Sepsis in Nursing Homes: Recognition and Response

Theresa Rowe, DO, MS
Assistant Professor of Medicine,
Northwestern University Feinberg School of Medicine

Northwestern

No Disclosures

Learning Objectives

1. Review definitions of sepsis
2. Discuss screening tools for detection of sepsis in older adults
3. Discuss how to manage suspected sepsis while adhering to antibiotic stewardship principles

Case Presentation

- Mrs. S is a 92 year old nursing home resident with dementia, hypertension, congestive heart failure and remote history of UTI with sepsis 4 years ago.
- Change in Condition
  - Suddenly less alert/interactive
  - T = 97.8° F, BP = 102/58, P = 102, RR = 18
  - SPO_2 = 94% on room air
  - No dysuria, suprapubic pain, or frequency / urgency
  - Crackles heard on lung exam

What is the most likely diagnosis?

A) Pneumonia
B) Possible Sepsis
C) UTI
D) Congestive heart failure exacerbation
E) A, B and D
F) All of the above

What is Sepsis ?

- Sepsis is life threatening organ dysfunction caused by a dysregulated host response to **infection**

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

What is Sepsis ?

- Sepsis is life threatening organ dysfunction caused by a dysregulated host response to infection
- Septic shock is a subset of sepsis with circulatory and cellular/metabolic dysfunction associated with higher risk of mortality

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

What is Sepsis ?

- Sepsis is life threatening organ dysfunction caused by a dysregulated host response to infection
- Septic shock is a subset of sepsis with circulatory and cellular/metabolic dysfunction associated with higher risk of mortality
- Definitions are not diagnostic of sepsis

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

Sepsis in Older Adults

- Over 1.5 million people get sepsis each year in the U.S.
  - Older adults ≥ 65 years account for the majority (>60%) of sepsis cases
  - Nursing home residents → 7 fold increase in mortality compared to community dwelling adults (14% vs 1.9%)

https://www.cdc.gov/sepsis/datareports/index.html

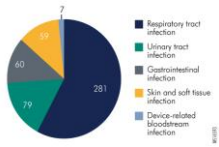
Sepsis in Older Adults

- Over 1.5 million people get sepsis each year in the U.S.
  - Older adults ≥ 65 years account for the majority (>60%) of sepsis cases
  - Nursing home residents → 7 fold increase in mortality compared to community dwelling adults (14% vs 1.9%)
- Prevalence of sepsis is increasing, mortality is decreasing

https://www.cdc.gov/sepsis/datareports/index.html

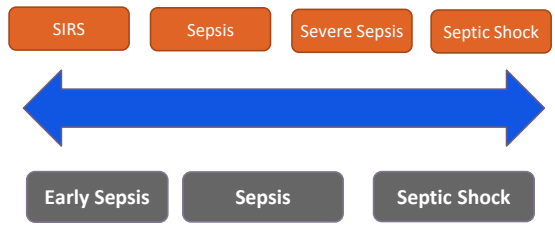
Sepsis in Older Adults

- Over 1.5 million people get sepsis each year in the U.S.
  - Older adults ≥ 65 years account for the majority (>60%) of sepsis cases
  - Nursing home residents → 7 fold increase in mortality compared to community dwelling adults (14% vs 1.9%)
- Prevalence of sepsis is increasing, mortality is decreasing
- In older adults, the most common cause of sepsis is **respiratory tract infection**



https://www.cdc.gov/sepsis/datareports/index.html

Sepsis Continuum



* Adapted from slide provided by David Nace, MD

Changes in Sepsis Definitions

Recommendations	SIRS*	Sepsis	Severe Sepsis	Septic Shock
1992 ACCP*/SCCM* Consensus Statement	T ≤ 36° C or > 38° C Pulse ≥ 90 RR ≥ 20 PaCO2 ≤ 32 WBC ≤4 K or > 12K Diff ≥ 10% bands	Infection + ≥ 2 SIRS criteria	Sepsis + EOD*	Sepsis + SBP <90, OR 40 mm below baseline, OR Low perfusion after IV fluid bolus

* Adapted from slide provided by David Nace, MD

Changes in Sepsis Definitions

Recommendations	SIRS*	Sepsis	Severe Sepsis	Septic Shock
1992 ACCP*/SCCM* Consensus Statement	T ≤ 36° C or > 38° C Pulse ≥ 90 RR ≥ 20 PaCO2 ≤ 32 WBC ≤4 K or > 12K Diff ≥ 10% bands	Infection + ≥ 2 SIRS criteria	Sepsis + EOD*	Sepsis + SBP <90, OR 40 mm below baseline, OR Low perfusion after IV fluid bolus
2015 CMS Core Measure	Same	Same	Sepsis + EOD Lactate > 2	Initial lactate > 4, OR SBP < 90 after 30 mL/kg fluid bolus

* Adapted from slide provided by David Nace, MD

Changes in Sepsis Definitions

Recommendations	SIRS*	Sepsis	Severe Sepsis	Septic Shock
1992 ACCP*/SCCM* Consensus Statement	T ≤ 36° C or > 38° C Pulse ≥ 90 RR ≥ 20 PaCO2 ≤ 32 WBC ≤4 K or > 12K Diff ≥ 10% bands	Infection + ≥ 2 SIRS criteria	Sepsis + EOD*	Sepsis + SBP <90, OR 40 mm below baseline, OR Low perfusion after IV fluid bolus
2015 CMS Core Measure	Same	Same	Sepsis + EOD Lactate > 2	Initial lactate > 4, OR SBP < 90 after 30 mL/kg fluid bolus
2016 Sepsis 3	SIRS eliminated qSOFA* introduced	Infection + 2 qSOFA criteria	Eliminated	SBP < 90 AND Lactate > 2 after fluid bolus

* Adapted from slide provided by David Nace, MD

Changes in Sepsis Definitions

Recommendations	SIRS*	Sepsis	Severe Sepsis	Septic Shock
1992 ACCP*/SCCM* Consensus Statement	T ≤ 36° C or > 38° C Pulse ≥ 90 RR ≥ 20 PaCO2 ≤ 32 WBC ≤4 K or > 12K Diff ≥ 10% bands	Infection + ≥ 2 SIRS criteria	Sepsis + EOD*	Sepsis + SBP <90, OR 40 mm below baseline, OR Low perfusion after IV fluid bolus
2015 CMS Core Measure	Same	Same	Sepsis + EOD Lactate > 2	Initial lactate > 4, OR SBP < 90 after 30 mL/kg fluid bolus
2016 Sepsis 3	SIRS eliminated qSOFA* introduced	Infection + 2 qSOFA criteria	Eliminated	SBP < 90 AND Lactate > 2 after fluid bolus
2017 SSCG*	No SIRS	**Infection + EOD**	Eliminated	**Subset of sepsis** with circulatory and cellular metabolic dysfunction associated with a higher risk of mortality (no clinical criteria)

* Adapted from slide provided by David Nace, MD

Sepsis – Early Identification Challenges

- Time from suspicion of sepsis to ICU or mortality is short (often < 24 hours)
- Most tools were intended for and tested in the ED settings
- Many parameters on existing detection/risk stratification tools are not available in LTC settings

Atypical Presentation of Infection

- Fever

Fever Definition	Guideline
ACCP/SCCM	T ≥ 38° C (100.4° F)
IDSA LTC	• ≥ 37.8° C (100° F) • Repeated ≥ 37.2° C (99° F) • > 1.1° C (2° F)over baseline

- Altered Mental Status

"Older is Colder"

High KP, et al. Clin Infect Dis. 2009 Clinical practice guideline for evaluation of fever and infection in older residents of long-term care facilities.

Tools - SIRS Criteria
Systemic Inflammatory Response System

Criteria (Score ≥ 2 = Positive)
T ≤ 36° C or > 38° C (96.8° F or 100.4° F)
Pulse ≥ 90
RR ≥ 20
PaCO2 ≤ 32
WBC ≤ 4 K or > 12K Diff ≥ 10% bands

Churpek MM, et al. Am J Resp Crit Care Med 2017;195:906-911
www.qSOFA.org

Northwestern

Tools - SIRS Criteria
Systemic Inflammatory Response System

Criteria (Score ≥ 2 = Positive)
T ≤ 36° C or > 38° C (96.8° F or 100.4° F)
Pulse ≥ 90
RR ≥ 20
PaCO2 ≤ 32
WBC ≤ 4 K or > 12K Diff ≥ 10% bands

- Sensitivity = Good; Specificity = Very Poor
- 90% of ICU patients and 50% of general ward patients met criteria
- Too many false positives

Churpek MM, et al. Am J Resp Crit Care Med 2017;195:906-911
www.qSOFA.org

Northwestern

Tools qSOFA
Quick Sequential Organ Failure Assessment

Criteria
Altered Mental Status – Glascow Coma Score < 15[a]
Systolic Blood Pressure < 90 mm Hg
Respiratory Rate ≥ 22 breaths per minute

[a] Some studies use cutoff of 13

http://www.qsofa.org
Churpek MM, et al. Am J Resp Crit Care Med 2017;195:906-911.
Dorsett M, et al. Prehospital Emergency Care 2017;21(4):489-497.

Northwestern

Tools qSOFA
Quick Sequential Organ Failure Assessment

Criteria
Altered Mental Status – Glascow Coma Score < 15[a]
Systolic Blood Pressure < 90 mm Hg
Respiratory Rate ≥ 22 breaths per minute

[a] Some studies use cutoff of 13

- Meant for ED and general wards – NOT LTC settings
- Derived using data from ICU database
- Sensitivity = Poor; Specificity = Good;
- Part of the 2016 guidelines

http://www.qsofa.org
Churpek MM, et al. Am J Resp Crit Care Med 2017;195:906-911.
Dorsett M, et al. Prehospital Emergency Care 2017;21(4):489-497.

Northwestern

Tools qSOFA
Quick Sequentia…ient

Criteria	**No**
Altered Mental Statu…	
Systolic Blood Pressu…	
Respiratory Rate ≥ 22	

[a] Some studies use cutoff of 13

TABLE 38-2
Glasgow Coma Scale

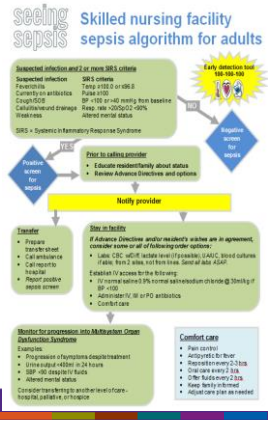
BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	*Best response*	15
	Comatose client	8 or less
	Totally unresponsive	3

http://www.qsofa.org
Churpek MM, et al. Am J Resp Crit Care Med 2017;195:906-911.
Dorsett M, et al. Prehospital Emergency Care 2017;21(4):489-49…

Northwestern

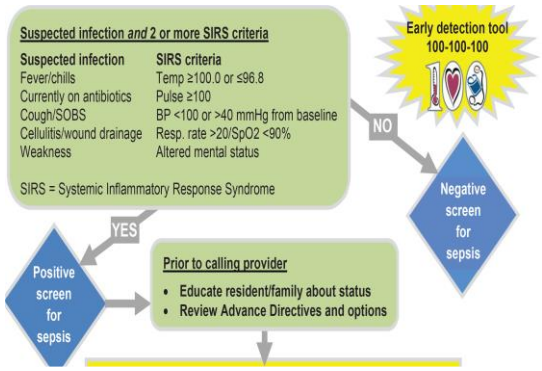
Tools 100-100-100
Seeing Sepsis Campaign

Minnesota Hospital Association

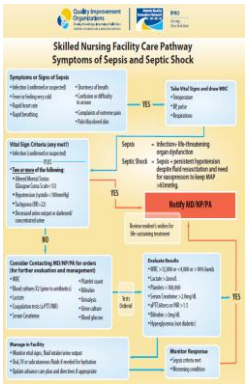


https://www.mnhospitals.org/quality-patient-safety/quality-patient-safety-initiatives/sepsis-and-septic-shock#/videos/list

Northwestern



Algorithms for early sepsis recognition in nursing homes



Screening Mrs. S for sepsis

100-100-100	Yes	No
Pulse ≥100	X	
T ≥ 100 °F		X
Systolic Blood Pressure ≤ 100 mm Hg		X

Positive

Early sepsis detection

Suspected Infection and ≥ 2 SIRS criteria	Yes	No
Pulse ≥100	X	
T ≥ 100 °F or ≤ 96.8 °F		X
Respiratory Rate > 20/SpO2<90%		X
Systolic Blood Pressure < 100 or >40 mm Hg		X
Altered Mental Status	?	

? Negative

Does the resident meet the definition of delirium?

Early sepsis detection

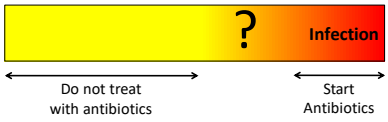
qSOFA	Yes	No
Altered Mental Status		?
Systolic Blood Pressure < 90 mm Hg		X
Respiratory Rate ≥ 22 bpm		X

? Negative

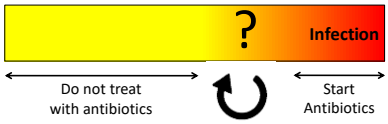
What would you do next?

A) Check a urinalysis and culture
B) Send the patient to the ED for further evaluation
C) Discuss with covering clinician and continuing monitoring
D) Start empiric antibiotics
E) Start antibiotics "just in case"

Antibiotic Stewardship



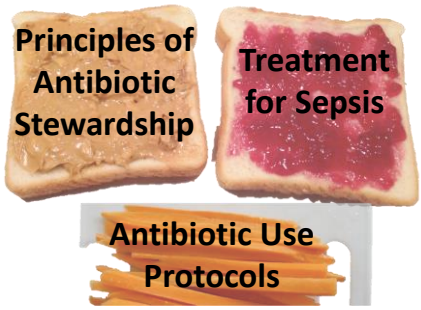
Antibiotic Stewardship



Active monitoring
Supportive Care
Diagnostic Tests
Keep Thinking!!

Principles of Antibiotic Stewardship

Treatment for Sepsis



Summary

- Identifying sepsis is hard!
- Tools that help identify a resident change in condition and provide a structured communication are critical
- Early detection of sepsis and antibiotic stewardship go together like PB&J

References & Resources

- https://www.cdc.gov/sepsis/index.html
- http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
- http://patientsafety.pa.gov/ADVISORIES/Pages/201609_108.aspx
- https://www.mnhospitals.org/quality-patient-safety/quality-patient-safety-initiatives/sepsis-and-septic-shock#/videos/list
- https://atlanticquality.org/download/AQIN_Nursing_Facility_Sepsis_Care_Pathway.pdf
- https://www.ahrq.gov/sites/default/files/wysiwyg/nhguide/4_TK1_T1-SBAR_UTI_Final.pdf
- http://www.interact2.net/docs/Communication%20Tools/SBAR_Communication_Tool_and_Progress_Notec.pdf
- http://www.pathway-interact.com/wp-content/uploads/2018/09/INTERACT-V4-SBAR_Communication_Form-Dec_June-2018.pdf

Questions?

Thank You

theresa.rowe@northwestern.edu or nnq1@cdc.gov

Comparison of Nursing Home Screening Tools for Identifying Sepsis[1]

- Retrospective chart audit of nursing home documentation in 236 residents hospitalized with sepsis and returned to the nursing home
- In up to **34%** of cases, documentation of vital signs were missing

1. Sloane et al, J Am Med Dir Assoc. 2018 Jun;19(6):492-496.e1.

Comparison of Nursing Home Screening Tools for Identifying Sepsis[1]

- Retrospective chart audit of nursing home documentation in 236 residents hospitalized with sepsis and returned to the nursing home
- Documentation of vital signs were missing in up to 34% of cases

In the 12 hours prior to hospitalization

Most sensitive	Most specific
100-100-100 criteria (79%), Temperature >99.0°F (51%)	Temperature > 100.2°F (93%) q-SOFA (88%) SIRS (86%) Temperature > 99.0°F (93%)

1. Sloane et al, J Am Med Dir Assoc. 2018 Jun;19(6):492-496.e1.

Identification of Sepsis

Bernardo J. Reyes MD
Assistant Professor Of Geriatrics
Associate Director
Internal Medicine Residency Program
Charles Schmidt College of Medicine

Disclosure

Support through FAU for research on INTERACT
from Point Click Care.

Objectives

- Limitations of current criteria to identify patients with sepsis in NF
- How to improve sensitivity and specificity
- Acute vs. Sub-Acute process of becoming septic
- The Value of Clinical Condition Variability
- Laboratory data as add-on criteria

What is INTERACT

- **Quality improvement program** designed to improve the care of older people with acute changes in condition in skilled nursing, long-term care, and assisted living facilities, and home health care
- **Prevent** conditions from becoming severe enough to require hospitalization through **early identification and evaluation** of changes in patient condition
- **Manage some conditions** without transfer when this is feasible and safe

http://www.interact-pathway.com/

Mr. M

- 89 y/o male previous community dweller
- Transferred to your NF from a local hospital after surgical repair of a hip fracture complicated with urinary retention (now resolved)
- PMH: Depression, Afib, HTN, MCI, CHF
- Three days after admission to your facility has less appetite
- On day 4, the patient feels weaker, you stop his diuretic and ACE inh and encourage PO intake
- On day 5, the RN calls your coverage at 3 AM reporting that the patient is disoriented, HR 78 BP 123/78, RR= 22 and Temp 98.9 F. → Treat Pain
- On day 6 the patient is too weak to leave his bed. In the afternoon he develops fever and becomes somnolent. You evaluate the patient and decide to transfer the patient back to the hospital.

Questions for the Audience

Was the transfer necessary ?

Was this situation avoidable?

Identification of Sepsis

- The human and financial costs of acute transfers, hospital admissions and readmissions from NF are substantial
- Significant proportion of them are considered potentially avoidable
- Sepsis is a common cause of acute transfers among NF patients/residents
- Stablished criteria to identify septic patients such as Quick Sepsis Related Organ Failure Assessment (QSOFA) and Systemic Inflammatory Response Syndrome (SIRS)
  - *Lack both sensitivity and specificity*
  - *Require assessments that are not part of the regular work flow of the care providers in NF*

Performance of Screening Tools in Distinguishing Patients Transferred From a NH to a Hospital With Early Sepsis From Patients Without Sepsis

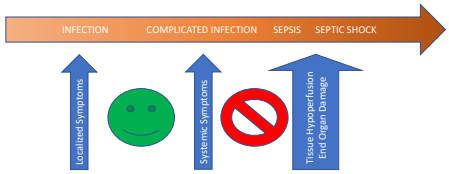
Sepsis Screening Tool	Variables	13–72 h Prior to Hospitalization		≤12 h Prior to Hospitalization	
Nonsepsis	Sepsis	Nonsepsis	Sepsis	Nonsepsis	Sepsis
SIRS	Met screening criteria	6%	10%	12%	36%
Sensitivity for sepsis		10%		36%	
Specificity for sepsis		94%		86%	
qSOFA	Met screening criteria	4%	7%	13%	27%
Sensitivity for sepsis		7%		27%	
Specificity for sepsis		96%		88%	
100-100-100	Met screening criteria	16%	28%	31%	79%
Sensitivity for sepsis		28%		79%	
Specificity for sepsis		84%		69%	
Temperature ≥99.0 ˚F	Met screening criteria	14%	22%	15%	51%
Sensitivity for sepsis		22%		51%	
Specificity for sepsis		86%		85%	
Temperature ≥100.2 ˚F	Met screening criteria	3%	9%	7%	20%
Sensitivity for sepsis		9%		40%	
Specificity for sepsis		97%		93%	

JAMDA 2018-05-01, Volume 19, Issue 6, Pages 492-496

Best Criteria

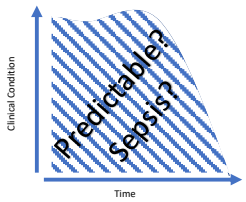
- Sensitive (we don't want to miss sepsis)
- Specific (we don't want to over-diagnose)
- Able to Identify Sepsis Early
  - Avoid the development of sepsis
  - Start Treatment Early
  - Triage those who need to be transferred

Right Timing



Improving Sensitivity

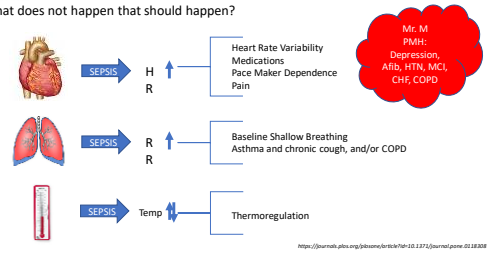
- Change in Condition



CHANGE IN CONDITION

SIRS/qSOFA/3x100

- What does not happen that should happen?



https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0118308

SIRS/qSOFA/3x100

- What does not happen that should happen?

On day 4, the patient feels weaker, you stop his diuretic and ACE inh and encourage PO intake

SEPSIS → M S

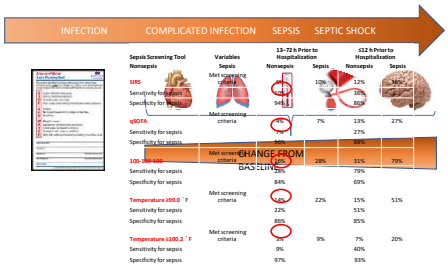
- Dementia
- Prior strokes
- Medication side effects
- Dehydration

SEPSIS → B P

- Use of Cardiovascular Drugs
- Age-related changes in baroreceptor reflexes

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0118308

Fine Tuning

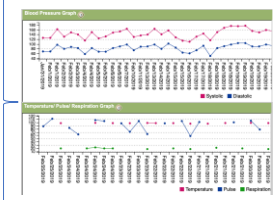


Initial Triggers

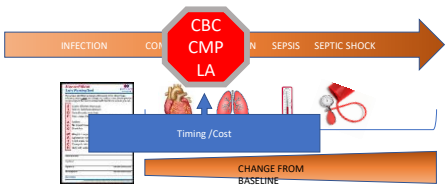
- Criteria should be designed to be used based on the capacities and available resources "typical" NFs and should be the result of common assessments already in place (do not add another task)
- Using changes in the resident's condition or function as the only parameters to identify septic patients may be very sensitive, the criteria may lack specificity, leading to overdiagnosis

Best Criteria

Changes in an individual's baseline function and vital signs may be more appropriate



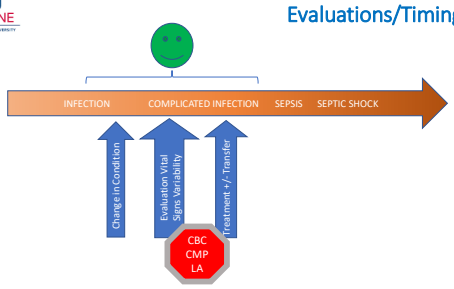
Labs



Labs

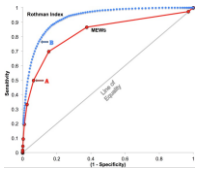
- To improve both specificity and sensitivity, ancillary data could be incorporated in the criteria.
- Laboratory values could improve the accuracy of the diagnosis of sepsis in NF residents.
- Consider Using Point of Care Technology
- IF considering using POC, look for CLIA waived technology
- IF possible, consider technology that is compatible with your EHR

Evaluations/Timing



What is a the degree of change that is clinically relevant?

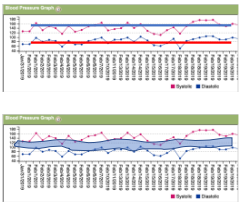
- We have experience with variability and outcomes
- Early warning systems suffer from high false-alarm rates
- Frequency of Assessments (as patients get sicker we evaluate them more often)
- How you calculate risk based on data entry thought the continuum
- AI (how to train your system)



Modified Early Warning Score (MEWS) and Rothman Index (RI).
24-hour hospital mortality of general medical-surgical unit patients (N = 32,472)

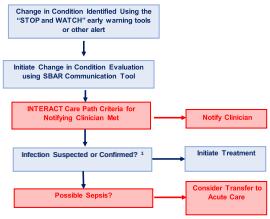
Teaching your EHR

- Do not alarm only based on fixed parameters (might not be sensitive or specific enough)
- Single point-in-time probability
- Personalized probability trends over time
  - What is considered normal variance
  - Modify normal variance based on evolving issues (adding or removing a blood pressure medication or a pacemaker implantation)
- How you could incorporate good old fashion clinical judgment to any calculation?
- When we get an alert, what we should do?



What to do with the data?

Management of Possible Sepsis Using INTERACT Tools



Take Home Message

- Sepsis is a common cause for acute transfers
- Some transfers are avoidable
- In order to treat sepsis in NF we need to identify it early
- Wide-used criteria are not sensitive or specific enough
- Optimal criteria should be based on every day assessments
- The most sensitive criteria is a change in condition
- Variability of vitals signs and other parameters instead of set values (train your EHR)
- Consider using POC Testing
- Plan what to the information
- Treat or transfer

Thank you

Updates in Management of Common Infections in Post-Acute and Long-Term Care Facilities

Swati Gaur, MD, MBA, CMD, AGSF

Chief Operating Officer, Care Advances Thru Technology

Medical Director, Post-Acute Long Term Care, Northeast Georgia Health System

amda THE SOCIETY FOR POST-ACUTE AND LONG TERM CARE MEDICINE™

Speaker Disclosures

Dr. Gaur has no financial relationships.

Learning Objectives

By the end of the session, participants will be able to:

- Objective 1: Know principles of sepsis clinical management
- Objective 2: Understand the role of communication cascade
- Objective 3: Discern whether to treat in LTC or transfer (location)

Case Presentation:

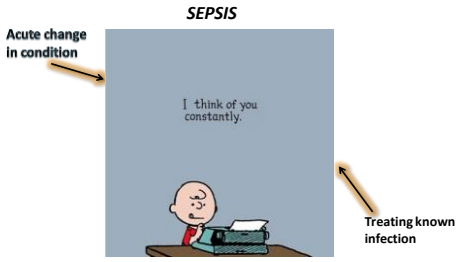
- 79 year old patient with indwelling foley and and history of CVA with dense left hemi, diabetes, hypertension, and CAD.
- Called by NP – facility called with patient having constitutional symptoms – acute change in condition initial workup 12K white count, no localizing symptoms. Ceftriaxone started and now with fever despite it, she wants to add more antibiotics.
- Is this enough information for decision making?
- What did we do with patient?

Outcomes of the Surviving Sepsis Campaign in intensive care units in the USA and Europe: a prospective cohort study

Mitchell M Levy, Antonio Artigas, Gary S Phillips, Andrew Rhodes, Richard Beale, Tiffany Osborn, Jean-Louis Vincent, Sean Townsend, Stanley Lemeshow, R Phillip Dellinger

Hospital mortality if origin is emergency department		3008 (24·6%) ↓	736 (34·1%) ↓	<0·0001
Hospital mortality if origin is ward	#	1661 (34·9%)	1481 (43·5%)	<0·0001
Hospital mortality if origin is ICU		644 (36·1%)	502 (48·0%)	<0·0001

Lancet 2012



TREATMENT OF ACUTE SEPSIS

Effectiveness of the Bundles

- 263 patients –
- 6 hour bundle vs traditional treatment
- In hospital mortality 30.5 vs 46.5 with P=0.009

Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock
Emanuel Rivers, M.D., M.P.H., Bryant Nguyen, M.D., Suzanne Havstad, M.A., Julie Ressler, B.S., Alexandria Muzzin, B.S., Bernhard Knoblich, M.D., Edward Peterson, Ph.D., and Michael Tomlanovich, M.D. for the Early Goal-Directed Therapy Collaborative Group*

NEJM 2001

What's in a bundle?

3 HR BUNDLE

- Measure lactate level
- Obtain blood cultures prior to administration of antibiotics
- Administer broad spectrum antibiotics
- Administer 30ml/kg crystalloid for hypotension or lactate ≥4mmol/L

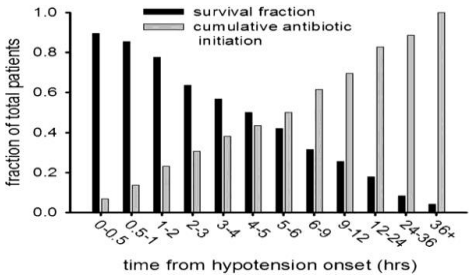
6 HOUR BUNDLE

- Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥65mmHg
- In the event of persistent hypotension after initial fluid administration (MAP<65mmHg) or if initial lactate was ≥4mmol/L, re-assess volume status and tissue perfusion.
- Re-measure lactate if initial lactate elevated.

Hour-1 Bundle

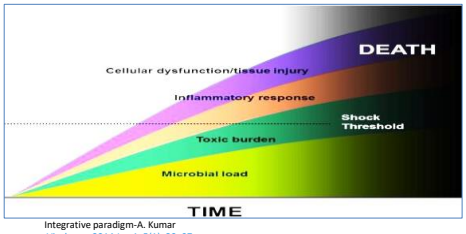
- Measure lactate level. Re-measure if initial lactate >2mmol/L
- Obtain blood cultures prior to antibiotic administration
- Administer broad- spectrum antibiotics
- Begin rapid administration of 30ml/kg crystalloid for hypotension or lactate ≥4mmol/L
- Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain MAP≥65mm Hg

Intensive Care Medicine Jun18: MMLevy



Curr Infect Dis Rep. 2015 Jul; 17(7): 493.

Broad Goals



Integrative paradigm-A. Kumar
Virulence. 2014 Jan 1; 5(1): 80–97

Antibiotic Choice

- Early – within 1 hour
- Appropriate –
  - Choice of antibiotic
  - Route of administration
  - Dose of antibiotic

Source	Choice
Lung	antipseudo beta lactam+AG/AntipseudoFQ+vanc
Urine	Antipseudo betalactam
Undifferentiated	Antipseudo beta lactam+AG/AntipseudoFQ+vanc

Curr Infect Dis Rep. 2015 Jul; 17(7): 493,
Clin Infect Dis 2009;48:503-35.

ORIGINAL ARTICLE

Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock

Emanuel Rivers, M.D., M.P.H., Bryant Nguyen, M.D., Suzanne Havstad, M.A., Julie Ressler, B.S., Alexandria Muzzin, B.S., Bernhard Knoblich, M.D., Edward Peterson, Ph.D., and Michael Tomlanovich, M.D. for the Early Goal-Directed Therapy Collaborative Group*

Article Figures/Media

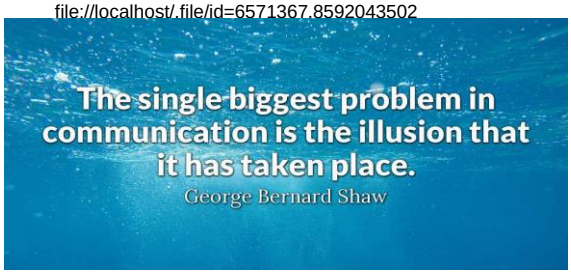
November 8, 2001
N Engl J Med 2001; 345:1368-1377
DOI: 10.1056/NEJMoa010307

36 References 5389 Citing Articles

Early Goal directed therapy- Fluid bolus –Decrease in mortality
NNT-6

Communication

file://localhost/.file/id=6571367.8592043502



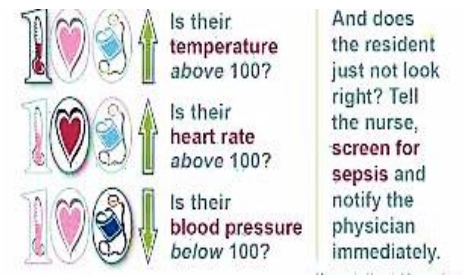
Journal of the American Medical Directors Association
Volume 19, Issue 6, June 2018, Pages 492-496.e1

Original Study

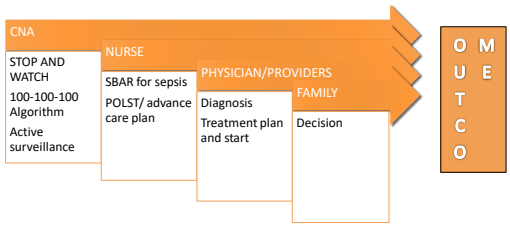
Can Sepsis Be Detected in the Nursing Home Prior to the Need for Hospital Transfer?

Philip D. Sloane MD, MPH [a, b, c, ⁂], Kimberly Ward BA [a], David J. Weber MD, MPH [c, d], Christine E. Kistler MD, MASc [a, b], Benjamin Brown BS [c], Katherine Davis BS [c], Sheryl Zimmerman PhD [a, e]

Seeing Sepsis: Identifying Sepsis



Communication flow Cascade



Stop and Watch
Early Warning Tool

INTERACT

If you have identified a change while caring for or observing a resident, please **circle** the change and notify a nurse. Either give the nurse a copy of this tool or review it with her/him as soon as you can.

S	Seems different than usual
T	Talks or communicates less
O	Overall needs more help
P	Pain – new or worsening; Participated less in activities
a	Ate less
n	No bowel movement in 3 days; or diarrhea
d	Drank less
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 patient

Situation:

_____ has screened positive for sepsis at _____
(patient name) *(time)*

Background:

1. _____ has the following *positive criteria for SIRS*
(patient name) *(state only those that apply)*

a. Temperature > 100.6 (38C) or < 96.8% (36)
b. BP < 90 mmHg or > 40 mmHg from baseline
c. HR > 90/min
d. Respiratory rate > 20/min
e. Change in mental status, ALOC

2. I suspect infection
The most recent WBC is _____
(Consider infection if WBC > 12, 000 or < 4,000)

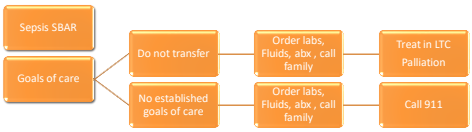
Assessment:

1. Vital signs are: _____
2. SaO_2 is _____, compared to _____ *(last reading)*
3. Mental status is now _____
4. Urine output is _____ cc per hour or _____ over the last 8°
5. The most recent creatinine is _____; Creatinine on admission was _____

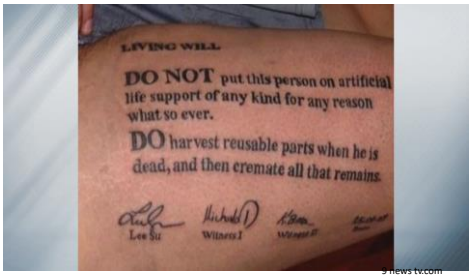
Recommendation:

1. I need you to evaluate the patient to confirm if they have severe sepsis
2. In addition to a stat Lactate, what other labs would you like me to order?
3. Should I start an IV and give a fluid bolus? *(if patient hypotensive)*

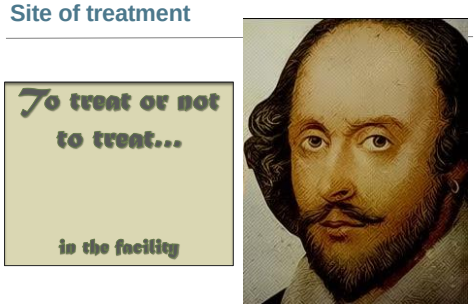
Decision cascade



Let's not make our patients do this!



Site of treatment



To transfer or NOT to transfer

Patient with severe sepsis	Nursing home residents	Non nursing home residents
Rate of ICU admission	40%	21%
Hospital LOS	7 days	5 days
In-hospital mortality	37%	15%

Ginde AA, Moss M, Shapiro NI, Schwartz RS. Impact of older age and nursing home residence on clinical outcomes of U.S. Emergency Department visits for severe sepsis. J Crit Care 2013;28:606e611.

Treat

- 30ml/kg X 60 KG= fluid bolus.
  - Sepsis is NOT a crisis of clysis!
- Keep MAP >65 [(diastolic X 2)+systolic]/3
  - Keep that VS machine in the room- Like Really!
- Follow up the lactate if the first level was high-
  - What color tube is that anyway?

Treat

- Send all Cultures before the first dose of antibiotics which should be within 1 hour-
  - Do we even have culture bottles?
- Start with broad spectrum antibiotics (2 with shock) and narrow a.s.a.p. –
  - Its 2 am, how long do I have to hold to get the ebox list?
- Duration 7-10 days (typical)
  - Will be tailored to the organ of origin


JAMDA xxx (2018) 1-4

JAMDA

journal homepage: www.jamda.com

ELSEVIER

Editorial

Post-acute and Long-term Care Settings as First Responders for the Surviving Sepsis Campaign

Robin LP. Jump MD, PhD [a,b,*], Susan M. Levy MD, CMD [c], Wayne S. Saltsman MD, PhD, CMD [d,*]

Surviving Sepsis Campaign Hour-1 Bundle*[10]	Implementation in Post-Acute and Long-Term Care Setting
Measure lactate level. Remeasure if initial lactate is > 2mmol/L.	
Obtain blood cultures prior to administration of antibiotics	Blood cultures, urine culture from a newly placed urinary catheter. When appropriate, obtain a sputum culture and swabs of gross pus.
Administer broad-spectrum antibiotics	Administer broad-spectrum antibiotics (see text for details)
Begin rapid administration of 30ml/kg of crystalloid for hypotension or lactate ≥ 4 mmol/L.	For hypotension (< 90/60 mmHg for residents with a baseline ≥ 120/80), begin rapid administration of 1-2 liters of crystalloid, with the first liter going in over 1 hour.
Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain mean arterial pressure of ≥65mm/Hg	

The S-Kit: Making it operational

Category	Specific Components
Durable equipment	Automated digital blood pressure machine Blood pressure cuffs (disposable) in several sizes Pulse oximeter Thermometer
Supplies	Mask and tubing for supplemental oxygen Kits for placing intravenous catheters (include several sizes) Blood-drawing equipment, including tourniquets Chlorhexidine swabs for cleansing skin prior to placing intravenous catheters and collecting blood cultures Kit for placing urinary catheter to monitor urine output Sterile gloves (include several sizes) for placing the urinary catheter Personal protective equipment including gowns, gloves, and masks (include several sets) Dressing supplies, packing, and tape Bags of sterile crystalloid fluid (eg, normal saline or lactated ringers)
Laboratory Tests	Blood culture bottles (at least 2 sets of aerobic and anaerobic bottles) Collection tubes for common laboratory studies[†] Sterile containers to collect additional specimens as clinically indicated: urine (from a newly placed catheter) sputum culture stool, particularly if liquid Bacterial culture swabs Viral culture swabs and transport medium
Antibiotics	Oral: amoxicillin/clavulanic acid and linezolid Intravenous: piperacillin/tazobactam and intravenous vancomycin If penicillin allergy: levofloxacin If concern for *Clostridioides* (formerly *Clostridium*) *difficile* infection: oral vancomycin or fidaxomicin

S-KIT, sepsis "kit."

[†]When appropriate, the components of the S-KIT should be labeled with an expiration date and replaced. Durable equipment should be checked quarterly for proper functioning and the supplies replaced at least annually.

Article in press Post-acute and Long-term Care Settings as First Responders for the Surviving Sepsis Campaign
Robin L.P. Jump MD, PhD a, b, *, Susan M. Levy MD, CMD c, Wayne S. Saltsman MD, PhD, CMD d, *

Suggested Antibiotics in the Sepsis Kit

- Oral: amoxicillin/clavulanic acid and linezolid
- Intravenous: piperacillin/tazobactam and intravenous vancomycin
- If penicillin allergy: levofloxacin
- If concern for *C. difficile* infection: oral vancomycin or fidaxomicin

Monitor

- Close monitoring of vital signs
- Watch for system failure with O2 monitoring, labs (glucose, creatinine, platelet)
- Watch for response (CBC, lactate level)
- Follow up on the Cultures

Watch out for complications

- Pressure ulcers
- DVT/ stress ulcer
- Deconditioning
- Nutrition
- Delirium

Communicate

- Call family to discuss prognosis and goals of care.

Treatment in LTC

- Treat
- Monitor
- Communicate

In summary:

- Patient level intervention: 3 big goals-
  - Start antibiotics
  - Maintain perfusion
  - Support patient through acute infection
- Facility level intervention: 3 big goals-
  - Don't miss it!
    - SBAR- Education!!!
  - Determine site of treatment:
    - Goals of care
  - Early intervention…regardless of site of care

Always Team Work

Questions:

Role of Medical Director

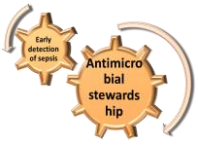
- Nurture the Antimicrobial Stewardship Committee
- Actively participate in QAPI
- Know the LTC capabilities checklist*
- Help develop capabilities – blood culture bottles, stat labs, IV fluids, E box antibiotics
- Standardization of Advanced Care Planning

INTERACT*

Role of Practitioners

- Know the capabilities
- High level of suspicion
- Education of nursing staff
- Proactive discussion of goals of care

Mindful approach to treatment of Infections



To transfer or NOT to transfer

- Nursing home residents with severe sepsis, compared with non-nursing home residents, had significantly higher rates of ICU admission (40% vs 21%), hospital LOS (median, 7 vs 5 days), and in-hospital mortality (37% vs 15%).

Ginde AA, Moss M, Shapiro NI, Schwartz RS. Impact of older age and nursing home residence on clinical outcomes of U.S. Emergency Department visits for severe sepsis. J Crit Care 2013;28:606e611.

Be aware:

- Mortality of sepsis is high if not following the full bundle!!
- May start treatment but several lab/ monitoring/ treatment resources may not be available in LTC facilities.
- The chance that patient will deteriorate despite initial treatment is high and we have no immediate ICU supportive interventions