

IV SITE INFECTION:

**A Prospective, Randomized
Clinical**

**Trial Comparing the Efficacy
of**

3 Methods of Skin Antisepsis:

**0.5% Chlorhexidine Gluconate
with 70% Isopropyl Alcohol
Swab,**

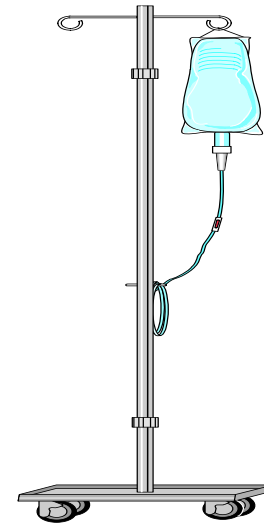
**Isopropyl Alcohol Swab followed
by 10% Povidone-iodine Swab
and**

**10% Povidone-iodine Swab
followed by Isopropyl Alcohol
Swab**

Shelley Cobbett, RN, MN

Angela LeBlanc, Bsc(Hed), CIC

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/THE OBJECTIVE OF THIS RANDOMIZED CLINICAL TRIAL WAS TO COMPARE THE EFFICACY OF THREE METHODS OF SKIN PREPARATION ON THE PREVENTION OF INTRAVENOUS CATHETER COLONIZATION AND CATHETER-RELATED INFECTION OF PERIPHERAL IV SITES.

DESIGN

Prospective randomized clinical trial with a sample size of 300.

The hypothesis that guided this study were:

1. The use of chlorhexidine gluconate- CHG (0.5%) swab is more effective than use of a povidone-iodine swab followed by an alcohol swab in reducing the incidence of IV site and catheter-related infection
2. The use of chlorhexidine gluconate- CHG (0.5%) swab is more effective than use of an alcohol swab followed by a povidone-iodine swab in reducing the incidence of IV site and catheter-related infection.

STUDY GROUPS

There were three study groups:

1. Recipients of CHG prior to IV insertion
2. Recipients of isopropyl alcohol swab followed by povidone-iodine swab prior to IV insertion
3. Recipients of povidone-iodine swab followed by isopropyl alcohol prior to IV insertion.

***There were **no** statistically significant differences among the three groups in relation to the variables of **age, gender, medical diagnosis, catheter size, type**

of IV fluid, type of IV medication, classification of initiator and the length of time that the IV was in situ (p values range from .114 to .859).

DATA COLLECTION

Baseline data collected upon discontinuing each IV included culture of the IV catheter tip as well as signs and symptoms of infection. Each patient was again assessed for signs and symptoms of infection at 72 hours post IV discontinuation.

OUTCOMES

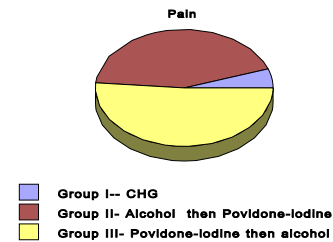
Baseline data (collected at time of IV discontinuation) demonstrated that a significant difference existed between the groups in the category of heat ($p = .02$) There were no objective signs of heat in the CHG group (I) upon IV removal whereas 7.5% of Group II (alcohol then povidone-iodine) experienced heat at the IV site and 6.17% of Group III (povidone-iodine followed by alcohol).

Significant differences at 72 hours post-IV removal included the categories of redness ($p = .001$), pain ($p < .0001$) and temperature ($p = .03$). The differences among groups is graphically depicted below.

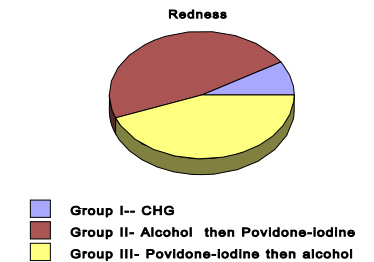
It is important to note that the majority of identified infections were assessed in post discharge patients therefore they would not have been identified during routine in-house surveillance for nosocomial infection.

In all statistically significant differences, patients who were randomly assigned to the CHG Group consistently exhibited fewer symptoms that patients in the other two groups.

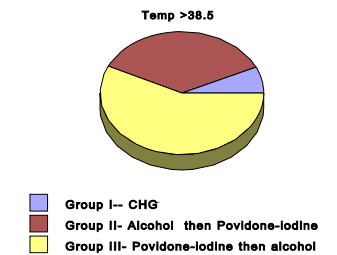
72 hours Post-IV Removal



72 hours Post-IV Removal



72 hours Post-IV Removal



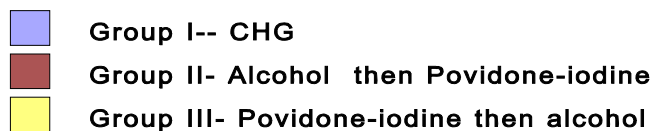
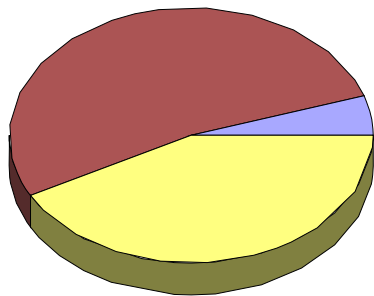
SUPPORT FOR HYPOTHESIS

Both of the directional hypothesis that were tested within this study have been strongly supported with a p value of **.008**. Support for the hypothesis indicates that significant differences exist between the method of skin antisepsis prior to IV therapy and the presence or absence of probable IV site infection.

The probable infection incidence rates for the three groups are **1.2%** for Group I (CHG) as compared to **12.5%** (Group II) and **9.8%** (Group III). Probable infection was defined as «one of the following: fever (>38.5 C) or pain, erythema or heat

Probable IV Site Infection

>15 colony forming units and symptoms



at the involved vascular [access] site **and** more than 15 colonies cultured from intra vascular cannula tip using semi-quantitative culture method» (Maki, 1992).

In essence, utilization of a CHG (0.5%) swab prior to IV insertion is the most efficacious of the three methods studied within this trial and leads to an improved quality of life for patients who do not experience IV site infection.

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