

Pediatric Sepsis and EMS Survey



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Suspect Sepsis. Save Lives.



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Sepsis and EMS Survey

- ▶ Sepsis is the body's overwhelming and life-threatening response to infection which can lead to tissue damage, organ failure, and death.
 - ▶ More than 75,000 children develop severe sepsis each year in the U.S.¹
 - ▶ More than 6,800 children die from sepsis each year, more than pediatric cancers.^{1,2}
 - ▶ Mortality from sepsis increases with every hour that treatment is delayed.^{3,4} As many as 80% of sepsis deaths could be prevented with rapid diagnosis and treatment.⁴

Why do EMS practitioners need to know about sepsis?

- ▶ Sepsis in children accounts for 100,000 emergency department visits each year.⁵
- ▶ Nearly 20% of children treated for septic shock arrive in the emergency department via ambulance.⁵

Methodology

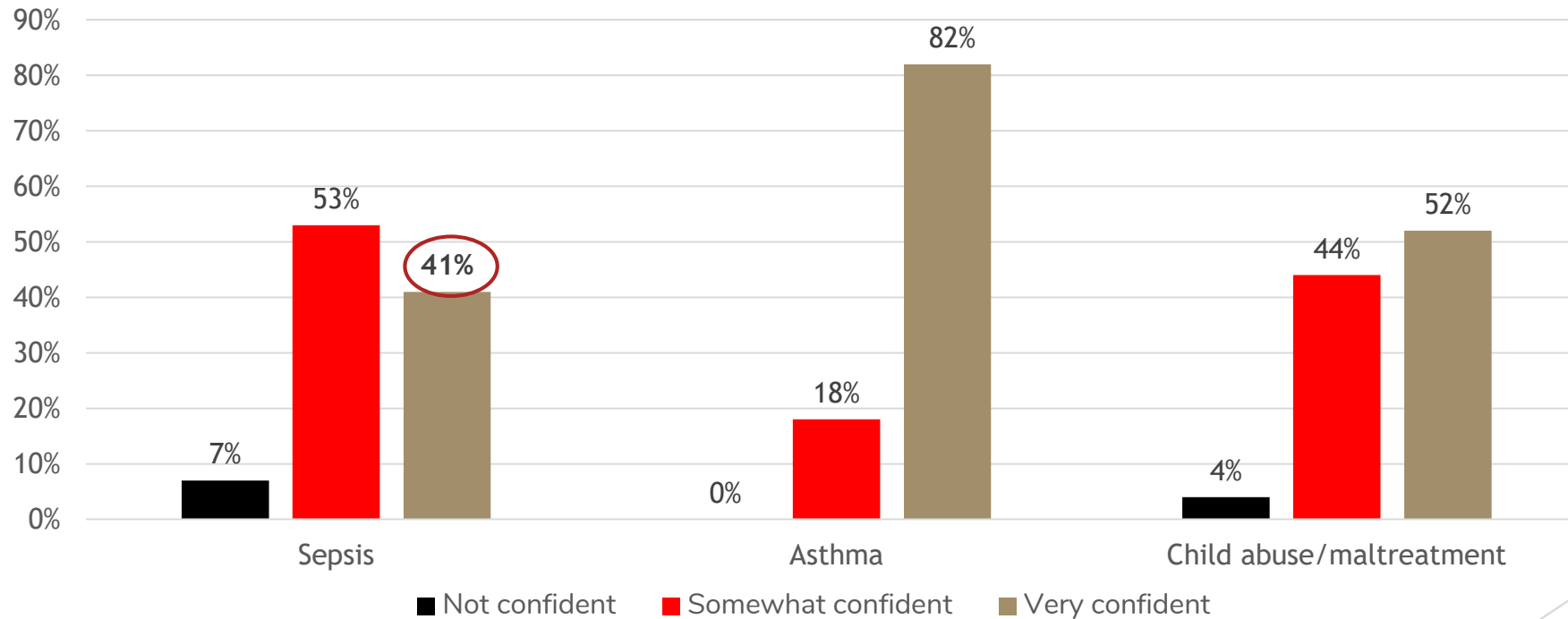
- ▶ This survey was conducted online within the United States by a partnership between Sepsis Alliance and National Association of Emergency Medical Technicians (NAEMT). The surveys were conducted in August and September 2019 among 323 adults, ages 18 and older, who have a primary role in EMS with pediatric patients and provide direct patient care. The sample utilized for the online survey was the NAEMT membership list.
- ▶ For further information, please contact Alex Sadorf at asadorf@sepsis.org.

Executive Summary

- ▶ The goal of this research is to understand pediatric sepsis encounters among EMS practitioners, their ability to recognize and diagnose sepsis, and the education they receive regarding sepsis. AMONG OUR KEY FINDINGS:
 - ▶ There is lack of confidence among EMS in recognizing sepsis signs and symptoms, with just 41% very confident. Yet nearly all consider it a medical emergency, regardless of the child's age.
 - ▶ Just over half of EMS practitioners are very aware of sepsis symptoms (54%), septic shock definition (54%), and sepsis alert criteria (51%).
 - ▶ Only 39% could correctly identify all 4 early signs of sepsis: fever, tachycardia, tachypnea, and altered mental status. In addition, only 53% believe that influenza is commonly associated with sepsis in pediatrics.

Fewer than half of first responders are very confident in their ability to recognize the signs and symptoms of sepsis.

Sepsis Signs and Symptoms Confidence



Most first responders consider sepsis a medical emergency across all pediatric age groups.

Neonate
< 28 days old

87%

Baby
Ages 1 – 12 months

92%

Toddler
1 year up to 3 years

90%

Child
3 years – 12 years

89%

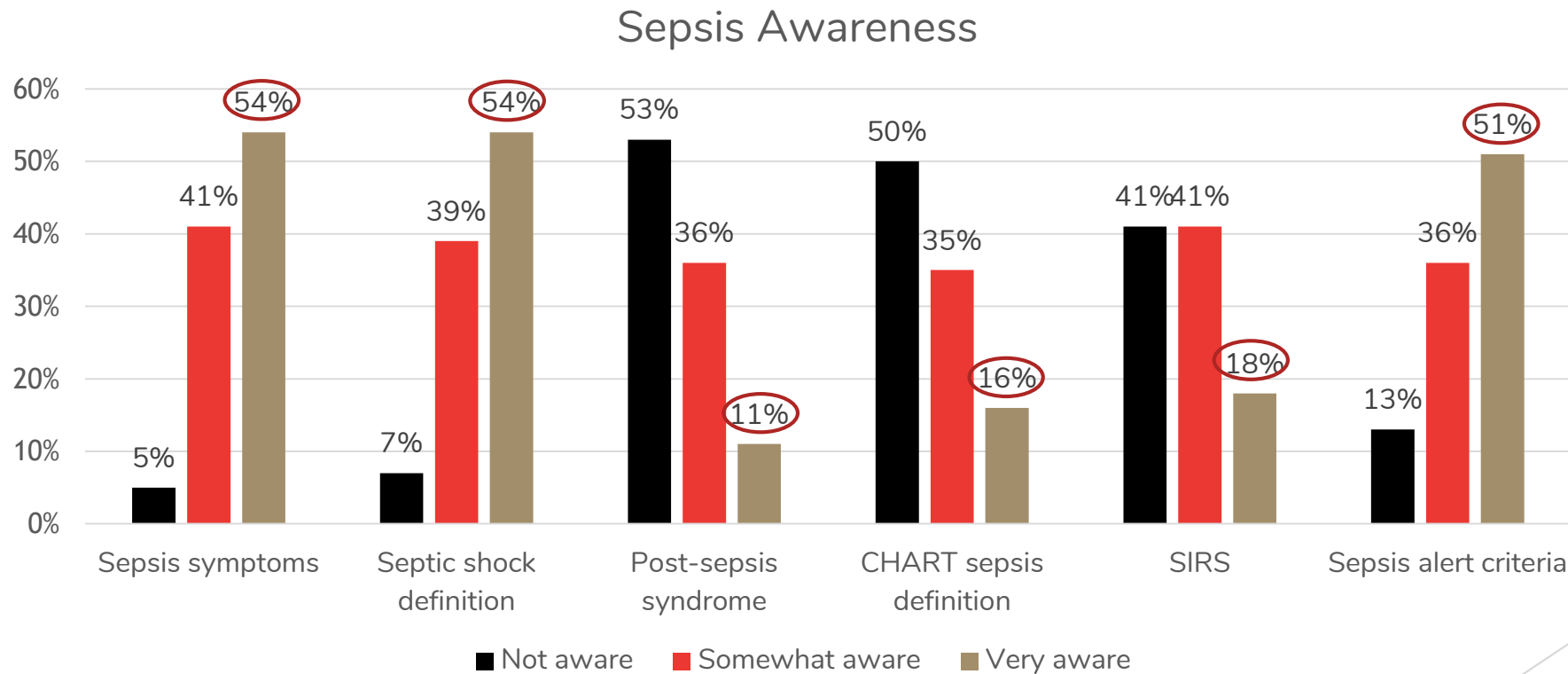
Adolescent
13 years – 18 years

80%

None

1%

First responders are aware of sepsis but not of different aspects of protocols and definitions.



While most EMS practitioners identified fever as an early sign of sepsis, only 39% could identify **all four** of these early signs of sepsis in pediatric patients.

Signs recognized by EMS practitioners	% of EMS practitioners
Fever	83%
Tachycardia	77%
Tachypnea	68%
Altered mental status	65%
Decreased urine output	55%
Poor perfusion	55%
Prolonged capillary refill	51%
Chills	48%
Dyspnea	42%
Hypotension	38%
Low temperature	37%
Cough	24%
Other	5%
I do not recognize any early signs of sepsis	1%

Just over half of first responders identified influenza as a condition commonly associated with sepsis in pediatrics.

According to the CDC, there were 187 deaths from influenza reported in children in 2017-2018, but the actual number is likely closer to 600 deaths due to underreporting.⁶

Condition	% of EMS Practitioners
Pneumonia	72%
UTI	67%
Meningitis	60%
Influenza	53%
Strep throat	49%
Appendicitis	41%
Bronchitis	36%
Croup	24%
Coxsackievirus	12%
Asthma	11%
Fifth disease	6%
Other	6%
I do not know what conditions are commonly associated with sepsis in pediatrics	9%

Most EMS practitioners can identify these four risk factors commonly associated with sepsis in pediatrics.

Only 35% recognized all four as common risk factors, and 15% responded that they do not know the common risk factors.

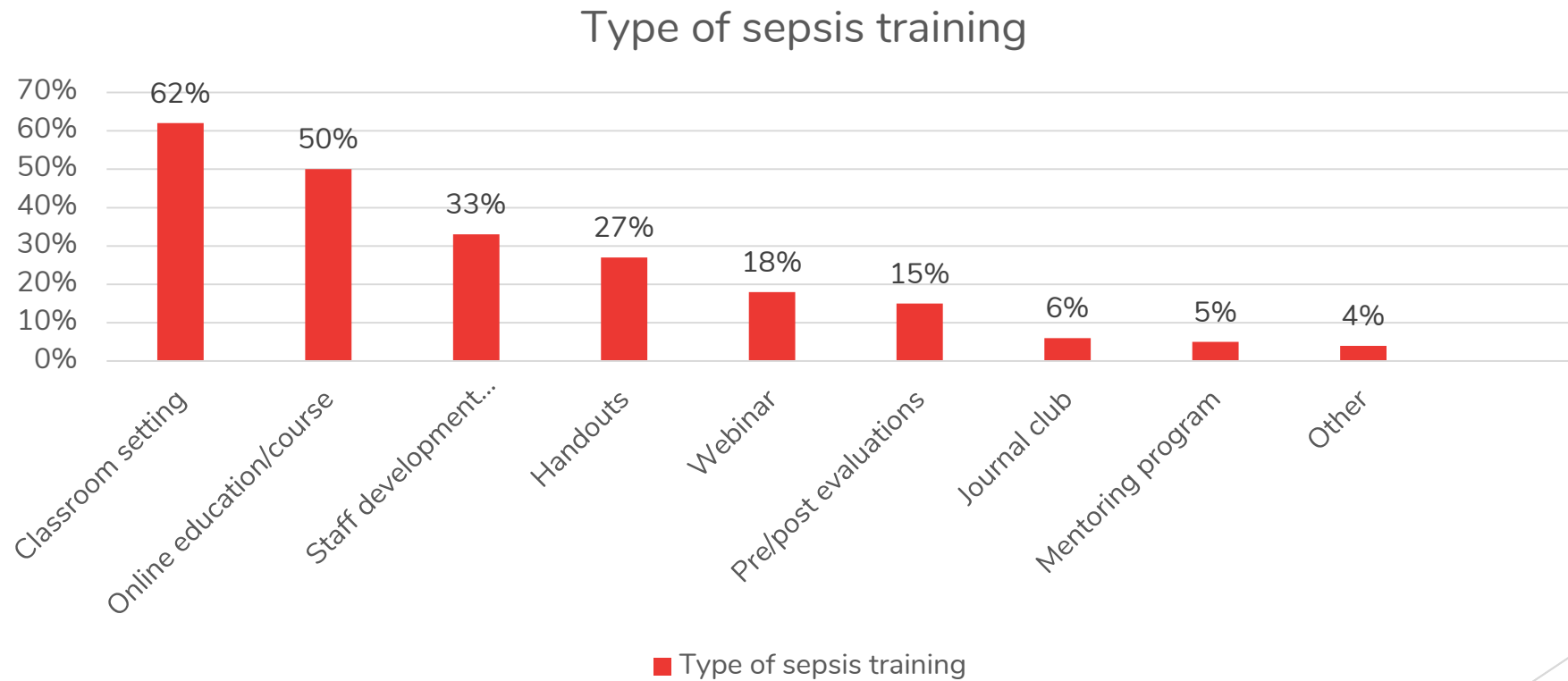
Risk factors	% of EMS Practitioners
Central access	73%
Tracheostomy tube	65%
J-tube	59%
<30 days old	56%
Other	3%
I do not know what risk factors are commonly associated with sepsis in pediatrics	15%

First responders state that their system has a sepsis-specific protocol for pediatrics, most often coming in house from their organization, as is sepsis education.

Sepsis Protocol	% of EMS practitioners
In house from their organization	31%
State-wide	28%
County-wide/Regionally	24%
From receiving hospital(s)	17%
Our system does not receive support for sepsis protocol	0%

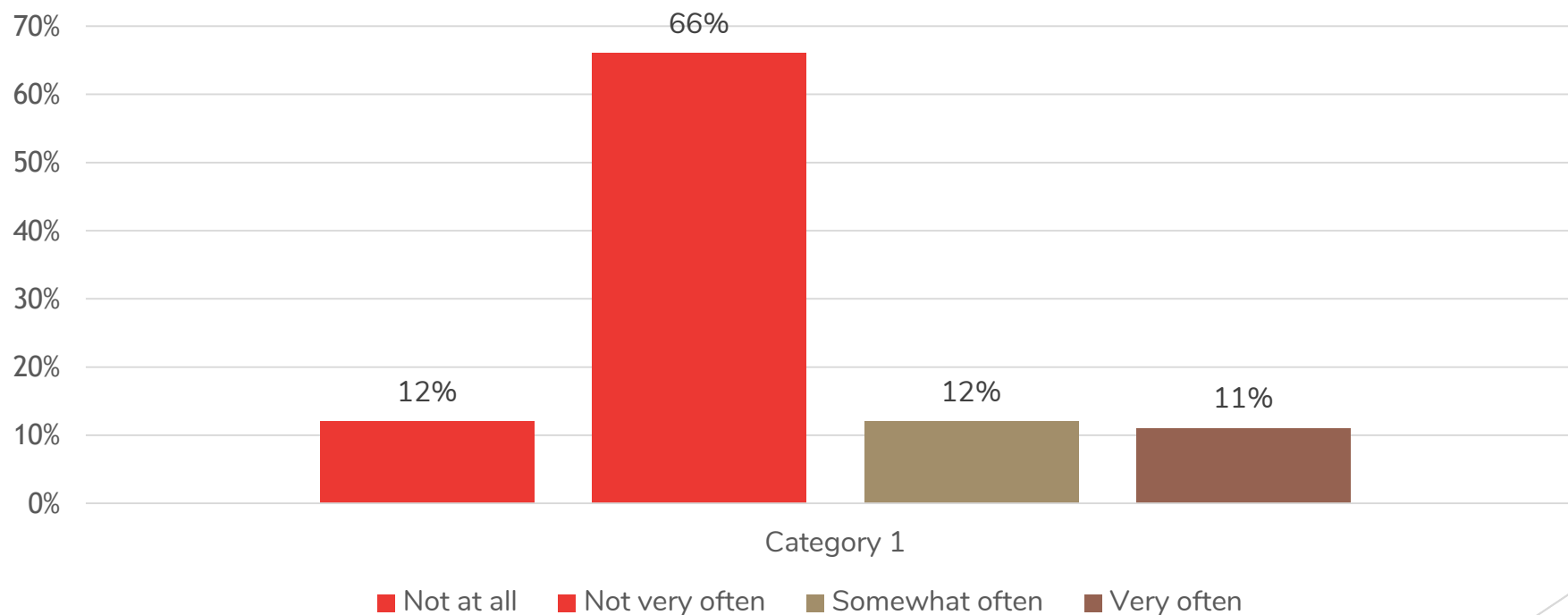
Sepsis Education	% of EMS practitioners
In-house from their organization	30%
I have obtained for myself	17%
State-wide	14%
County-wide/Regionally	11%
From receiving hospital(s)	12%
Other	3%
My organization does not offer	0%

Classroom and online are the most common types of pediatric sepsis training.



Most first responders do not initiate sepsis treatment in the field for pediatric patients often, in spite of the protocols and education available.

Initiate Treatment in Field



Lack of confidence, tools, and sepsis protocols are reasons why sepsis treatment is not initiated while in the field.

Reasons **treatment not initiated** ...

Lack of confidence in treating pediatric patients in the field	19%
Do not have the tools	15%
Not received training	10%
There is no sepsis protocol to follow	9%
Other*	56%

*The majority of the other comments are related to a reported lack of frequency of seeing pediatric patients with sepsis.

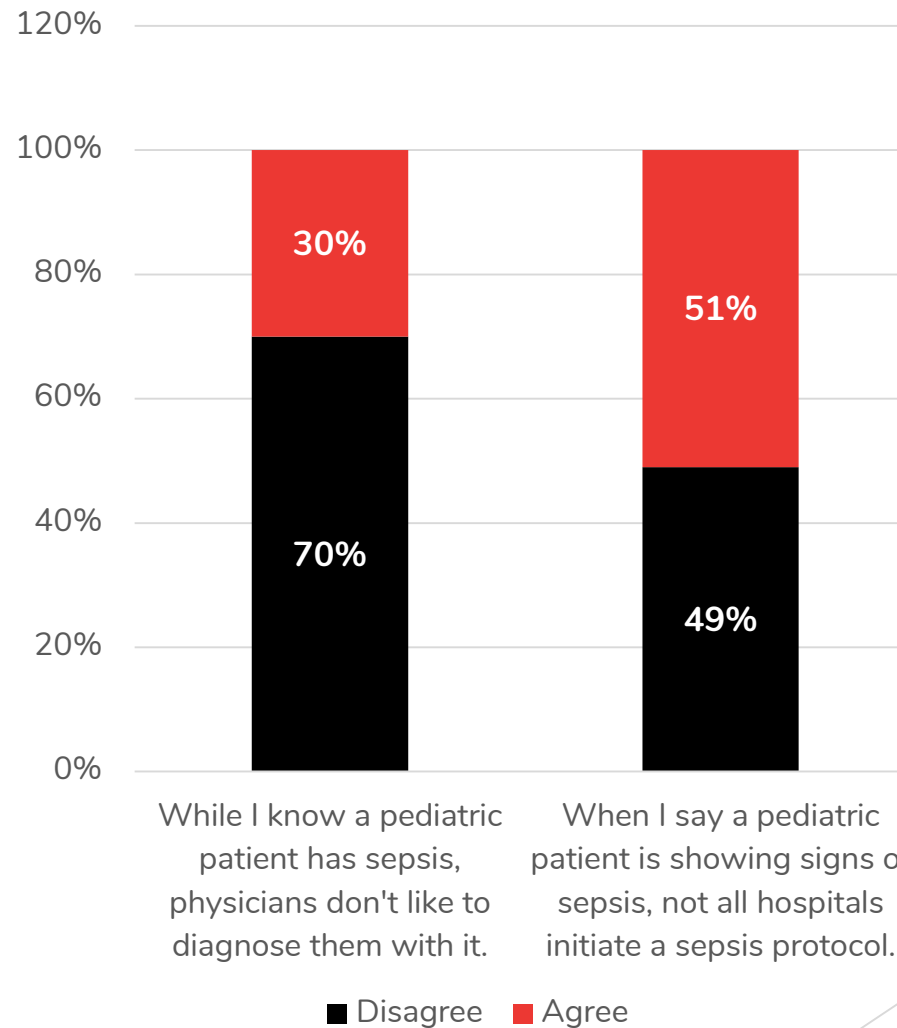
30% state that while they know a pediatric patient has sepsis, physicians don't like to diagnose them with it.

51% say when a pediatric patient is showing signs of sepsis, not all hospitals initiate a sepsis protocol.

“Although sepsis alerts are being implemented more widely, EMS professionals still need to **advocate** for their patients and say ‘I suspect sepsis!’”

- Rom Duckworth,
award-winning EMS educator, career fire captain, and EMS coordinator

Diagnosis and Protocol



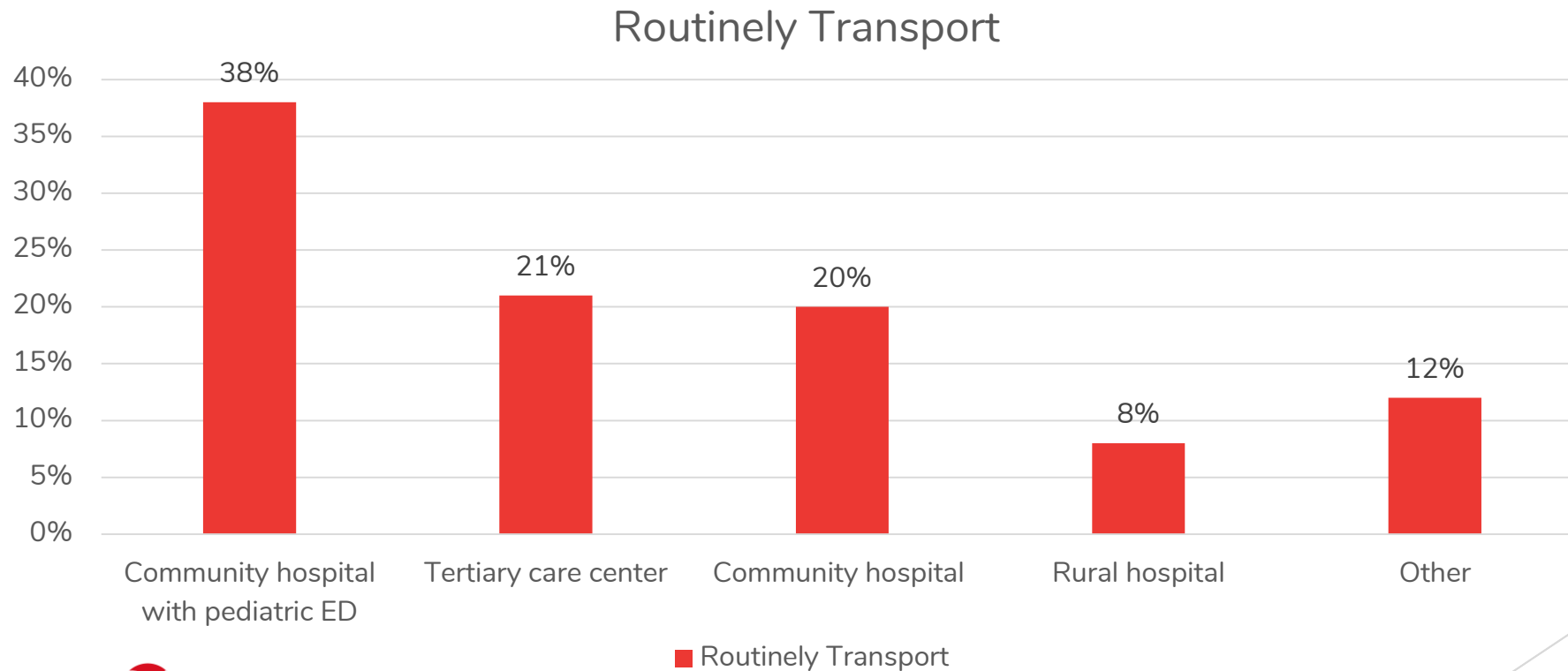
EMS practitioners look to their own associations for information regarding sepsis.

Source of Sepsis Information	
EMT/EMS Associations	60%
JEMS	51%
Their own facility	46%
CDC	41%
EMS World	41%

While point of care lactate is often used for early detection of sepsis, few have this device available.

Devices	% Available
etCO2	86%
Thermometer	86%
Automatic BP monitor with MAP	83%
Fluid infusion device	52%
Other sepsis protocol medical equipment	13%
Blood cultures	10%
Point of care lactate machine	5%
I do not have any medical devices available to me.	3%

Since most pediatric tertiary centers are more than 50 miles away, first responders most often take pediatric patients exhibiting sepsis symptoms to Community Hospitals.



Survey Demographics

Primary role

EMR – 1%
EMT – 27%
Paramedic – 46%
Supervisor – 5%
Manager – 2%
Training coordinator – 8%
EMS Director – 5%
Medical Director – 1%
Other – 5%

Level of patient care

First aid only – 5%
First response – 31%
BLS transport to emergency department – 38%
ALS transport to emergency department – 68%
Critical care transport – 25%
Other – 11%

Seen sepsis patients

83% have seen patients with sepsis in past year.

Primary employment

Paid – 81%
Volunteer – 15%
Other – 4%

Years in the EMS profession

0-47 years

References

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- ▶ 3. Seymour CW, et al. *N Engl J Med*. 2017;376(23):2235-2244.
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- ▶ 4. Kumar A, et al. *Crit Care Med* 2006;34(6):1589-1596.
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- ▶ 6. Children & Influenza (Flu). CDC. Retrieved November 18, 2019.
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