SKIN PREPARATION TECHNIQUES IN THE HAND SURGERY CLINIC

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Background

- Surgical site infection was an accepted complication of surgery in the 1900's
- Scottish surgeon Joseph Lister, inspired by Louis Pasteur's discovery of microorganisms causing wine to spoil, developed the concept of surgical site antisepsis
- He used carbolic acid (phenol) both as a spray onto wounds during surgery and then applied on to the wounds at the termination of surgery
- Death of his surgical patients fell from 45% to 15%

Background

- Modern surgical practice includes the application of an antiseptic solution to the skin prior to making the incision

- Concept is to reduce the bacterial count of the skin prior to making an incision to minimize the risk of surgical site infection

- Definition (Health Canada) - **Topical antiseptics** - antimicrobial substances used to destroy or reduce harmful microorganisms such as bacteria or fungi on the skin

Background

- **Hand Clinic**: outpatient care area where hand surgery procedures are performed under local anesthetic

Standard Protocol – Hand Clinic:

- Patient first washes their hands at the clinic immediately pre-procedure to remove gross contamination (dirt or any debris)
- Member of the surgical team applies antiseptic solution to the patient's skin
- Sterile surgical drapes are applied to complete preparation of the sterile field prior to commencement of surgery
- Variations exist between institutions and individual surgeons – who applies the antiseptic solution (nurse or surgeon) and what solution is applied


3M
AVAGARD
Surgical &
Healthcare Personnel
Hand Antiseptic
Moisturizers
9200


3M
AVAGARD

Health Canada Approved Agents

- ethyl alcohol
- isopropyl alcohol
- povidone-iodine
- chlorhexidine gluconate

Purpose - Three-part study

- 1. To survey Canadian Plastic Surgeons who perform hand surgery, to determine their method of skin disinfection

- 2 To record the time and cost for the current technique in use at the Sault Area Hospital hand clinic

- 3 To record the time and cost of a novel technique of a patient-applied antiseptic solution

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Methods

- **Part 1** – a survey was sent to all members of the Canadian Society of Plastic Surgeons.

- **Part 2** - observe the time to complete the current standard technique of nurse-applied antiseptic solution, and calculate the cost of the procedure.

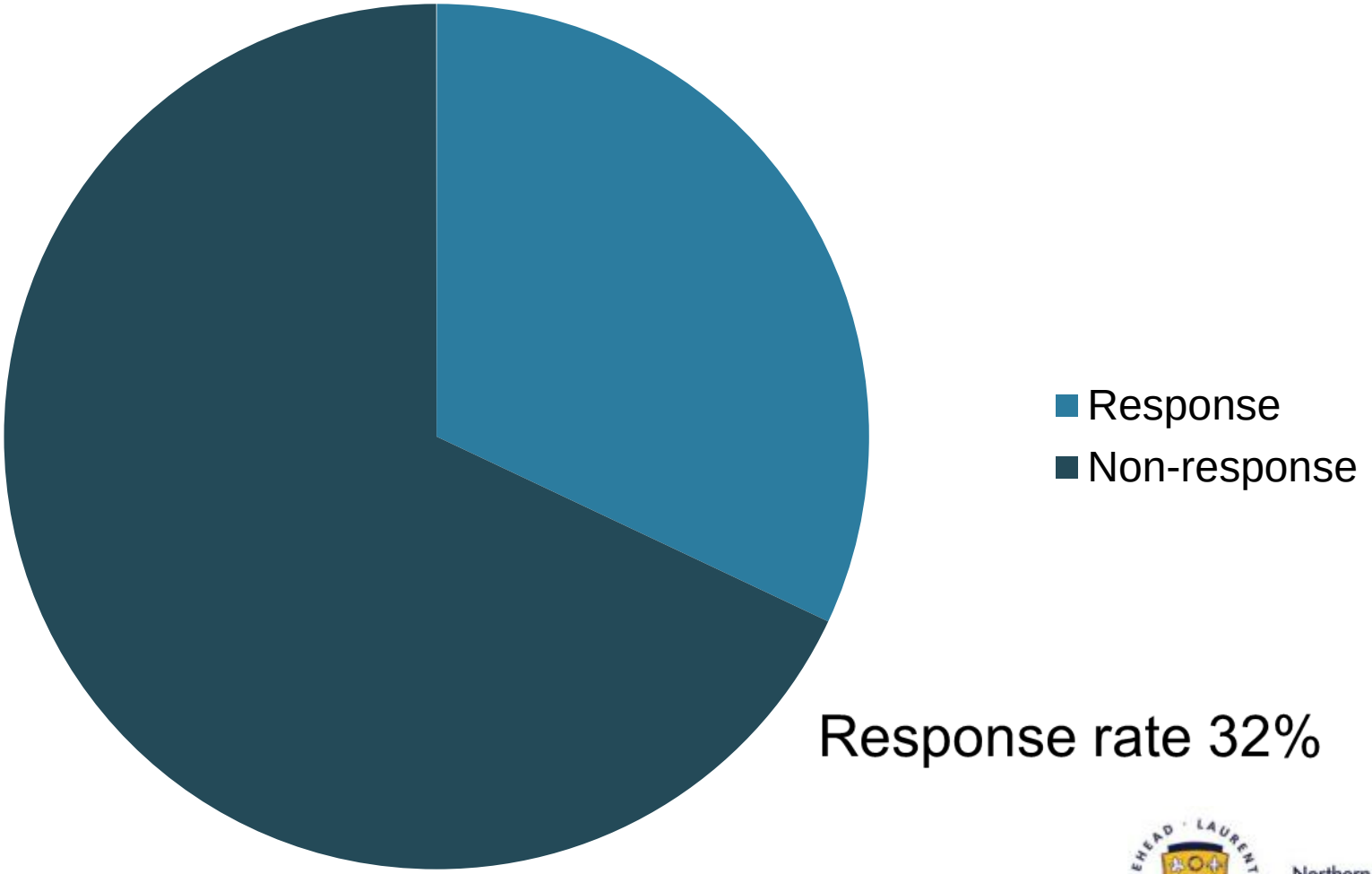
- **Part 3 -** repeat Part 2 but patients apply their own antiseptic solution under the clinic nurse's supervision, otherwise identical protocol

Part 1 – Survey, CSPS members

In the Hand Clinic,

- 1. Are patients required to wash their hands prior to the procedure?
- 2. Who applies the skin prep solution?
- 3. What skin prep solution is routinely used?
- 4. What type of product do you use?

Part 1 – Survey, CSPS members



Response rate 32%

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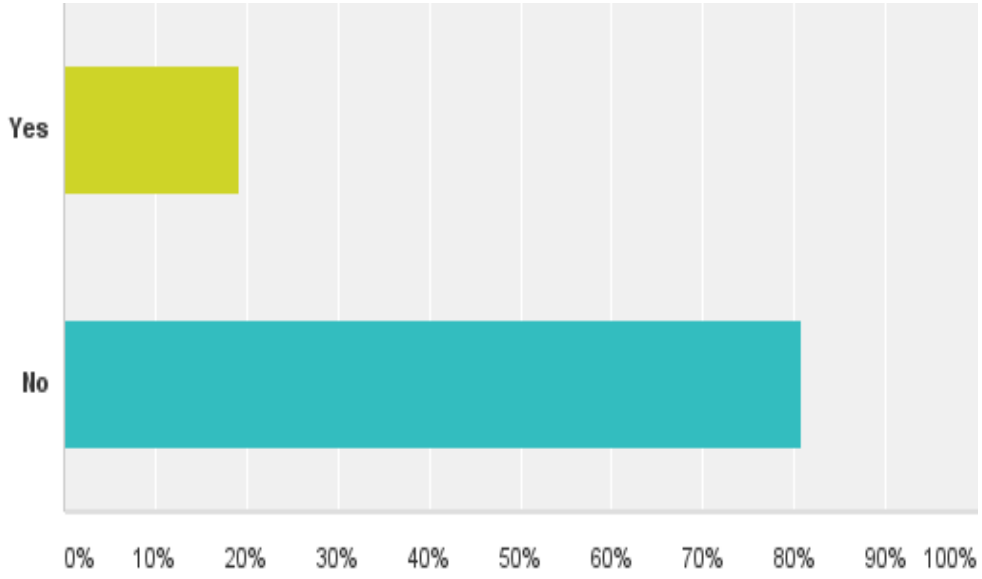
Q1: Hand Clinic - Are patients required to wash their hands prior to the procedure?



Yes 19%, No 81%

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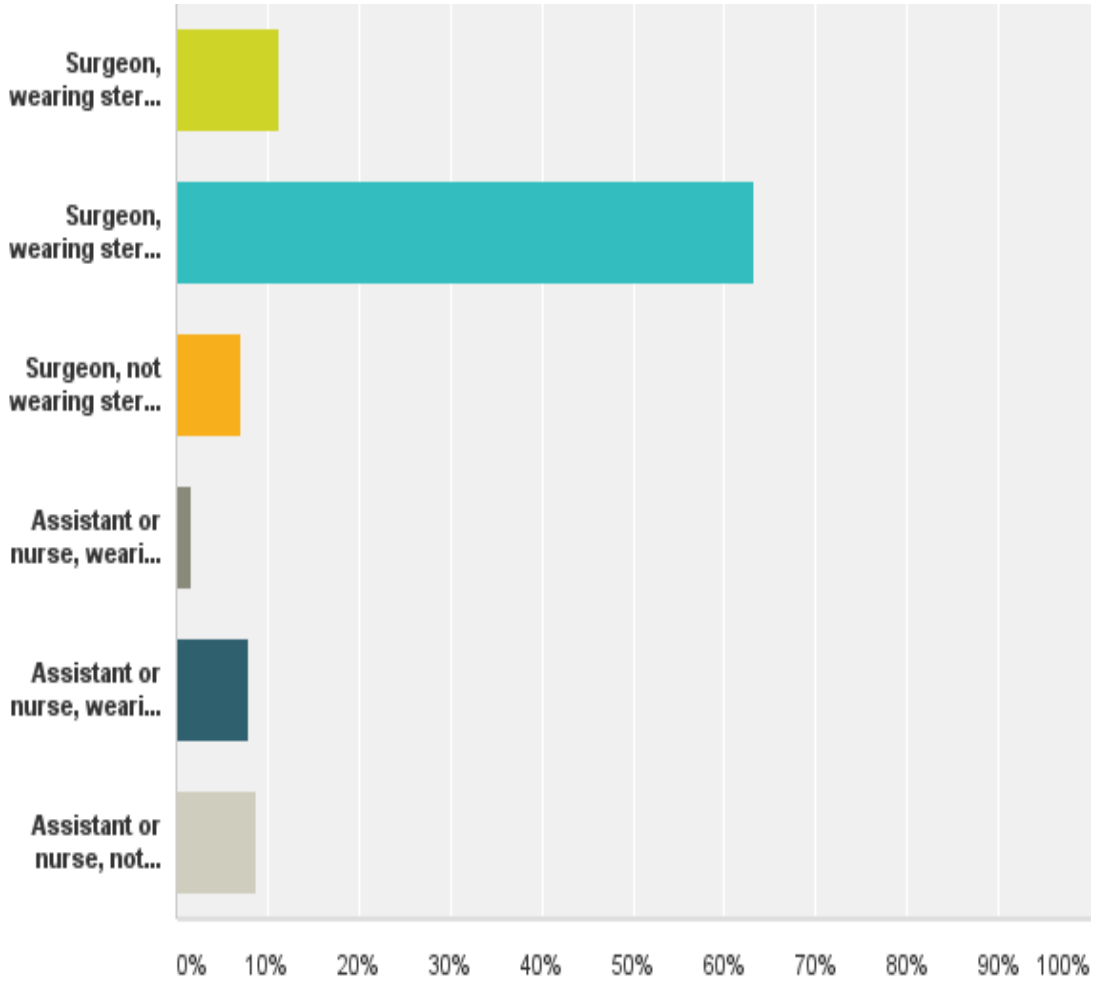
Q2: Hand Clinic - Who applies the skin prep solution?



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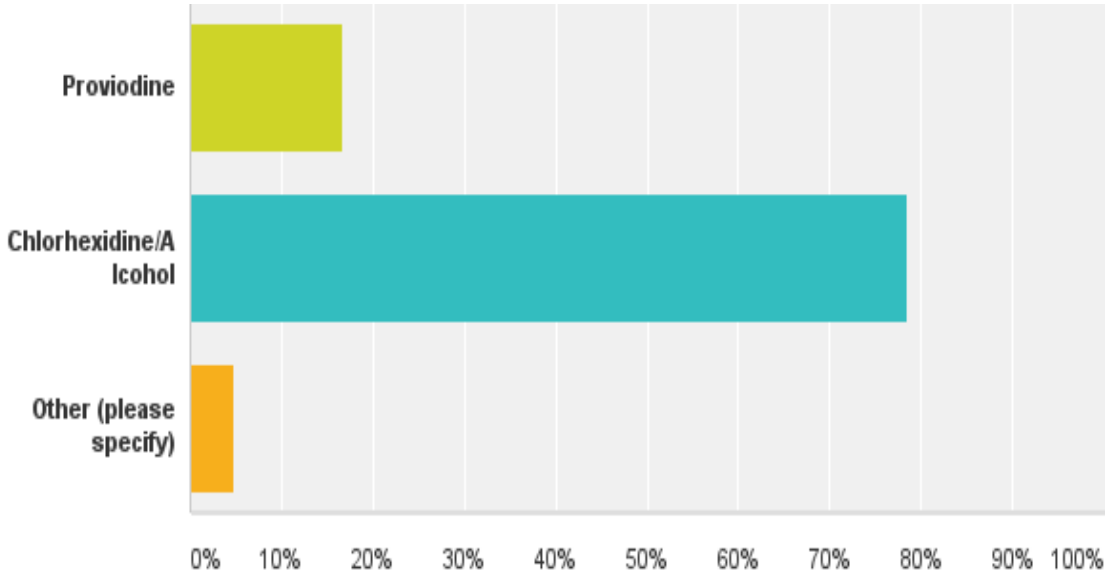
Q3: Hand Clinic - What skin prep solution is routinely used?



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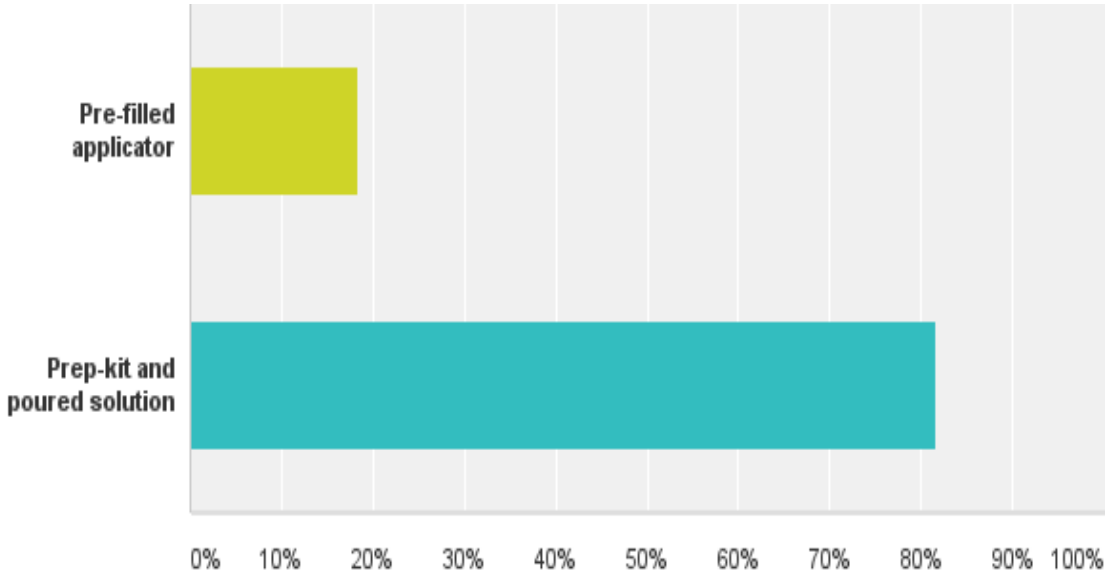
Q4: Hand Clinic - What type of product do you use?



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Parts 2 and 3

Vs.

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Results: Parts 2 and 3

- 45 participants, who were randomly separated into Group 1 (proviodine and nurse application) and Group 2 (chlorhexidine/alcohol and self application)

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Results: Parts 2 and 3

	Group 1	Group 2
Number	21	24
Mean time (s)	130.9	46.7
SD	46.2	17.2

Statistical Analysis

- Student's 2-tailed unpaired t-test

- $P<0.0001$

Overall Analysis

- By switching from nurse to patient-applied antiseptic solution we observed a mean time savings of 84.2 seconds per procedure

- On average, 15 procedures performed per day in clinic – switching skin preparation methods will result in an average time savings of 21 minutes per clinic, allowing a 16th patient to receive care each day with no additional nursing cost to the institution

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Overall Analysis

- Cost savings – estimation
- Nursing time $30 to 40 per hour x 84 seconds = 70 to 93 cents per procedure
- Prep kit – sterilized by SPD at hospital - ?

- Others – environmental cost of sterilizing each prep kit, cotton gauze to landfill
- Replacement costs of prep kits, personnel to supply kits to clinic, bring used kits back to SPD, etc.

Overall Analysis

- Caution – some patients - cognitively challenged, elder, arthritic, extremely nervous, etc. - may find self-application difficult or impossible to do correctly, so nurse-applied system needs to be available

- Infection rate – not accurate due to small sample size – no surgical site infections diagnosed in follow-up visits in either group, 1 suture abscess detected in nurse-applied proviodine group (doesn't meet CDC criteria of a surgical site infection) – in implementing change of technique, this rate needs to be monitored

Conclusions

- Large variability in application of standards of surgical skin preparation technique in the Hand Clinic reported by Canadian Plastic Surgeons

- Alcohol/Chlorhexidine skin antiseptic solutions most commonly used

Conclusions

- This study found an average of 84 seconds per procedure is saved by switching from a nurse-applied procedure to a patient-applied procedure
- In the SAH Hand Clinic this will facilitate performing 1 more procedure per clinic day with no increase in personnel cost to the hospital
- Switching to the new technique will reduce the need for SPD to supply and clean multiple prep trays per clinic day and reduce medical waste