Fingersticks and Fruit: Implications of Skin Preparation for Point of Care Glucose Testing

Background

- Various methods exist for preparing skin for a fingerstick blood sample
- Hospital staff may use soap and water or alcohol to prepare the patient's skin for fingerstick samples.
- FDA and ADA instruct patients to wash hands.

Background cont.

- Mosby's nursing skills instructs both handwashing and alcohol.
- Several small studies suggested that fruit residue left on the skin may affect the accuracy of fingerstick glucose results (false high readings), depending on the method of cleansing prior to sampling (Hirose, Mita, Fujitani, Kawamori, & Watanda, 2011; El aziz Basal & El Nagar (2011); Hortensius, Kleefstra, Slingerland, Fokkert, Groenier, Houweling, & Bilo (2010); Arakawa & Ebato (2012); Palese, Chiandetti, & Mansutti, 2013).
Background cont.

- Investigators could not find any U.S. studies.
- Some U.S. hospitals were beginning to change practice based on the few existing studies.

Purpose

- The purpose of this research study is to determine variations in blood glucose readings that exist in methods of preparing skin for capillary blood sample collection among healthy individuals who have been exposed to the handling of fruit.

Research question

What differences exist, based on the method of cleaning, in capillary blood glucose results of healthy individuals whose fingertips have been exposed to fruit sugar?

Specifically:
- Alcohol wipe
- Hand sanitizer wipes
- Soap and water handwashing

The method

Inclusion criteria: Healthy volunteer health workers without diabetes, aged 18-64.

Exclusion criteria: Hospitalized patients, people with diabetes, poor circulation/edema/pain in fingers, use of peritoneal dialysis, younger than 18 or older than 64, initial blood sugar result 140 dL/mL or greater.

The method

- 28 participants (healthy individuals) washed hands, then gloved their control hand.
- Intervention hand stirred cut grapes in a cup for 5 minutes, then dried for 30 minutes.
- Control hand glucose result checked.
- Intervention hand glucose results checked:
  - Finger #1 with alcohol wipe
  - Finger #2 with hand sanitizer wipe
  - Finger #3 - hands washed, then alcohol wipe

Fingersticks and Fruit!
Fingersticks and Fruit: Conclusion and Recommendations

Handwashing provided the most accurate fingerstick glucose result. False results could lead to inaccurate treatment.

Table 1: Glucose level by fingers and drops (n=28)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Intervention 1</th>
<th>Intervention 2</th>
<th>Intervention 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>P value</td>
<td>0.219</td>
<td>0.0001</td>
<td>0.0009</td>
<td>0.033</td>
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<tr>
<td>1st vs 2nd drop</td>
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<td>0.0001</td>
<td>0.0001</td>
<td>0.0001</td>
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<tr>
<td>Interv vs Control</td>
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<td>0.0008</td>
<td>0.0008</td>
<td>0.0008</td>
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<tr>
<td>1st drop vs 2nd</td>
<td>0.0001</td>
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Conclusions/Recommendations

The most accurate results are demonstrated when using handwashing.

Inpatient: BSWH subscribes to Mosby’s Nursing Skills, which instructs handwashing and then alcohol. We recommend following Mosby’s instructions.

• Assist patient’s to go to the sink and wash hands if able.
• NPO patients may not be a priority
• If glucose is higher than usual for patient, prepare skin differently rather than only repeating test.

Outpatient: FDA and ADA instructs handwashing, so we recommend following their instructions.

References