How Dense Are You? Going Beyond the Standardized Infection/Utilization Ratios(SIR/SUR) to Prevent Bloodstream Infections

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1. **Disclosure of Relevant Financial Relationships**
   I have no financial relationships to disclose.

   2. Disclosure of Off-Label and/or investigative Uses
   I will not discuss off label use and/or investigational use in my presentation.

Understanding Implicit Bias

Attitudes that are unconscious and unintentional	May be deeply Ingrained and Subconscious	You and or the Speaker may not be Consciously aware	Self-reflect Your views	Strive towards a more inclusive and equitable state
Implicit bias refers to unconscious attitudes, beliefs, stereotypes, or prejudices that individuals may hold towards certain groups or individuals based on characteristics such as race, gender, age, or socioeconomic status. These biases are often unintentional and can influence our perceptions, decisions, and behaviors, even when we may consciously strive to be fair and impartial.	Implicit biases are formed through societal, cultural, and personal experiences, as well as the influence of media and upbringing. They can be deeply ingrained and operate at a subconscious level, impacting our interactions and decision-making processes.	What sets implicit biases apart from explicit biases is that individuals may not be consciously aware of holding them. These biases can persist despite an individual's genuinely held commitment to equality and fairness.	Recognizing and addressing implicit biases is crucial in promoting inclusivity, fairness, and equity in various domains, including healthcare, education, and employment. It is important to engage in self-reflection, education, and dialogue to identify and challenge our implicit biases, as this can help foster more equitable treatment and decision-making.	It's important to note that implicit biases can be countered through conscious efforts, such as increasing awareness, providing diverse perspectives, implementing unbiased policies and practices, and fostering empathy and understanding. By actively addressing implicit biases, we can strive towards a more inclusive and equitable society.

Objectives

1. Define Population SIR (PSIR) and how this metric is a more comprehensive measure of infection compared to the SIR alone

2. Define Vascular Access Device Density (VADD) and how this metric is a more comprehensive measure of line utilization compare to the SUR alone

3. Understand how these metrics can be useful tools when paired with other bloodstream infection prevention initiatives

Let's Review-What is the SIR?

The Standardized Infection Ratio (SIR) is the primary summary measure used by the National Healthcare Safety Network (NHSN) to track healthcare-associated infections (HAIs). As NHSN grows, both in its user-base and surveillance capability, the SIR continues to evolve. Highlighting the SIR and changes resulting from an updated baseline, this document is intended to serve both as guidance for those who are new to this metric as well as a useful reference for more experienced infection prevention professionals.

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

- Does not take into account individual patient acuity
- Does distinguish between facilities that are better at preventing infections with central lines in place
- Does not give credit to facilities that do well at discontinuing central lines

Let's Review-What is the SUR?

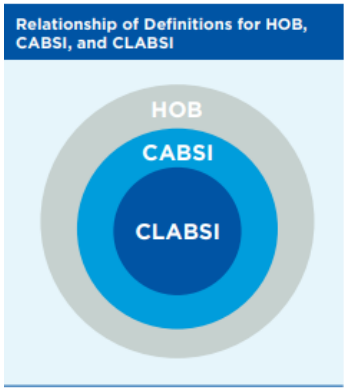
The Standardized Utilization Ratio (SUR) is the primary summary measure used by the National Healthcare Safety Network (NHSN) to compare device utilization at the national, state, or facility level by tracking central line, urinary catheter, and ventilator use. Tracking device use in healthcare settings is essential to measuring exposure for device-associated infections. Highlighting the SUR as part of the new baseline project, this document is intended to serve as both guidance for those who are new to this metric, as well as a useful reference for more experienced infection prevention professionals.

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

- Only accounts for **central line** utilization (i.e. 3 central lines in 1 patient = 1 central line day)
- Don't peripheral IVs cause harm too?
- Why do we care which line gave the patient a bacteremia?

https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guide-508.pdf

Hospital Onset Bacteremia



- **Purpose:** Expand NHSN surveillance of bloodstream infections, regardless of organism (e.g., MRSA) or association with device (CLABSI)
- **Definitions:**
  - HOB: Blood culture collected on day ≥4 with pathogenic bacteria or fungi
- **Key Data Elements:** Microbiology

https://www.cdc.gov/nhsn/pdfs/training/D1_Introducing-NHSNs-New-Digital-Quality-Measures_508c.pdf

Population SIR (pSIR)

pSIR = SIR x SUR

Why is this a more comprehensive metric than SIR/SUR alone?

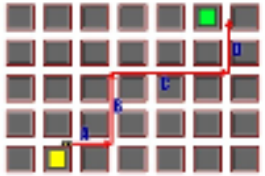
1. Accounts for device utilization
2. Reduces unfairly elevated SIRs in facilities that prioritize reducing device utilization

Fakih M, Huang RH, Bufalino A, Sturm L, Hendrich A, Haydar Z. 2158. Introducing the Population Standardized Infection Ratio (SIR): A Metric that Marries the Device SIR to the Standardized Utilization Ratio (SUR). Open Forum Infect Dis. 2018 Nov 26;5(Suppl 1):S636. doi: 10.1093/ofid/ofy210.1814. PMCID: PMC6252887.

Hypothetically Speaking…

- Let's say Hospital A is a large academic medical center made up of only Medical ICUs. Hospital B has the same exact patient population and census as Hospital A.
- Let's pretend the national CLABSI rate per 1000 line days is 2/1000 line days (number of predicted infections)
- In 2024, Hospital A had 6 CLABSI and 3000 line days
  - 6/3000=2/1000 = SIR 1.0
- Hospital B had 1 CLABSI and 500 line days
  - 1/500=2/1000= SIR1.0
- Both of these look identical in their SIRs

MATH ALERT!



But which one did a better job at *preventing* infections?

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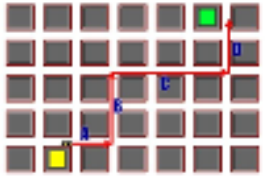

Hospital B!

Hypothetically Speaking…

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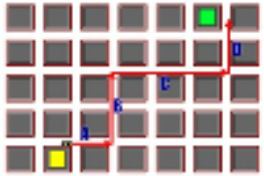

Which facility will look worse when HO Bacteremia becomes reportable?

Hypothetically Speaking…

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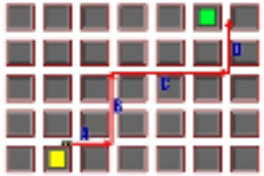


Hospital A!

The SIR compares large academic medical centers to one another, but not all of them care for the same types of patients…

This is why we need to look *beyond* the SIR and utilize the pSIR

- Population SIR (pSIR) accounts for overall infection risk in a population
- pSIR accounts for both line utilization AND infection rate

What is the best way to prevent a CLABSI?

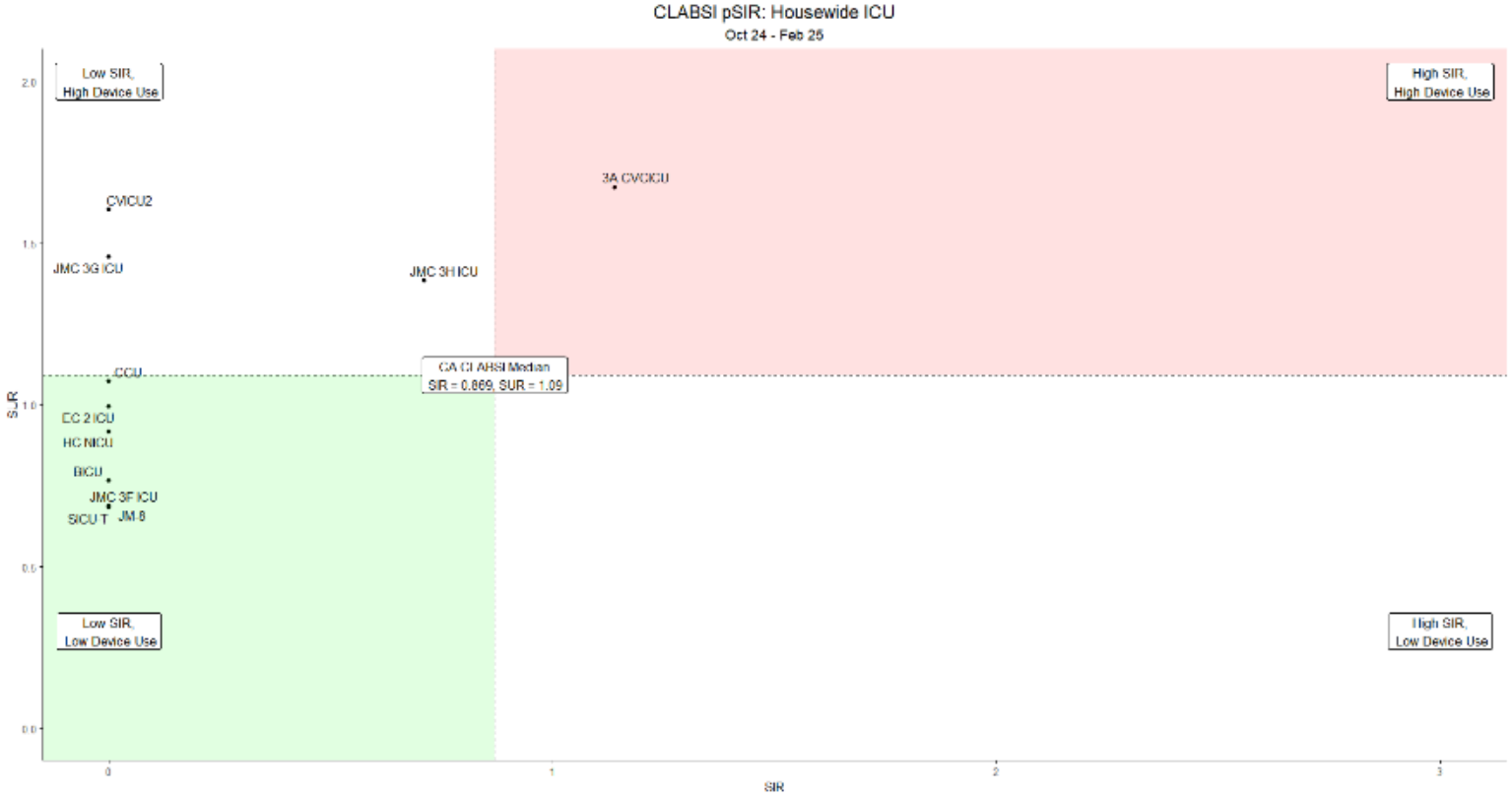
Maybe don’t have one of these in your patient?

The pSIR is especially useful when interventions have led to substantial reductions in device use, as it better reflects the impact of these efforts on overall infection risk.

UC San Diego Health

- 3 General Acute Care Hospitals
- Over 1,000 licensed beds
- Solid organ and bone marrow transplant
- Level 1 Trauma Center
- San Diego County and Imperial County's only adult and pediatric burn center
- FY 25 CLABSI SIR 0.42*

Which units are doing well? Why?



Limitations of the pSIR

- Only accounts for *central line* utilization (SUR)
- Don’t worry - we can go beyond the SUR as well

There is no denying PIVs are HARMFUL

Article Category: Research Article | Online Publication Date: 19 May 2023

Peripheral Venous Catheter-Associated Bloodstream Infections (PVC-BSI) Risk Compared With Central Line-Associated Bloodstream Infections (CLABSI)

ARYEH FELDHEIM MPH, JESSICA ALICDAN MPH, CIC, CALVIN FONG, FRANK EDWARD MYERS III MA, CIC, FAPIC, and FRANCESCA J. TORRIANI MD, FIDSA

Page Range: 23 - 25

DOI: 10.2309/JAVA.D-23-00001

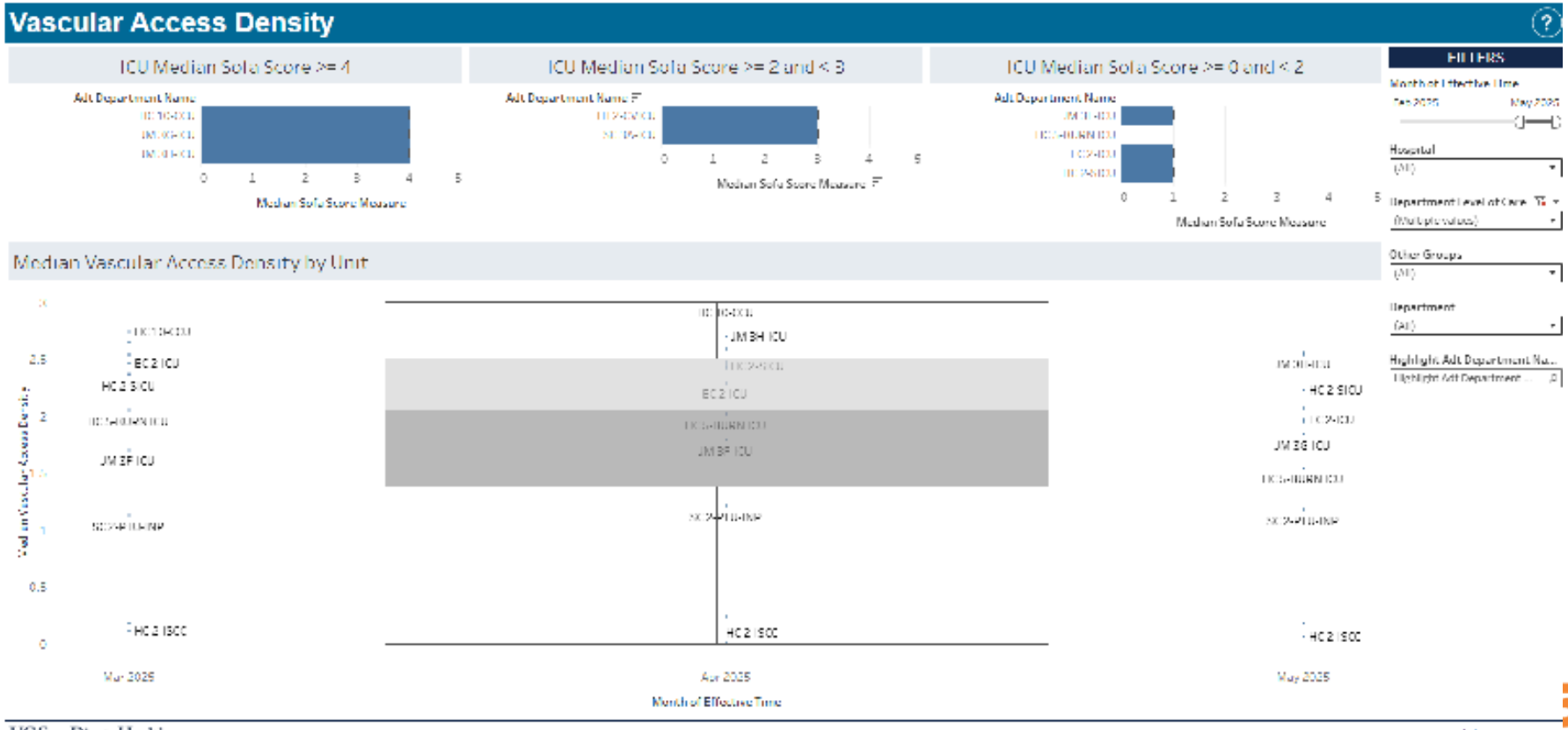
- Outside of the ICU, the CLABSI and PIV BSI rate per 1,000 line days is the same
- PIV BSI is more likely to kill you especially if the organism is staph aureus

There is no denying PIVs are HARMFUL

- PIV BSI rate is lower than that of CLABSI
- Greater number of PIVs in use means absolute infection rates for PIV BSI approach that of CLABSI

Vascular Access Device Density (VADD)

= number of CL + PIV line days/number of patient days aka average # lines per



But is Higher VADD Associated with Higher SIR?

SHEA

Concise Communication

Hospital-onset bacteremia and fungemia: examining healthcare-associated infections prevention through a wider lens

Gregory M. Schrank MD, MPH[1,2], Graham M. Snyder MD, SM[3] and Surbhi Leekha MBBS, MPH[2]

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Abstract

A hospital-onset bacteremia and fungemia (HOB) metric will expand hospital surveillance of bloodstream infections beyond common care and provide an opportunity to re-evaluate infection prevention strategies. Here we consider the added value and potential pitfalls of HOB surveillance and present a framework for the standardized assessment of HOB events.

BSI reduction strategy	Rationale	Considerations for future intervention and innovation
Device and procedure-specific interventions	Significant proportion of BSI is not captured by the current narrow surveillance strategy Focus on device-specific risk may not capture overall risk	• Peripheral venous catheter-associated HOB prevention bundle • Expand BSI prevention beyond central venous catheters, urinary catheters, and limited surgeries with required surveillance of all devices and procedures. • Balance device-specific infection risk reduction against broader harm e.g., avoidance of urinary catheters should be one component of a larger strategy for appropriate urinary bladder management that also addresses risk of infection from urinary retention and suboptimal urinary drainage

What Can The VADD Tell Us?

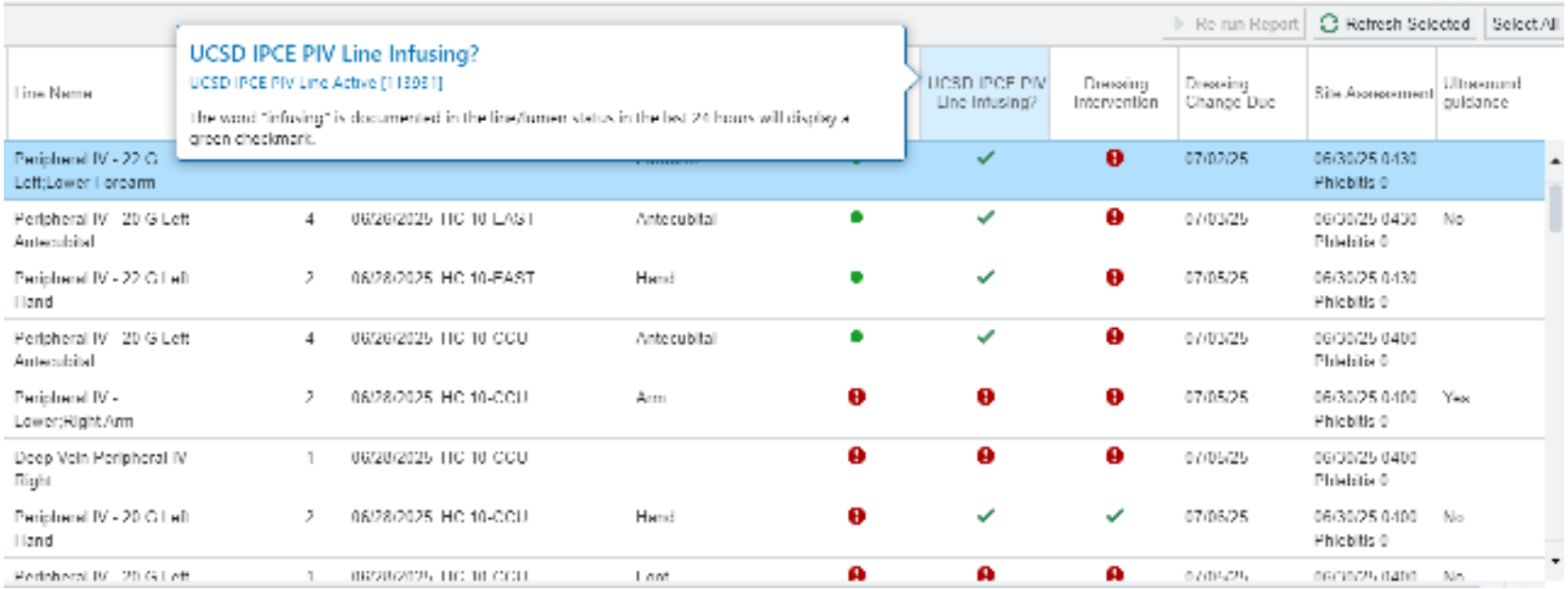
Next Steps

UCSD PIV Lines Report

Practice Recommendations

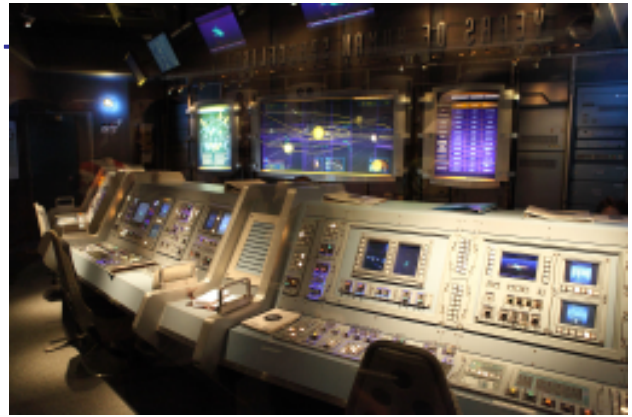
I. Short and Long Peripheral Intravenous Catheters (PIVCs) and Midline Catheters

A. Remove if no longer included in the plan of care or if not used for 24 hours or more.[1-4] (III)



Next Steps

Mission Control CLABSI - go Live June 30



1. **Central Line Not Infusing**: Hi Dr. _____, Our Mission Control group is working with primary teams to reduce central line-associated bloodstream infections. This patient's (insert name of central line), as indicated by the LDA summary flowsheet, has not been used for infusion in the last 36 hours. Please review the clinical indication for this central line and place an order for removal if it is no longer clinically indicated. Thank you.

2. **Central Line + 2 PIVs:** Hi Dr. _____, Our Mission Control group is working with primary teams to reduce central line-associated bloodstream infections. This patient currently has a central line and 2 POIVs which is considered a significant line burden, also known as vascular access device density (VADD). Higher VADD is associated with an increased risk for bloodstream infection. Please review the indication of each of these vascular access devices and order removal of those that are no longer clinically indicated. Thank you.

3. **Central Line Not Meeting Necessity:** Hi Dr. _____, Our Mission Control group is working with primary teams to reduce central line-associated bloodstream infections. Yesterday, the documented line indication on the LDA summary flowsheet for this patient's (insert name of central line) was "No longer indicated, will request order from provider to discontinue". If the central line is no longer indicated, please place an order for removal. Thank you.

Next Steps

Vascular Access Team - Do you have one?

4. INFUSION AND VASCULAR ACCESS SERVICES

Standard

4.1 Infusion and vascular access services require inter-professional collaboration and clinical experts to advance patient and organizational outcomes of care.

4.2 The scope of services provided by infusion and vascular access specialist teams (VAST) is structured to meet patient and organizational needs for safe delivery/administration of quality infusion therapy.

4.3 Infusion and vascular access services follow regulations applicable to each jurisdiction.

Nickel, B., Gorski, L., Kleidon, T., Kyes, A., DeVries, M., Keogh, S., Meyer, B., Sarver, M. J., Crickman, R., Ong, J., Clare, S., & Hagle, M. E. (2024). Infusion Therapy Standards of Practice, 9th Edition. *Journal of Infusion Nursing*, *47*(1S), S1–S285. https://doi.org/10.1097/nan.0000000000000532

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Questions?


It is better to prepare and prevent
than it is to repair and repent.

IMPORTANT

Record the Session ID and CE Code below to earn continuing education credit for this session

Session ID

CE Code