Early Sepsis Detection in the Skilled Nursing Facility

Can we change the tide?

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"Wise and humane management of the patient is the best safeguard against infection."

- Florence Nightingale

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What is Sepsis?

- Described first by Hippocrates and is derived from the Greek word *sipsi,* meaning “to make rotten”
- Sepsis is one of the oldest syndromes known to medicine, but continues to be a major healthcare issue due to its high mortality, large number of cases and cost

Pa Patient Saf Advis 2016 Sep;13(3):108-113. Early Detection of Sepsis in Pennsylvania’s Long-Term Care Residents http://patientsafety.pa.gov/ADVISORIES/Pages/201609_108.aspx#

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What is Sepsis?

- The Centers for Disease Control and Prevention (CDC) defines sepsis as “the body’s extreme response to an infection.”
- The infection that causes sepsis starts prior to a patient going to the hospital 87% of the time.
- 1 in 3 people who die in the hospital had sepsis during that hospitalization.

https://www.cdc.gov/sepsis/what-is-sepsis.html

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Who is at Risk?

- People over age 65
- People who are chronically ill
- Young children
- People who are immunosuppressed
- People who previously had sepsis
- People who had a recent severe illness or hospitalization

https://www.cdc.gov/sepsis/what-is-sepsis.html

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Sepsis in Long-Term Care

Nursing home residents:

- Are 7 times more likely to have severe sepsis
- Are more likely to be admitted to the intensive care unit (ICU)
- Have longer hospital lengths of stay associated with sepsis
- Have higher mortality rates associated with sepsis
- Are more susceptible to adverse affects of hospitalization (nosocomial infections, delirium, etc.)

Ginde AA, Moss M, Shapiro NI, Schwartz RS. Impact of older age and nursing home residence on clinical outcomes of US emergency department visits for severe sepsis. J Crit Care. 2013 Oct;28(5):606-11. doi: 10.1016/j.jcrc.2013.03.018. Epub 2013 May 15. PMID: 23683561; PMCID: PMC3770757.

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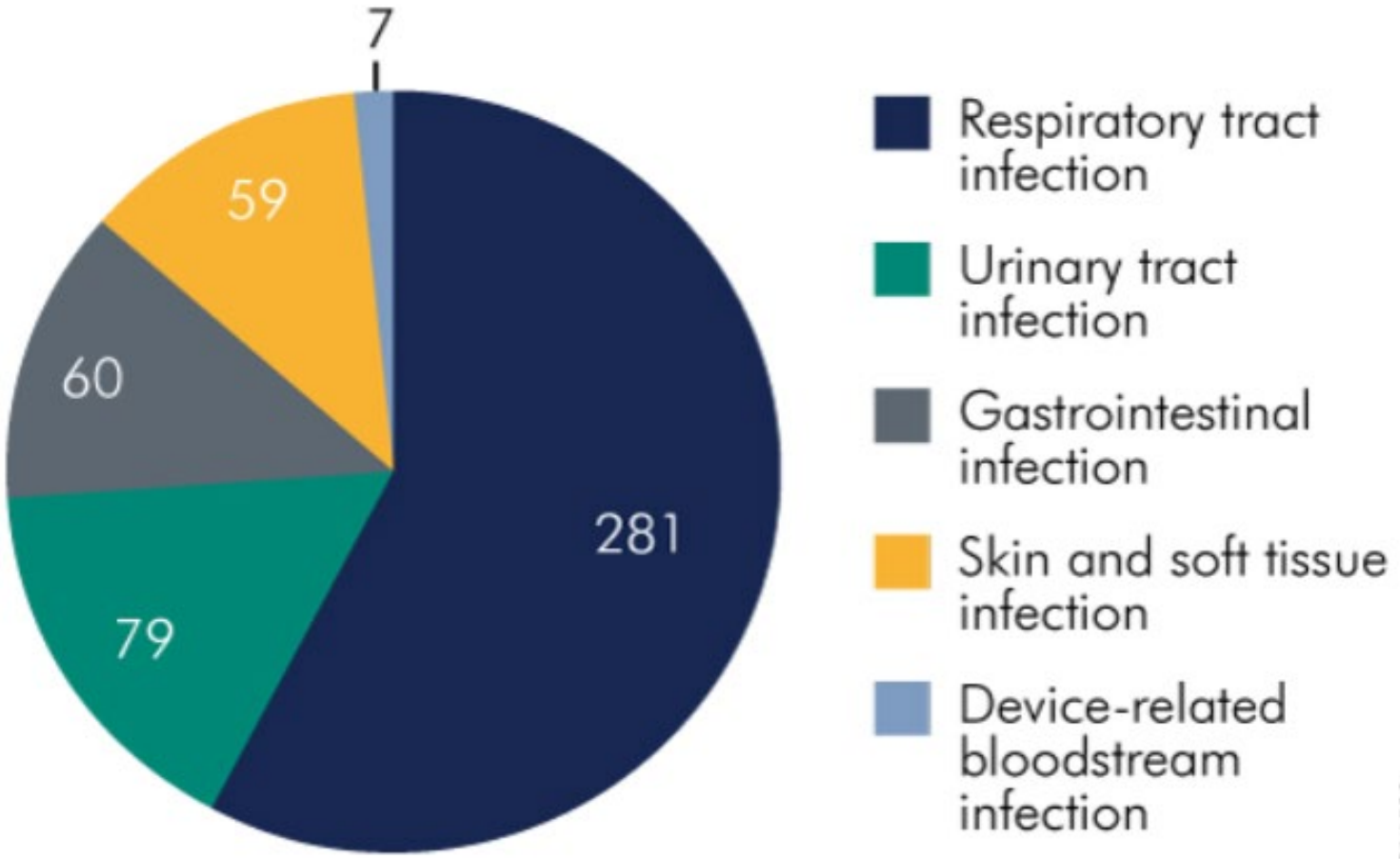
Sepsis Causes



Hospital-Acquired Infections Reported from April 1, 2014, through March 31, 2016, in which the Resident was Transferred to a Higher Level of Care (N = 486)

Pa Patient Saf Advis 2016 Sep;13(3):108-113. Early Detection of Sepsis in Pennsylvania's Long-Term Care Residents
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Can We Prevent Sepsis in the Nursing Home?

"Because symptoms and signs are nonspecific in older patients, especially those with multiple comorbidities and/or cognitive impairment, virtually any acute change in condition could represent possible sepsis due to an infection."

Reyes BJ, Chang J, Vaynberg L, Diaz S, Ouslander JG. Early Identification and Management of Sepsis in Nursing Facilities: Challenges and Opportunities. J Am Med Dir Assoc. 2018 Jun;19(6):465-471. doi: 10.1016/j.jamda.2018.04.004. PMID: 29793674.

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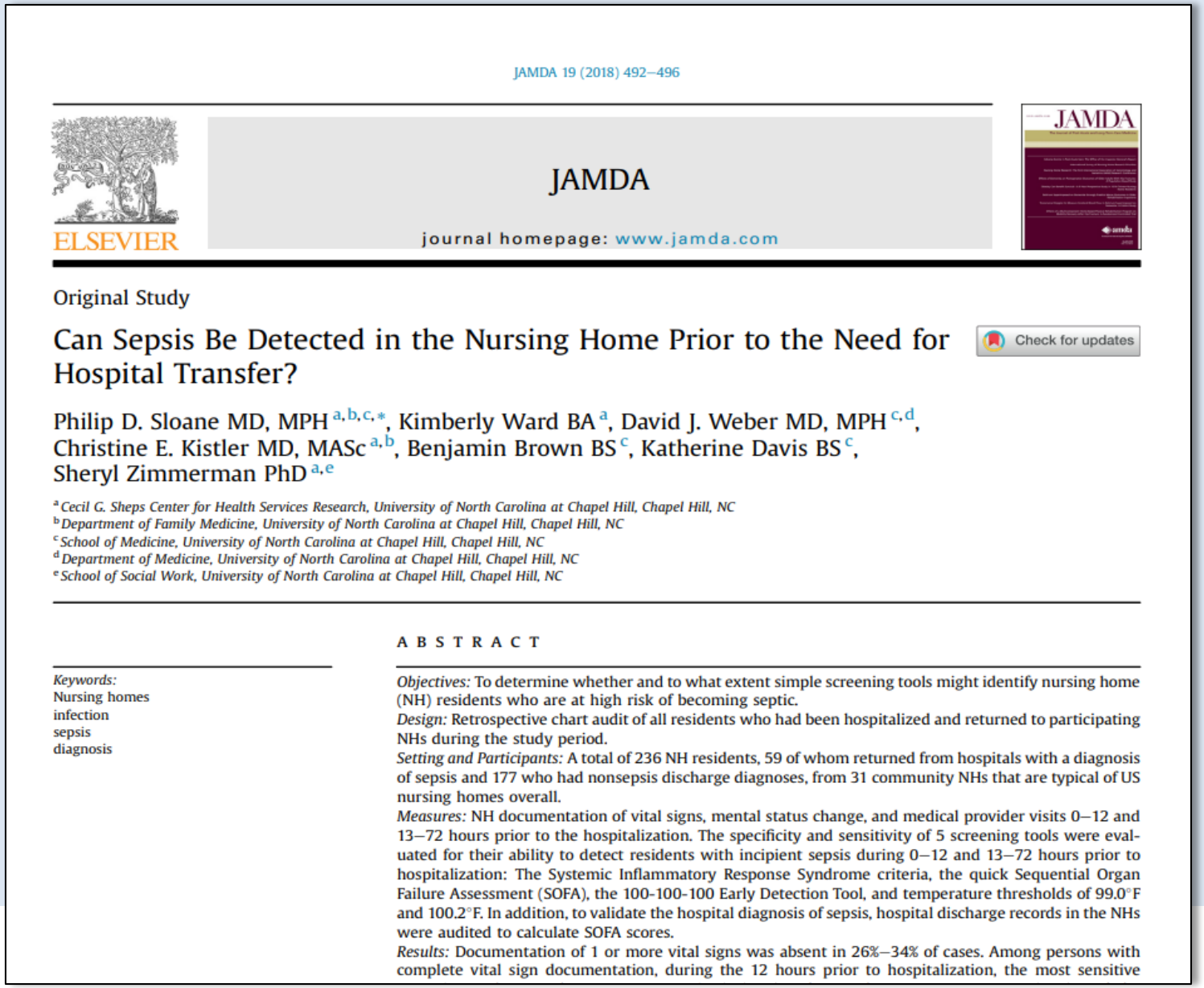
Prevention

Very few studies, but there is this one…



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JAMDA

journal homepage: www.jamda.com

Original Study

Can Sepsis Be Detected in the Nursing Home Prior to the Need for Hospital Transfer?

Check for updates

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Keywords:
Nursing homes
infection
sepsis
diagnosis

ABSTRACT

Objectives: To determine whether and to what extent simple screening tools might identify nursing home (NH) residents who are at high risk of becoming septic.
Design: Retrospective chart audit of all residents who had been hospitalized and returned to participating NHs during the study period.
Setting and Participants: A total of 236 NH residents, 59 of whom returned from hospitals with a diagnosis of sepsis and 177 who had nonsepsis discharge diagnoses, from 31 community NHs that are typical of US nursing homes overall.
Measures: NH documentation of vital signs, mental status change, and medical provider visits 0–12 and 13–72 hours prior to the hospitalization. The specificity and sensitivity of 5 screening tools were evaluated for their ability to detect residents with incipient sepsis during 0–12 and 13–72 hours prior to hospitalization: The Systemic Inflammatory Response Syndrome criteria, the quick Sequential Organ Failure Assessment (SOFA), the 100-100-100 Early Detection Tool, and temperature thresholds of 99.0°F and 100.2°F. In addition, to validate the hospital diagnosis of sepsis, hospital discharge records in the NHs were audited to calculate SOFA scores.
Results: Documentation of 1 or more vital signs was absent in 26%–34% of cases. Among persons with complete vital sign documentation, during the 12 hours prior to hospitalization, the most sensitive

Sloane PD, Ward K, Weber DJ, Kistler CE, Brown B, Davis K, Zimmerman S. Can Sepsis Be Detected in the Nursing Home Prior to the Need for Hospital Transfer? J Am Med Dir Assoc. 2018 Jun;19(6):492-496.e1. doi: 10.1016/j.jamda.2018.02.001. Epub 2018 Mar 26. PMID: 29599052.

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The Study

- 31 community nursing homes in North Carolina
- Mean bed size was 113 (mean occupancy was 87%)
- Licensed nurses and certified nursing assistants were staffed at an average rate of 1.5 and 2.2 hours, respectively, per resident; and the mean quality rating on Nursing Home Compare was 3.3
- The nursing homes did not differ from nursing homes nationally

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The Findings

- 59 sepsis and 177 nonsepsis cases
- All 4 vital signs (temperature, pulse, respiratory rate, and blood pressure) were documented during the 12 hours prior to hospitalization in 66% of the sepsis cases; for 13-72 hours prior to hospitalization all 4 vital signs were documented in 73% of the sepsis cases
- Documentation of a visit by a medical provider (physician, nurse practitioner, or physician assistant) in the 12 hours prior to hospital transfer was present in only 19% of the sepsis cases and during the 13-72 hours prior to transfer that figure was also 19%

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Learning Points

- The sepsis tool that was shown to be the most sensitive was the 100-100-100 tool as well as oral temperature > 99.0 F
- It is essential to obtain and document vitals signs as well as changes in cognitive status
- It is important to engage the physician or provider early to provide an in person visit if possible

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100-100-100 Screening Tool

- Is their temperature above 100°F?
- Is their systolic blood pressure below 100?
- Is their pulse rate above 100?

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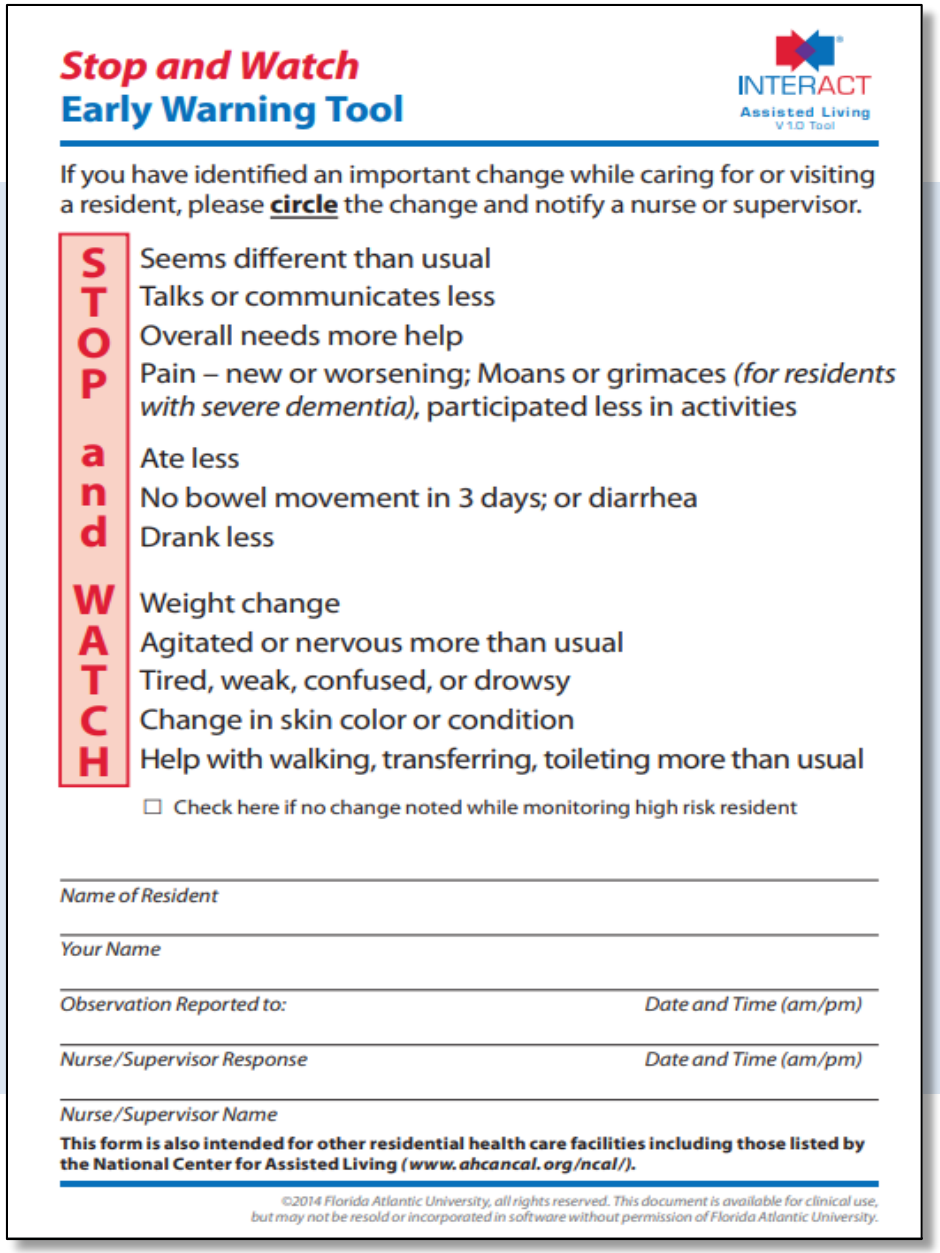

Stop and Watch
Early Warning Tool

INTERACT Assisted Living V 1.0 Tool

If you have identified an important change while caring for or visiting a resident, please **circle** the change and notify a nurse or supervisor.

S
Seems different than usual
Talks or communicates less
Overall needs more help

T
Pain – new or worsening; Moans or grimaces *(for residents with severe dementia)*, participated less in activities

O
Ate less
No bowel movement in 3 days; or diarrhea

P
Drank less

a

n

d

W
Weight change

A
Agitated or nervous more than usual

T
Tired, weak, confused, or drowsy

C
Change in skin color or condition

H
Help with walking, transferring, toileting more than usual

☐ Check here if no change noted while monitoring high risk resident

Name of Resident

Your Name

Observation Reported to: *Date and Time (am/pm)*

Nurse/Supervisor Response *Date and Time (am/pm)*

Nurse/Supervisor Name

This form is also intended for other residential health care facilities including those listed by the National Center for Assisted Living *(www.ahcancal.org/ncal/)*.

INTERACT Assisted Living. “Stop and Watch: Early Warning Tool” (2014). https://www.ohsu.edu/sites/default/files/2019-03/INTERACT-Stop-and-Watch.pdf

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Management Wish List

Recommendations for Management of Sepsis:

1. At least 30 mL/kg of IV crystalloid fluid should be given within the first 3 h
2. Additional fluid administration should be guided by frequent reassessment of hemodynamic status.
3. Mean arterial pressure (MAP) and serum lactate are considered adequate indicators of tissue perfusion. These values should be maintained at MAP ≥65 mmHg and lactate.
4. To estimate MAP, double the diastolic blood pressure and add the sum to the systolic blood pressure. Then divide by 3.
5. Appropriate routine microbiologic cultures (including blood) should be obtained before starting antimicrobial therapy in patients with suspected sepsis.
6. Administration of IV antimicrobials should be initiated as soon as possible, within 1 h after recognition of sepsis.
7. Goals of care and prognosis should be discussed with patients and families.
8. Goals of care should be incorporated into treatment and end-of-life care planning, using palliative care principles where appropriate

Reyes BJ, Chang J, Vaynberg L, Diaz S, Ouslander JG. Early Identification and Management of Sepsis in Nursing Facilities: Challenges and Opportunities. J Am Med Dir Assoc. 2018 Jun;19(6):465-471. doi: 10.1016/j.jamda.2018.04.004. PMID: 29793674.

Realistic List

Educate staff to recognize and respond early

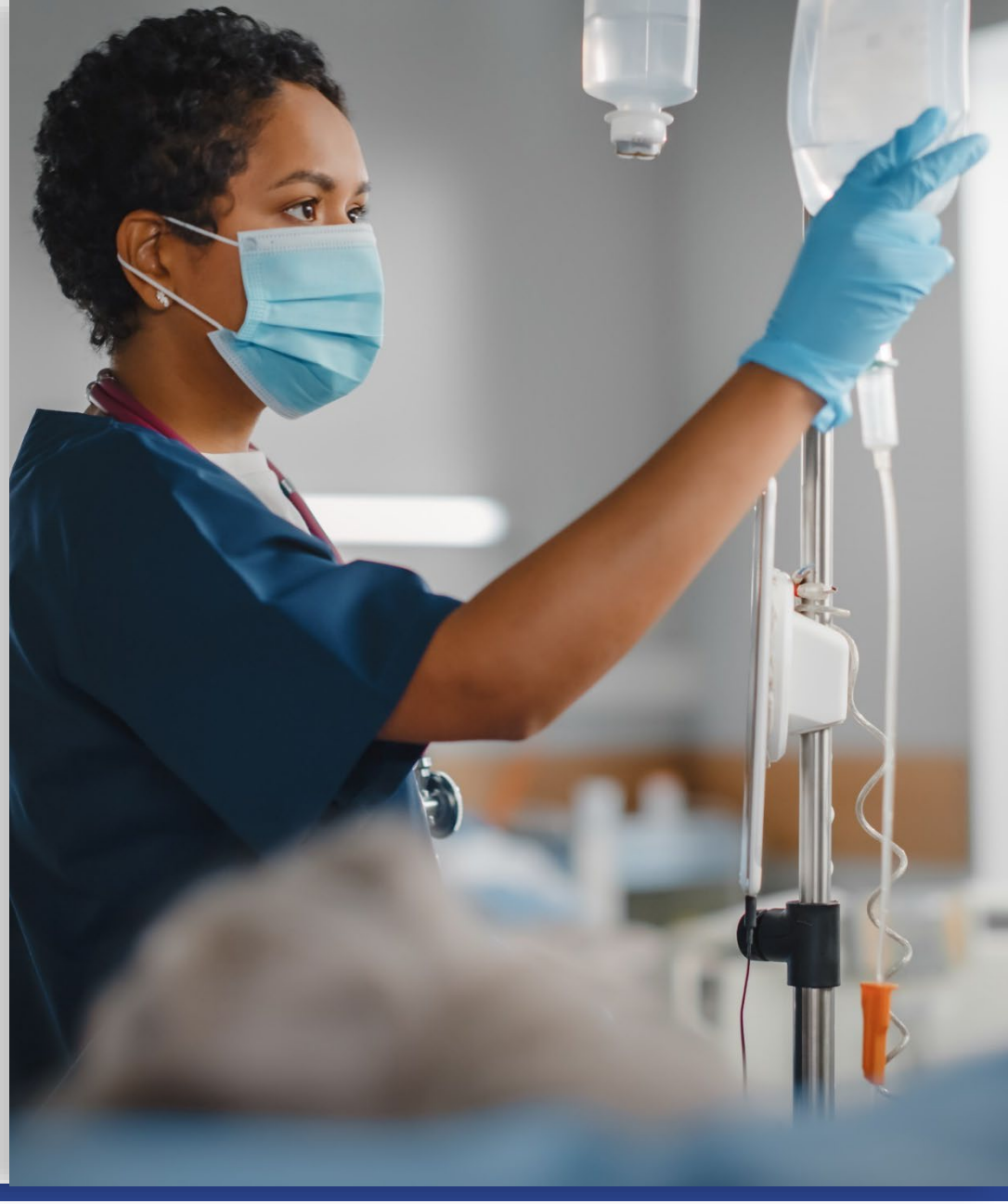
- Opportunity to empower staff to impact outcomes
- CNA leadership opportunity
- Possibility of both points positively influencing staffing

Contact the provider early

- Holding the medical director or attending physician accountable

Order lab studies early (white blood cells, lactate, procalcitonin)

- Or at least the basics



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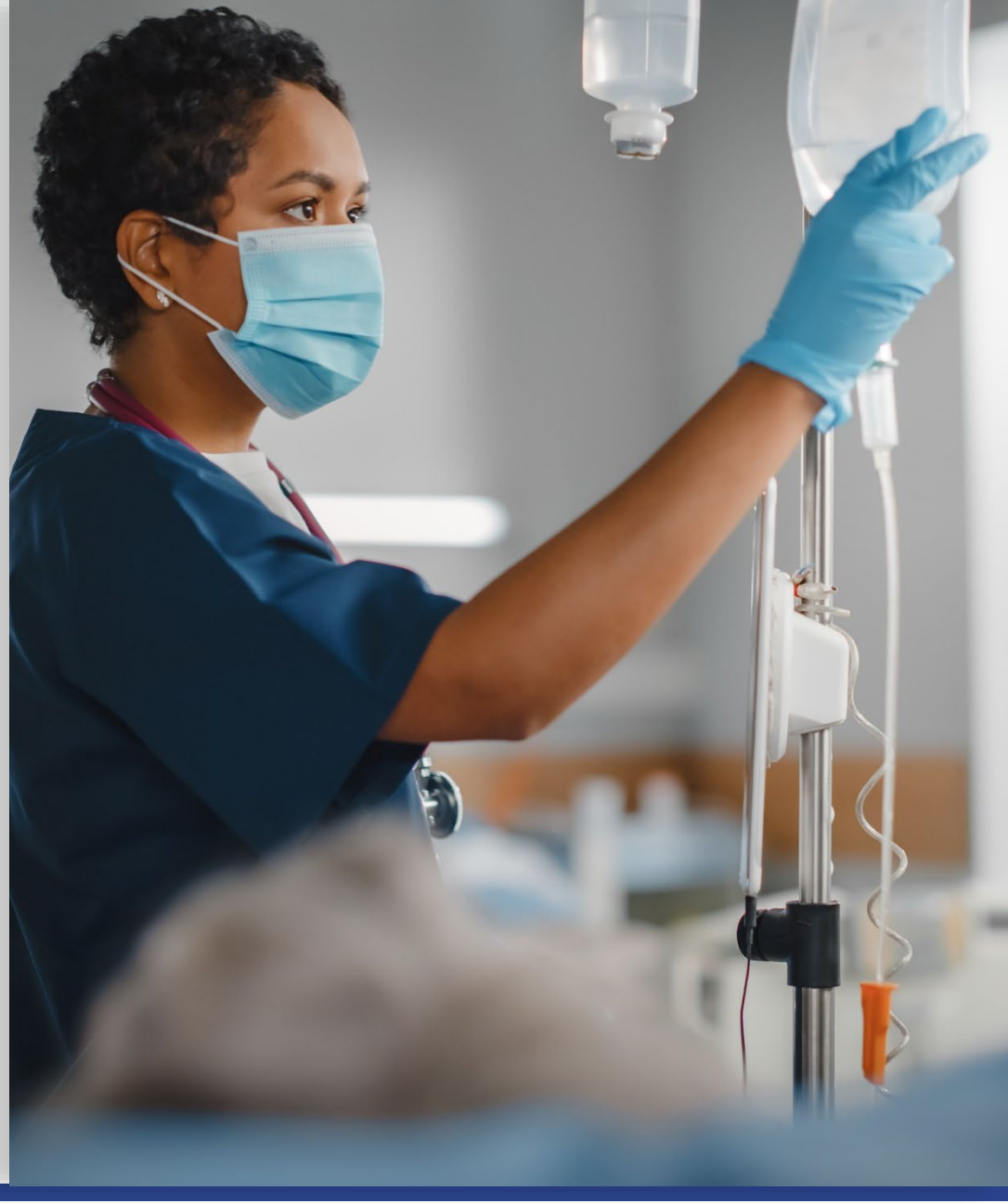
Realistic Management

- IV hydration is the cornerstone of sepsis management and should be started early
- IV antibiotics should also be initiated early, preferably within 1 hour of sepsis recognition
- Discuss contingency plan with provider (then what?)



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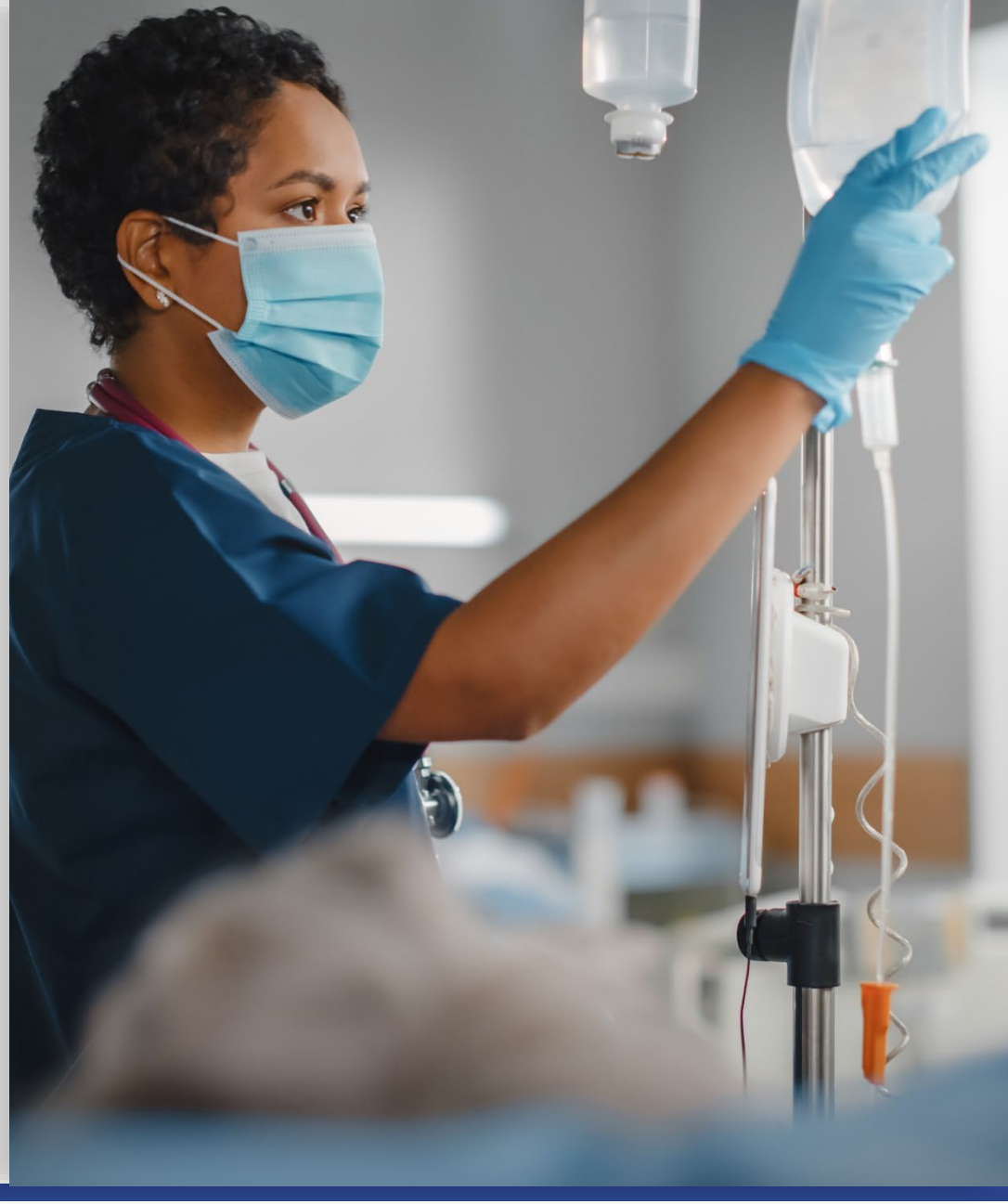
Treat in Place Option

Hypodermoclysis:

- Subcutaneous infusion of IV fluid
- Up to 3,000 mL per day (1 mL per minute via two administration sites) has been given using this technique
- May be used to get a “jump start” on hydration if an IV site cannot be established right away
- Cannot be used if large volume of IV fluids need to be administered rapidly due to resident condition



Humphrey, Pegge MSM, BSN, RN, CEN. Hypodermoclysis: An alternative to I.V. infusion therapy. Nursing 41(11):p 16-17, November 2011. | DOI: 10.1097/01.NURSE.0000405126.91849.e3

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Subcutaneous Infusion	Intravenous Therapy
Easy to initiate	Harder to initiate
Can be done with limited training	Needs trained personnel
Easy to restart	Difficult to restart
Infection rare	Cellulitis and septicemia
Minimal bruising	Multiple bruises
Easier to maintain (unlikely to need restraints)	Difficult to maintain (restraints often requested)
Reasonable volume can be delivered	Greater volumes can be delivered
Fluid overload rare (but sometimes localized edema)	Fluid overload a problem
High staff and patient acceptance	Variable acceptance
Can be done at home by family member (eg, palliative care)	Cannot be done at home
Can be used to deliver some drugs (eg, opiates)	Better drug delivery system
Very cost effective	Less cost effective

Hussain NA, Warshaw G. Utility of clysis for hydration in nursing home residents. J Am Geriatr Soc 1996;44:969 –973.

Take Home Points

- Long-term care residents are at increased risk of sepsis, and this condition causes significant morbidity and mortality in this population
- Sepsis can potentially be prevented or treated in the early stages in the facility if recognized early
- Vital signs should be taken frequently if sepsis is suspected
- The provider should be notified early of potential early sepsis signs

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