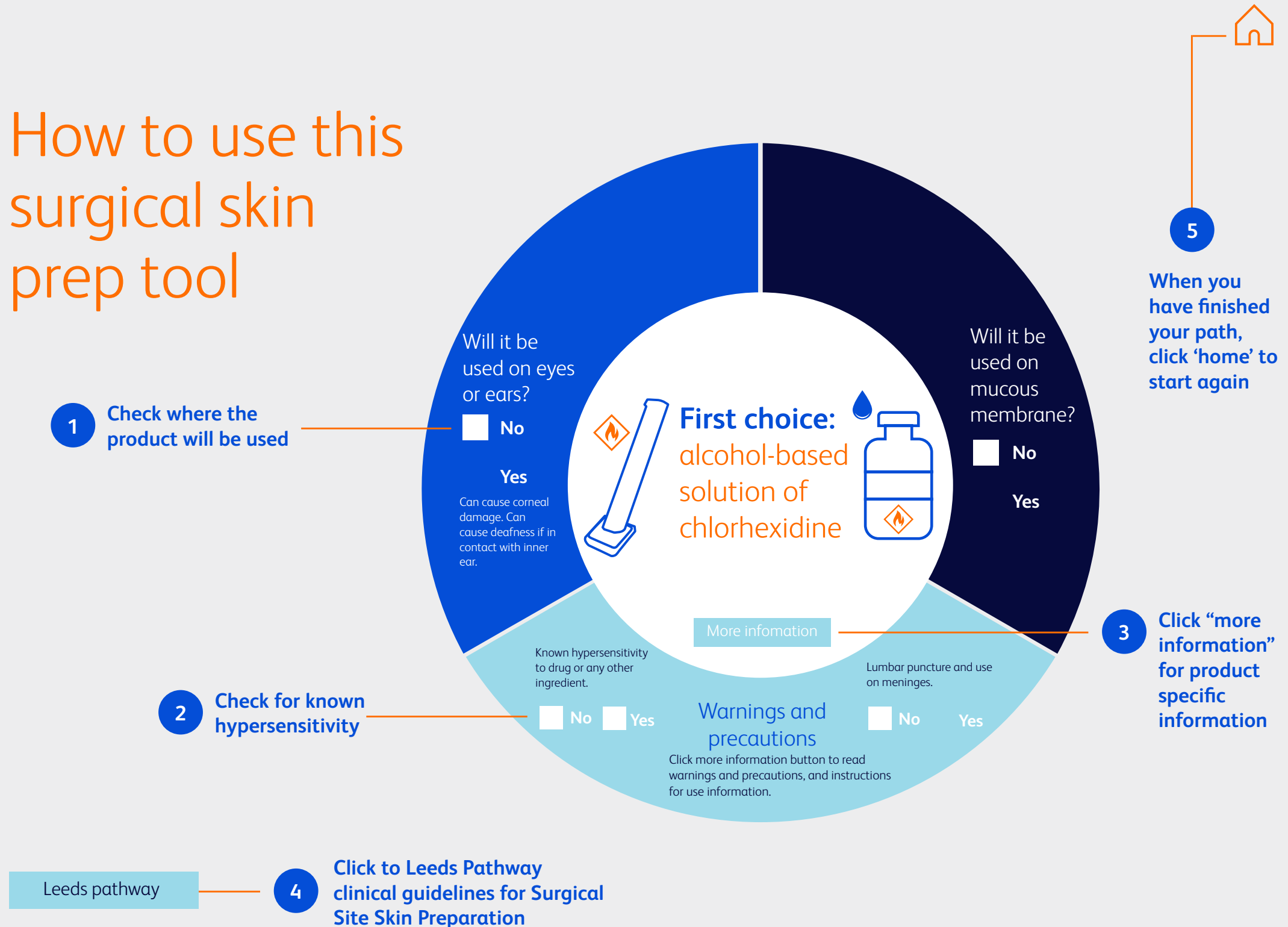




Surgical skin prep decision tool

Preventing harm caused by incorrect selection of surgical skin preparation solution

How to use this surgical skin prep tool



Choice of antiseptic skin preparation –

Surgical Site Infections NICE Guideline¹

First choice:
alcohol-based solution of chlorhexidine

At the time of publication (April 2019), **0.5% chlorhexidine** in 70% alcohol solution was licensed for 'preoperative skin disinfection prior to minor surgical procedures' and only **2.0% chlorhexidine** in 70% alcohol applicators were licensed for 'disinfection of the skin prior to invasive medical procedures'.

One possible exception to the use of 2% might be where neurotoxicity is a concern e.g. spinal procedures

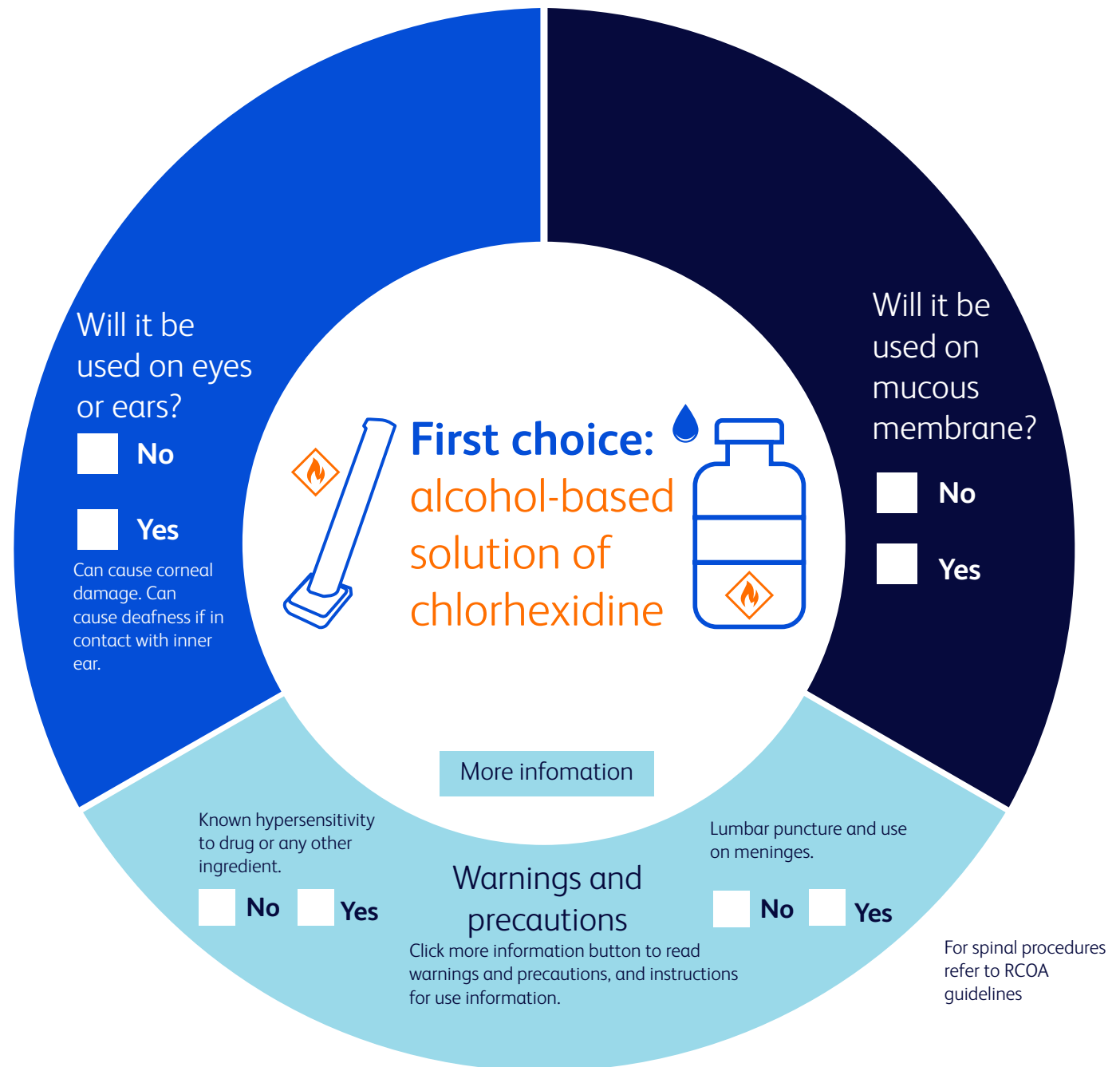
For consideration when used next to **mucous membrane** refer to local policy, guidance or protocol.

For considerations when using on **face**, refer to Leeds pathway

Leeds pathway

 **Prevent pooling of prep fluid**

 **Surgical fire risk**



Choice of antiseptic skin preparation –

Surgical Site Infections NICE Guideline¹

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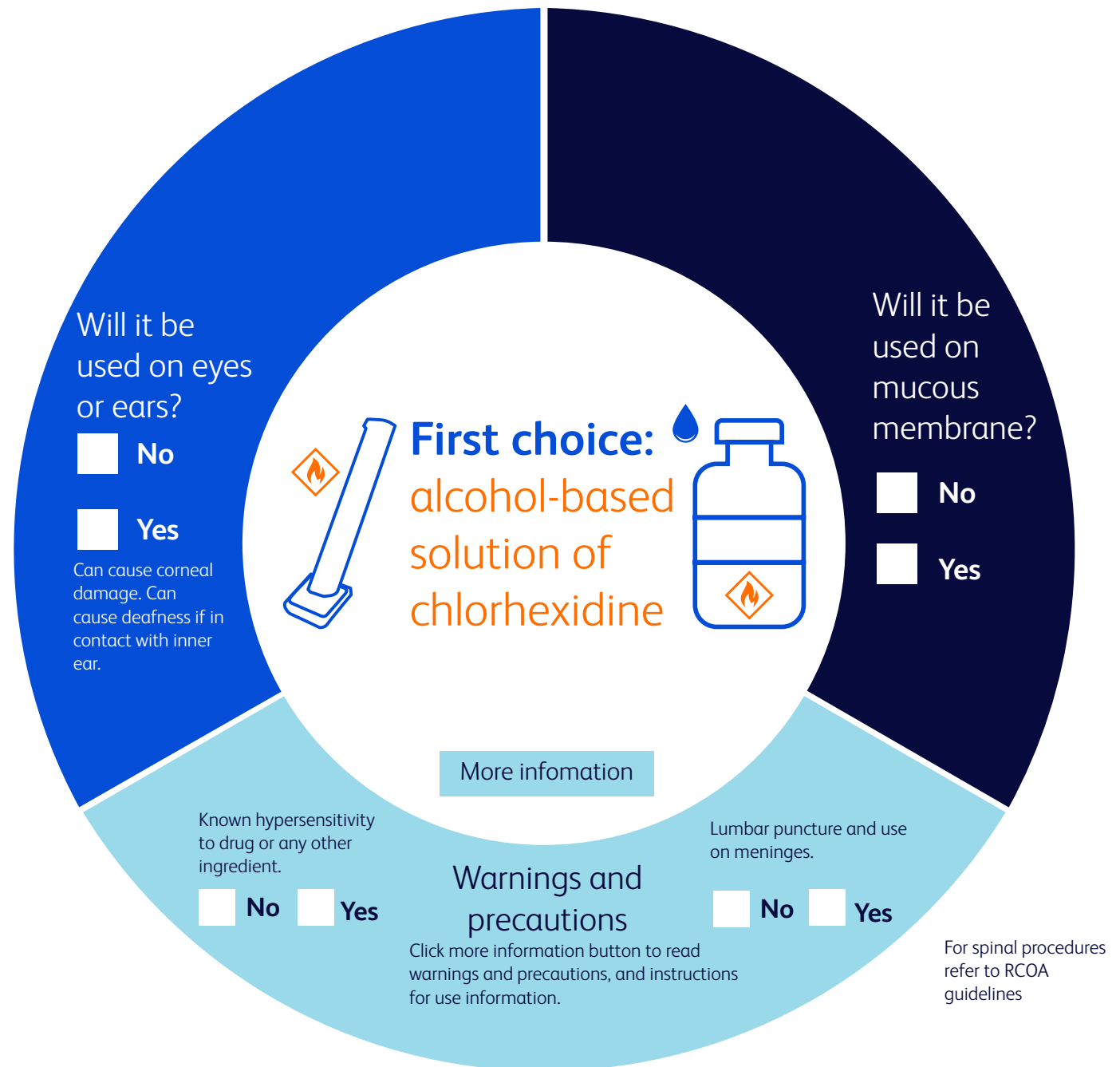
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Leeds pathway

 **Prevent pooling of prep fluid**

 **Surgical fire risk**





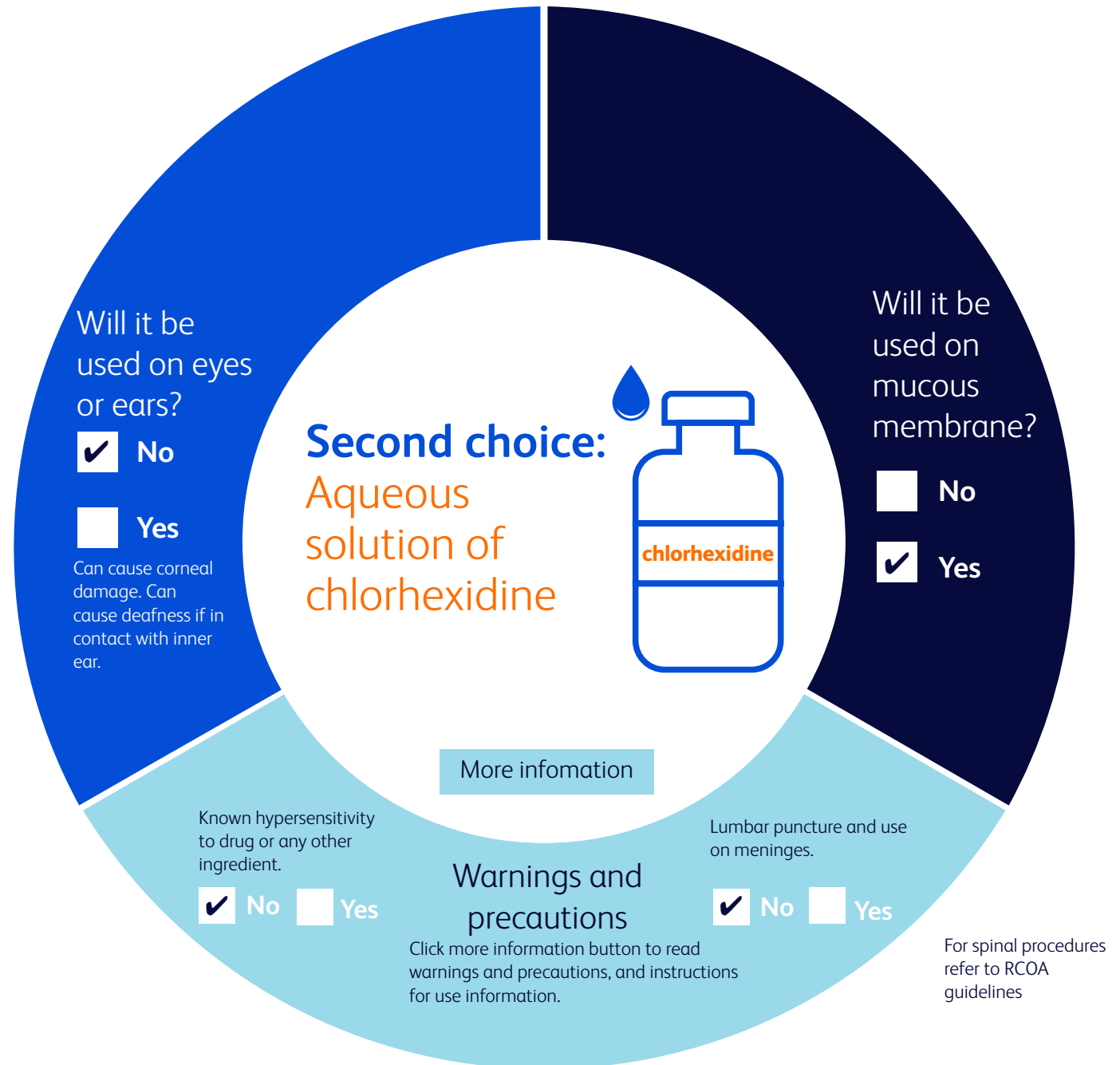
Choice of antiseptic skin preparation –

Surgical Site Infections NICE Guideline¹

Second choice: aqueous solution of chlorhexidine*

At the time of publication (April 2019), 4.0% aqueous chlorhexidine was licensed for 'preoperative and postoperative skin antisepsis for patients undergoing elective surgery'; however, relevant instructions were limited to use as a body wash to be used before the person enters the operating theatre.

*If using off label solution, local policy will be required.



Leeds pathway

 Prevent pooling of
prep fluid

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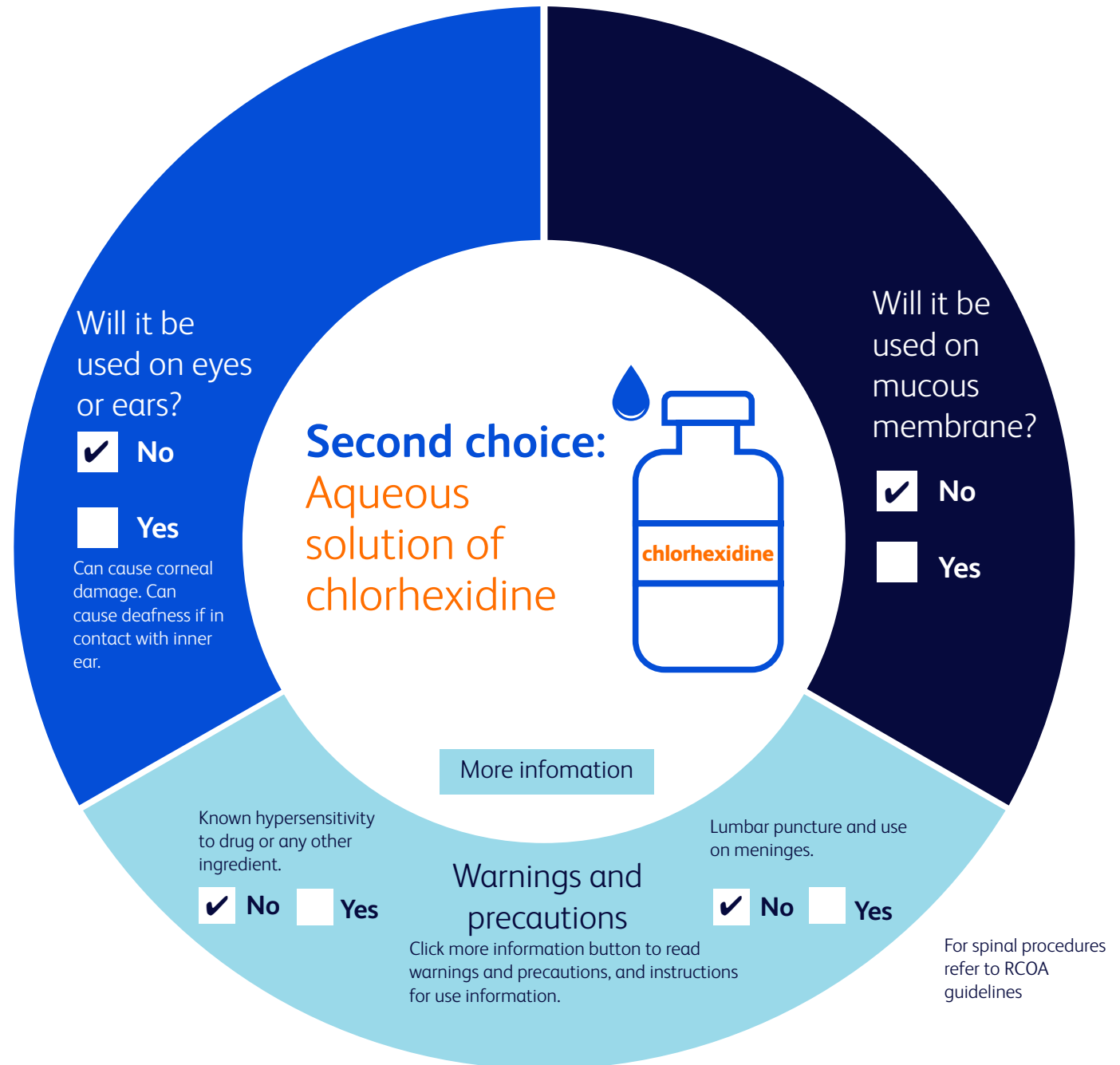
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Leeds pathway

 Prevent pooling of prep fluid

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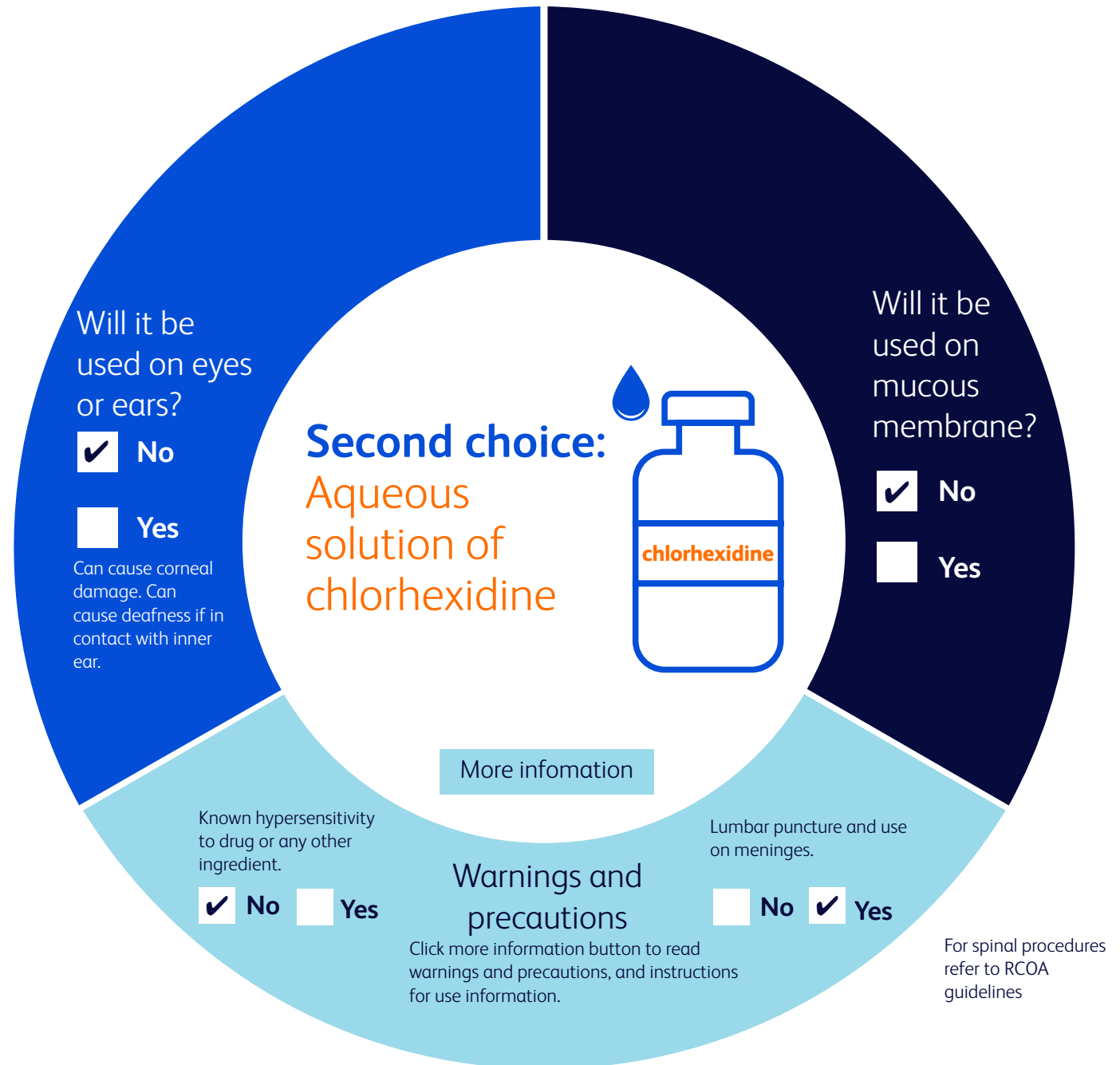
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*If using off label solution, local policy will be required.



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**Prevent pooling of
prep fluid**

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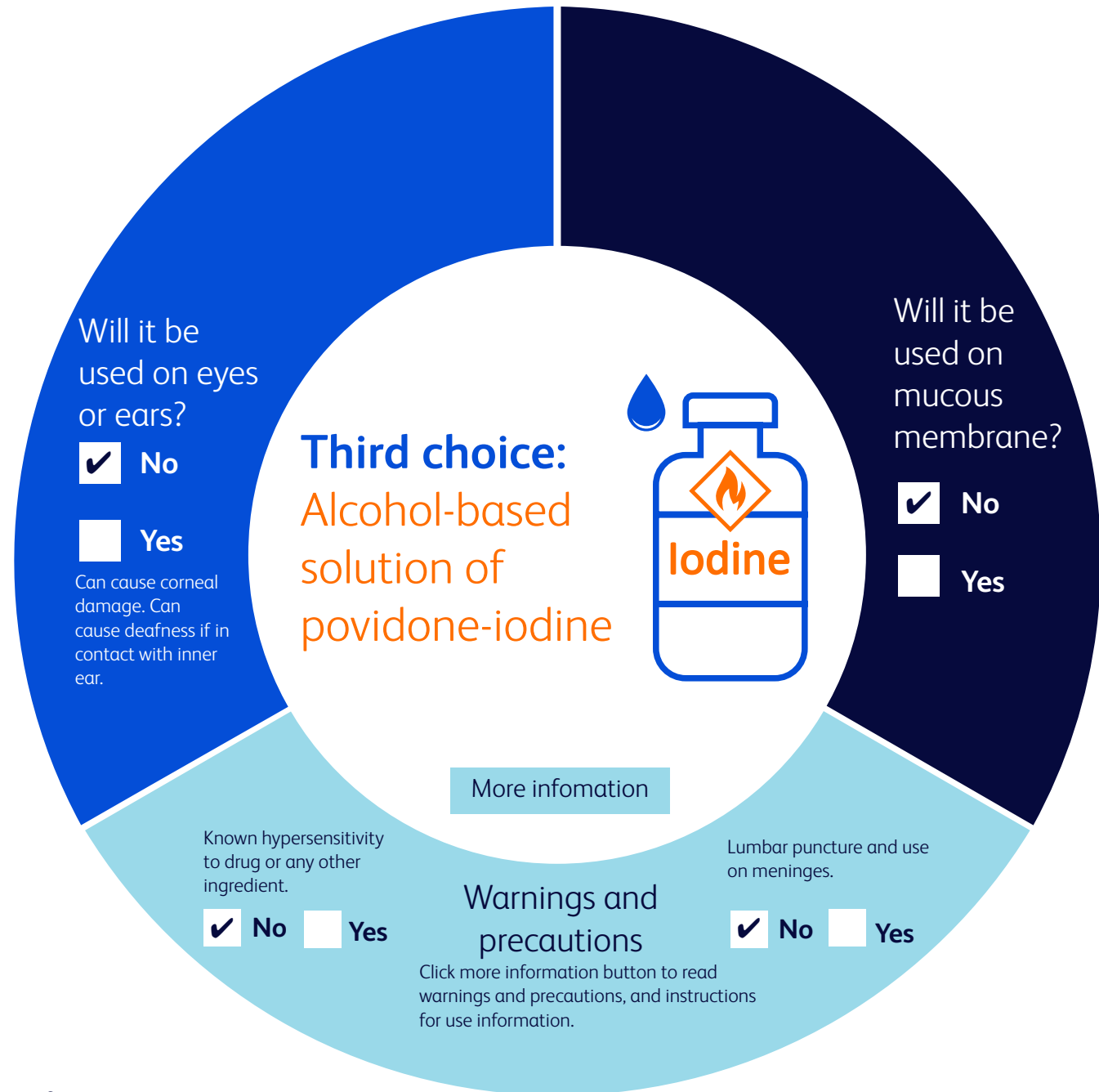


Choice of antiseptic skin preparation –

Surgical Site Infections NICE Guideline¹

Third choice:
alcohol-based solution of povidone-iodine

At the time of publication (April 2019), **10% povidone-iodine alcoholic solution** was licensed for 'topical application'. **10% povidone-iodine** was licensed for 'antiseptic skin cleanser for major and minor surgical procedures'.



 **Prevent pooling of prep fluid**

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 **Surgical fire risk**

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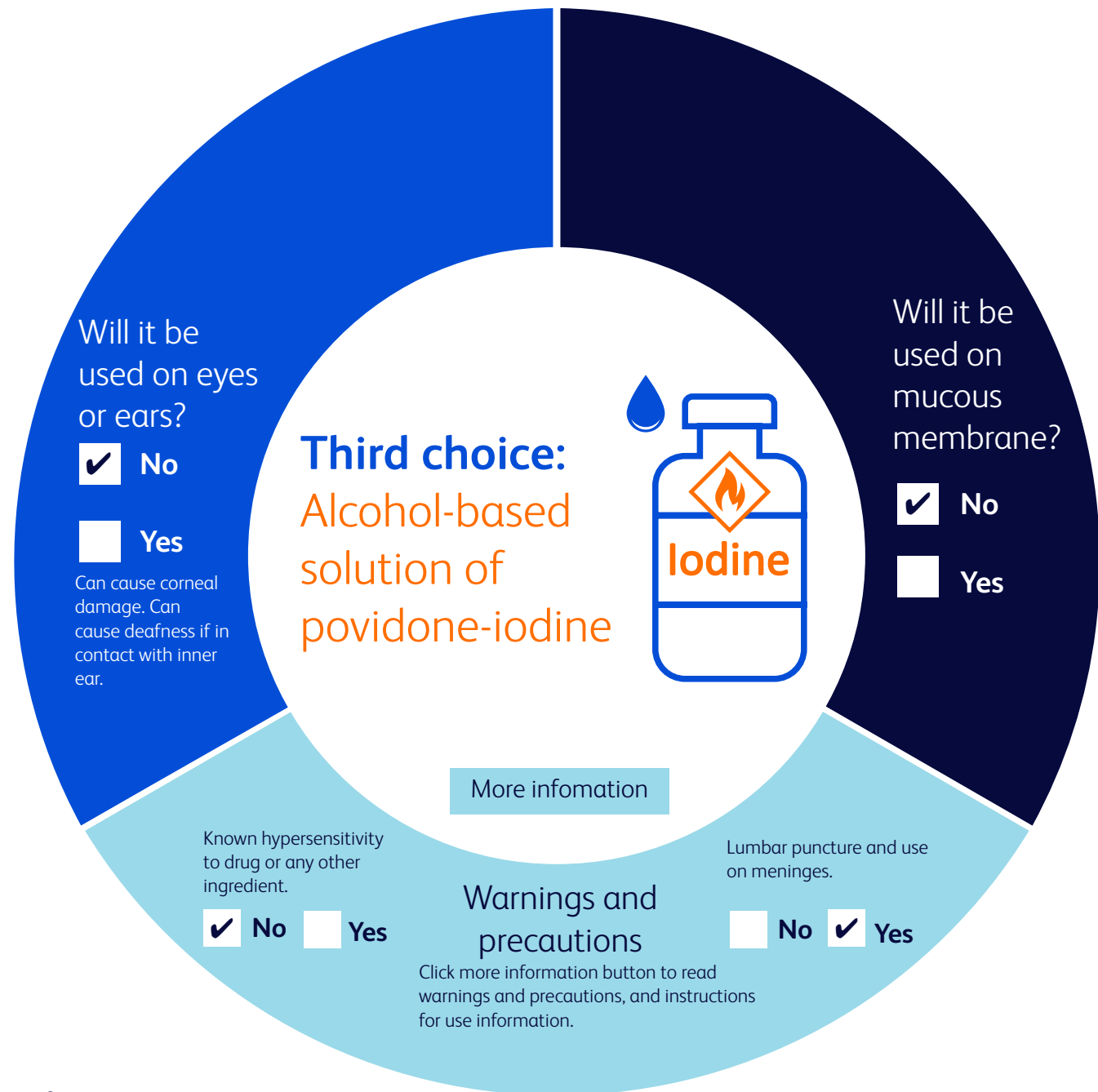


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Surgical Site Infections NICE Guideline¹

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 **Prevent pooling of prep fluid**

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 **Surgical fire risk**

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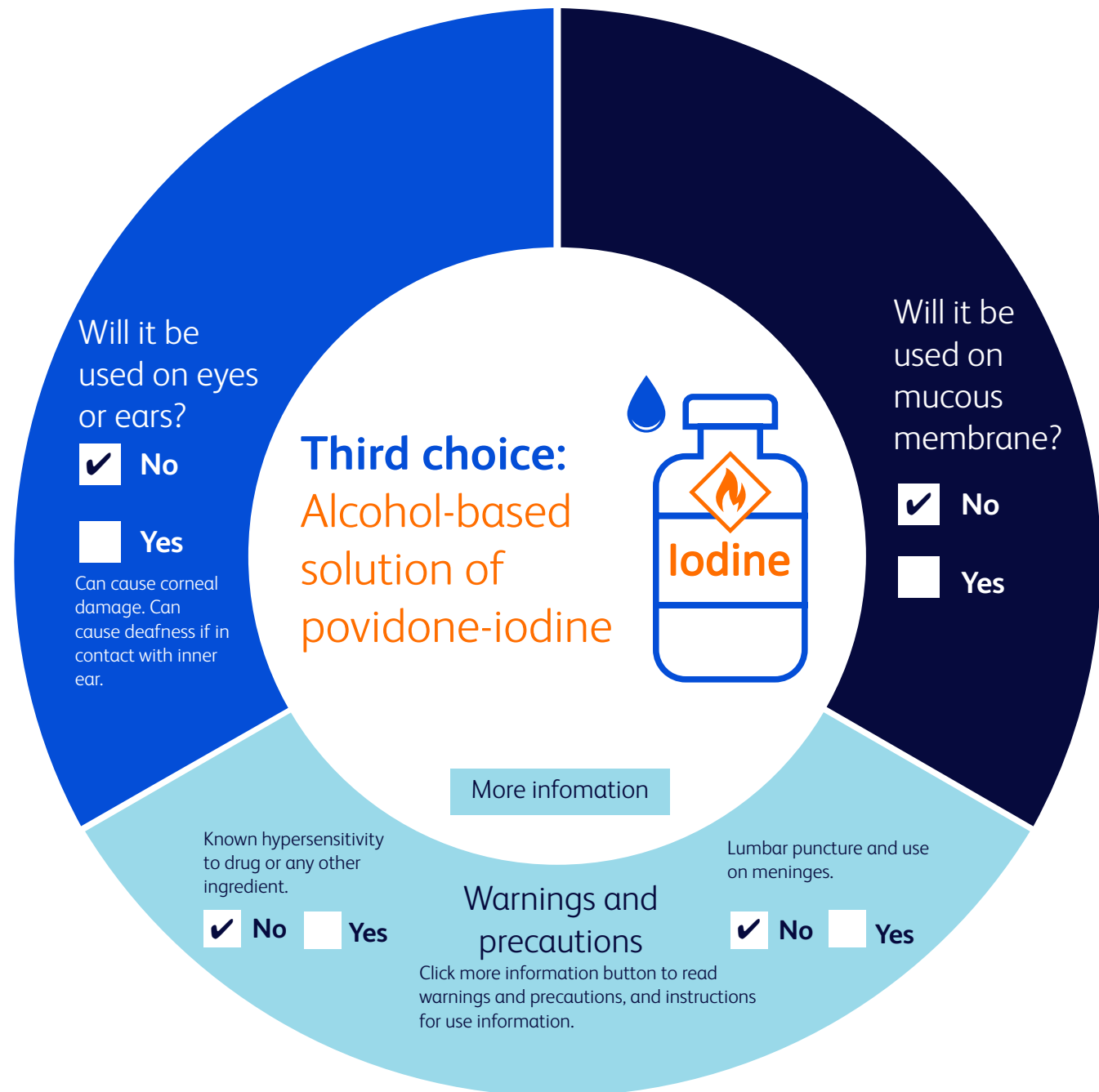


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Prevent pooling of prep fluid



Surgical fire risk

Leeds pathway

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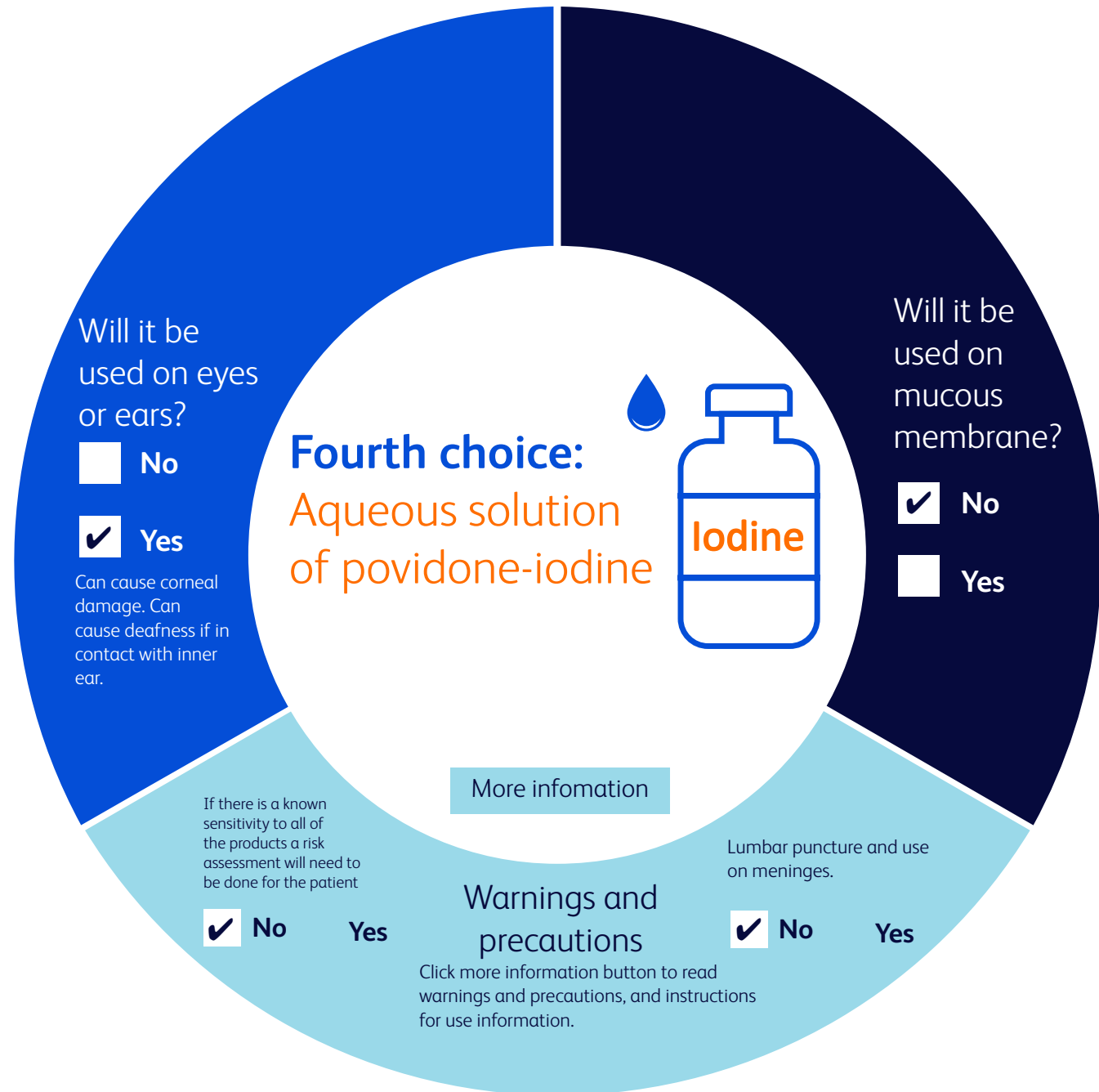


Choice of antiseptic skin preparation –

Surgical Site Infections NICE Guideline¹

Fourth choice: aqueous solution of povidone-iodine

At the time of publication (April 2019), **7.5% povidone-iodine** surgical scrub solution was licensed for 'disinfecting the site of incision prior to elective surgery' and **7.5% povidone-iodine** was licensed for 'preoperative preparation of patients' skin'. **10% iodine antiseptic solution** was licensed for 'disinfection of intact external skin or as a mucosal antiseptic' and **10% povidone-iodine solution** was licensed for 'preoperative and postoperative antiseptic skin cleanser for major and minor surgical procedures'.



Leeds pathway



Prevent pooling of
prep fluid

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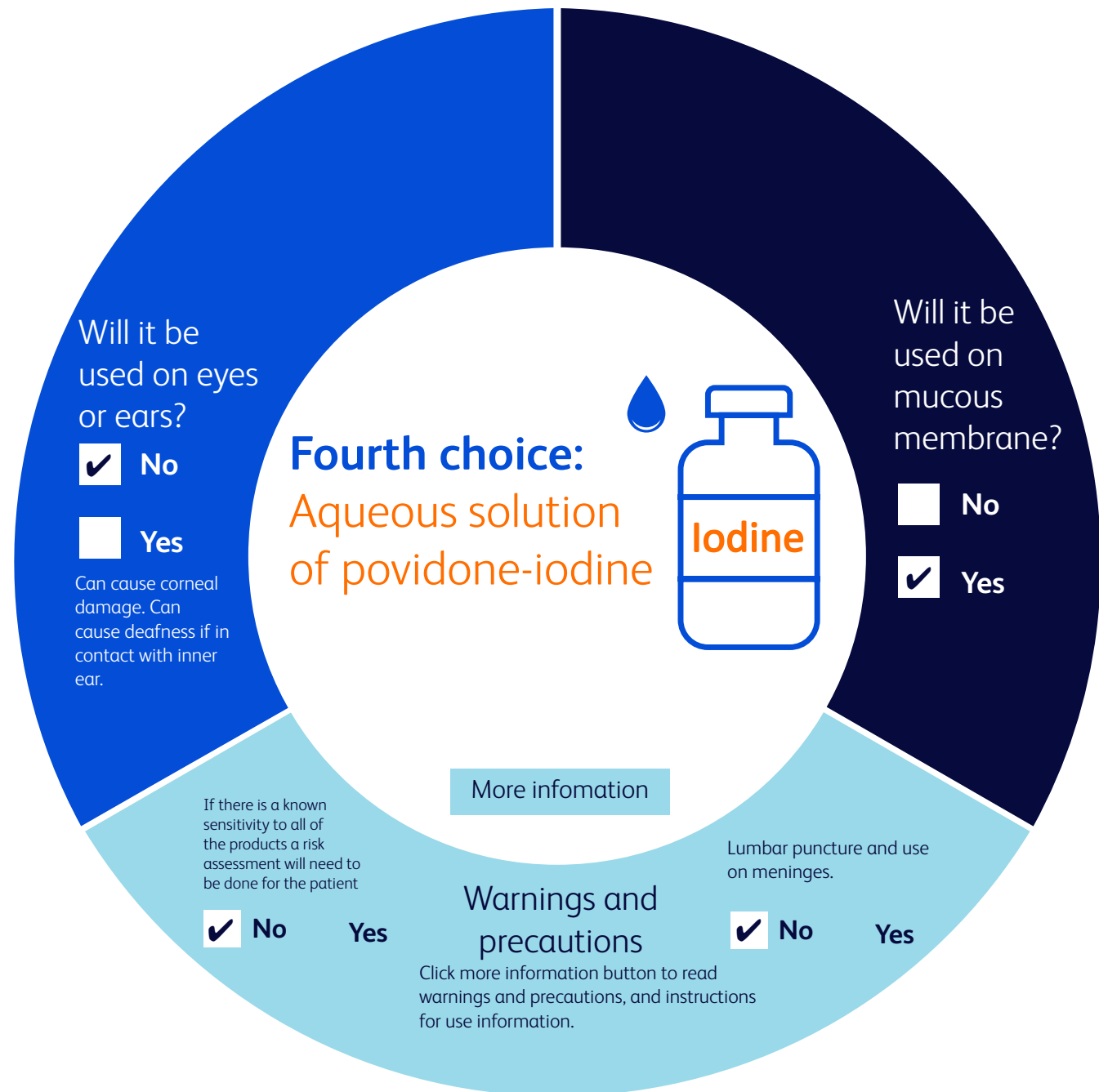


Choice of antiseptic skin preparation –

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Leeds pathway

 Prevent pooling of prep fluid

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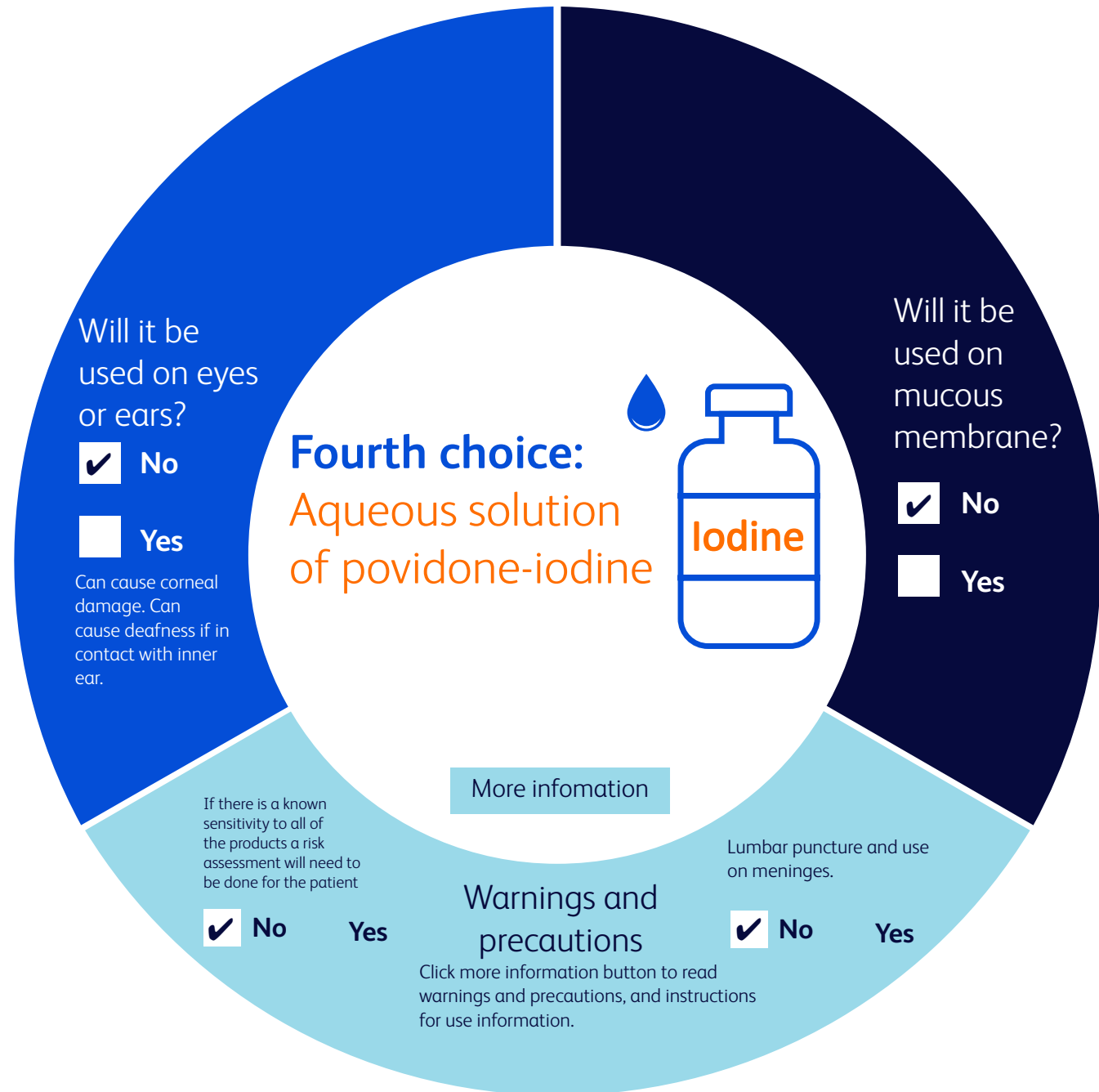


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Leeds pathway

 Prevent pooling of prep fluid

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Alcohol-based solution of chlorhexidine

At the time of publication (April 2021), **0.5% chlorhexidine** in 70% alcohol solution was licensed for 'preoperative skin disinfection prior to minor surgical procedures' and only **2.0% chlorhexidine** in 70% alcohol applicators were licensed for 'disinfection of the skin prior to invasive medical procedures'.

Applicator sizes and coverage area



- One 26ml applicator should be sufficient per limb, chest/abdomen
- Assess the size of the area to be prepped

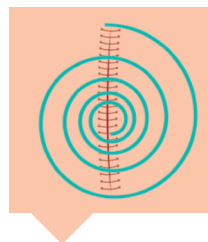
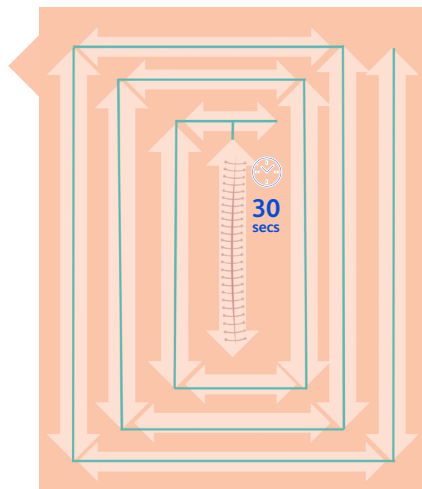


- Disposal. Any unused product or waste material should be discarded in accordance with local requirements.
- If using a bottled solution use a suitable volume of solution for the area to be prepped.

Back and forth motion proven to be superior to other traditional methods¹

The back-and-forth technique is proven to be superior to traditional concentric prepping techniques,^{2,3} concentrating first on the wound line for 30 seconds and then moving away from it, ensures that bacteria is not being inadvertently spread back across the wound line. By moving around and away from the wound line, optimal protection can be achieved.

[Watch video](#)



A traditional prepping technique uses a concentric pattern, with the applicator constantly crossing the wound or incision line. But this means that any bacteria on the skin at the outside of the wound could be transferred back across the wound line.

[Leeds pathway](#)



Age of patient

The use of chlorhexidine solutions, both alcohol based and aqueous, for skin antisepsis prior to invasive procedures has been associated with chemical burns in neonates. Based on available case reports and the published literature, this risk appears to be higher in preterm infants, especially those born before 32 weeks of gestation and with less than 2 weeks of life.⁴



Anatomical area

Do not use on open skin wounds. Do not use on broken or damaged skin. In addition, direct contact with neural tissue or the middle ear must be avoided. Prolonged skin contact with alcohol containing solutions should be avoided.



Storage – COSHH recommendations

Flammable. This medicinal product does not require any special temperature storage conditions. Store in the original packaging; applicator is sterile unless seal is broken. Avoid exposure of the container and contents to naked flames during use, storage and disposal.⁵



Recommendation on re-use of alcoholic skin preparation

This product is for single use only. Any unused product or waste material should be discarded in accordance with local requirements. No additional environmental precautions for disposal are necessary.

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Aqueous solution of chlorhexidine

At the time of publication (April 2019), **4.0% aqueous chlorhexidine** was licensed for 'preoperative and postoperative skin antisepsis for patients undergoing elective surgery'; however, relevant instructions were limited to use as a body wash to be used before the person enters the operating theatre'.

Applicator sizes and coverage area

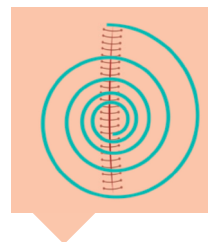
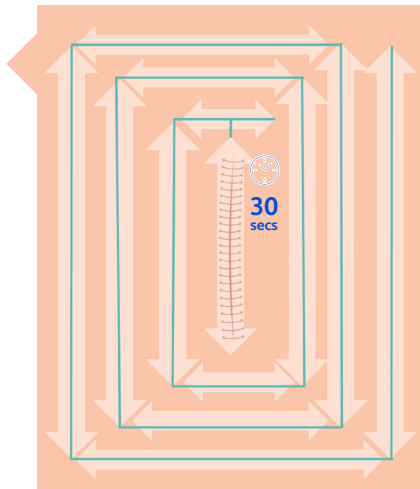


- Disposable considerations.
- Recommended that waste minimisation be practiced. The best available technologies should be used to prevent environmental releases.
- If using off label solution, local policy will be required.

Back and forth motion proven to be superior to other traditional methods¹

The back-and-forth technique is proven to be superior to traditional concentric prepping techniques,^{2,3} concentrating first on the wound line for 30 seconds and then moving away from it, ensures that bacteria is not being inadvertently spread back across the wound line. By moving around and away from the wound line, optimal protection can be achieved.

[Watch video](#)



A traditional prepping technique uses a concentric pattern, with the applicator constantly crossing the wound or incision line. But this means that any bacteria on the skin at the outside of the wound could be transferred back across the wound line.

[Leeds pathway](#)



Age of patient

The use of chlorhexidine solutions, both alcohol based and aqueous, for skin antisepsis prior to invasive procedures has been associated with chemical burns in neonates. Based on available case reports and the published literature, this risk appears to be higher in preterm infants, especially those born before 32 weeks of gestation and within the first 2 weeks of life.⁶



Anatomical area

Do not use on open skin wounds. Do not use on broken or damaged skin. In addition, direct contact with neural tissue or the middle ear must be avoided. Prolonged skin contact with alcohol containing solutions should be avoided.



Storage – COSHH recommendations

Store as directed by product packaging.



Recommendation on re-use of aqueous skin preparation

This product is for single use only. Any unused product or waste material should be discarded in accordance with local requirements. No additional environmental precautions for disposal are necessary.

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Alcohol-based solution of povidone-iodine

At the time of publication (April 2021), **10% povidone-iodine alcoholic solution** was licensed for 'topical application'.

Applicator device sizes and coverage area



Indications for use:

Alcoholic povidone iodine – Should be used topically as a pre-operative skin disinfectant, must not be used on broken skin. It is a quick drying solution often used in orthopaedic surgery.

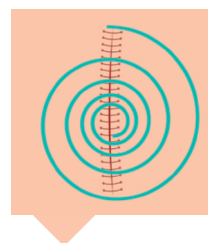
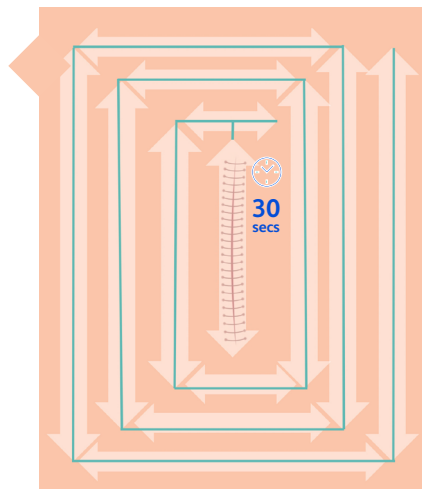
Disposal of Povidone iodine⁷

Dispose of in accordance with the European Directives on waste and hazardous waste. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities

Back and forth motion proven to be superior to other traditional methods¹

The back-and-forth technique is proven to be superior to traditional concentric prepping techniques,^{2,3} concentrating first on the wound line for 30 seconds and then moving away from it, ensures that bacteria is not being inadvertently spread back across the wound line. By moving around and away from the wound line, optimal protection can be achieved.

[Watch video](#)



A traditional prepping technique uses a concentric pattern, with the applicator constantly crossing the wound or incision line. But this means that any bacteria on the skin at the outside of the wound could be transferred back across the wound line.

[Leeds pathway](#)



Age of patient

Use with care in neonates, especially those born before 32 weeks of gestation and within the first 2 weeks of life.^{8,9}



Anatomical area

Must never be used on mucous membranes such as the mouth or inner lip. Should never be used above the neck, middle ear, or external ear with perforated tympanic membrane as it is ototoxic and can cause sensorineural deafness if it comes into contact with the inner ear. Alcohol based preps should never be used on the scalp as there is a high risk of combustion. Never use alcohol-based preps above the neck.



Storage – COSHH recommendations

Keep away from heat and sources of ignition. Keep in a cool, well-ventilated place. Keep away from oxidizing agents. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers. Storage temperature: 5 °C to 25 °C. See Safety Data Sheet and formulate local COSHH risk assessment.



Individual risk assessment (organisation) for 'non-compliance'

Risk assessment, local policy, and competences



Method of use - technique

The solution should be allowed to dry. If electrosurgical devices are used following application, do not allow pooling of the fluid to occur, ensuring that the skin and surrounding drapes are dry.

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Aqueous solution of povidone-iodine

At the time of publication (June 2021) **10% povidone-iodine antiseptic solution** was licensed for preoperative and postoperative antiseptic skin cleanser for major and minor surgical procedures. **10% povidone-iodine** was licensed for 'antiseptic skin cleanser for major and minor surgical procedures.

Applicator device sizes and coverage area



Indications for use:

Antiseptic povidone iodine Solution (Videne®) – should be used as pre-operative skin disinfectant, mucosa or for wound treatment. It is suitable for surgical use with diathermy.

Warning for use near eyes

Povidone iodine can cause patient discomfort when used in higher concentration. 10% Povidone-iodine is routinely diluted (50:50). AAO and ESCRS recommends Povidone-iodine 5-10% to be applied at least 3 minutes before surgery. There is limited guidance available regarding an exact regime, therefore a local protocol and policy should reflect evidence based practice

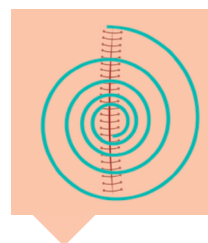
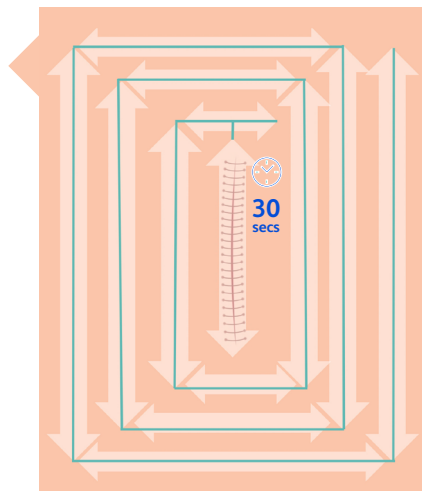
Disposal of povidone-iodine.

Dispose of in accordance with the European Directives on waste and hazardous waste. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities

Back and forth motion proven to be superior to other traditional methods¹

The back-and-forth technique is proven to be superior to traditional concentric prepping techniques,^{2,3} concentrating first on the wound line for 30 seconds and then moving away from it, ensures that bacteria is not being inadvertently spread back across the wound line. By moving around and away from the wound line, optimal protection can be achieved.

[Watch video](#)



A traditional prepping technique uses a concentric pattern, with the applicator constantly crossing the wound or incision line. But this means that any bacteria on the skin at the outside of the wound could be transferred back across the wound line.

[Leeds pathway](#)



Age of patient

Should be used with care in neonates and nursing infants up to the age of 6. If used in children thyroid functions must be monitored.

During pregnancy and lactation antiseptic povidone iodine must be used following a very careful assessment and in extremely limited amounts due to marked absorption of iodine, and levels being present in the mother's milk.¹⁰



Anatomical area

must not be used as skin prep in the ear canal as it can be ototoxic causing sensorineural deafness if it enters the inner ear.



Storage – COSHH recommendations

Povidone (videne®) Antiseptic solution 5-10% is non-flammable. It should be stored between the following temperatures: 5 to 30°C (SDS ECOLAB). Store in accordance with SDS, and local COSHH risk assessment.



Individual risk assessment (organisation) for 'non-compliance'

Ophthalmology and ENT See NICE NG125 guidelines. Protocol should be in place if any deviance from NICE guidelines.



Method of use - technique

The solution should be allowed to dry. Do not allow pooling of the fluid to occur, ensuring that the skin and surrounding drapes are dry.

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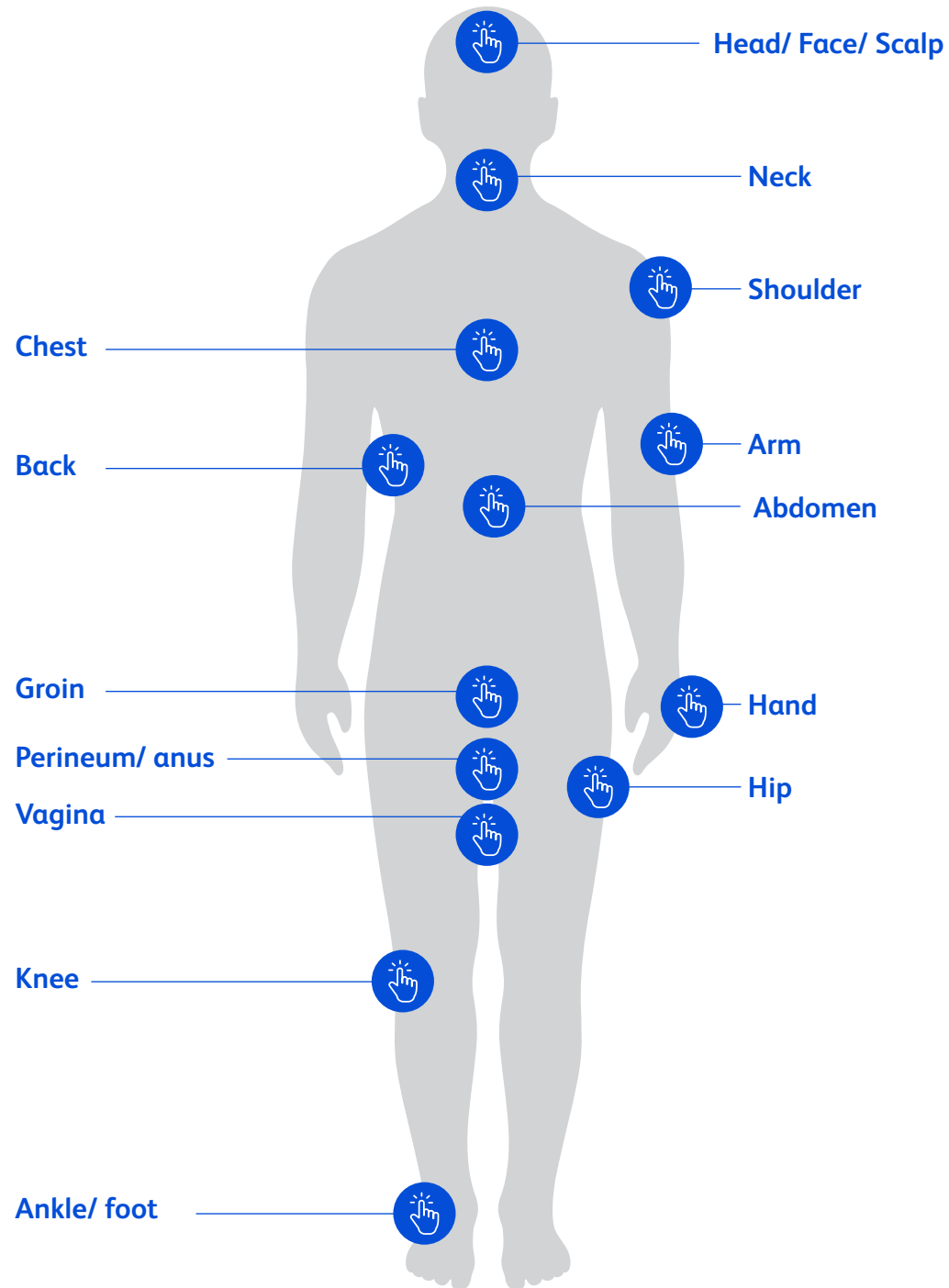
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Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

[click here](#)



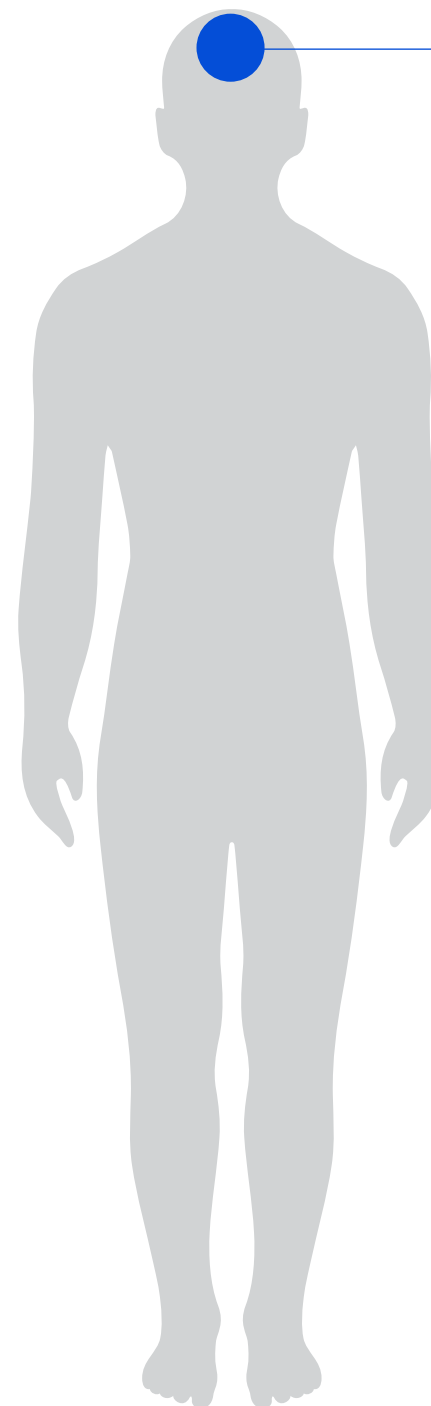
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Head/ Face/ Scalp

- Do not use chlorhexidine gluconate or alcohol skin prep near or on/in the eyes – it may cause corneal damage
- Eyes must be protected by prepping the surrounding area (this can be using a simple ophthalmic ointment and a film shield). If it is necessary to prep the eyelids do so from medial to lateral then working out in half circles to bridge of nose, cheek and forehead with gentle strokes. povidone- iodine antiseptic solution 5% i.e. Evidence required povidone- iodine 10% mixed with the same volume of 0.9% saline solution may be used. For intraocular use povidone-iodine 5% may be used
- On the scalp ensure the prep solution penetrates the hair and reaches the skin. There is a high risk of combustion with alcohol based preps as prep can take considerably longer to dry on hairy surfaces
- Do not use chlorhexidine gluconate or alcohol skin prep on the middle ear or external ear with perforated tympanic membrane as they are ototoxic and can cause sensorineural deafness if it comes into contact with the inner ear
- Do not use povidone-iodine as skin prep in the ear canal as povidone-iodine can also be ototoxic if it enters the inner ear
- Place cotton wool ball in the external ear canal prior to skin prep. Start with external ear then extend to edge of hairline, cheek and jaw. Remove cotton wool ball if operating through the canal and document
- Do not use chlorhexidine gluconate or alcoholic skin prep on mucous membranes e.g. mouth/ inner lip

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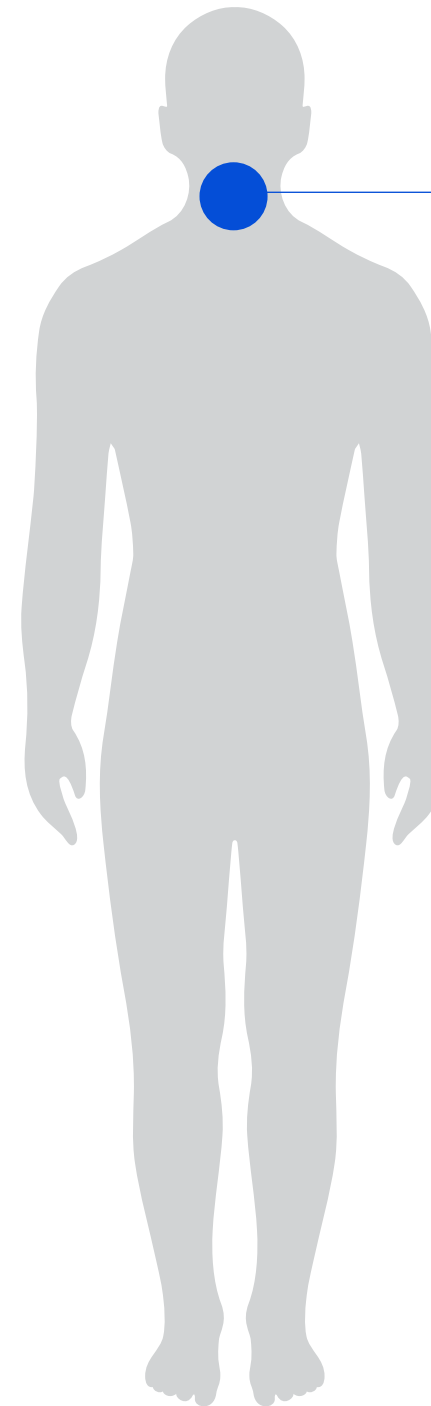
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Neck

Prep from incision site and out in concentric circles

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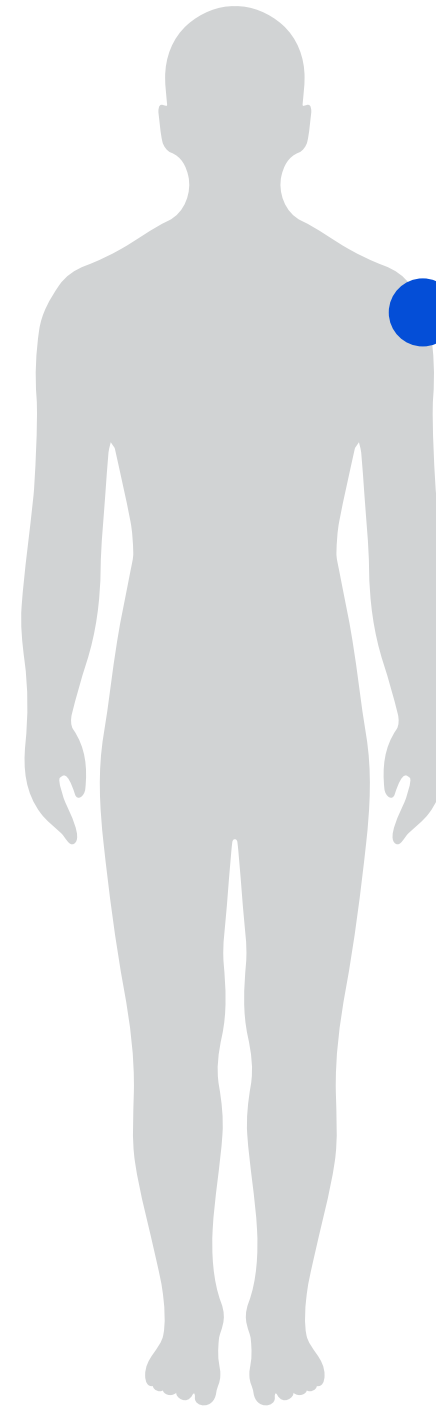
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Shoulder

Prep chest, neck, shoulder, upper arm, scapula, axilla - prepping the axilla last

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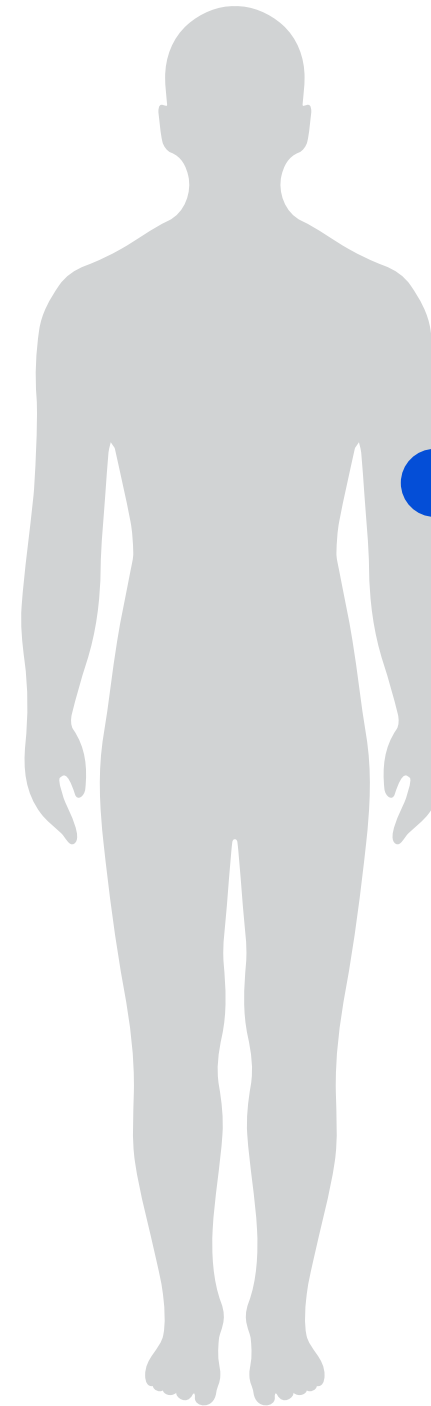
Leeds pathway

Appendix 2 SURGICAL SITE – skin
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To access the full Leeds Pathway
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Arm

For upper arm prep from
mid forearm to shoulder
including axilla, commencing
at incision site - prepping the
axilla last

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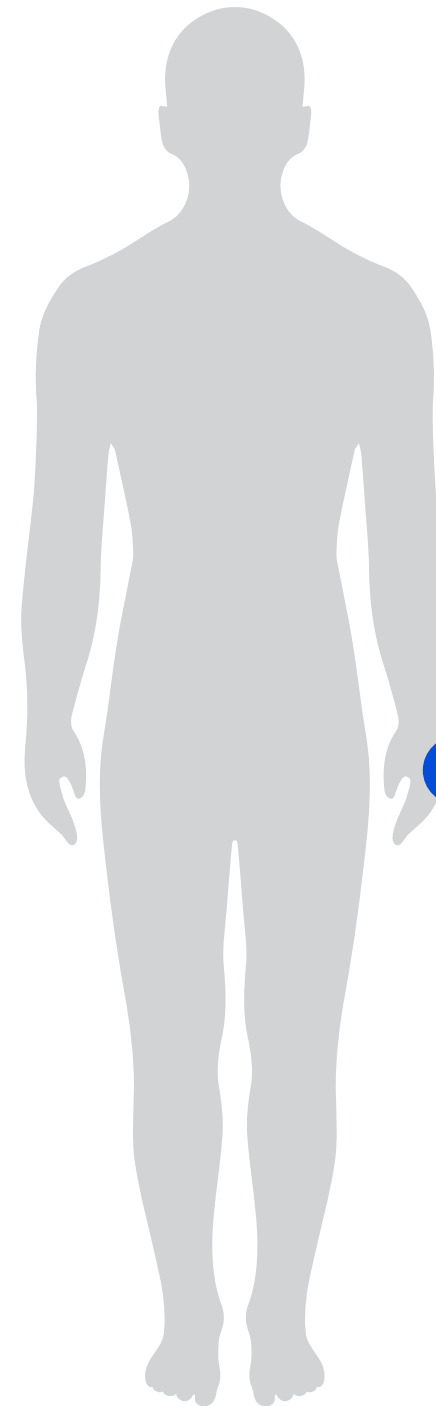
Leeds pathway

Appendix 2 SURGICAL SITE – skin
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Always follow manufacturer's
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Perioperative Environment

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Hand

Clean under fingernails
prior to prep. Prep hand to
mid forearm commencing
with incision site. Complete
one side of the hand prior
to turning the hand then
prep up the forearm in
circular motions

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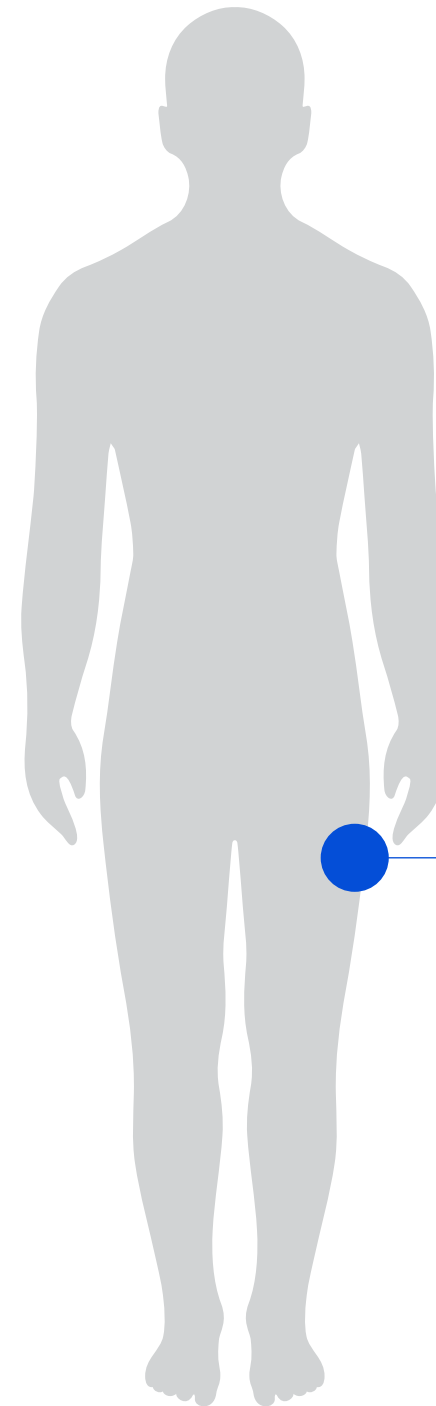
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Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

[click here](#)



Hip

Start at incision site, working out in concentric circles to midline abdomen, to lateral costal margin, to buttock on affected side. Prep down the leg to knee, then prep groin and perineal area last (may require the leg raised during skin prep)

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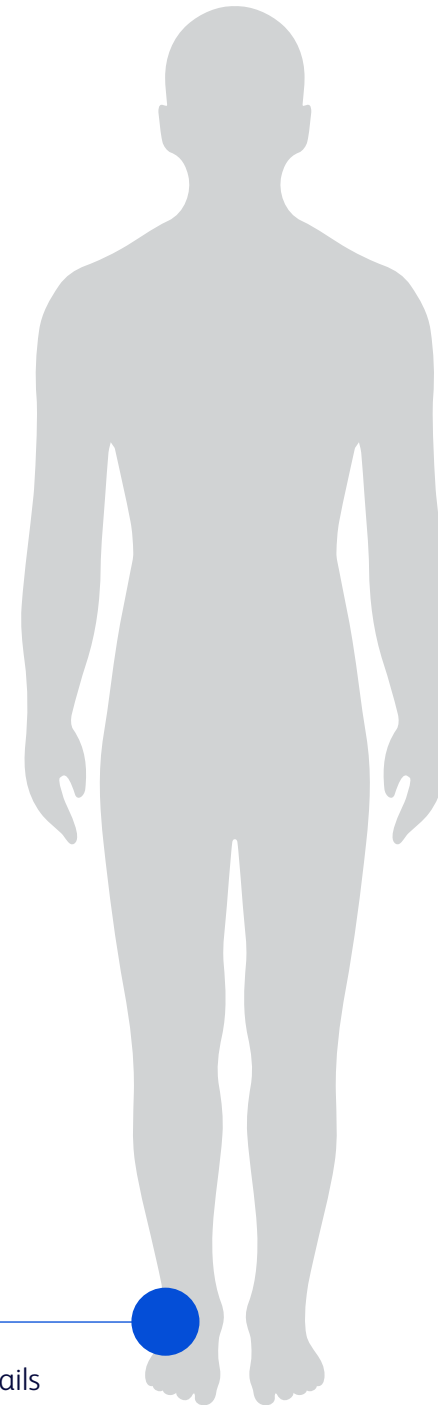
Leeds pathway

Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

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Ankle/ foot

Clean under the toe nails prior to skin prep. Elevate the limb. Prep to mid-calf not forgetting between the toes

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Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

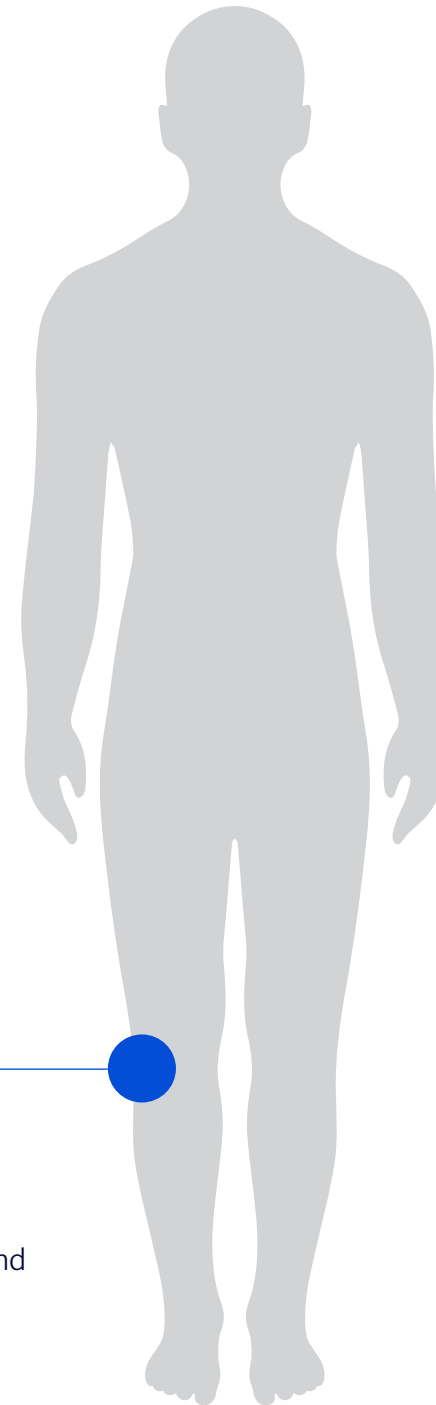
Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

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Knee

Elevate the leg. Prep circumferentially from incision site up to tourniquet (if used) and down to ankle.



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Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

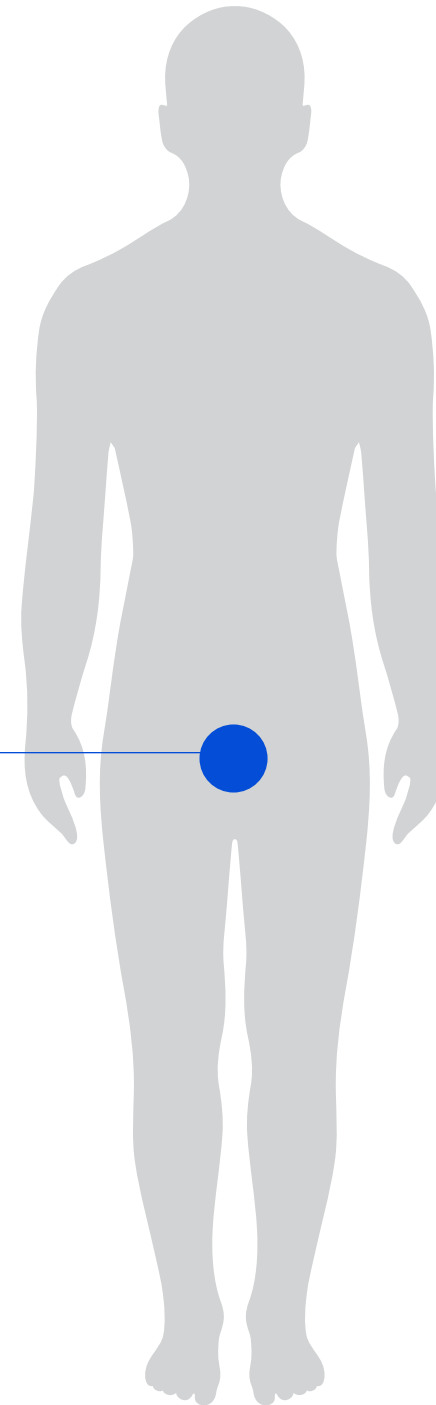
Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

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Groin

Incision site then out in concentric circles to level of umbilicus down abdominal side, upper thigh and pubic region/ scrotum



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Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

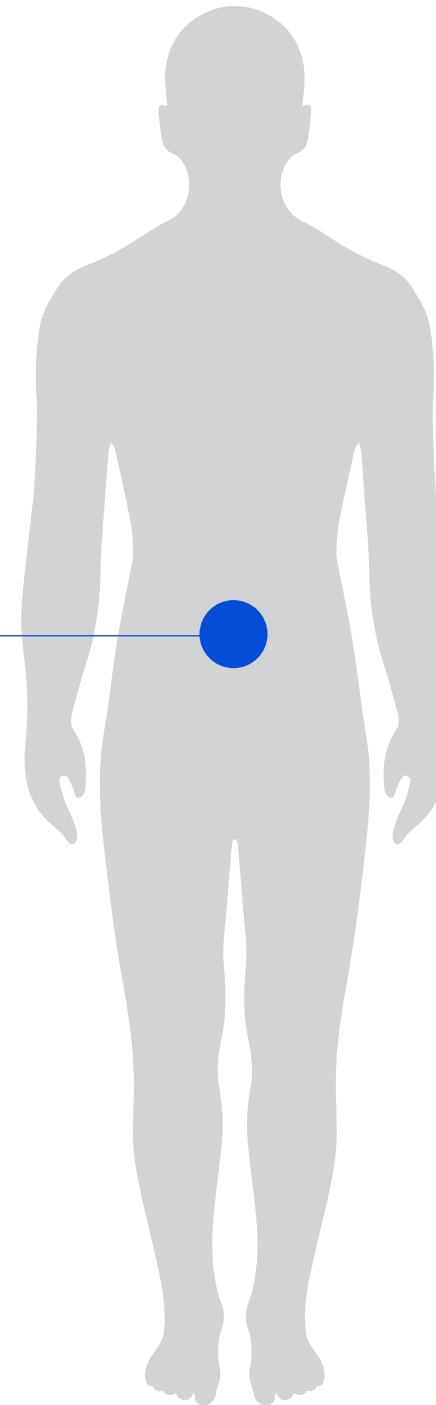
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Perineum/ anus

Prevent pooling of skin prep fluid under sacrum. Prep pubic region, then labia/scrotum to inner thighs. Prep anus last. Do not penetrate the anus with skin prep swab



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Leeds pathway

Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

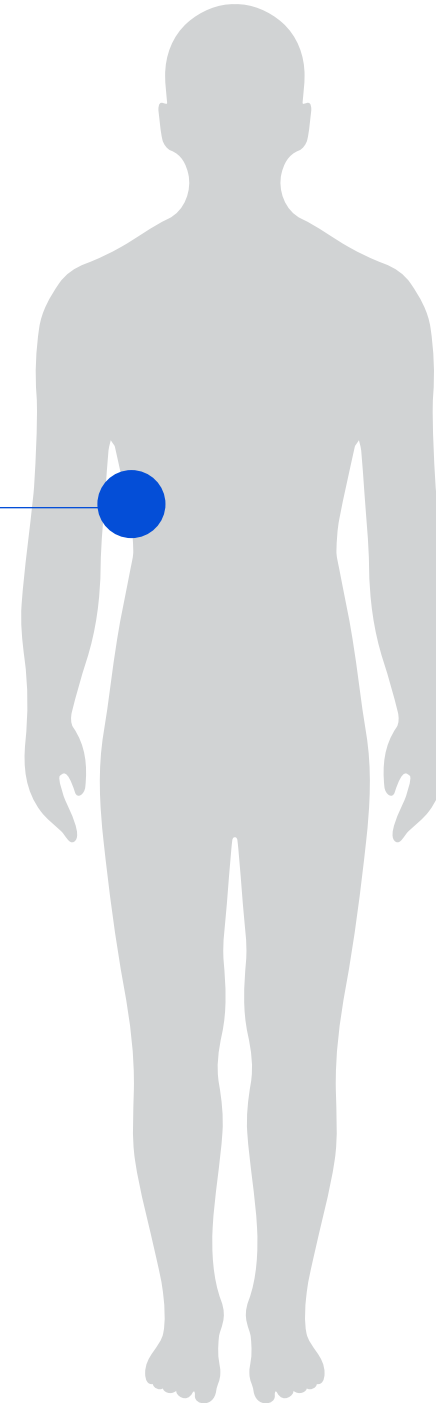
To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

[click here](#)

Back

If prone neck to sacrum and down sides dependent on surgery

Do not use chlorhexidine gluconate or alcohol skin prep on brain/ meninges/ spinal cord



Back



Leeds pathway

Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

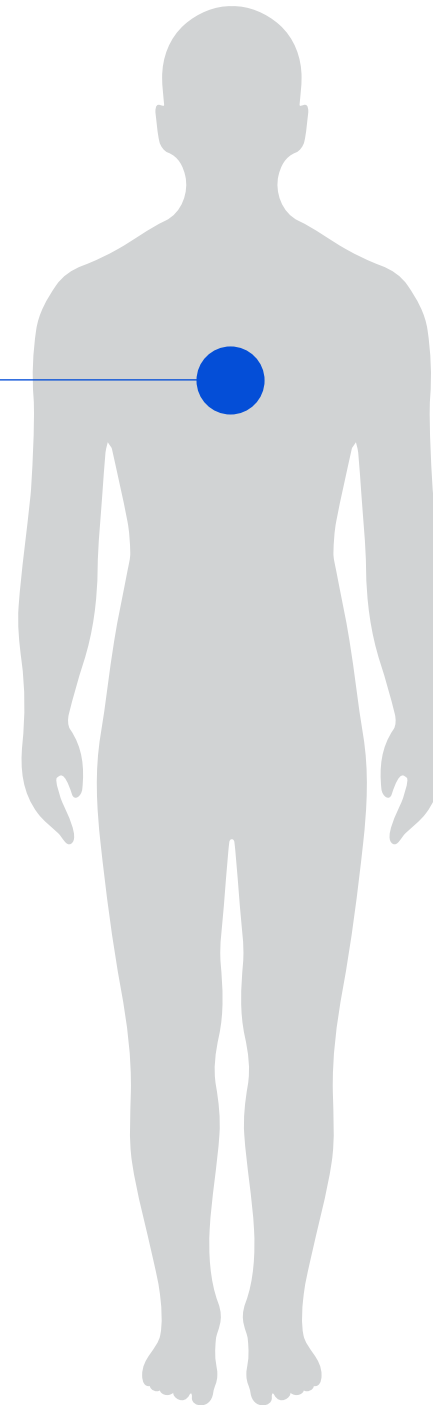
Always follow manufacturer's instructions for skin prepping solutions and evidence based guidance and recommendations

To access the full Leeds Pathway clinical guidelines for Surgical Site Skin Preparation within the Perioperative Environment

[click here](#)

Chest

From neck to below diaphragm, to include upper arm, axilla and across sternum/ spine of opposite side to incision if unilateral, dependent on surgery. If bilateral or midline, include both sides



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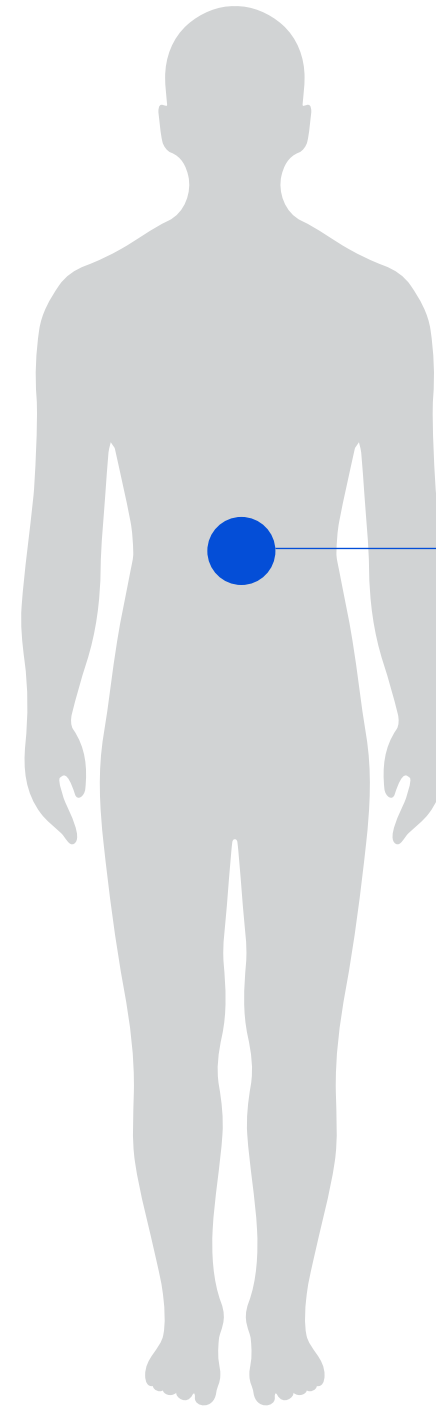
Leeds pathway

Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

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[click here](#)



Abdomen

Start at umbilicus then discard this applicator/ swab/sponge - work out in concentric circles. Cover up to nipple line and down to upper thighs and down abdominal sides dependent on procedure

Back



Leeds pathway

Appendix 2 SURGICAL SITE – skin prep area dependent on surgical/ invasive procedure

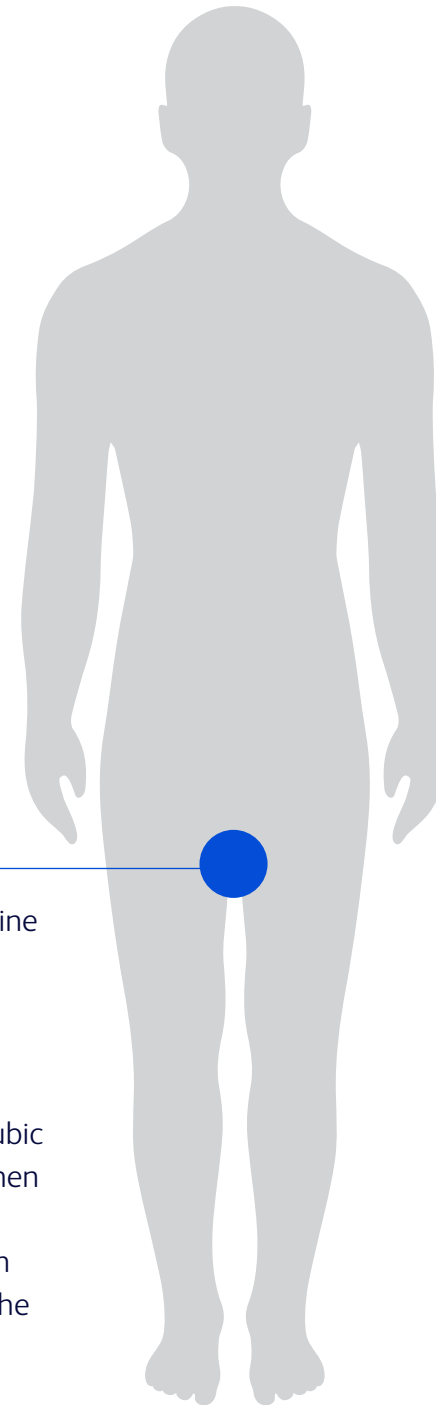
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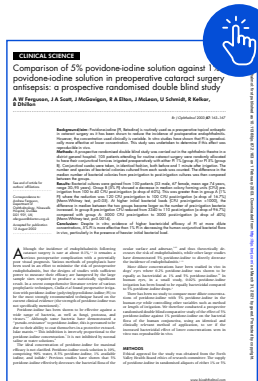
[click here](#)

Vagina

Do not use chlorhexidine gluconate or alcohol skin prep on mucous membranes. Prevent pooling of prep fluid under sacrum. Prep pubic region to iliac crests then labia to inner thighs, prep vagina with clean skin prep swab, then the anus last



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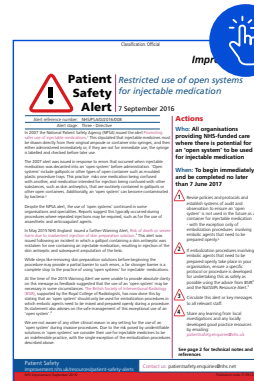
Comparison of 5% povidone-iodine solution against 1% povidone-iodine solution in preoperative cataract surgery antiseptics: a prospective randomised double blind study



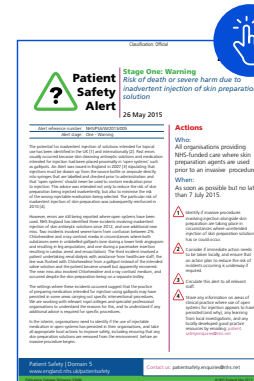
Preoperative povidone iodine: weighing the risks



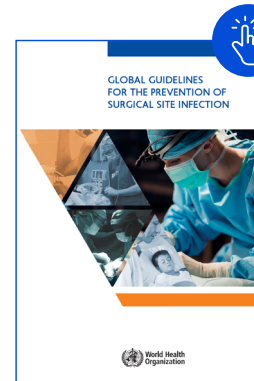
Joint RCS/MHRA statement on use of topical chlorhexidine for skin preparation prior to surgery



Patient Safety Alert. Restricted use of open systems for injectable medication



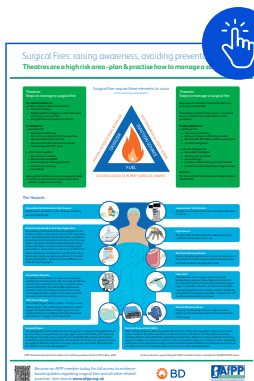
Patient Safety Alert. Stage One: Warning. Risk of death or severe harm due to inadvertent injection of skin preparation solution



Global guidelines for the prevention of surgical site infection



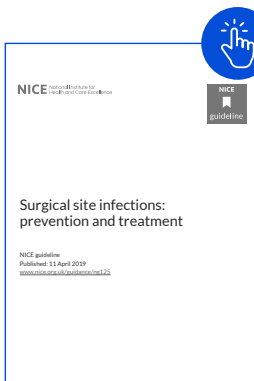
How using ChloroPrep™ can substantially reduce the incidence of SSI^{1 2 3}



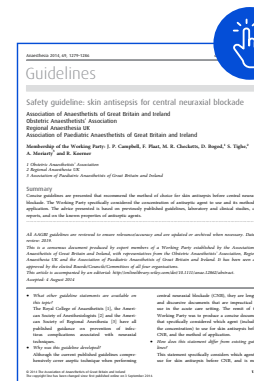
Surgical Fires: raising awareness, avoiding preventable harm



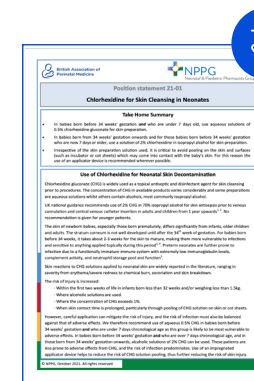
The Association for Perioperative Practice Infection control. Patient skin preparation.



NICE NG125



Safety guideline: skin antiseptics for central neuraxial blockade



Position statement 21-01: Chlorhexidine for Skin Cleansing in Neonates

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