Human Factors Development of Communication Tools for Stollery Children’s Hospital Hematology Program Venous Access Device Use

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Summary

Occasionally, pediatric hematology patients may require an implanted venous access device for the purposes of apheresis (Vortex Port). As this is an uncommon use for such a device, the interaction with the device is a departure from standard procedure. Clear communication tools are required to ensure the interaction with the device occurs in a proper manner so as to not compromise the patient’s safe care. A human factors design approach resulted in the development of communication tools that followed principles of information design and assist in communicating the a) patient’s condition, b) rules for the accessing implanted device, and c) guidelines to follow when accessing the implanted device. These principles included:

<table>
<thead>
<tr>
<th>Human Factors Principle</th>
<th>Description</th>
<th>Example</th>
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<tbody>
<tr>
<td>Making important information accessible</td>
<td>Having key pieces of information at hand when being used to make a decision.</td>
<td>The checklist was designed to be used as a tool at the bedside and specially designed to highlight the change from standard procedure when accessing the Vortex Port</td>
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<tr>
<td>Making use of familiar symbols and terminology</td>
<td>The use of familiar symbols and terminology make it easier for the end user to follow instructions outlined on the various communication tools</td>
<td>The heparin label made use of the word stop (a standard alerting word) and octagon symbols (acknowledged symbol for stop).</td>
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<td>Using top down processing</td>
<td>Because people follow processes in a manner that follows their familiarity or expectations, the use of a tool such as a checklist requires that deviations need to be adequately highlighted.</td>
<td>The checklist highlighted pauses in the processes to encourage end users to be thoughtful and mindful of the process as it was a deviation from standard practice</td>
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<td>Including redundancy gain</td>
<td>When care conditions are inconsistent and less than ideal, end users benefit from the information being presented in a variety of ways</td>
<td>Because this patient could be treated by a variety of care providers, at a variety of facilities, different tools were designed to ensure that information is best communicated and reinforced through a variety of means</td>
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<td>Replacing memory with visual information</td>
<td>In the care of patients, it is better to also have information available for reference rather than solely relying on information that the care provider retains through memory</td>
<td>The design of the heparin sticker, and including specific care related information on the bracelet and card allow care providers a reference for information to confirm the information in their memory. In particular, because of the departure from standard practice (draw blood then flush with heparin), this information was best presented as a reminder through the checklist</td>
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Designing with human factors principles promotes greater uptake and continued use of the tools. The final version of each communication tool is demonstrated below.

**Medical Alert Bracelet and text for engraving**

![Medical Alert Bracelet Image]

**Patient Information/Wallet Card**

**Health Information Card**

Patient Name: ______________________________

Diagnosis: Sickle Cell Disease

Central Vortex dual ports in chest

**DO NOT ACCESS** these ports

Contact Stollery Children’s Hospital
Pediatric Hematology Service 780 407 8822

**Heparin Warning Label**

STOP

HIGH Concentration Heparin

Vortex port SCC required to proceed
## Vortex Port Access Checklist

### Gather all necessary equipment and supplies

1. **Assess site for complications or infection**
2. **Aseptically clean the site**

**PAUSE**

Allow site to dry

3. **Access the medial port with the needle**
4. **Twist Cap counter clockwise**
5. **Advance needle using ridges to the back of port**
6. **Repeat above steps with the lateral port**

**PAUSE**

Instruct patient to **HOLD THEIR BREATH**

3. **Remove** the needle trocar quickly, and quickly attach primed 1mL extension tubing and cap on medial port

**PAUSE**

Patient can now breathe normally

4. **Repeat step 3 with the lateral port**

### CRITICAL STEP

5. **With empty syringe withdraw and discard** 3mL of blood from each port

**PAUSE**

6. **Flush with 20mLs normal saline then, proceed with orders**