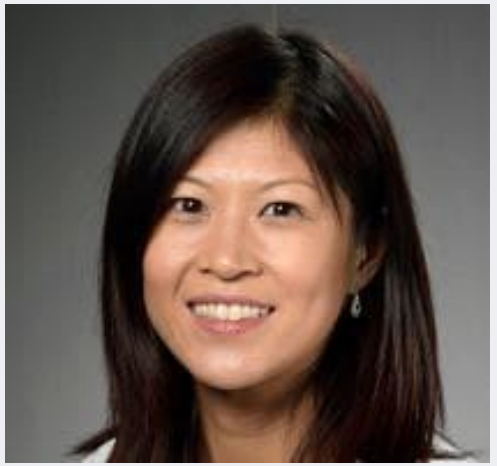
Why One Size Does not Fit All: Examining the Intersocietal Position on Ultrasound Transducer Disinfection

Nancy Moureau, RN, PhD, CRNI, CPUI, VA-BC
and
Natwalee Kittisarapong, DO

Disclosures



Speaker affiliations:

Nancy Moureau *has the following financial relationships to disclose:*

PICC Excellence, Inc, - owner of the educational company

Consultant/Speakers Bureau for:
3M, Access Scientific, Access Vascular, Accuvein, Adv Medical Solutions, BBraun, Bedal, Cathaid, Chiesi, CIVCO, Cleansite, Dale Medical, Exo, IVNational, Javelin Health, Nexus Medical, Parker Laboratories, Piper Access, and Teleflex

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All conflicts of interest have been resolved.

Contact hours are awarded after attending the educational activity and completion of the evaluation.
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Upon completion of this session, the attendee will be awarded 1 contact hour.
This certificate must be retained by the attendee for a period of 4 years.

Disclosures

Nancy Moureau has the following financial relationships to disclose:

Owner and CEO of PICC Excellence, Inc

***Speakers Bureau** for education and research 3M, Access Vascular, Accuvein, Advanced Medical Solutions, BBraun, Cathaid, Chiesi, CIVCO, Cleansite, Dale Medical, IV National, Linear, Nexus Medical, Parker Laboratories, and Teleflex*

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Consider Implicit Bias

Please take a moment to reflect upon how our attitudes or internalized stereotypes may impact patients requiring peripheral or central intravenous catheters

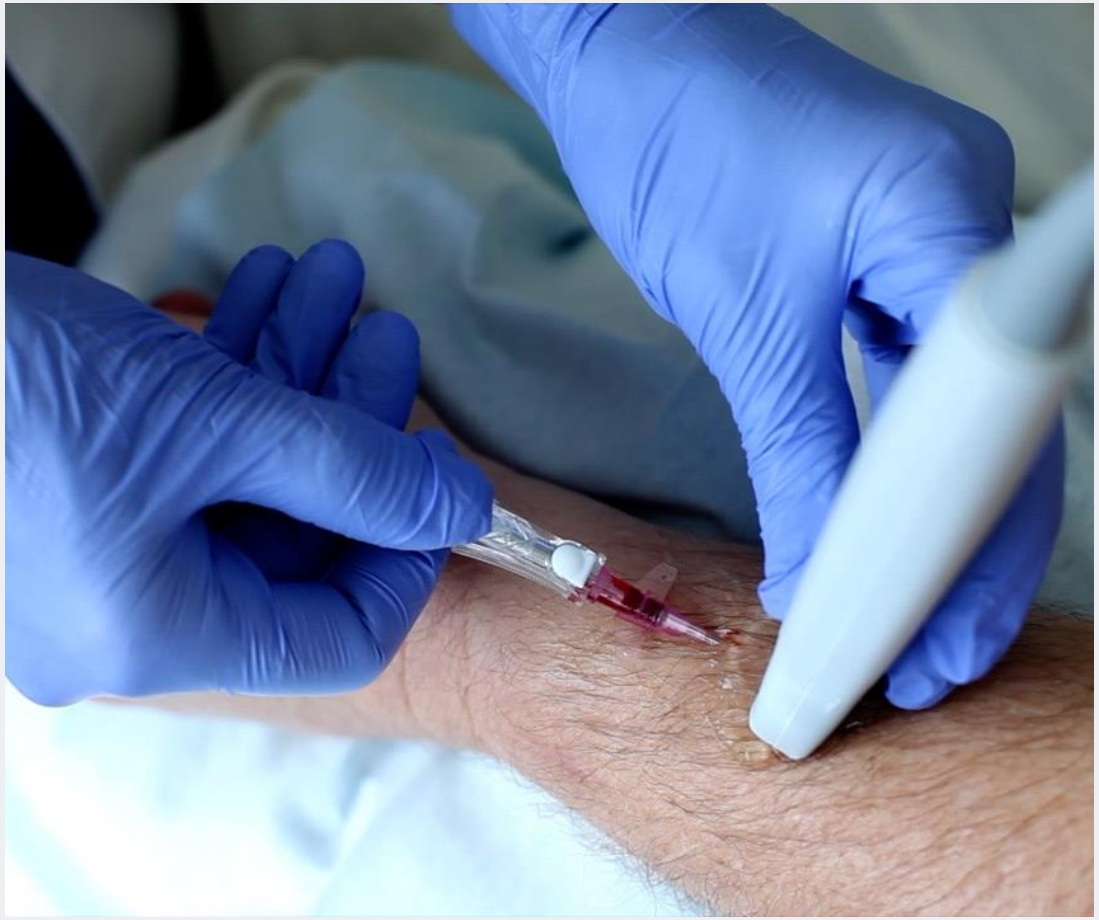
"Implicit bias" means the attitudes or internalized stereotypes that affect nurses' perceptions, actions, and decisions in an unconscious manner, that exist and often contribute to unequal treatment of people based on race, ethnicity, gender identity, sexual orientation, age, disability, and other characteristics that contribute to health disparities. (CA Bill 241)

Learning Objectives

At the end of the presentation, participants will be able to:

Outline	Outline the contamination concerns associated with ultrasound transducers
Discuss	Discuss the development of the Intersocietal Position Paper and its application to ultrasound-guided peripheral catheter insertion and transducer/probe management
Compare	Compare low-level disinfection and high-level disinfection for transducer/probe decontamination

Aseptic Technique often Compromised by Variations in Practice



- Inconsistent use of supplies and probe protection
- Touch contamination
- Contamination during clean-up

Polling Question

How often do you see variations in practice with ultrasound guided peripheral venous catheter insertions, variations that cause you concern?

A. All the time
B. Occasionally
C. Once in a while
D. Never
E. Not something I pay attention to

ECRI Ultrasound Risk Identified as Safety Concern

Safety issues with point of care ultrasound → Lack of training → Appropriate use of Ultrasound

Appropriate use of Ultrasound → US Safety measures have struggled to keep up → 2021 **Peripheral catheters** listed as safety concern for complications and infection

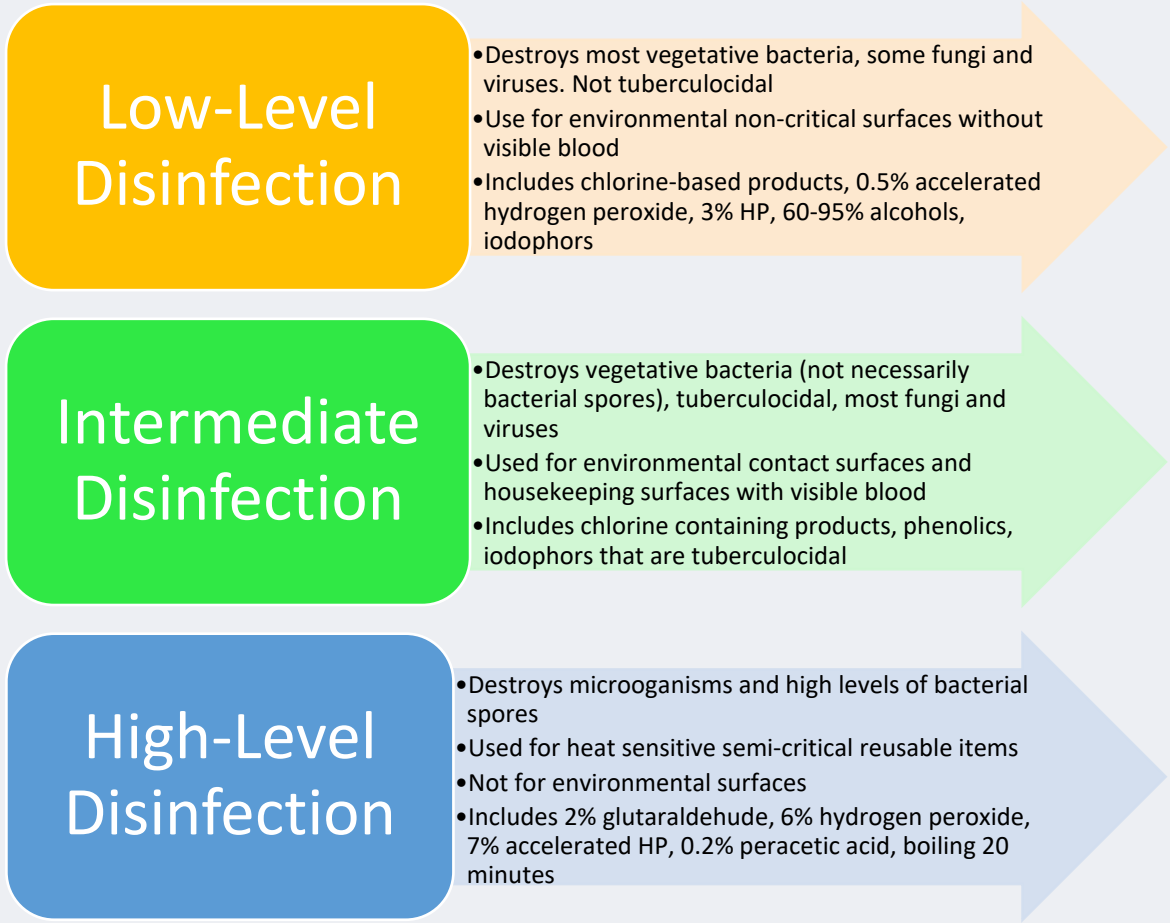
Orlando INS2022 June 4-7

Development of the AIUM Position Statement (2019-2021)

Low Level versus High Level Disinfection

Low Level Disinfection

- Low-level disinfection means disinfection which kills most vegetative bacteria, fungi, and lipid viruses. Does not kill spores and non-lipid viruses. Low-level disinfection is sometimes less active against some of the gram-negative rods (Pseudomonas) and Mycobacterium (TB).
- Check with manufacturer for level of kill



https://www.cdhbc.com/Documents/Root-of-the-Matter-IPC-Part-2-Nov-2017.aspx

Spaulding Classification 1957

TABLE 1. Levels/Categories of Patient Care Items

Level/Category	Definition	Example of Item
Critical	Penetrate soft tissue or contact bone or the bloodstream and, therefore, must be heat sterilized (kills spores).	• Periodontal scalers and curets • Burs • Surgical instruments
Semicritical	Contact mucous membranes but do not penetrate soft tissues, do not contact bone, and do not enter blood stream. Should be heat sterilized if heat tolerant.	• Mouth mirror • Amalgam condenser • Reusable impression trays
Noncritical	Only contact the skin and can be disinfected. Disinfection (with a spray or a wipe) is a process that kills many microorganisms, but not all bacterial spores.	• Blood pressure cuff • Stethoscope • Radiograph tube head/cone

Spaulding E. Chemical disinfection and antisepsis in the hospital. Hosp Res 1957; 9:5–1.
https://dimensionsofdentalhygiene.com/wp-content/uploads/2018/08/technology1.jpg

Polling Question

What form of probe disinfection do you use before and after a procedure?

A. Wipes for Low-Level disinfection
B. Spray with Low-Level disinfection
C. Trophon for High-Level disinfection
D. Other High-Level disinfection

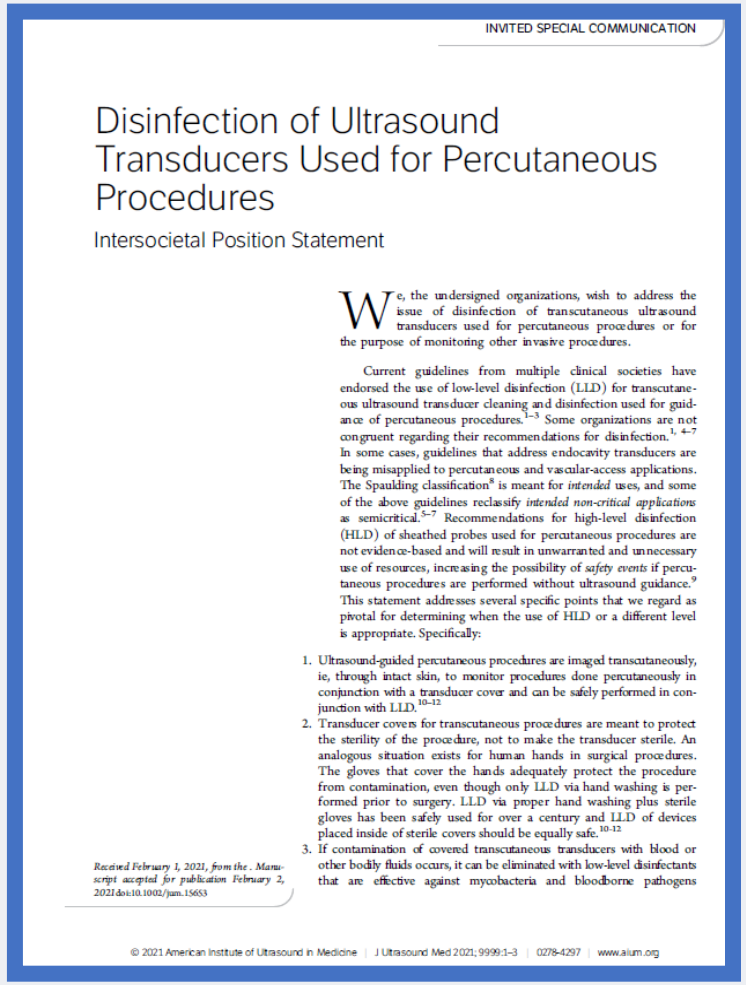
AIUM Position Statement: Key Points

"Ultrasound probes that are non-critical devices should be cleaned and undergo low level disinfection between patient uses."

"Recommendations for high-level disinfection (HLD) of sheathed probes used for percutaneous procedures are not evidence-based and will result in unwarranted and unnecessary use of resources, increasing the possibility of safety events *if percutaneous procedures are performed without ultrasound guidance."*

HLD was meant to clean instruments intended for contact with internal organs or mucous membranes.

Evidence of infection from ultrasound (US) transducers relates to contaminated gel and improper cleaning of internal transducers.



INVITED SPECIAL COMMUNICATION

Disinfection of Ultrasound Transducers Used for Percutaneous Procedures

Intersocietal Position Statement

We, the undersigned organizations, wish to address the issue of disinfection of transcutaneous ultrasound transducers used for percutaneous procedures or for the purpose of monitoring other invasive procedures.

Current guidelines from multiple clinical societies have endorsed the use of low-level disinfection (LLD) for transcutaneous ultrasound transducer cleaning and disinfection used for guidance of percutaneous procedures.[1–3] Some organizations are not congruent regarding their recommendations for disinfection.[1, 4–7] In some cases, guidelines that address endocavity transducers are being misapplied to percutaneous and vascular-access applications. The Spaulding classification[8] is meant for *intended* uses, and some of the above guidelines reclassify *intended non-critical applications* as semicritical.[5–7] Recommendations for high-level disinfection (HLD) of sheathed probes used for percutaneous procedures are not evidence-based and will result in unwarranted and unnecessary use of resources, increasing the possibility of *safety events* if percutaneous procedures are performed without ultrasound guidance.[9] This statement addresses several specific points that we regard as pivotal for determining when the use of HLD or a different level is appropriate. Specifically:

1. Ultrasound-guided percutaneous procedures are imaged transcutaneously, ie, through intact skin, to monitor procedures done percutaneously in conjunction with a transducer cover and can be safely performed in conjunction with LLD.[10–12]
2. Transducer covers for transcutaneous procedures are meant to protect the sterility of the procedure, not to make the transducer sterile. An analogous situation exists for human hands in surgical procedures. The gloves that cover the hands adequately protect the procedure from contamination, even though only LLD via hand washing is performed prior to surgery. LLD via proper hand washing plus sterile gloves has been safely used for over a century and LLD of devices placed inside of sterile covers should be equally safe.[10-12]
3. If contamination of covered transcutaneous transducers with blood or other bodily fluids occurs, it can be eliminated with low-level disinfectants that are effective against mycobacteria and bloodborne pathogens

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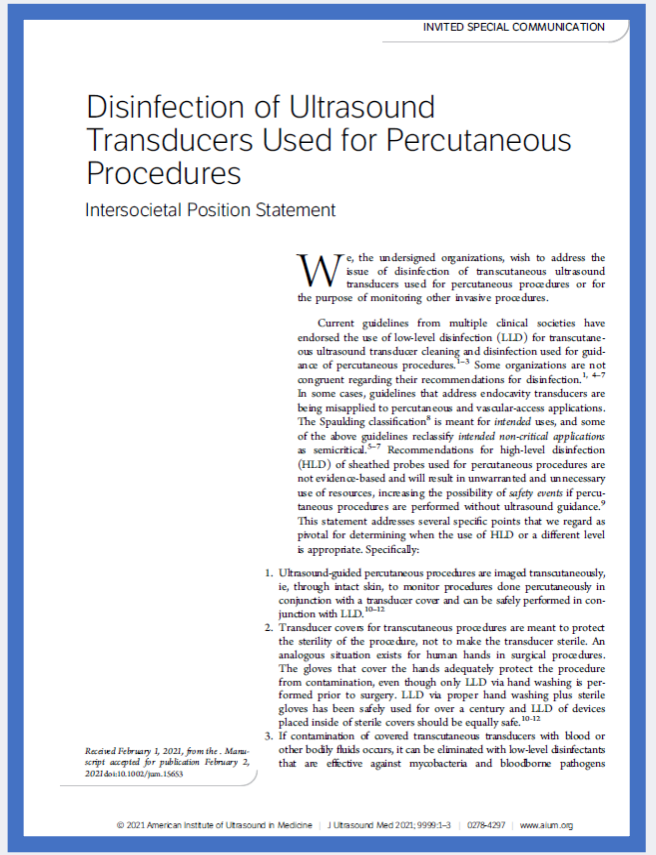
AIUM Disinfection of Ultrasound Transducers Used for Percutaneous Procedures Intersocietal Position Statement. J Ultrasound Med 2021; 9999:1–3 2021 doi:10.1002/jum.15653

AIUM Position Statement: Key Points

This position paper is endorsed and supported by more than 23 associations including the Infusion Nurses Society

- American Academy of Emergency Medicine (AAEM and EUS-AAEM)
- American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM)
- American College of Emergency Physicians (ACEP)
- American College of Osteopathic Obstetricians and Gynecologists (ACOOG)
- American College of Radiology (ACR)
- American Institute of Ultrasound in Medicine (AIUM)
- American Medical Society for Sports Medicine (AMSSM)
- American Registry for Diagnostic Medical Sonography (ARDMS)
- American Registry of Radiologic Technologists (ARRT)
- American Society of Anesthesiologists (ASA)
- Association for Professionals in Infection Control and Epidemiology (APIC)
- Association for Vascular Access (AVA)
- Emergency Nurses Association (ENA)
- Infusion Nurses Society (INS)
- International Society of Ultrasound in Obstetrics and Gynecology (ISUOG)
- Point-of-Care Ultrasound (POCUS) Certification Academy
- Society for Healthcare Epidemiology of America (SHEA)
- Society for Maternal-Fetal Medicine (SMFM)
- Society of Academic Emergency Medicine (SAEM)
- Society of Breast Imaging (SBI)
- Society of Radiologists in Ultrasound (SRU)

850,000+ total endorsing members



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3. If contamination of covered transcutaneous transducers with blood or other bodily fluids occurs, it can be eliminated with low-level disinfectants that are effective against mycobacteria and bloodborne pathogens

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1. *AIUM Disinfection of Ultrasound Transducers Used for Percutaneous Procedures: Intersocietal Position Statement. J Ultrasound Med.* 2021:9999:1-3 https://doi.org/10.1002/jum.15653
2. *Marketing Clearance of Diagnostic Ultrasound Systems and Transducers;* Guidance for Industry and Food and Drug Administration Staff. Silver Spring, MD: Center for Devices and Radiological Health, FDA, 2017 (Appendix E, p49); available at: www.fda.gov/media/71100/download.

AIUM Guide for Cleaning Transducers (2021)

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CHANGES DUE TO COVID-19 OUTBREAK

Level of disinfection: For external and interventional procedures, low-level disinfection is effective per CDC guidelines

1 Currently, EPA-approved disinfectants for use against SARS-CoV-2, which causes COVID-19, can be found online.

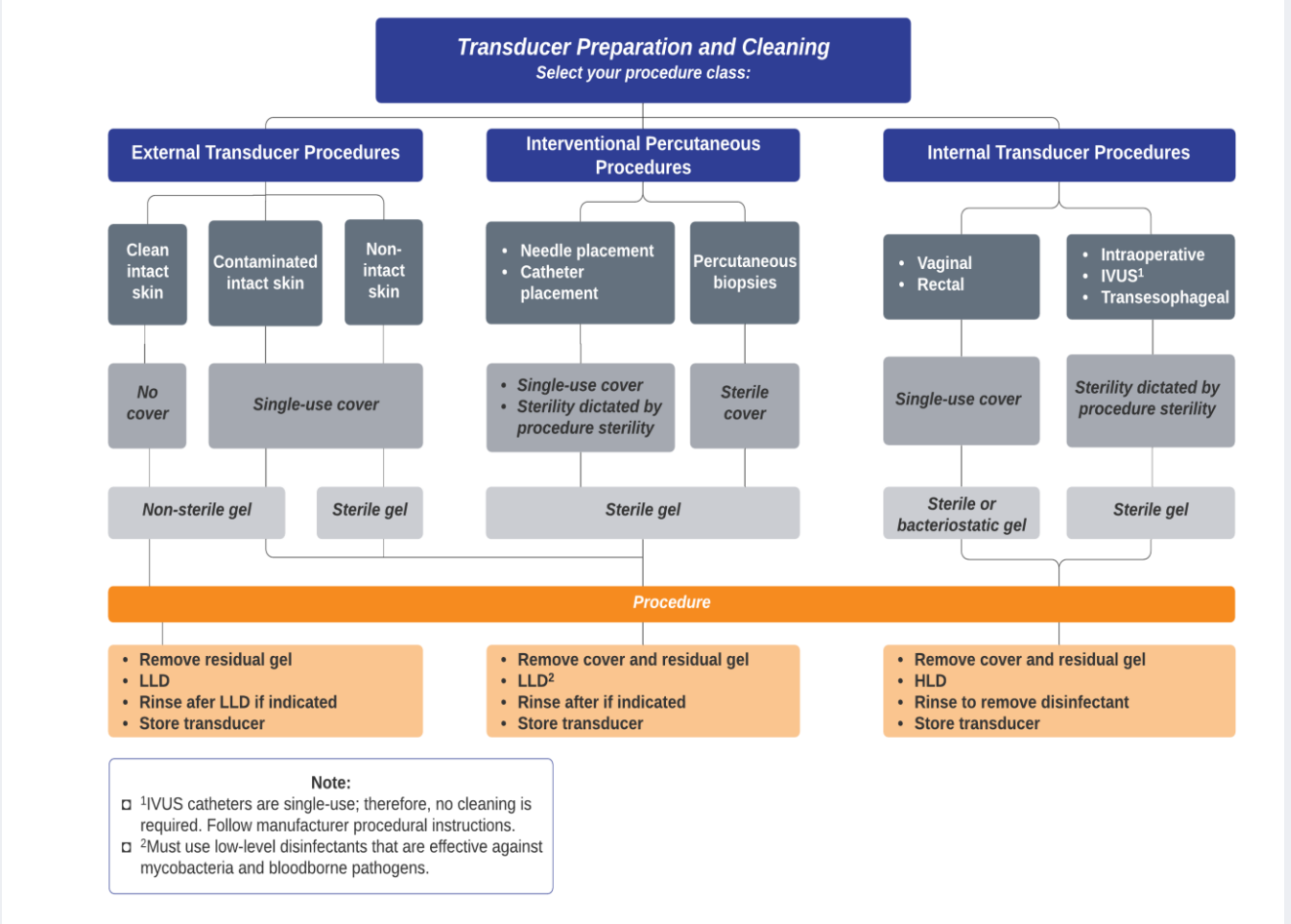
2 If LLD agents are depleted, soap and water should be used per CDC guidelines. If indicated but no transducer covers are available, medical gloves or other physical barriers (eg, compatible medical dressings) should be used.

Education and execution: Dissemination of cleaning guidelines is essential and so is their proper execution.

Equipment: Cleaning involves all ancillary equipment utilized during the procedure at hand. In addition to LLD cleaning, a cover sheet may be used as a physical barrier between the keyboard/console and the operator. If possible, use a dedicated system (scanner and transducers) for COVID-19, positive or suspected, patients. COVID-19 is viable on plastic surfaces for up to 72 hours.4

Special attention needs to be paid to COVID-19 and other respiratory infection cases requiring aerosolization procedures (eg, mechanical ventilation, aerosolization application, etc). In such cases, a transducer cover should be used, and the entire equipment requires full LLD (top to bottom) as pathogens are likely to become airborne.

Always follow manufacturer guidance and institutional guidelines.



https://www.aium.org/officialStatements/57

AIUM Practice Parameters for Vascular Access (2019)

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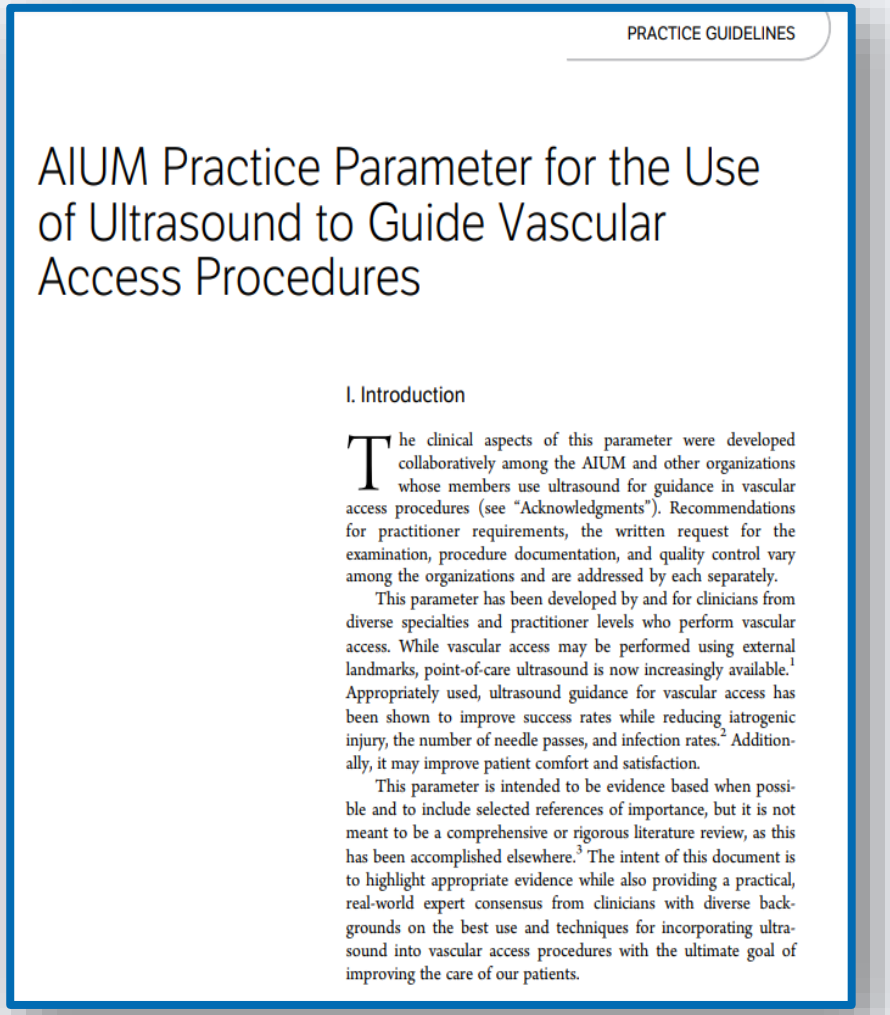
1. Establishes qualifications and training for use of ultrasound
2. Provides access to ultrasound equipment designed for the application
3. Outlines training information and evidence for practice parameters of peripheral and central vascular access device procedures with ultrasound
4. UGPIV procedures to use adequate skin preparation, sterile gel and sterile probe protection
5. UGPIV procedure with clean or sterile gloves, adequate catheter length, and short or long axis view

https://www.aium.org/resources/guidelines/usgva.pdf



PRACTICE GUIDELINES

AIUM Practice Parameter for the Use of Ultrasound to Guide Vascular Access Procedures

I. Introduction

The clinical aspects of this parameter were developed collaboratively among the AIUM and other organizations whose members use ultrasound for guidance in vascular access procedures (see "Acknowledgments"). Recommendations for practitioner requirements, the written request for the examination, procedure documentation, and quality control vary among the organizations and are addressed by each separately.

This parameter has been developed by and for clinicians from diverse specialties and practitioner levels who perform vascular access. While vascular access may be performed using external landmarks, point-of-care ultrasound is now increasingly available.[1] Appropriately used, ultrasound guidance for vascular access has been shown to improve success rates while reducing iatrogenic injury, the number of needle passes, and infection rates.[2] Additionally, it may improve patient comfort and satisfaction.

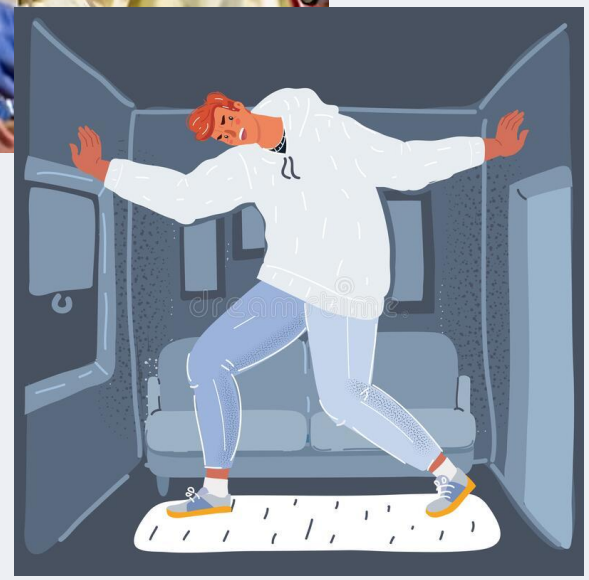
This parameter is intended to be evidence based when possible and to include selected references of importance, but it is not meant to be a comprehensive or rigorous literature review, as this has been accomplished elsewhere.[3] The intent of this document is to highlight appropriate evidence while also providing a practical, real-world expert consensus from clinicians with diverse backgrounds on the best use and techniques for incorporating ultrasound into vascular access procedures with the ultimate goal of improving the care of our patients.

Telling our story

Challenges We Face in the ED

Time and Space are Scarce

- Trauma, shock, Code Blue and the need for immediate access
- Small rooms, big machines, and difficult positioning



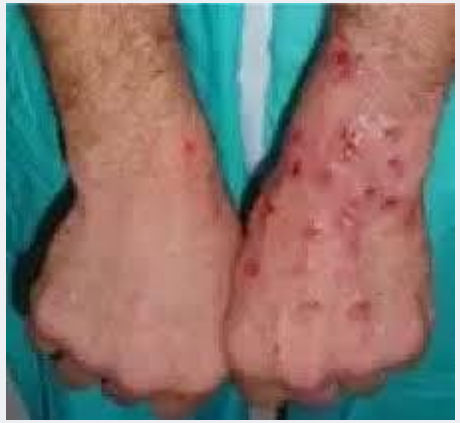
Challenges We Face in the ED

Tough Patient Populations

- Vasculopaths
- ESRD, cancer, IVD
- Uncooperative, agitated patient

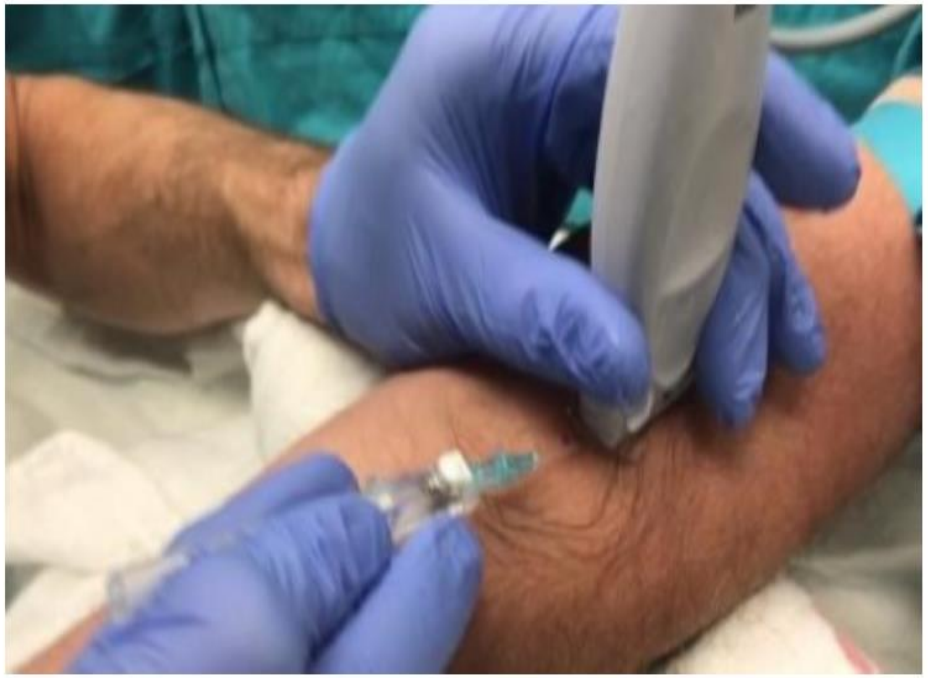
Inconsistent Supplies

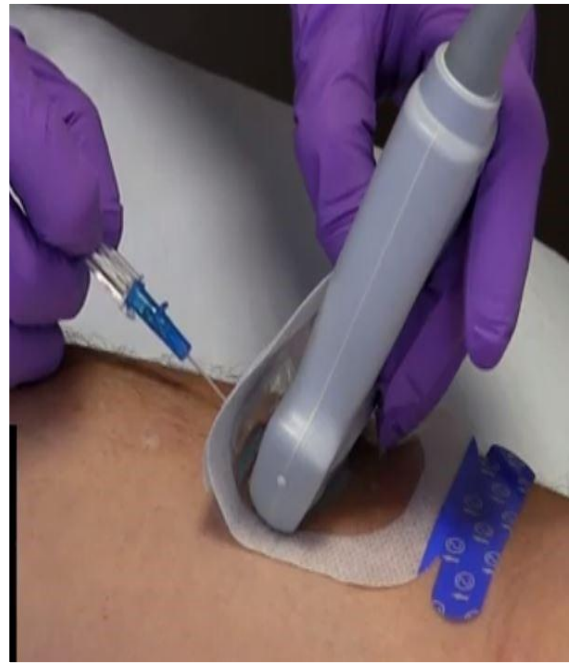
Inconsistent Training

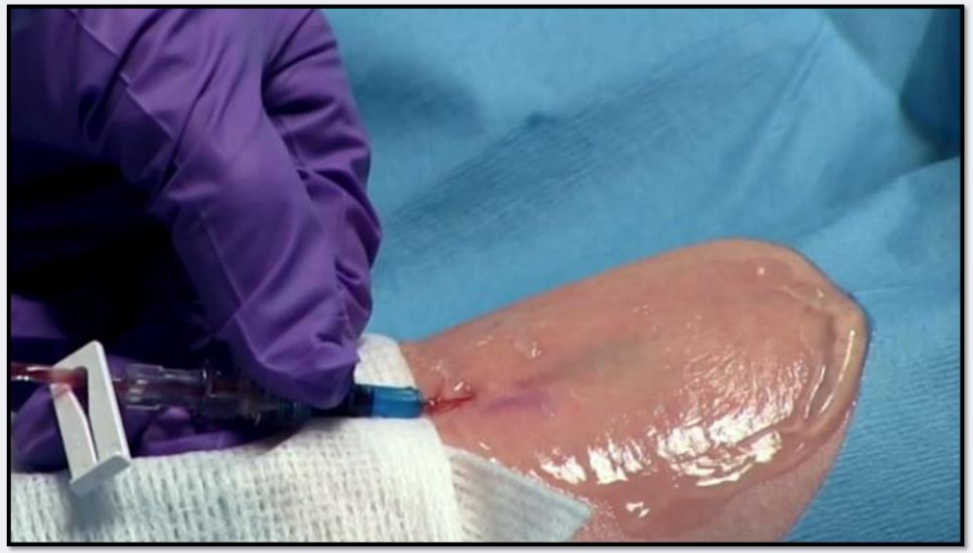


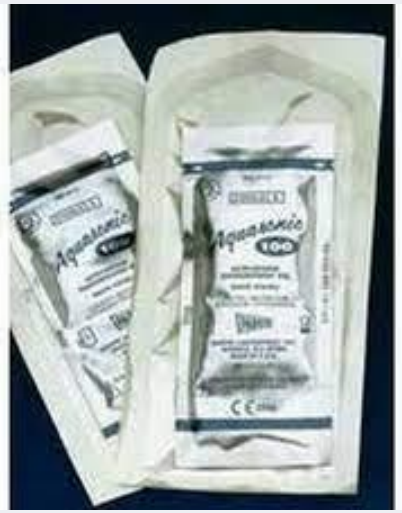
Challenges We Face in the ED

- Priorities for patients and procedures
- Use of ultrasound by trained staff
- Percentages of difficult access patients









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Polling Question

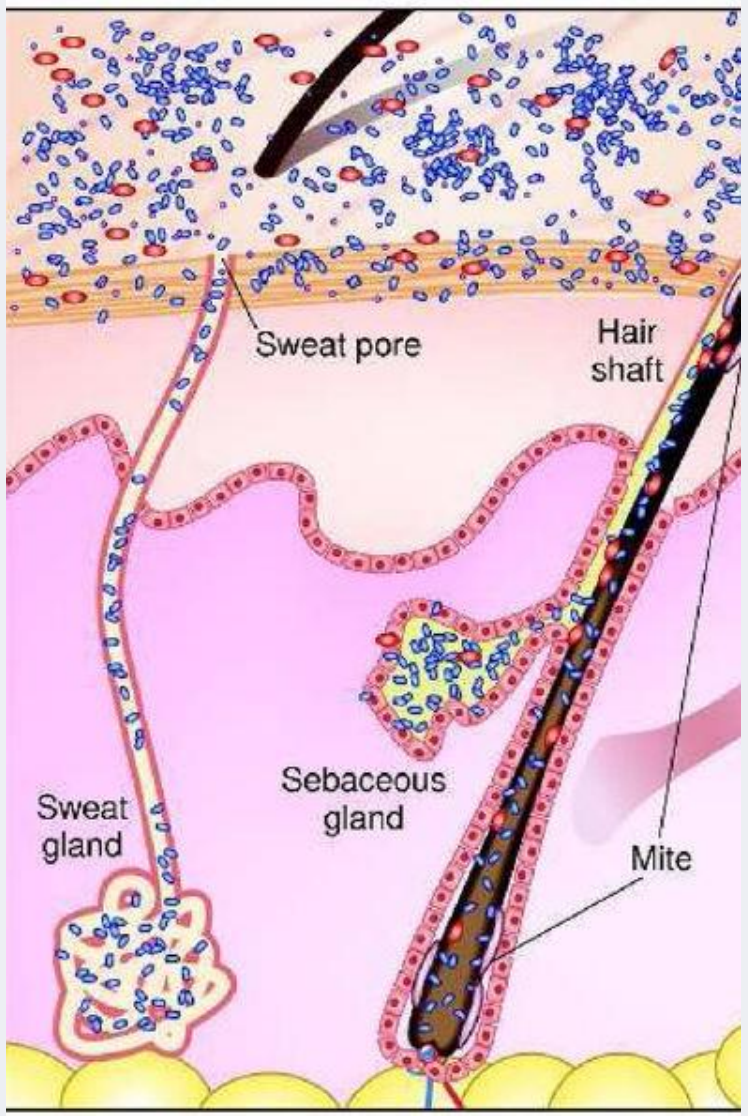
What challenges have you faced or seen at your facility with UGPIV insertion safety?

a) Lack of sufficient supplies
b) Variable probe protection
c) Variable gel containers and packs used
d) Skin or hand contamination during insertion
e) Inability to achieve good adherence of dressing
f) All of the above
g) None of the above

UGPIV Contamination from Skin, Probe and Gel

Skin

- 60% of CLABSI are associated with skin flora
- Infection concern not just central, but also peripheral sites
- Most common Coagulase-negative Staphylococcus, such as S epidermidis, and S capitis species found on both PIVCs and skin sites
- If aseptic technique is not maintained bacteria can colonize insertion site, insertion track and bloodstream



Choudhury et al. Skin colonization at peripheral catheter insertion sites increases risk of colonization and infection. American Journal of Infection Control 2019:(47)1484–1488

Risk of Contamination with PIV and UGPIV Insertions

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Issues

- Focusing on UGPIV success rather than asepsis and patient safety
- Failure to standardize procedure
- Selection of supplies based on availability at hand

Modes of contamination

- From probe and failure to disinfect properly
- From skin and touch contamination
- From multi-use gel bottles

American Journal of Infection Control 46 (2018) 913-20

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

Ultrasound probe use and reprocessing: Results from a national survey among U.S. infection preventionists

Ruth M. Carrico PhD, DNP, FSHEA, CIC *, Stephen Furmanek MS, MPH, Connor English BS, MPH

University of Louisville Global Health Program, Division of Infectious Diseases, University of Louisville School of Medicine, Louisville, KY

Key Words:
Disinfection
Interventional ultrasound
Reprocessing
Probe
Endocavitary
Doppler
Ultrasound gel

Background: Improper infection prevention practice associated with ultrasound probe use has been linked to increased infection risk, outbreaks, and death. Although guidelines for reprocessing and use of probes exist, it is unclear how extensively these have been adopted in practice.

Methods: Infection preventionists from U.S. health care facilities were surveyed (N= 358). The anonymous survey had 31 multiple choice, sliding scale, and text response questions. The survey was developed and deployed and the data were stored in the REDCap system.

Results: A high degree of noncompliance with U.S. guidelines was identified. Surface probes used in invasive procedures were not high-level disinfected or sterilized 15% (intraoperative) to 78% (peripheral line placements) of the time. Of invasive procedures, 5%-47% did not use sterile gel (same procedures, respectively). Of the participants, 20% were aware of instances where an ultrasound probe was used but was not correctly reprocessed. Extensive breaches of infection

expansion in use of ultrasound has brought clinical benefit bu

infection risk.

Conclusions: Infection preventionists are well placed to act

expertise and experience in the management of infection risk

along with clinicians responsible for probe use and reprocess

trasound in their facilities. Where practice does not comply

be updated to ensure patient safety.

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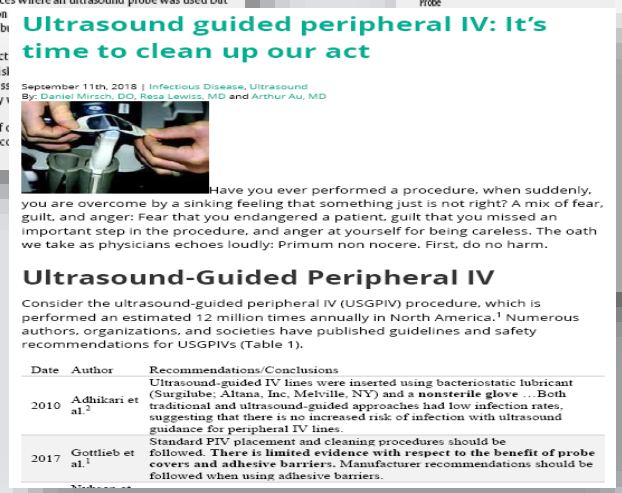
Control and Epidemiology, Inc. This is an open ac



Ultrasound guided peripheral IV: It's time to clean up our act

September 11th, 2018 | Infectious Disease, Ultrasound

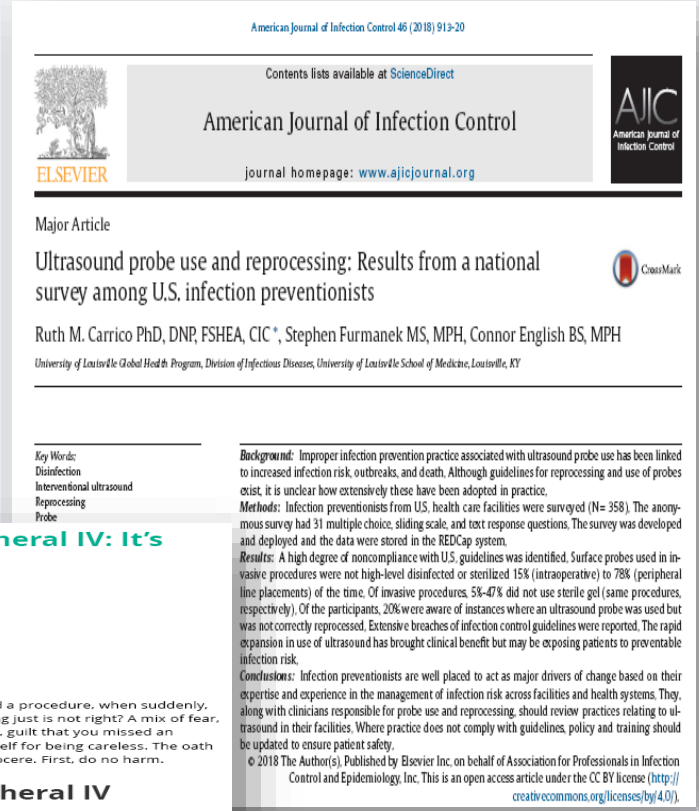
By: Daniel Mirsch, DO, Resa Lewiss, MD and Arthur Au, MD

Have you ever performed a procedure, when suddenly, you are overcome by a sinking feeling that something just is not right? A mix of fear, guilt, and anger: Fear that you endangered a patient, guilt that you missed an important step in the procedure, and anger at yourself for being careless. The oath we take as physicians echoes loudly: Primum non nocere. First, do no harm.

Ultrasound-Guided Peripheral IV

Consider the ultrasound-guided peripheral IV (USGPIV) procedure, which is performed an estimated 12 million times annually in North America.[1] Numerous authors, organizations, and societies have published guidelines and safety recommendations for USGPIVs (Table 1).

Date	Author	Recommendations/Conclusions
2010	Adhikari et al.[2]	Ultrasound-guided IV lines were inserted using bacteriostatic lubricant (Surglube; Altana, Inc, Melville, NY) and a **nonsterile glove** . . . Both traditional and ultrasound-guided approaches had low infection rates, suggesting that there is no increased risk of infection with ultrasound guidance for peripheral IV lines.
2017	Gottlieb et al.[1]	Standard PIV placement and cleaning procedures should be followed. **There is limited evidence with respect to the benefit of probe covers and adhesive barriers.** Manufacturer recommendations should be followed when using adhesive barriers.



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Conclusions: Infection preventionists are well placed to act as major drivers of change based on their expertise and experience in the management of infection risk across facilities and health systems. They, along with clinicians responsible for probe use and reprocessing, should review practices relating to ultrasound in their facilities. Where practice does not comply with guidelines, policy and training should be updated to ensure patient safety.

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https://www.aliem.com/ultrasound-guided-periphal-iv-time-to-clean-up-our-act/

Polling Question

How do you protect the probe during UGPIV insertions?

A. Cover with glove
B. Cover with standard transparent dressing
C. Cover with sheath
D. Dressing to separate probe and gel
E. No time to protect probe (naked probe)

Transducer/Probe, Gel and Risk

Clinical Radiology (2007) 62, 694–698

TECHNICAL REPORT

How clean is your probe? Microbiological assessment of ultrasound transducers in routine clinical use, and cost-effective ways to reduce contamination

P.J. Mullaney[a,*], P. Munthali[b], P. Vlachou[a], D. Jenkins[b], A. Rathod[a], J. Entwisle[a]

Departments of [a]Radiology, and [b]Clinical M

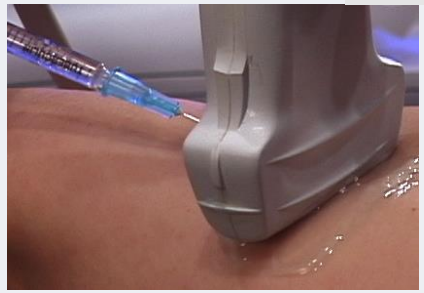
Introduction

Ultrasound is a proven technique that ha
available in clinical practice for over three d
and is used in the management of patients
almost all medical and surgical discipline
safe, quick, and allows real-time imaging f
diagnosis and for therapeutic intervention
contact required with the patient to gain
can potentially contaminate the transducer,
can then act as a source for cross-inf
especially with patients with broken skin.

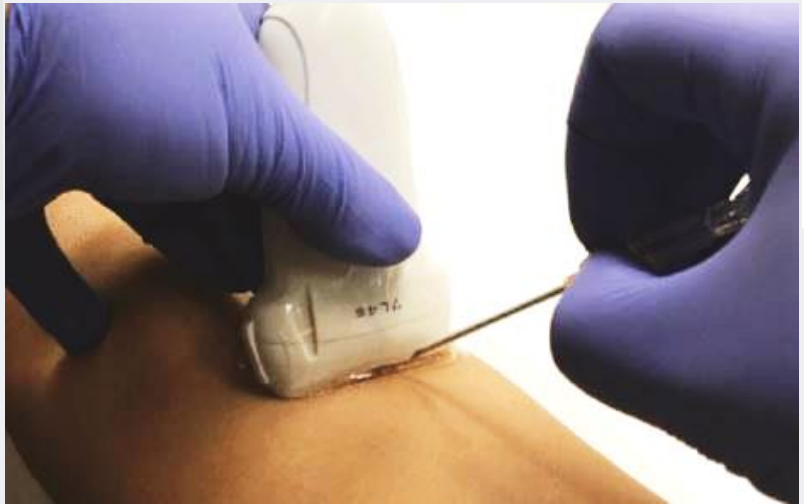
Table 1 Absolute number of positive cultures according to species isolated in each clinical sampling run (Gel results not included)

	Number of positive results	
	Clinical run 1 ($n=40$)	Clinical run 2 ($n=48$)
No growth	14	20
Coagulase-negative staphylococci	7	24
Diphtheroids	0	1
Micrococcus species	7	5
Pseudomonas aeruginosa	3	0
Staphylococcus aureus	4	1
Staphylococcus epidermidis	9	0
Total	44	51

Multiple cultures from single transducers included in the numbers.



Ultrasound machines, probe cords and coupling gel are all potential sources of infection and need to be cleaned, changed regularly or upgraded to new formats to minimize risks of infection. Ultrasound operators and equipment manufacturers need to be aware of these issues so that they can improve the practice of infection control.
Westerway, et al. 2017



Ultrasound instruments as possible vectors of staphylococcal infection

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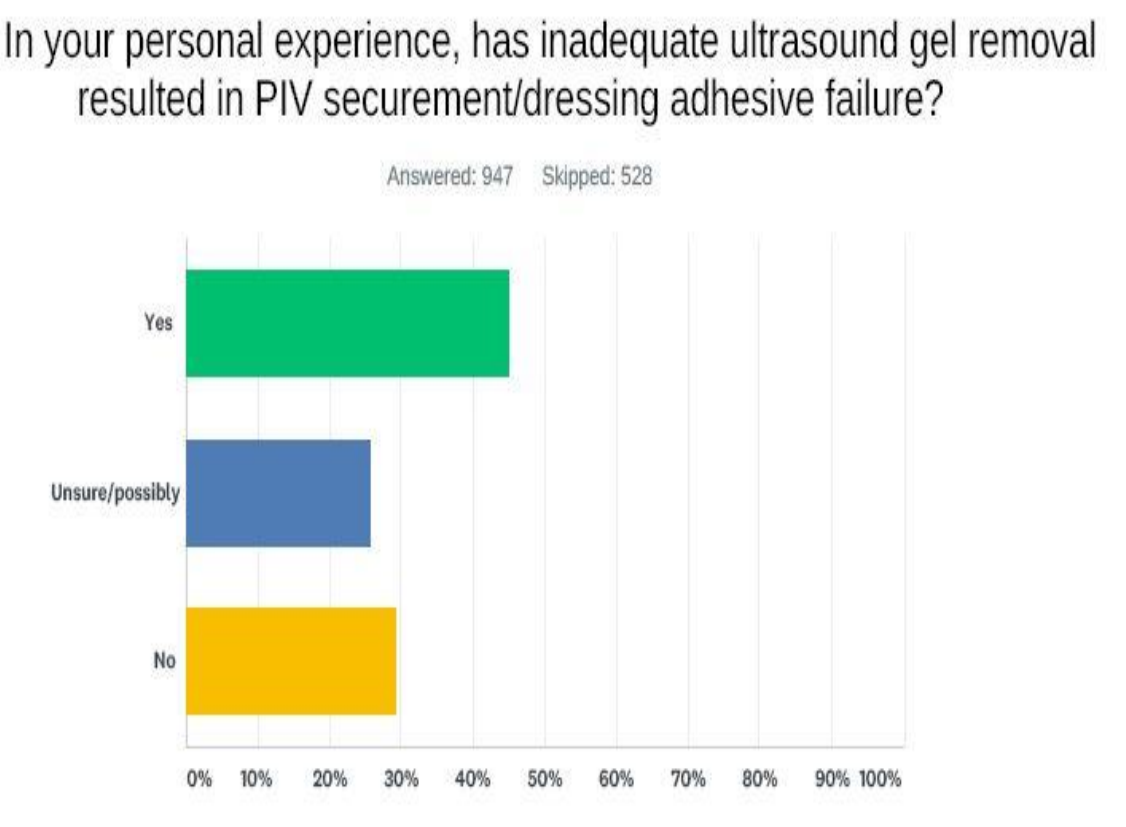
Summary: In this study, we evaluated whether ultrasound instruments are important in the spread of nosocomial staphylococcal infections. Following genomic typing by pulsed-field gel electrophoresis, it was apparent that ultrasound procedures transferred colonizing staphylococci from a patient's skin to the ultrasound instruments. *Staphylococcus aureus* survived in the transmission medium for longer than in water. Furthermore, *S. aureus* was more resistant to the ultrasonic medium than *Pseudomonas aeruginosa*, also a significant cause of hospital-acquired infections. To prevent staphylococcal transmission by ultrasound equipment, we recommend disinfection of the probe and removal of the medium after each examination.

Keywords: Ultrasound; nosocomial infection; *Staphylococcus aureus*; *Escherichia coli*; *Pseudomonas aeruginosa*.

Sticky Mess: Inadequate Gel Removal



- Gel on the skin may contribute to insertion site contamination and gel down the insertion tract
- Clean up of gel from the skin is difficult and requires extra sterile supplies that are not often considered or available
- Gel left on skin reduces adherence of transparent dressings resulting in dressing failure and increases in accidental dislodgment
- Increased time, cost, and patient safety issues

Moureau N, Gregory E G. Survey of ultrasound-guided peripheral intravenous practices: a report of supply usage and variability between clinical roles and departments. British Journal of Nursing. 2020 Oct 22;29(19):S30-8.

Transducer/Probe Protection – Efficiency with Safety

Disinfect transducer before and after insertion

Cover or separate transducer/probe from skin during insertion

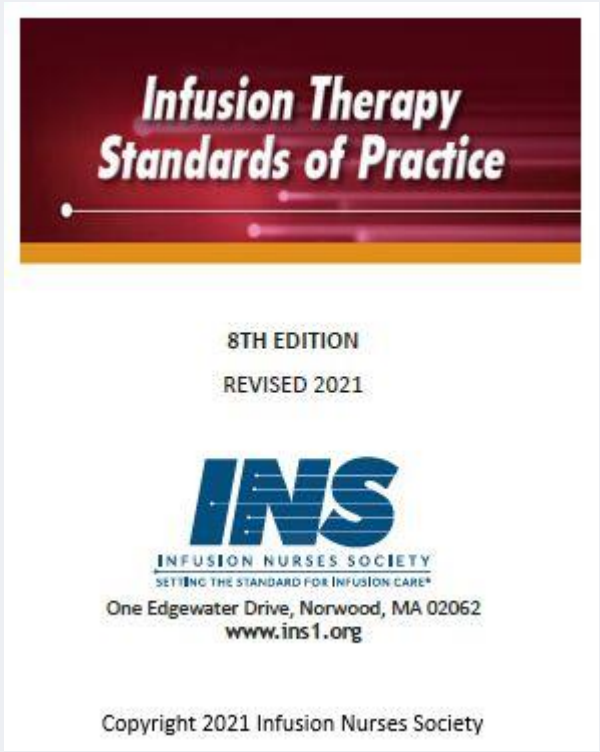
Cover options

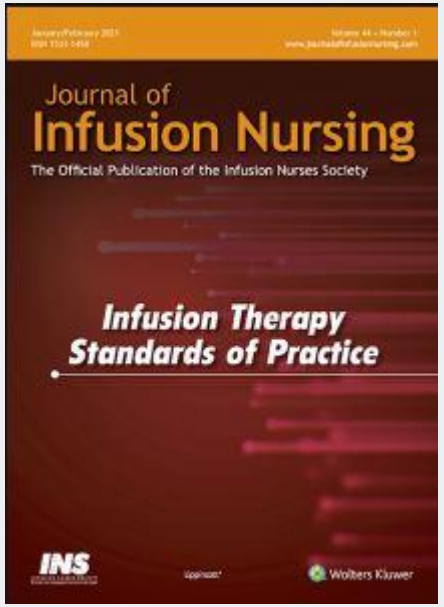
- Sterile sheath probe covers
- Protective sterile barrier and securement dressing
- Gel-free sheath covers or barriers

INS Infusion Nursing Society (2021) Vascular Visualization

Perform appropriate decontamination and disinfection (before, during, and after clinical intervention) of DME used with an ANTT procedure (eg, ultrasound, electronic infusion pump). See Standard 17 (V)

Use a sterile single-use gel packet and a sterile sheath over the probe and disinfect before and after each use to reduce the risk for ultrasound probe contamination and subsequent risk for infection; refer to manufacturers' directions for use. Standard 22 (V)





Solutions that Protect: Disinfection and Separation of Probe and Gel from the Insertion Site

- Any equipment in direct patient skin contact must be cleaned and disinfected prior to first use and after every examination
- Low level disinfection (LLD) is appropriate for external percutaneous procedures
- Sterile probe cover or sterile barrier with single use sterile gel when used at insertion site for percutaneous/skin procedures, such as with IV insertions
- Gel-free insertions with barrier probe protection and single use/sterile gel reduces or eliminates skin contact and has advantages of reduced time and cost

Polling Question

What is the most important factor for you with UGPIV insertions?

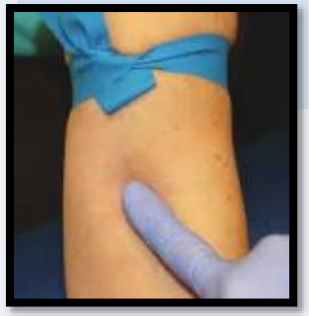
a) Success?
b) Time to success?
c) Cost of supplies?
d) Protection of insertion site?

UGPIV Insertions – Think it through

1. Perform hand hygiene and apply non-sterile gloves applied

2. Perform transducer disinfection and turn on US. No cover for assessment

3. Apply tourniquet (optional)

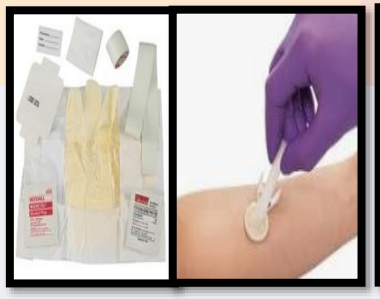


4. Assess veins and select site – mark

5. Hand hygiene and new gloves. Disinfect transducer.

6. Prepare supplies on aseptic field – key parts protected

   Disinfect selected vein and site



7. Apply probe protection using aseptic technique

Establishing a Multidisciplinary Approach to Patient Safety

The use of ultrasound for diagnostic and intervention purposes continues to be one of the fastest growing areas of patient care and presents **unique safety challenges** that require a multi-professional approach to ensure patient safety and minimize risk.

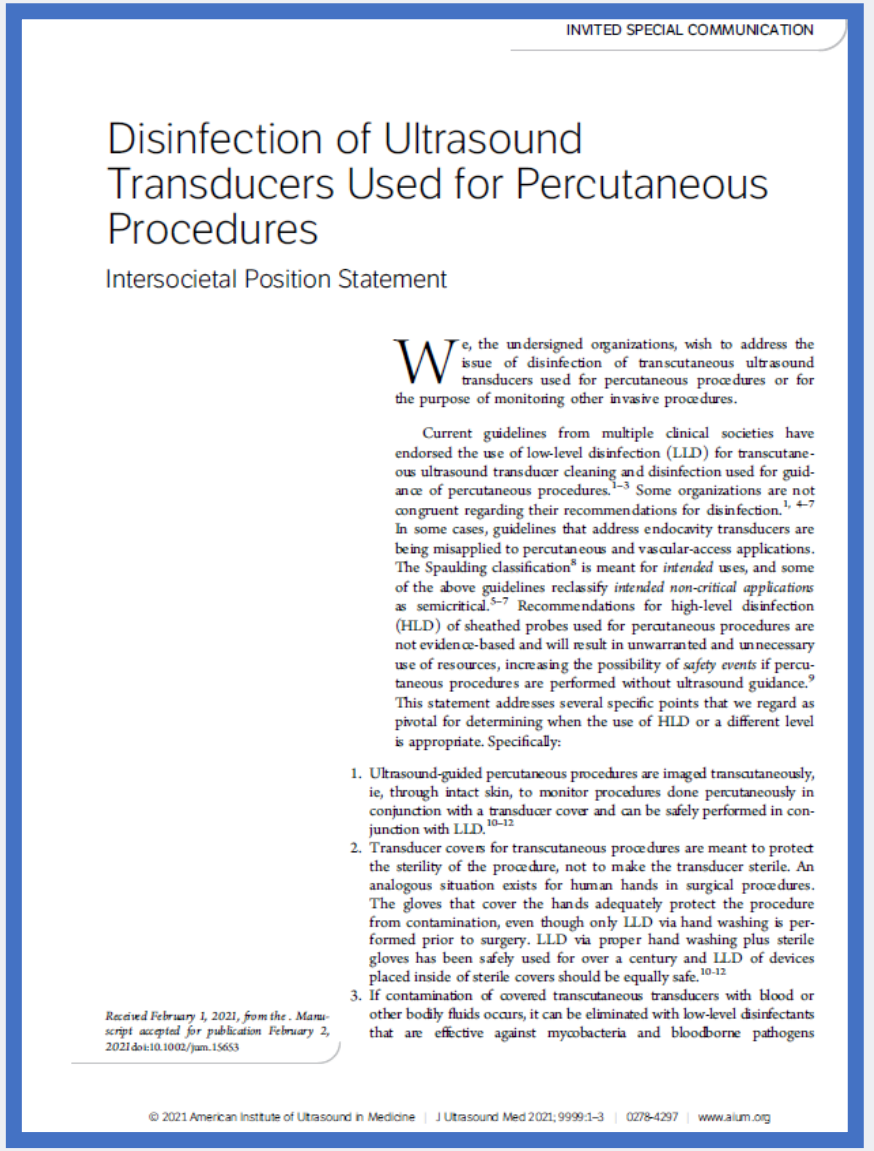
This growth requires constant review of standards, research, and governmental regulation that present a unique challenge in establishing best practices and **standardization of procedures** in the absence of strong evidence.

Consistent Education and **compliance monitoring** are needed to achieve the goal of standardization for safety

Ultrasound Disinfection in Summary

Ultrasound Units must be wiped and disinfected before and after use

AIUM and more than 23 associations recommend Transducer disinfection using Low Level processing for percutaneous external procedures including peripheral catheter insertions



INVITED SPECIAL COMMUNICATION

Disinfection of Ultrasound Transducers Used for Percutaneous Procedures

Intersocietal Position Statement

We, the undersigned organizations, wish to address the issue of disinfection of transcutaneous ultrasound transducers used for percutaneous procedures or for the purpose of monitoring other invasive procedures.

Current guidelines from multiple clinical societies have endorsed the use of low-level disinfection (LLD) for transcutaneous ultrasound transducer cleaning and disinfection used for guidance of percutaneous procedures.[1–3] Some organizations are not congruent regarding their recommendations for disinfection.[1, 4–7] In some cases, guidelines that address endocavity transducers are being misapplied to percutaneous and vascular-access applications. The Spaulding classification[8] is meant for *intended* uses, and some of the above guidelines reclassify *intended non-critical applications* as semicritical.[5–7] Recommendations for high-level disinfection (HLD) of sheathed probes used for percutaneous procedures are not evidence-based and will result in unwarranted and unnecessary use of resources, increasing the possibility of *safety events* if percutaneous procedures are performed without ultrasound guidance.[9] This statement addresses several specific points that we regard as pivotal for determining when the use of HLD or a different level is appropriate. Specifically:

1. Ultrasound-guided percutaneous procedures are imaged transcutaneously, ie, through intact skin, to monitor procedures done percutaneously in conjunction with a transducer cover and can be safely performed in conjunction with LLD.[10–12]
2. Transducer covers for transcutaneous procedures are meant to protect the sterility of the procedure, not to make the transducer sterile. An analogous situation exists for human hands in surgical procedures. The gloves that cover the hands adequately protect the procedure from contamination, even though only LLD via hand washing is performed prior to surgery. LLD via proper hand washing plus sterile gloves has been safely used for over a century and LLD of devices placed inside of sterile covers should be equally safe.[10-12]
3. If contamination of covered transcutaneous transducers with blood or other bodily fluids occurs, it can be eliminated with low-level disinfectants that are effective against mycobacteria and bloodborne pathogens

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Experiences From the Bedside and Emergency Department

Optimal UGPIV procedures are needed to ensure patient safety

- Provide adequate training with competency assessment
- Establish standardized procedures with observation and monitoring
- Ensure maintenance of supply stock

California Board of Nursing: Implicit Bias

In accordance with Assembly Bill 241, 16 CCR 1451.2, as a Continuing Education Provider (CEP) for the California Board of Registered Nursing, all INS continuing educational sessions shall address at least one or in combination of the following:

- Examples of how implicit bias affects perceptions and treatment decisions of registered nurses leading to health disparities in health outcomes

- Strategies to address how unintended biases in decision making may contribute to health care disparities by shaping behavior and producing differences in medical treatment along lines of race, ethnicity, gender identity, sexual orientation, age, socioeconomic status, or other characteristics.

Thank you

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