

# ULTRASOUND TRANSDUCER DISINFECTION FOR PERCUTANEOUS PROCEDURES.

*A REVIEW OF THE EVIDENCE SUPPORTING GUIDELINE  
RECOMMENDATIONS*

**Dr Nathan Peters**

*Senior Staff Specialist Anaesthetist*

*Royal Brisbane and Women's Hospital QLD*

# Conflicts of interest

- Nil
- Acknowledge contributions of co-authors



Review Article |  **Open Access** |  

## **Ultrasound transducer disinfection for percutaneous procedures: A review of the evidence supporting guideline recommendations**

Nathan Peters , Frances Williamson, Victoria Eley

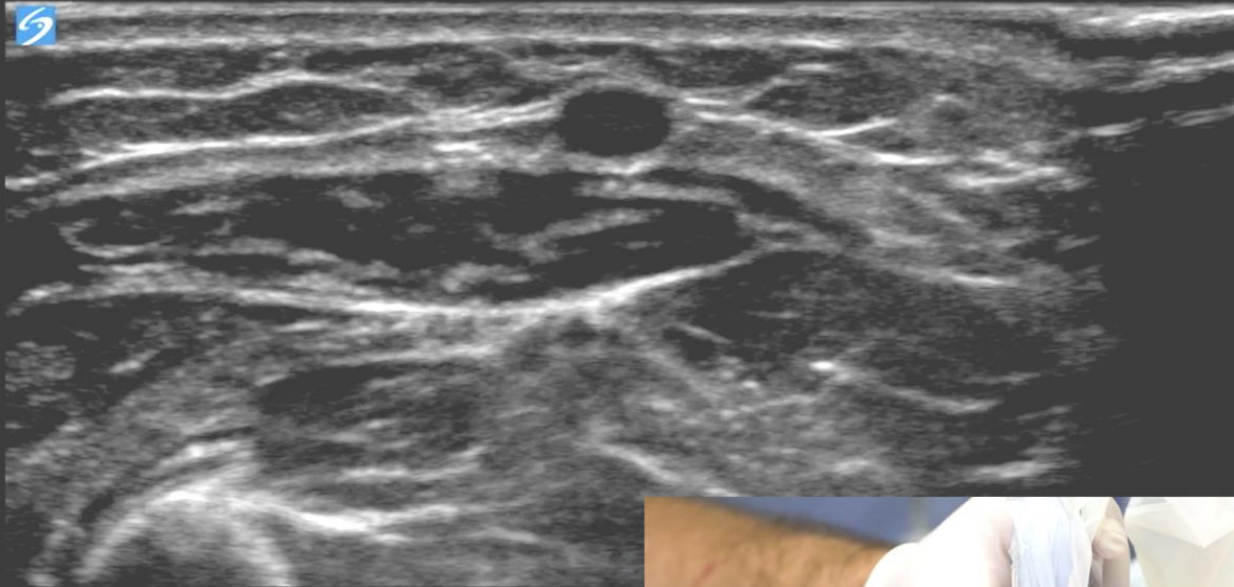
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# US guided Percutaneous Procedures

- Vascular access
- Therapeutic injections
- Aspirations/drainage
- Biopsy



# Ultrasound in Difficult IV Access



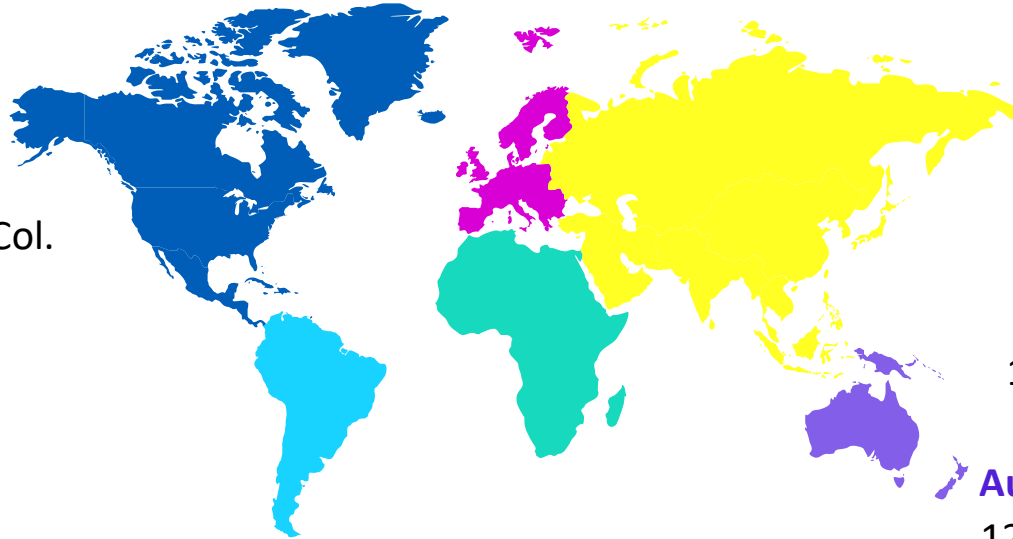
# Would you reprocess these the same?....



# What do international guidelines say?

## North america

1. Can Assoc Em Phys
2. College of P&S Brit. Col.
3. Inf P&C Canada
4. AIUM
5. Soc. Diag. Med US
6. Am Coll Em Phys



## Europe

7. Brit Med US Soc
8. Germ Soc US Med
9. NHS - Scotland
10. Europ. Soc Rad.

## World

11. WFUMB

## Australia

12. ASUM
13. CICM

# Evidence to support level of disinfection

- No high-level evidence available

Evidence used:

1. *IP&C principles*
2. *Other published guidelines*
3. *National guidelines/standards*
4. *Retrospective infection rates*

# Application of IPC principles

## Spaulding's Classification

Level of risk	Definition	Minimum level of disinfection
Critical	Intended to be introduced directly into or have contact with the vascular system or normally sterile areas of the body	Sterilisation
Semi-critical	Medical device that comes into contact with mucous membranes or non-intact skin	High-level
Non-critical	Medical device that comes into contact with intact skin but not mucous membranes	Low-level

- 5 = Critical → 7 = HLD
- 3 = Semi-critical → 7 = HLD
- 2 = Non-critical → 4 = LLD
- 3 = Not used → 4 = LLD



# Application of IPC principles

## Discussion

- Frequently used
- Linked to national standards
- Modified definitions (*5 of 10*)
- Poor reproducibility = low accuracy



# Published guidelines/National standards

## Results

- 11 referenced previously published guidelines
- 10 National standards

## Discussion

Very commonly used as evidence

### Risks:

- Extrapolation from other US modalities
- Evidence from Non-US practice
- Contaminated if not cleaned

# Infection markers/outcomes

## Results

- 5 guidelines utilized
- *Peters et al – LLD v HLD*
- Retrospective observational data
  - *Cervini et al – 13,500 = 0.1%*
  - *Adhikari – 0.5% US 0.8% Trad*
  - *German Soc – 0.1-0.2%*

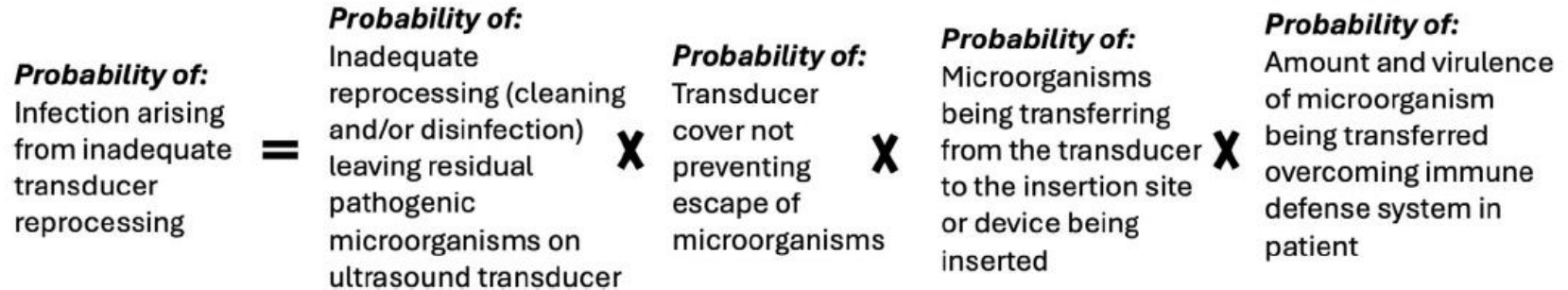
## Discussion

- Less commonly utilized (more so recently)
- Supportive of LLD (except ASUM)
- Infection rate = very low
- Transducer related?

# Where to from here?

## *Level of disinfection* – no consensus

- High-level evidence.... but will this ever be available?
- Contextualized risk assessment:



# Transducer covers

## Results

- Where included ALL recommended
- Sterility:
  - Sterile = 6
  - Procedure dependent = 4
- Some concern about loss of integrity

## Discussion

- What is their role?
  - = Aseptic technique

*“If the transducer could possibly contact the puncture site or device a sterile cover should be used”*

# Sterile gel

## Results

- Where included ALL recommended sterile gel = 10
- Case reports of infection arising from contaminated US gel
  - Burkholderia spp.
  - Acinetobacter spp.

## Discussion

- Evidence supports the use of sterile US gel



# Conclusion

- Covers & Sterile gel – uniformly supported
- Differing recommendations on level of disinfection
  - Spaulding’s risk assessment less useful in isolation
- Risk assessment likely to be utilized more in future guidelines
  - Include the highest level of evidence available
  - Recognize all steps aimed at mitigating infectious risk

# Questions

