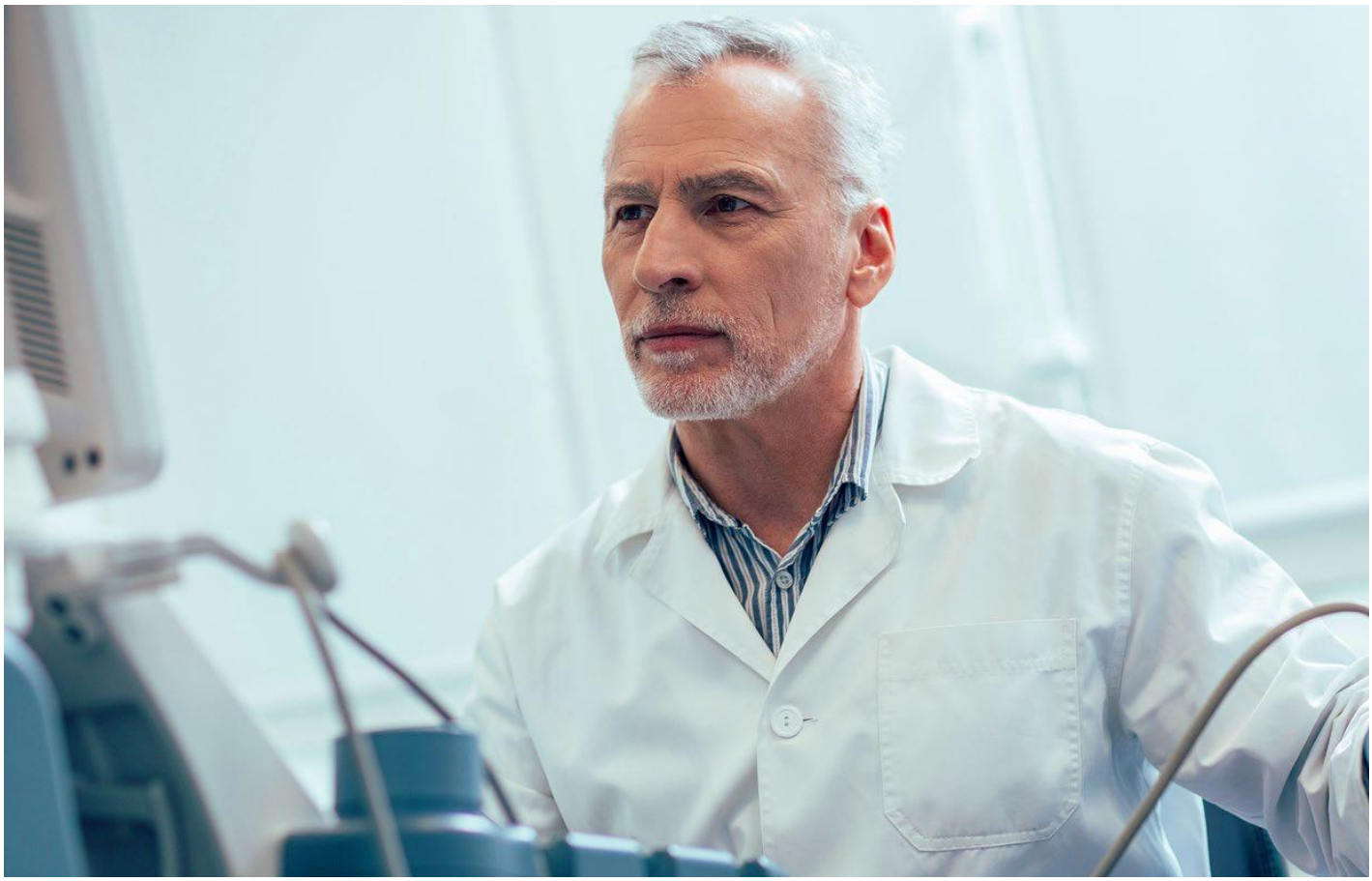
Ultrasound Infection Prevention Toolkit

Ver. 1.0



Prevention of infection during ultrasound probe use and reprocessing

Tool 2 Algorithm

www.ultrasoundinfectionprevention.org.uk/

This tool is organised by department and provides a range of typical procedures that may be encountered in that department. Probe use and reprocessing requirements based on current editions of local, regional and global guidelines are presented as a decision-making algorithm.[1-7] The flow chart can be printed out and displayed throughout the office and procedure rooms and used as a quick reference chart for healthcare workers to determine whether a practice is compliant with available guidelines.

This tool can also be used in conjunction with Tool 1: Part B – Profile to determine whether policy and practice comply with best practice recommendations.

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Guidelines

The following tool is based on the Spaulding Classification system that is referenced in U.K., European and global ultrasound guidelines.[1-6] Local regulatory authorities could refer to these documents for accreditation of health care facilities.

The Spaulding Classification system dictates the level of disinfection or sterilisation a medical device should be subjected to based on the degree of infection risk involved with its use and contact sites

with patients.[11] The following definitions below are drawn from local and regional guidelines:[1-7]

Non-critical devices – only contacts intact patient skin, not mucous membranes. If decontamination is necessary, disinfect with compatible low or intermediate level disinfectant after cleaning.

Semi-critical devices – contacts intact mucous membranes or non-intact skin, such as skin broken from the insertion of a vascular device or complex wounds.[1-6] Probes include a transoesophageal echocardiogram, transrectal ultrasound and transvaginal probes.[2-6]

A high-level chemical or thermal disinfection process that is bactericidal, mycobactericidal, fungicidal and virucidal with a small number of spores permitted must be used after cleaning.[2-4] If this process includes equipment, it must be validated and also maintained following relevant standards and manufacturer's instructions.[2-4] HLD is recommended regardless of sheath use.[1-6]

Critical devices – probes contacting sterile tissues or blood, includes ultrasound probes used in sterile body cavities, intraoperative, biopsy and puncture techniques. The critical devices are not defined in the HSE Ireland and NHS Scotland guidelines though it is referenced in SCoR/BMUS, ECMUS and WFUMB guidance.

Critical devices require **sterilisation**. However, some sterilising methods can cause damage to ultrasound probes, and the SCoR/BMUS and ESR guidelines propose an alternative HLD combined with the use of a sterile sheath.[1,4]

Note: The ESR suggested in 2017 simplifying the classification by moving the semi-critical devices into the critical category. This toolkit does not implement this proposal and keeps three distinct categories in alignment with the U.K./Ireland recommendations. However, while performing any risk analysis, it is advisable to consider the fragility of mucous membranes and the risk of micro-trauma.

The following procedure charts are based on these recommendations and are divided by department. Typical procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other Spaulding Classification categories depending on the specific clinical situation and which tissues are contacted. Print these charts and place them in treatment rooms to guide best practice ultrasound reprocessing and use for patient safety. Any deviation from best practice recommendations needs to be supported with clinical evidence and thorough risk profiling with a multidisciplinary assessment team. This process needs to be documented and reviewed according to hospital policy and procedure.

Algorithm for probe use and reprocessing template

Department name: _____

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Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
Add critical procedures here. Type here	Add critical procedures here. Type here	Add critical procedures here. Type here
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **High-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in ANESTHETICS

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Preliminary diagnostic scans on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Preliminary diagnostic scans on non-intact skin.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Ultrasound guided nerve block
- Ultrasound guided general/ local anesthesia
- Ultrasound guided neuroaxial and chronic pain procedures (e.g. spinal injections, joint injections, peripheral nerve injections)
- Ultrasound guided truncal blocks.

Probe is Critical and minimally needs:**

- **High-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in EMERGENCY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Focussed Assessment with Sonography in Trauma (FAST), blunt injury with intact skin
- Transthoracic echocardiography over intact skin
- Wound assessment, healed intact scar tissue
- Ultrasound guided urinary catheterisation, scan on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Focussed Assessment with Sonography in Trauma (FAST), blunt injury with non-intact skin
- Transthoracic echocardiography over non-intact skin
- Transvaginal ultrasound, healthy mucosa
- 1st degree burns assessment
- Wound assessment, superficial or partly healed wound, non-intact skin
- Ultrasound guided urinary catheterisation, scan on non-intact skin.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Focussed Assessment with Sonography in Trauma (FAST), penetrating injury
- Transthoracic echocardiography for penetrating thoracic injuries
- Ultrasound guided central and peripheral venous access†
- Transvaginal ultrasound, mucosa with trauma, ulcers
- 2nd, 3rd, 4th degree burns assessment
- Penetrating wound scans
- Ultrasound guided tracheostomy.

Probe is Critical and minimally needs:

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

†It is important that patients continue to receive ultrasound guidance for peripheral IVs, midlines and PICCs as evidence shows increased risk of infection where ultrasound guidance is not performed. Where HLD would prevent the use of ultrasound for these procedures, the relative risks need to be considered. See Section 5.2.1 in Tool 4 – Policy Development Framework for more information.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in CARDIOLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Echocardiogram, scan on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Transesophageal echocardiography (TEE), healthy oral cavity/esophagus
- Echocardiogram, scan on non-intact skin.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Transesophageal echocardiography (TEE), oral cavity/esophagus with ulcers/ trauma
- Ultrasound guided procedures requiring percutaneous vascular access, (e.g. angioplasty, coronary intervention, heart ablations, atrial septal defect closures, intravascular ultrasound, intracardiac echocardiography (ICE), pacemaker placement.)
- Echocardiogram with penetrating injury, deep wounds, post-op stitches
- Endo/myocardial biopsies
- Ultrasound guided drainages (e.g. pericardiocentesis)
- Injections (e.g. thrombin for arterial pseudoaneurysms)
- Intraoperative procedures (e.g. assessment of carotid endarterectomy and stent angioplasty, detection of tumor thrombosis of vessel, heart surgery).

Probe is Critical and minimally needs:**

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in GASTROENTEROLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Transabdominal scan on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Transabdominal scan on non-intact skin
- Transesophageal echocardiography (TEE), healthy oral cavity/esophagus.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Transesophageal echocardiography (TEE), oral cavity/esophagus with trauma, ulcers
- Ultrasound guided percutaneous drainages (e.g. paracentesis, transhepatic biliary drainage, transcutaneous cholangiography)
- Intraoperative interventions (e.g. thermal liver lesion ablation, biliary stenting)
- Ultrasound guided percutaneous interventions (e.g. suprapubic cystostomy, cholecystectomy, liver lesion ablation).

Probe is Critical and minimally needs:**

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in OBGYN/MFM

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Transabdominal scan on intact skin.	• Transabdominal scan on non-intact skin • Routine transvaginal ultrasound (e.g. routine pelvic, uterine, fetal imagining) • Transvaginal ultrasound guided follicular assessment.	• Transvaginal ultrasound guided oocyte retrieval • Transvaginal ultrasound guided implantations • Ultrasound guided tissue sampling during pregnancy (e.g. amniocentesis, cordocentesis and transabdominal or transcervical chorionic villus sampling).
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in MUSCULOSKELETAL

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Preliminary diagnostic scans on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Preliminary diagnostic scans on non-intact skin.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Ultrasound guided aspirations (e.g. tendinous calcium barbotage, arthrocentesis, juxta-articular, joint and soft tissue collection)
- Ultrasound guided percutaneous needle guidance (e.g. trigger point needling, tenotomy, fasciotomy)
- Ultrasound guided tendon and articular injections
- Intraoperative procedures (e.g. foreign body removal).

Probe is Critical and minimally needs:**

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in NEPHROLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Diagnostic ultrasound (e.g. kidney stones, bladder health, prostatitis), scan on intact skin.	• Diagnostic ultrasound (e.g. kidney stones, bladder health, prostatitis), scan on non-intact skin.	• Diagnostic ultrasound (e.g. kidney stones, bladder health, prostatitis) in post-surgery patients with open wounds or fresh stitches near the scan region • Ultrasound guided renal biopsy • Ultrasound guided percutaneous nephrostomy.
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in NEUROLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Preliminary diagnostic scans on intact skin.	• Preliminary diagnostic scans on non-intact skin.	• Ultrasound guided nerve blocks • Ultrasound guided percutaneous needle guidance (e.g. peripheral nerve stimulation, spinal pain procedures) • Ultrasound guided perineural catheter placement • Intraoperative ultrasound in neurosurgery.
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in ONCOLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Surface ultrasound scan, intact skin.	• Endocavitary scan or surface scan on non-intact skin.	• Intraoperative procedures under ultrasound guidance (e.g. metastasectomy, ablative surgery, tumour localisation, resection surgery, biopsies of internal organs/tissues) • Ultrasound guided percutaneous ablations • Ultrasound guided percutaneous tumor biopsies (e.g. breast, liver, kidney).
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in PULMONOLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Pulmonary surface ultrasound, scan on intact skin.	• Pulmonary surface ultrasound, scan on non-intact skin.	• Ultrasound guided drainages (e.g. thoracentesis, pneumothorax treatment) • Ultrasound guided biopsies (e.g. transbronchial needle aspiration for lymph node/lung biopsies) • Ultrasound guided tracheostomy and cricothyrotomy.
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in RADIOLOGY and INTERVENTIONAL RADIOLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Surface ultrasound (e.g. abdomen, breast, pelvis, neck, leg) on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Surface ultrasound (e.g. abdomen, breast, pelvis, neck, leg) on non-intact skin
- Endocavitary ultrasound (e.g. transvaginal, transrectal), healthy mucosa.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Endocavitary ultrasound (e.g. transvaginal, transrectal), mucosa with trauma, ulcers
- Endocavitary ultrasound for interventional procedures (e.g. aspirations, biopsies
- Ultrasound guided biopsies (e.g. liver, renal, breast, bone, lesion, lymph, prostate, chest/abdominal mass)
- Ultrasound guided aspirations and drainages (e.g. fluid, cyst and abscess aspirations, neck or thyroid mass aspirations)
- Ultrasound guided percutaneous ablations (e.g. liver lesions, vascular malformations)
- Intraoperative procedures (e.g. thrombectomy, breast surgery, hepatic tumor ablations, transplants, TIPSS)
- Foreign body localisation/removal.

Probe is Critical and minimally needs:**

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in UROLOGY

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**

Example procedures:

- Diagnostic surface ultrasound (e.g. kidney stones, bladder health, prostatitis, scrotum and testicular pathology) on intact skin.

Probe is Non-Critical and minimally needs:

- **Low-level disinfection**
- **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**

Probe risks contacting **mucous membranes or non-intact* skin.**

Example procedures:

- Diagnostic surface ultrasound (e.g. kidney stones, bladder health, prostatitis, scrotum and testicular pathology) on non-intact skin
- Transrectal ultrasound, healthy mucosa.

Probe is Semi-Critical and minimally needs:

- **High-level disinfection**
- **Non-sterile single-use sheath**
- **Non-sterile single-use gel.**

Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**

Example procedures:

- Diagnostic surface ultrasound (e.g. kidney stones, bladder health, prostatitis, scrotum and testicular pathology) on post-op patients with open wounds or fresh stitches near the scan region
- Transrectal ultrasound, unhealthy mucosa (e.g. bleeding, ulcers)
- Transrectal ultrasound during interventional procedures (e.g. prostate biopsy, prostatitis treatment, catheterisation)
- Ultrasound guided scrotal drainage; suprapubic bladder aspiration
- Ultrasound guided testicular biopsy.

Probe is Critical and minimally needs:**

- **Sterilisation (recommended) or high-level disinfection**
- **Sterile sheath**
- **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and ESR recommend the probe should minimally be high-level disinfected and covered with a sterile probe cover.

Algorithm for probe use and reprocessing in VASCULAR

Based on recommendations from the SCoR/BMUS, HSE Ireland, NHS Scotland, ESR, ECMUS and WFUMB.

What will the probe contact during the procedure?

Probe only contacts **intact skin.**	Probe risks contacting **mucous membranes or non-intact* skin.**	Probe risks entering or contacting **sterile tissue, bloodstream or sterile body cavities.**
Example procedures:	**Example procedures:**	**Example procedures:**
• Arterial/venous/carotid duplex or Doppler scan on intact skin.	• Arterial/venous/carotid duplex or Doppler scan on non-intact skin.	• Vascular access for angiogram, angioplasty, endovascular aneurysm repair • Venous ablation • Ultrasound guided central and peripheral venous access.†
Probe is **Non-Critical** and minimally needs:	Probe is **Semi-Critical** and minimally needs:	Probe is **Critical** and minimally needs:**
• **Low-level disinfection** • **Single-use gel (preferred) or multi-use, non-refillable gel (risk assessment recommended).**	• **High-level disinfection** • **Non-sterile single-use sheath** • **Non-sterile single-use gel.**	• **Sterilisation (recommended) or high-level disinfection** • **Sterile sheath** • **Sterile single-use gel.**

Probe is ready for the procedure

NOTE: Example procedures have been provided as examples based on interpretation of the Spaulding Classification. Some procedures may fall into other categories depending on the specific clinical situation and on which tissues may be contacted. Additionally, the probe cable and ultrasound console are generally considered non-critical surfaces and should be cleaned and undergo LLD between patients as part of the room turnover process. Check with manufacturer to determine whether chosen disinfectant is compatible with the probe and cable.

*Non-intact skin: Areas of the skin that have been opened by cuts, abrasions, dermatitis, chapped skin or unhealthy skin etc.

†It is important that patients continue to receive ultrasound guidance for peripheral IVs, midlines and PICCs as evidence shows increased risk of infection where ultrasound guidance is not performed. Where HLD would prevent the use of ultrasound for these procedures, the relative risks need to be considered. See Section 5.2.1 in Tool 4 – Policy Development Framework for more information.

**European and global ultrasound guidelines states that the probes should be sterilised between each patient use as with other critical items. If this is not possible, SCOR/BMUS and WSR recommend the probe should minimally be high level disinfected and covered with a sterile probe cover.

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