Alcohol based skin preparations: latest information

ACORN conference 2012 presentation
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Safe Use of Alcohol Based Skin Preparations for Surgical and Anaesthetic Procedures

This Safety Information supersedes Safety Information SI: 001/07 issued on 27 June 2007

This Safety Information outlines guidance for safe use of alcohol based agents for preoperative skin preparation for surgical and anaesthetic procedures. Staff need to be trained and supported in the correct use of these solutions for safe use.

Background
Surgical-site infection increases morbidity, mortality, length of hospital stay and cost after surgical procedures.¹

There is a growing body of evidence that alcohol based skin preparations are superior to water based skin preparations in reducing surgical site infections.¹

Despite the use of alcohol based surgical skin preparations over many years, fires and burns are rare complications of use.

Steps to safe use
If a surgeon wishes to use alcohol based skin preparations, then local implementation protocols, plans and training programs must first be put in place. Examples of these can be found at http://www.health.nsw.gov.au/resources/quality/hai/pr2009_294_pdf.asp.²

The use and application of alcohol based skin preparations is the responsibility of the surgeon. Written acknowledgement that s/he has read the local protocol should be provided by the surgeon to the LHD prior to use of alcohol based skin preparations in surgery.

Alcohol based skin preparations for surgical and anaesthetic procedures are safe provided that these preparations are used correctly with the following safety precautions:³⁴⁵

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• An article dated May 10, 2008 was placed on our theatre managers desk by one of our orthopaedic surgeons….part of it read…

• “PATIENTS are being put at risk because NSW Health has an inexplicably inconsistent approach to infection control procedures before operations, an orthopaedic surgeon says.”

• “The rules vary across hospitals: alcoholic solution can be used at hospital A, B, C & D but is barred at hospitals E, F & G.”
Background

Until 2009 Gosford & Wyong hospitals (Central Coast Health) were some of the hospitals “banned” from using alcohol based skin preparations for surgical procedures, with it only being allowed for anaesthetic procedures.
The reason for them being banned was that at that time there was a 2007 NSW Health Safety Information document called: *S1:001/07 Alcohol Based Skin Preparation and Fire in the Operating Theatre* which told us we were NOT to use alcohol based skin preps in conjunction with diathermy… which is many of our procedures…
Some of our surgeons wanted to use alcohol based skin preparations .... but NSW Health were telling us not to....... following some research though, I found that the newspaper article was correct, some NSW hospitals were using it, others weren’t....

What to do?

Following much research and consultation with
• OH&S committee
• Infection Control committee
• Drug & Therapeutics committee
• Surgeons
• Anaesthetists
• CCH Executive committee

we had our procedure approved and we implemented the use of alcohol based skin preparations in Central Coast Health operating theatres in 2009.
one thing has led to another …
and NSW now has something new!!!!!

Last year I assisted the NSW Health Quality & Safety Branch to update the 2007 Safety Bulletin that I mentioned before. We now have the new

**Safe use of Alcohol Based Skin Preparations for surgical and anaesthetic procedures. Safety Information. S1:001/1**

Today I would like to share this new information with you all, focusing on alcohol based skin preparations used for SURGICAL procedures, however the safety strategies apply to all staff, including it’s use by anaesthetists.
Fires can occur when an ignition source, fuel and an oxidiser come together.

So why all the fuss?

Alcohol based skin preps are very flammable....!!!!
All three elements can be present in the operating theatre, for example, alcohol based skin preparation, combined with the oxygen rich environment in the operating theatre, can ignite when exposed to a heat producing source such as a diathermy (or laser).
Patients have been burnt...

Despite the use of alcohol based surgical skin preparations over many years, fires and burns are rare complications of use.¹

However, the consequences are devastating...

“Woman's face catches on fire during surgery”
November 30, 2011 9:29 AM   Crest
View news bulletin
The literature has many other examples...

Root causes of fires:

- 75% involve oxygen enriched environments
- 70% involve an ESU
- 13% involve lasers

Light leads:

Alcohol based skin prep
Location of patient fires

- On the patient: 44%
- In the patient: 26%
  - In the airway: 21%
  - Elsewhere in the patient: 8%
- Elsewhere on the patient: 26%
- On the head, neck, or upper chest: 44%
Other information from the literature:

- Surgical-site infection increases morbidity, mortality, length of hospital stay and cost after surgical procedures.¹

- There is a growing body of evidence that alcohol based skin preparations are superior to water based skin preparations in reducing surgical site infections.¹
and....

the literature tells us that when QUALIFIED, EDUCATED operating theatre staff follow the appropriate precautions and procedures, the use of alcohol skin prep in the operating theatre can be safe.
Steps to safe use...

Alcohol based skin preparations for surgical and anaesthetic procedures are safe provided that these preparations are used correctly with the following safety precautions. ¹
Surgeons responsibilities

• If a surgeon wishes to use alcohol based skin preparations, then local implementation protocols, plans and training programs must first be put in place. Examples of these can be found at \(^1\) (there is a link in the NSW Health Safety Information document to our Central Coast procedure.)

• The use and application of alcohol based skin preparations is the responsibility of the surgeon. Written acknowledgement that s/he has read the local protocol should be provided by the surgeon to the LHD prior to use of alcohol based skin preparations in surgery. \(^1\)
VMO Surgeons,

We advise you that the use of alcohol based skin preparations for surgery in CCH operating theatres was approved by the Central Coast Health Executive Committee in April 2009. This approval was on the proviso that specific risk management strategies are implemented and adhered to by individual surgeons, nursing staff and operation assistants as agreed to at the Central Coast Health Executive Committee in April 2009.

The current solutions available in CCH operating theatres for surgical and anaesthetic procedures are outlined in the attached skin prep selections poster.

The CCH Division of Anaesthesia, Surgery & Intensive Care require you as agreement to provide written acknowledgement that you have read and understand the attached CCH procedure: *Alcohol based skin preparation – safe use in CCH operating suites PR2009_294* and also to nominate if you wish to use alcohol based skin preparations for your patient’s skin preparation.

Operating theatre nursing staff will only provide alcohol based skin preps to surgeons who have provided us with the below information.
Education

Only staff with documented training in safe use can participate in procedures involving alcohol based skin preparations. ¹

- When we first implemented in 2009 we attended mandatory education for ALL nursing staff and OA’s.
- We then included this education into our nursing and OA induction programs.
- This is recorded in our education database as evidence of their acknowledgement of their responsibilities.
Product selection

Only alcohol based skin preparations with dye added are to be used to easily identify what part of the body has been prepped and more easily identify any pooling. ¹

- Our surgeons had to agree on one product only, nominating Povidone Iodine 10% in 70% alcohol.

- Used as per surgeons preference card. (all the orthopaedic surgeons except one + 2 general surgeons are using it)
Product selection

Our anaesthetists use
- Chlorhexidine 2% in 70% alcohol.
- Red tint
- Used for adults central venous access devices, spinals, epidurals etc

Alcohol skin prep shall only be used for the purposes as specified by the manufacturer. Eg: “topical” or “not on mucous membranes”

The product must be TGA, pharmacy and infection control approved
Solution quantity, run off & pooling

The amount of solution used to prepare the skin is kept to a minimum to avoid run-off and pooling either on or around:

- the patient
- beneath tourniquets
- endotracheal tube ties
- hair
- skin folds / umbilicus
- electrodes
- diathermy pads
- in between digits

- Only use single use, pre measured containers
- Only pour into the gallipot the amount required for the area to be prepped
Solution quantity, run off & pooling, cont’d

- Any solution run off that occurs is contained by absorbent disposable plastic-backed sheets that are placed around the patient and are removed before any drapes are applied. ¹

- This ensures there is no prep solution on bed linen or under the patient.

- Any pools of excess prep on the patient (eg: crevices / umbilicus etc) are wiped dry with a raytecn swab or sponge.
• Any swabs and remaining prep solution are removed as far from the surgical field as possible (don’t place them under the operating table or instrument trolley).

* At CCH we use 5 swabs when prepping with alcohol, we then count and bag them off prior to starting the surgery.

Any left over prep is tipped into the bag with the swabs.

This ensures there are no fumes coming from wet swabs or the gallipot.
Drying & evaporating times

Sufficient time must be allowed for alcohol-based skin preparations to dry prior to draping the patient.¹

Most manufacturers recommend a minimum drying time, which for our solution is 2 to 3 minutes, but the literature supports and recommends a 5 minute wait time.
Drying & evaporating times

- We made it the surgeons responsibility to make the decision that the area was dry and the staff ask the surgeon if it is OK to start the draping.
Electrosurgical equipment

Alcohol-based skin preparations must evaporate completely before electrical, diathermy or laser instruments are switched on. 

BE CAREFUL

THIS MACHINE HAS NO BRAIN

USE YOUR OWN
Electrosurgical equipment

Ideally they should be used on the lowest setting as this minimises the risk of sparking and excessive temperatures.

Place the electrode in the quiver when not in use!!!

Careful where the footpedal is placed to ensure it doesn’t get confused for another pedal…
Oxygen rich environments

The creation of oxygen rich atmospheres is to be avoided by being careful not to create oxygen tents by the placement of surgical drapes over nasal cannula or oxygen masks.

Special care is taken in head and neck surgery, when the operative field is close to the oxygen source, either a closed system is used or a non-alcohol containing disinfectant. 

In the literature this is the most common cause of incidents, so anaesthetic staff need to be particularly aware of this problem.
Figure 1. Manikin positioned for surgery, oxygen mask on, ready for sterile preparation.
Figure 2. Manikin prepared and draped for surgery. Electrosurgical unit monopolar pencil electrode applied to operative site at start of surgery.

Figure 3. Electrosurgical unit application + 6 s. Smoke appears under drapes.

Figure 4. Electrosurgical unit application + 14 s. Flames burst through drapes.
Figure 5. Electrosurgical unit application + 24 s. Entire patient head and drapes in flames.

Product storage

Alcohol based skin preparations are not to be stored in the operating theatre. ¹

We collect from one storage place specifically for each individual set up that is being done, and, if unused, we return it at the end of the case/list

Alcohol based skin preparations are handled and stored in accordance with both the manufacturer’s instructions and Hazardous Substances and Dangerous Goods in NSW Health Guidelines for the Safe Use. ⁶

- They must be stored away from incompatible substances (eg: acetone, soda lime)
- There must be an MSDS available at point of storage.
Incident management

Any incidents must be
• Report immediately to nursing manager
• Document in patient’s notes
• Complete an IIM’s report

This includes any NEAR MISS as well as actual incidents
If scrubs, uniforms or personal protective equipment become soaked in alcohol based skin preparation solution, staff must leave the area and replace the soaked item(s) immediately, or prior to further tasks. 

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Alcohol skin prep reminders!!

**Staff have been educated and signed off?**

**Minimum quantity of solution?**

**Have the “blueys” caught all of it?**

**Surgeon told you it’s OK to drape?**

**Move your left over swabs and prep dish as far from the surgical field as possible**

**WIPE ANY CREVICES DRY WITH A DRY SWAB OR SPONGE**

**Diathermy**
- lowest setting?
- handpiece in its quiver?
- where is the footpedal?

**Checked surgeon’s preference card for approval? Registrar? Check approval**

**No run off or pooling?**

**Linen is dry?**

**Has it COMPLETELY dried & evaporated?**

**Prior to draping, remove “blueys” and place them in the rubbish**

**Oxygen rich atmosphere?**
Be aware of oxygen “tents” = drapes over nasal cannula / oxygen masks

**Someone not doing the right thing?**
- Report immediately to nursing manager
- Document in patient’s notes
- Complete an IIMs report
References

1. NSW Health, Safe use of Alcohol Based Skin Preparations for surgical and anaesthetic procedures. Safety Information. 001/11


   - Central Coast Health. Alcohol Based Skin Preparations – Safe Use in Operating Suites. PR2009_294.


Questions?

Your patients will THANK YOU for keeping them safe.

NSW Health Safety bulletin + a copy of the CCH procedure is available on the NSW OTA web site

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