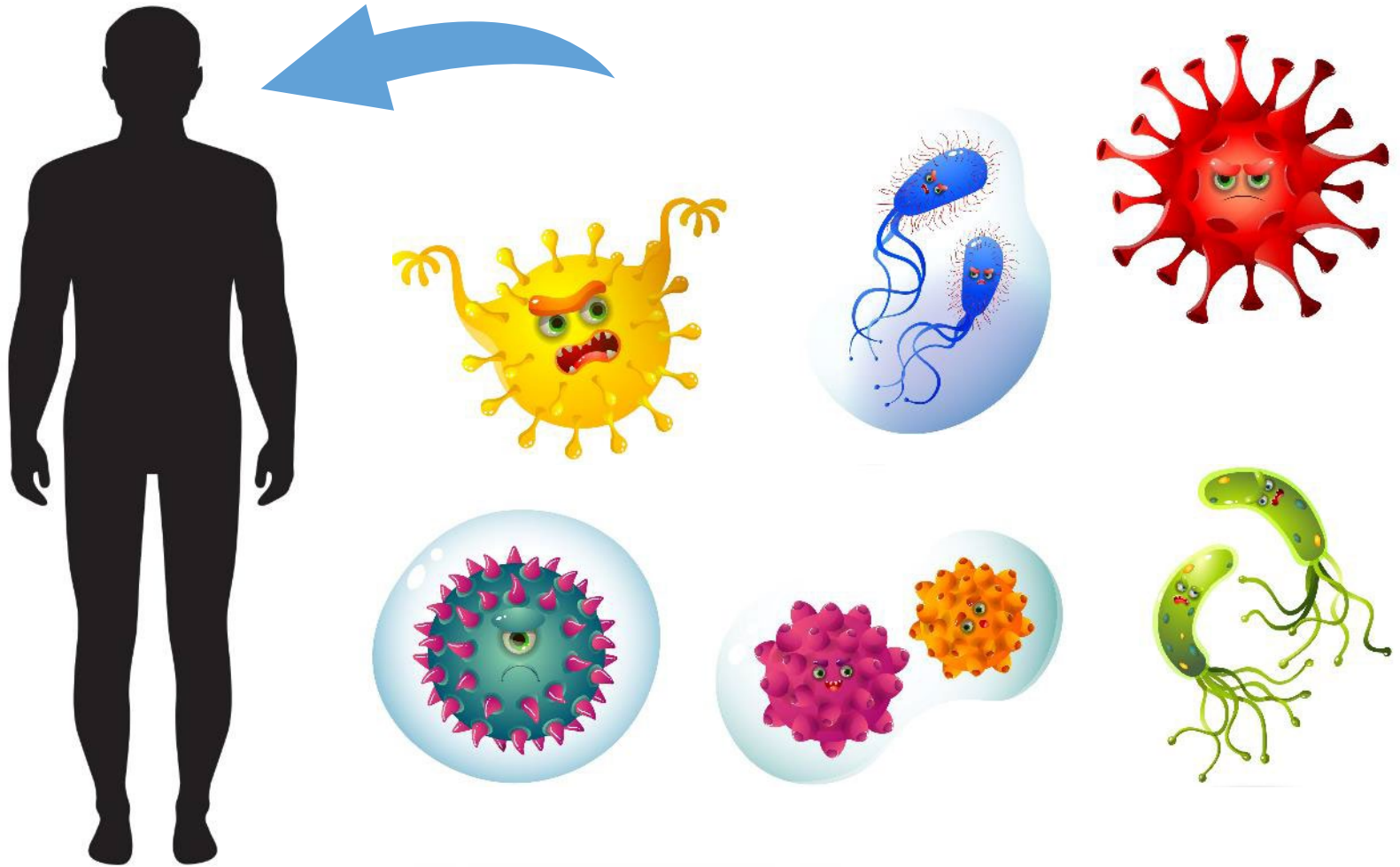
- Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection.*
- Sepsis is a medical emergency. It is not infection; it is the body's overwhelming and life-threatening response to infection. Sepsis can lead to tissue damage, organ failure, and death.

- *Society of Critical Care Medicine. <https://www.sccm.org/Research/Quality/Sepsis-Definitions#:~:text=The%20new%20recommendations%20define%20sepsis,metabolic%20abnormalities%20substantially%20increase%20mortality.>
- Singer M, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)



Simple Sepsis Pathophysiology

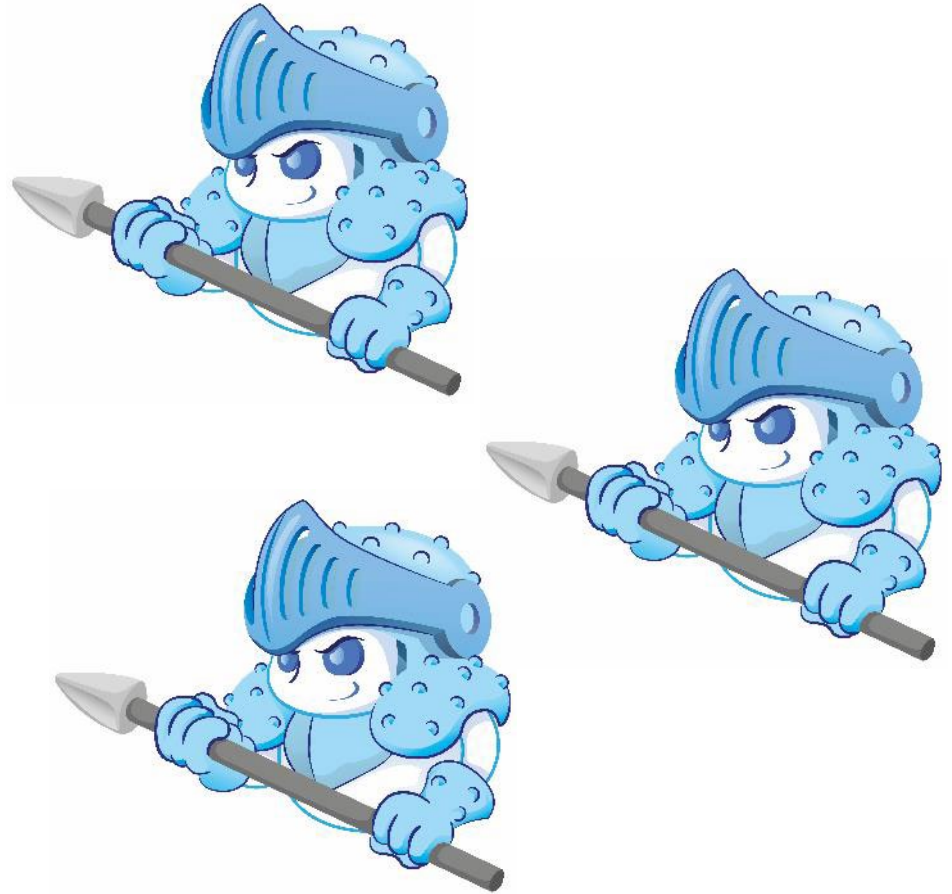
Body Is Invaded by a Pathogen



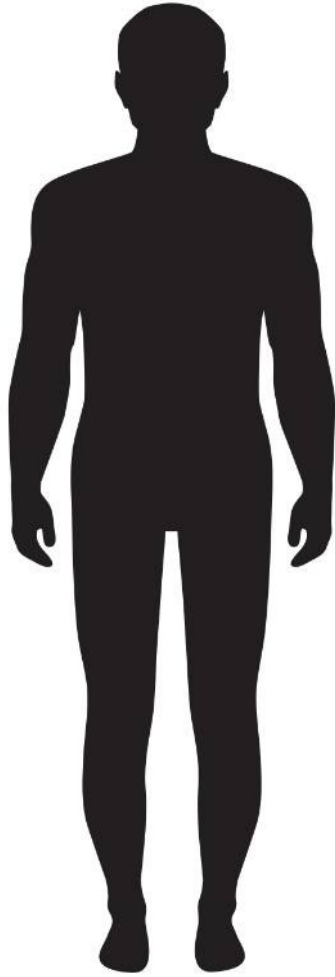
Immune Response Is Triggered

White blood cells increase to kill the invading pathogen, producing inflammatory mediators such as:

- Histamine
- Interferons
- Interleukins
- Tumor necrosis factor



Response to Inflammatory Mediators



- Vasodilation

- Capillary leak

- Blood clotting

Insufficient Blood Flow to Organs



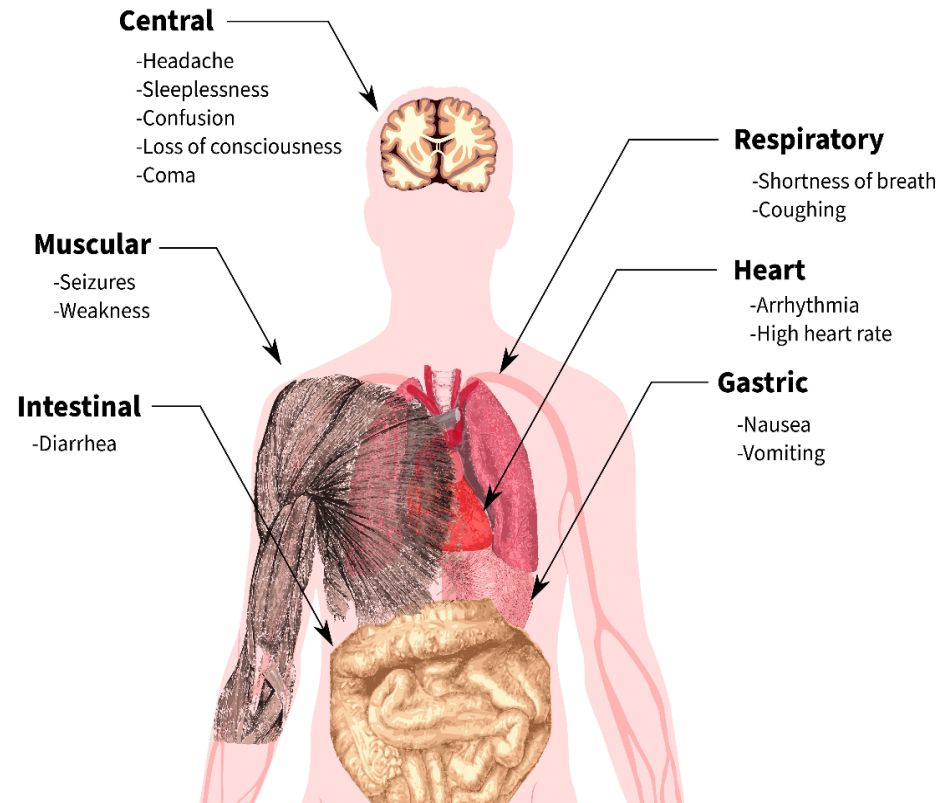
Vasodilation, capillary leak, and blood clotting can decrease blood flow to organs and extremities.

Metabolic Acidosis

Hypoperfused kidneys:

- Cannot get rid of waste.
- Cannot produce enough bicarbonate to balance the pH.
- Will lead to an increase in lactic acid.

Symptoms of acidosis



Septic Shock

- Patients with septic shock can be clinically identified by:
 - A vasopressor requirement to maintain a mean arterial pressure of 65 mm Hg or greater, and
 - Serum lactate level greater than 2 mmol/L (>18 mg/dL) in the absence of hypovolemia.

- If septic shock continues, organs can fail.



Hypovolemia = a condition that occurs when the body loses fluid, like blood or water.

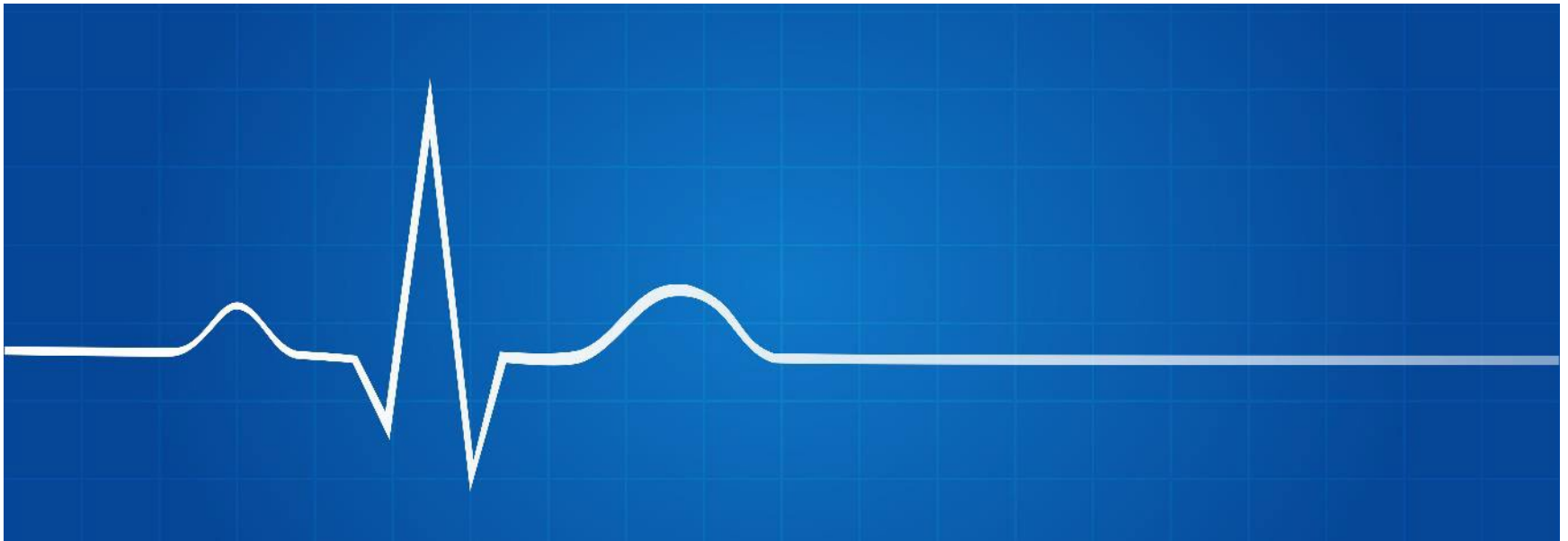
Multi-Organ Failure

- Related to decreased blood flow
- Increases the likelihood of death



Death

- Related to multiple organs failing at the same time
- Cessation of life
- Permanent cessation of all vital bodily functions



Simplified Sepsis Pathophysiology

Body invaded by pathogen



Immune response



Vasodilation, capillary leak, blood clotting



Decreased blood flow to organs



Metabolic acidosis



Septic shock



Multi-organ failure

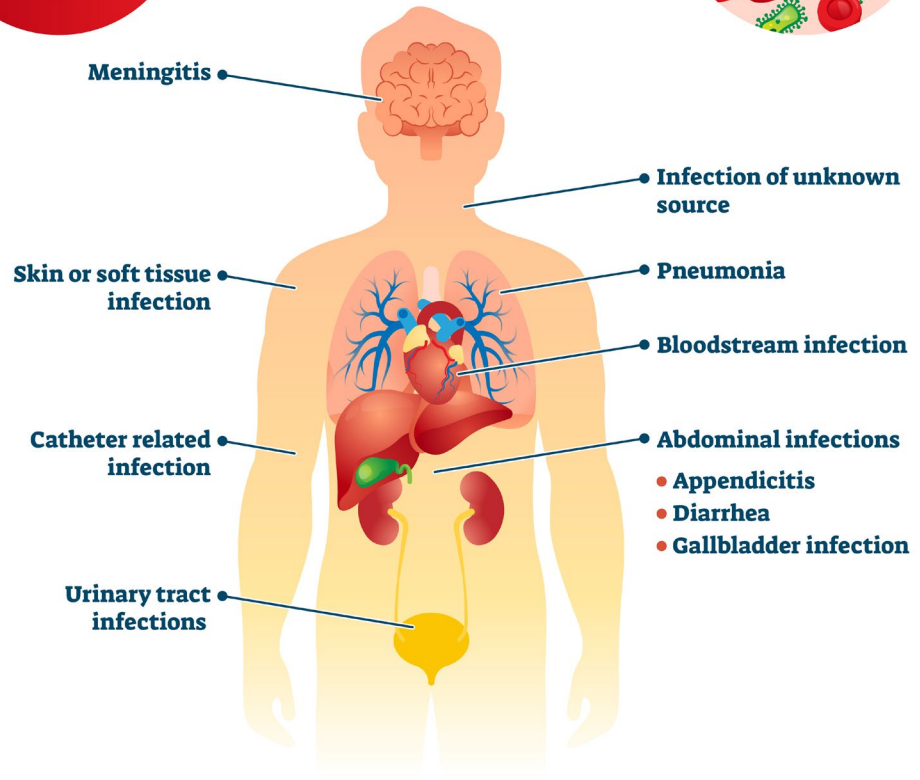
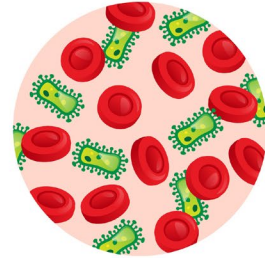


Death

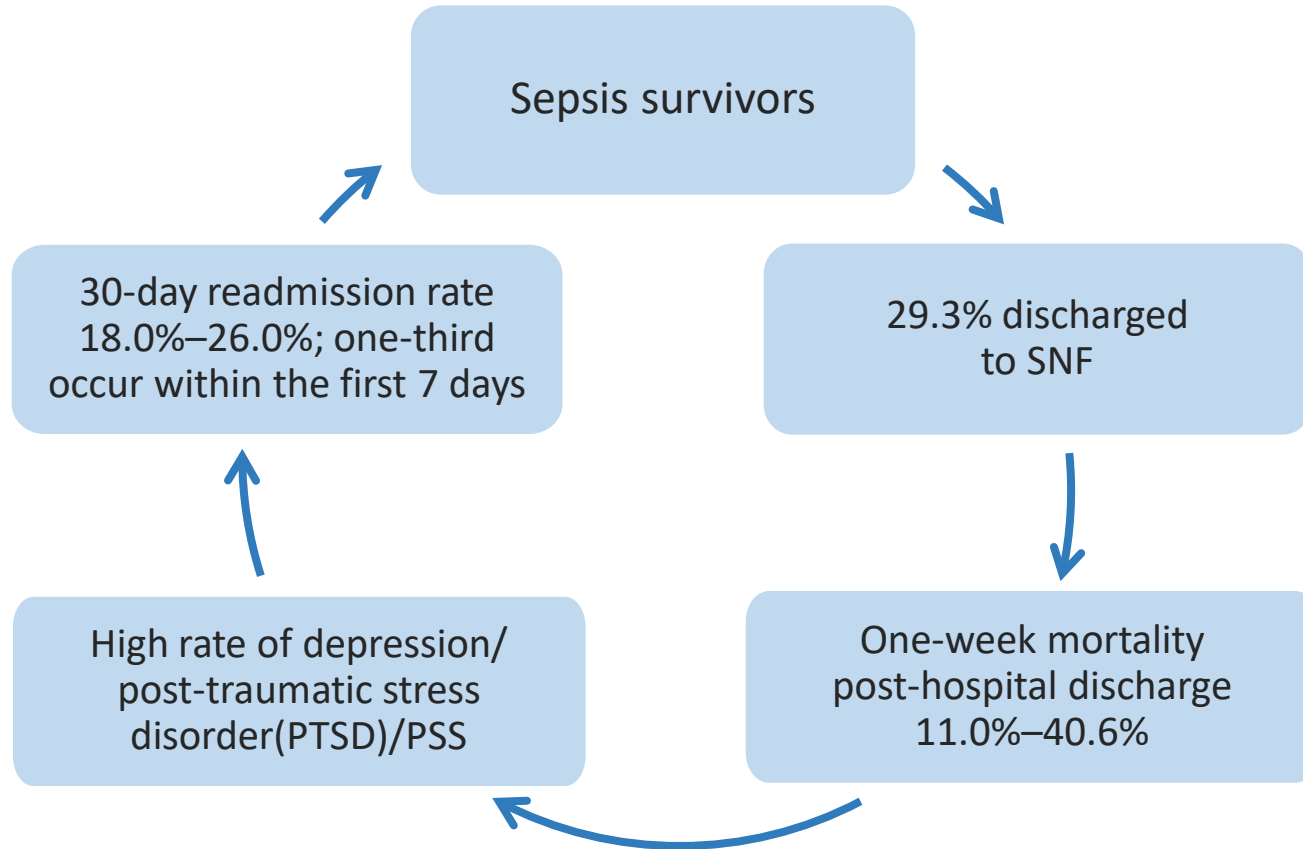


SEPSIS

Sepsis is a potentially life-threatening condition caused by the **body's response** to an infection



Surviving Sepsis



- Goodwin AJ, and Ford DW. Readmissions among sepsis survivors: Risk factors and prevention. Clin Pulm Med 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6141202/>
- Lee JT, et al. Trends post-acute care use after admissions for sepsis. Ann Am Thorac Soc 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6944346/#:~:text=Of%201%2C640%2C433%20hospital%20discharges%20after,%2C%20and%202.5%25%20to%20IRFs.>
- Sepsis Alliance. <https://www.sepsis.org/sepsis-basics/post-sepsis-syndrome/>



Early Recognition and Rapid Treatment

Recognition: Confirmed or Suspected Infection Combined With Triggers (2 or More From Either Tool)

Systemic Inflammatory Response Syndrome (SIRS)

- Temperature
 - $\leq 36\text{ }^{\circ}\text{C}$ or $\geq 38\text{ }^{\circ}\text{C}$
 - $\leq 96.8\text{ }^{\circ}\text{F}$ or $\geq 100.4\text{ }^{\circ}\text{F}$
- Heart rate ≥ 90 beats per minute
- Respiratory rate ≥ 20 or partial pressure of carbon dioxide (PaCO_2) < 32 mmHg
- White blood cell count $\geq 12\text{K}$ or $\leq 4\text{K}$ or $> 10\%$ bands

Quick Sequential Organ Failure Assessment (qSOFA)

- Altered mentation (more than usual)
- Respiratory rate ≥ 22
- Systolic blood pressure (SBP) ≤ 100

Treatment: Sepsis Bundle Project (SEP)

SEP-1

- 3 hour
1. Lactate
 2. Blood cultures before antibiotics
 3. Broad spectrum antibiotic
 4. 30mL/kg crystalloid fluid bolus for hypotension or lactate ≥ 4
- 6 hour
5. Vasopressors (if BP does not respond to fluids and to maintain mean arterial pressure [MAP] ≥ 65)
 6. Reassess tissue perfusion
 7. Remeasure lactate if initial was elevated

SEP-3 (Hour-1)

1. Lactate
(Remeasure if initial > 2)
2. Blood cultures before antibiotics
3. Broad spectrum antibiotic
4. 30 mL/kg crystalloid for hypotension or lactate ≥ 4
5. Vasopressors if hypotension during or after rapid fluids to maintain a MAP ≥ 65

- 17
- Centers for Medicare & Medicaid Services (CMS). *SEP-1 Specifications Manual for National Hospital Inpatient Quality Measures*. https://qualitynet.cms.gov/files/61b0df4330ffbc00229c36ba?filename=2a-b_SEP-List_v5.12.pdf
 - Society of Critical Care Medicine. *Hour-1. Surviving Sepsis*. <https://www.sccm.org/SurvivingSepsisCampaign/Guidelines/Adult-Patients>

Antibiotics

- Every hour delay of appropriate antibiotics = 7.6% lower survival.*
 - In the first 12 hours, there is 1% mortality per each 5-minute delay.**
- Draw blood cultures first.
- Administer broad-spectrum antibiotics covering the most likely pathogen.
- ***Time is tissue***
 - *The same way **time is muscle** for STEMI*** and **time is brain** for stroke.*

*Kumar et al. *CritCare Med*2006; 34: 1589-96.

**Funk and Kumar, *CritCare Clinics*2011; 53-76.

***STEMI = ST-segment elevation myocardial infarction

O'Brien, J. *Sepsis: A Medical Emergency*. Ohio Health. April 24, 2017.

Unintended Consequences

Antibiotic-resistant organisms

- 70% of total medically important antibiotic sales by volumes are in food animal production

Antibiotic stewardship (ABS) programs

- < 40% of U.S. hospitals have a full program

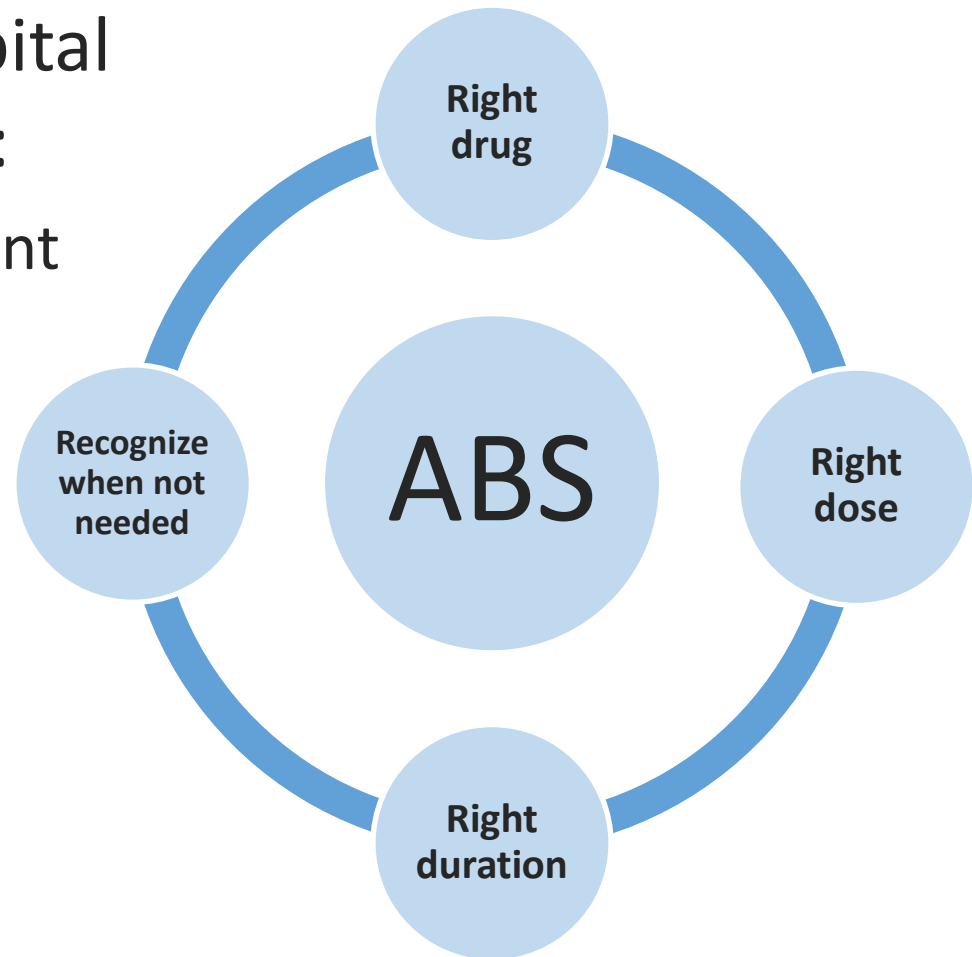
13% of outpatient visits result in an antibiotic prescription

- 30% (47 million) are needless

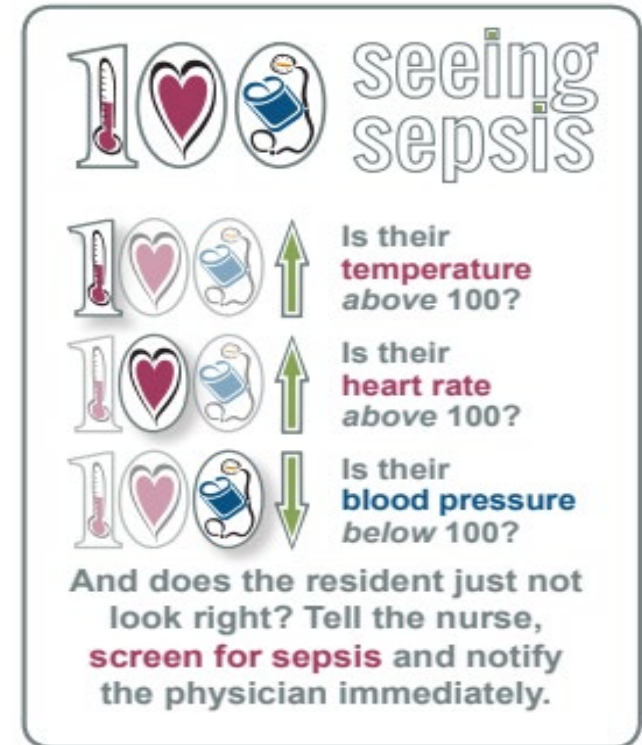
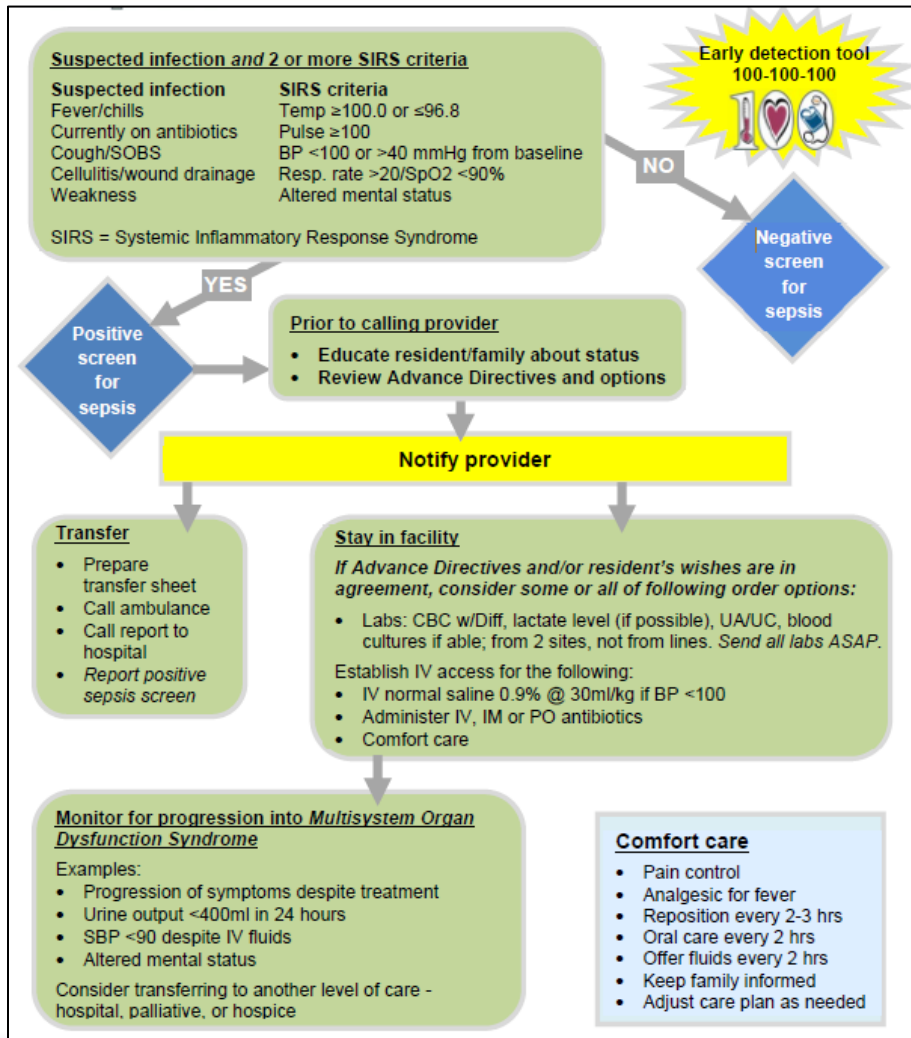
Core Elements of ABS Programs

Core elements of hospital ABS programs include:

1. Leadership commitment
2. Accountability
3. Drug expertise
4. Action
5. Tracking
6. Reporting
7. Education



Seeing Sepsis: SNF Sepsis Algorithm for Adults



- U.S. Dept. of Health & Human Services Partnership for Patients (HSS), Betsy Lehman Center for Patient Safety. *Seeing Sepsis algorithm for SNFs*. <https://betsylehmancenterma.gov/assets/uploads/SepsisLTSS-SeeingSepsisAlgorithm.pdf>
- HSS. Minnesota Hospital Association. *Seeing Sepsis tools*. <https://www.mnhospitals.org/Portals/0/Documents/ptsafety/SeeingSepsisLTC/1.%20Seeing%20Sepsis%20-%20LTC%20Poster.pdf>

HSAG Post-Acute Sepsis SBAR

Post-Acute Situation Background Assessment Recommendation (SBAR) for Sepsis

Systemic Inflammatory Response Syndrome (SIRS)

Sepsis = two or more SIRS criteria and suspected or documented infection

Communicate immediately with attending provider when a patient screens positive for sepsis

Situation:

- _____ has met two or more of the following SIRS criteria (circle only those that apply) and has a confirmed or suspected source of infection.
 - Temperature greater than 38°C (100.4°F) or less than 36°C (96.8°F)
 - Heart rate greater than 90 beats per minute
 - Respiratory rate greater than 20 breaths per minute
 - White blood cell count (WBC) is greater than 12,000; less than 4,000 or greater than 10 percent bands

Background:

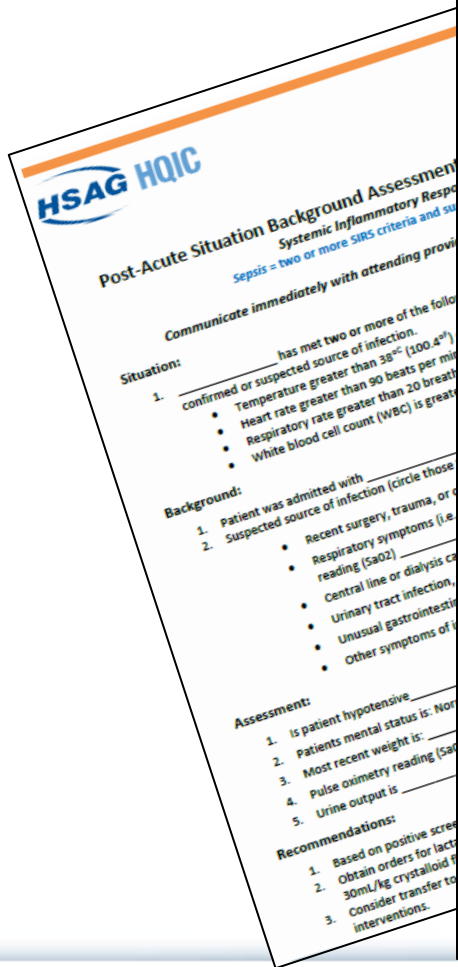
1. Patient was admitted with _____ and now has two or more positive SIRS criteria (see above).
2. Suspected source of infection (circle those that apply):
 - Recent surgery, trauma, or open wound(s) _____
 - Respiratory symptoms (i.e., productive cough, abnormal chest x-ray, decrease in pulse oximetry reading (SaO2) _____
 - Central line or dialysis catheter _____
 - Urinary tract infection, recent use of a Foley catheter _____
 - Unusual gastrointestinal (GI) symptoms _____
 - Other symptoms of infection _____

Assessment:

1. Is patient hypotensive _____ (systolic blood pressure 100 mm Hg or less)
2. Patient's mental status is: Normal/Abnormal (compared to baseline)
3. Most recent weight is: _____
4. Pulse oximetry reading (SaO2) is now _____. Previous reading _____
5. Urine output is _____ mL per hour or _____ over the last 8 hours

Recommendations:

1. Based on positive screening criteria notify attending provider.
2. Obtain orders for lactate level and blood cultures if possible, but administer broad spectrum antibiotic(s) and 30mL/kg crystalloid fluid with rapid infusion even if blood work not done.
3. Consider transfer to an acute care facility based on patient presentation, availability of resources, and response to interventions.





PSS

PSS Symptoms

Physical

- Insomnia, difficulty getting to sleep or staying asleep
- Disabling muscle and joint pain
- Fatigue, lethargy
- Shortness of breath (SOB)
- Swelling of limbs
- Repeat infections
- Poor appetite
- Hair loss
- Skin rash
- Reduced organ function (kidney, liver, heart)

Psychological

- Nightmare, vivid hallucinations, and panic attacks
- Flashbacks
- Poor concentration
- Decreased mental (cognitive) function
- Loss of self-esteem and self-belief
- Depression
- Mood swings
- Memory loss
- PTSD

PSS Treatment

- Emotional and psychological support
 - Counseling
 - Cognitive behavioral therapy
 - Neuropsychiatric assessment
- Physical support
 - Physical therapy
 - Neurorehabilitation

PSS SBAR

Situation: Resident/patient has symptoms of PSS.

Background: A large percentage of sepsis survivors and their families experience PSS symptoms.

Assessment: The patient is experiencing the following symptoms:

- Insomnia, difficulty getting to sleep or staying asleep
- Disabling muscle and joint pain
- Fatigue, lethargy
- SOB
- Swelling of limbs
- Repeat infections
- Poor appetite
- Hair loss
- Skin rash
- Reduced organ function (kidney, liver, heart)
- Nightmare, vivid hallucinations, and panic attacks
- Flashbacks
- Poor concentration
- Decreased mental (cognitive) function
- Loss of self-esteem and self-belief
- Depression
- Mood swings
- Memory loss
- PTSD

Recommendation: “I think this patient has Post Sepsis Syndrome. Please consider a referral/consult for counseling or physical therapy.”

Interventions

- Understand the potential for PSS.
 - Communicate with the provider.
 - Sometimes letting your patient know they are not alone helps healing.
 - Sometimes your patient will need to talk.
- Reinforce patient education provided in the acute care hospital.



Sepsis Prevention

Common Sources

SEPSIS



- Respiratory
- Urinary tract
- Gut
- Skin

Sepsis Prevention

If you prevent infection, then you cannot get sepsis

- Perform hand hygiene.
 - Ensure patient has the opportunity to wash hands before eating, after toileting, and after coughing or sneezing. (This may mean keeping hand sanitizer or wipes at the bedside.)
- Avoid Foleys and central lines as much as possible.
- Stay up-to-date with vaccines.
 - Flu, COVID-19, chicken pox, shingles, pneumonia, tetanus, etc.
- Provide proper wound care.
 - Wash hands before touching an open wound, use clean gloves if possible.
 - Follow doctors' orders regarding wound care.
 - Watch for signs and symptoms of infection: redness, warmth, increased pain, and/or discharge from wound.
 - Do not pop blisters.
- Encourage mobility.
 - Ensure adequate pain control.
 - Promote ambulation or at least out of bed multiple times per day.
- Maintain oral care.
- Use pressure injury prevention measures.

Pledge for Clean Hands

To Help Keep Each Other Safe

As a patient of this facility it is okay for me to speak up for clean hands.

Washing your hands for at least 20 seconds is the most effective way to prevent the spread of diseases like the flu, cold, and COVID-19.

When should I wash my hands?

Before:

- Touching your eyes, nose, or mouth
- Leaving the bathroom

Before and after:

- Eating
- Leaving your room

After:

- Blowing your nose, coughing, or sneezing
- Touching common surfaces and objects such as bed rails, remote controls, or the phone
- Touching garbage



When should I ask others to wash their hands?

Before:

- Entering and leaving the room
- Leaving the bathroom

Before and after:

- Your team provides personal care such as treating a cut or wound
- Receiving medications
- Handling equipment
- Close contact with others

After:

- They blow their nose, cough, or sneeze

Your healthcare team supports this effort and cares about your health. Speak up and remind us to keep our pledge for clean hands.

HSAG HQIC

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Source: Centers for Disease Control and Prevention, When and How to Wash Your Hands. Accessed December 2, 2020. Available at: <https://www.cdc.gov/handwashing/when-how-handwashing.html#why>

Compromiso de lavado de manos

para mantenernos todos a salvo

Como paciente de este centro, puedo hablar a favor del lavado de manos.

Lavarse las manos durante por lo menos 20 segundos es la manera más eficaz de prevenir la propagación de enfermedades como la gripe, el resfrío y la COVID-19.

¿Cuándo debería lavarme las manos?

Antes de:

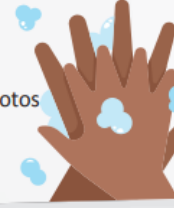
- Tocarse los ojos, la nariz o la boca
- Salir del baño

Antes y después de:

- Comer
- Salir de su habitación

Después de:

- Sonarse la nariz, toser o estornudar
- Tocar superficies y objetos comunes, como barandillas de camas, controles remotos o el teléfono
- Tocar basura



¿Cuándo debería pedirle a otras personas que se laven las manos?

Antes de:

- Entrar y salir de la habitación
- Salir del baño

Antes y después de:

- Que su equipo le suministre atención personal, como durante el tratamiento de una cortadura o una herida
- Recibir medicamentos
- Manipular equipos
- Un contacto estrecho con otras personas

Después de:

- Que ellos se suenen la nariz, tosan o estornuden

Su equipo de atención médica apoya esta iniciativa y se preocupa por su salud. Diga lo que piensa y recuérdenos nuestro compromiso de lavado de manos.

HSAG HQIC

Este material fue preparado por Health Services Advisory Group (HSAG), por sus siglas en inglés, lo cual es una compañía contratada a la medida de la calidad hospitalaria (HQIC) por sus siglas en inglés), bajo contrato con los Centros de Servicios de Medicare y Medicaid (CMS), por sus siglas en inglés, lo cual es una agencia del Departamento de Salud y Servicios Humanos de Estados Unidos (HHS), por sus siglas en inglés, y cualquier referencia específica de este documento, o algún producto o entidad no constituye respaldo a ese producto o entidad por parte de CMS o HHS. Publicación No. IS-HQIC-IP-2020-0221-01

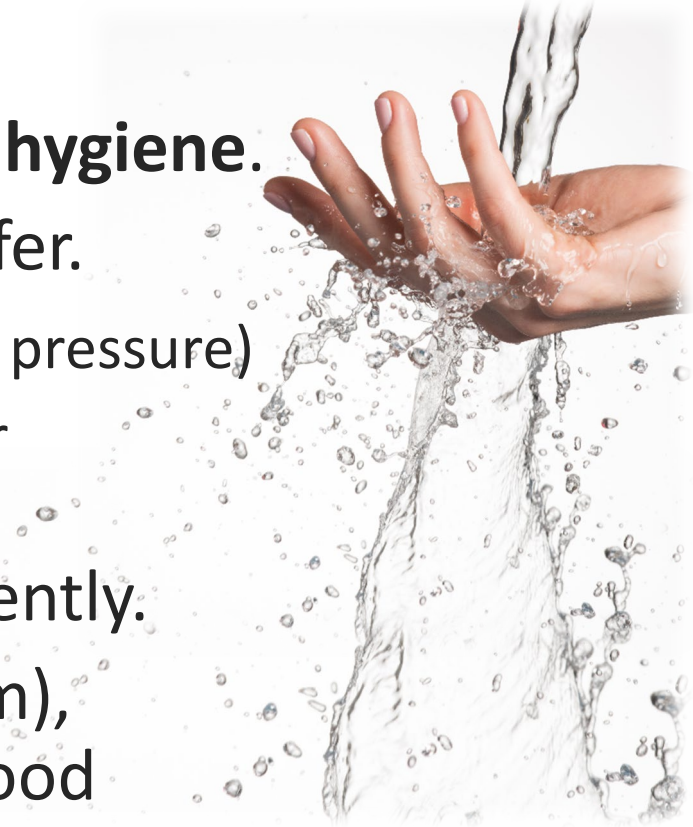
Fuente: Centros para el Control y la Prevención de Enfermedades, Cuidado y cómo lavarse las manos, se accedió por última vez el 2 de diciembre de 2020. Disponible en <https://www.cdc.gov/handwashing/when-how-handwashing.html>



Putting it all Together

Recommendations, Part 1

- **Always suspect sepsis.**
- **Hand hygiene, hand hygiene, hand hygiene.**
- Prioritize early care over early transfer.
- 100s (↑temperature/↑heart rate/↓blood pressure)
 - Screen patients for sepsis if ≥ 2 100s or patient just does not seem right.
- Use standardized order sets consistently.
- Administer tailored (by organ system), broad-spectrum antibiotics **after** blood cultures and within **1-hour** of sepsis recognition.
- Have antibiotics readily available.



Recommendations, Part 2

- Use the sepsis bundles.
- Develop a sepsis checklist and use it consistently.
- Develop templates for physician and staff member documentation.
- Employ visual management for fluid resuscitation.
 - All bags (full, empty, and in between) hung on IV pole. Everyone can see how far the patient is in their fluid resuscitation.
- Transfer report to include:
 - Sepsis time zero (the time the patient had 2 or more SIRS criteria with a known or suspected infection).
 - Sepsis care provided thus far with times.



Self Reflection

- What is my facility's culture?
 - Are we open to learning?
- What are the knowledge and skill levels of our staff and physicians?
- What is the level of engagement of physicians, staff, and residents?



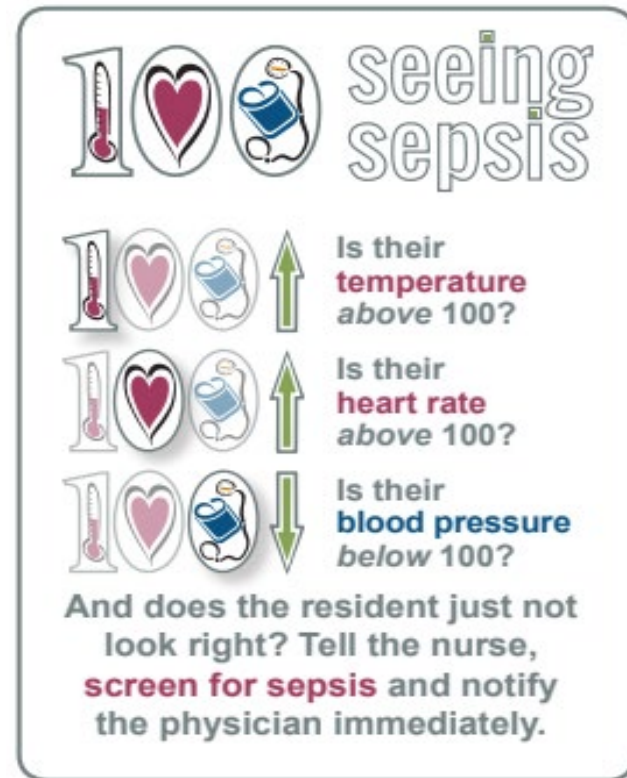
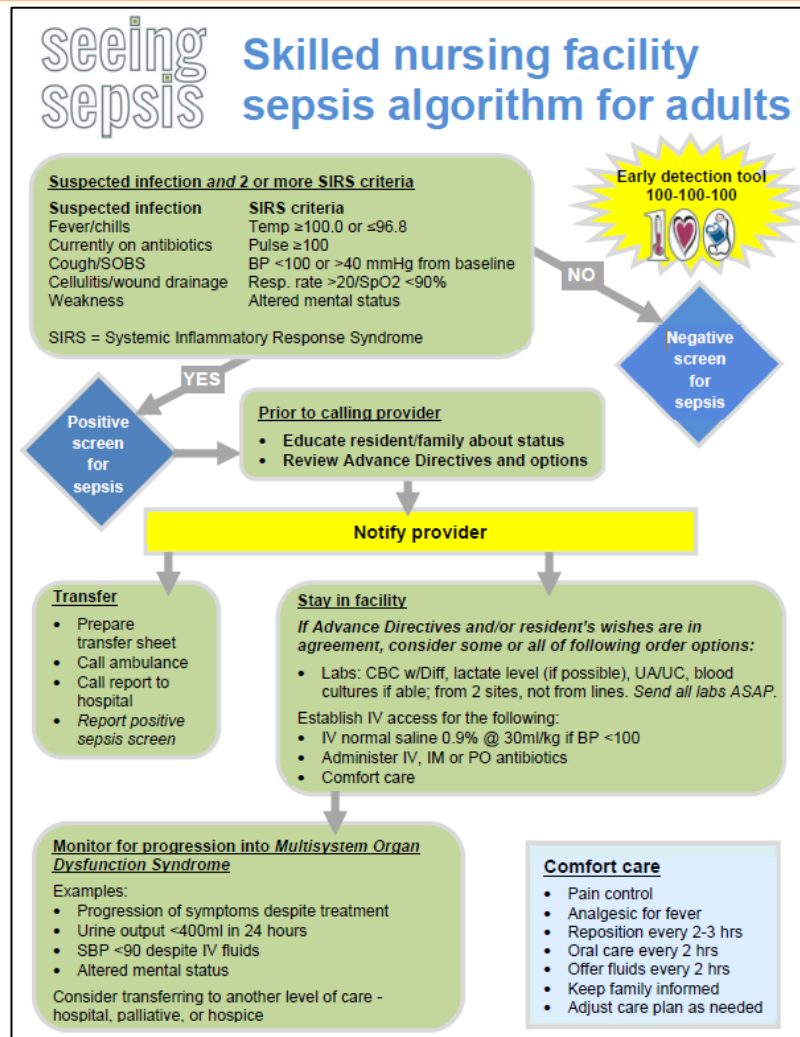
Tools and Resources



Tools and Resources

1. HSAG. Simple Sepsis Pathophysiology.
<https://www.hsag.com/globalassets/hqic/hqicsepsispathophysiology.pdf>
2. Sepsis Alliance. Post Sepsis Syndrome.
<https://www.sepsis.org/sepsis-basics/post-sepsis-syndrome/>
3. CDC. Life After Sepsis fact sheet.
<https://www.cdc.gov/sepsis/pdfs/life-after-sepsis-fact-sheet.pdf>
4. Minnesota Hospital Association. Seeing Sepsis tools.
<https://www.mnhospitals.org/Portals/0/Documents/ptsafety/SeeingSepsisLTC/1.%20Seeing%20Sepsis%20-%20LTC%20Poster.pdf>
5. Betsy Lehman Center for Patient Safety. Seeing Sepsis algorithm for SNFs.
<https://betsylehmancenterma.gov/assets/uploads/SepsisLTSS-SeeingSepsisAlgorithm.pdf>
6. HSAG. Post Acute Sepsis SBAR.
https://www.hsag.com/globalassets/hqic/hsaghqic_sepsisbar.pdf

Seeing Sepsis SNF Algorithm



- U.S. Dept. of Health & Human Services Partnership for Patients (HSS), Betsy Lehman Center for Patient Safety. *Seeing Sepsis algorithm for SNFs*. <https://betsylehmancenterma.gov/assets/uploads/SepsisLTSS-SeeingSepsisAlgorithm.pdf>
- HSS. Minnesota Hospital Association. Seeing Sepsis tools. <https://www.mnhospitals.org/Portals/0/Documents/ptsafety/SeeingSepsisLTC/1.%20Seeing%20Sepsis%20-%20LTC%20Poster.pdf>

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- Singer, et al. The third international consensus definitions for sepsis and septic shock (Sepsis-3) *JAMA*. 2016. <https://jamanetwork.com/journals/jama/fullarticle/2492881>
- University of Pittsburgh. qSOFA: quick Sepsis Related Organ Failure Assessment. *Crit Care Med*. <http://qsofa.org/>.



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