The Problem of Drowsy Driving

- Drowsy driving is a serious problem that results in severe outcomes.
- From 2011-2015: 160,000 Injuries, 3,600 Deaths
- 60% of US drivers have driven drowsy and 37% have fallen asleep at the wheel (National Sleep Foundation, 2018)

Nurses and Drowsy Driving

- 79% of night shift nurses have driven drowsy after their shift (Gold et al., 1992).
- Night shift nurses have a higher chance of being involved in a drowsiness related crash than other nurses (Gold et al., 1992).

Drowsy Driving Mitigation Technology

- May and Baldwin (2009) outline variety of technologies to combat drowsy driving including: detection, crash alerts, fatigue countermeasures
- Strengths and weaknesses associated with
- Available technologies are not used by nurses
- Nurses are often resistant to new technology (Mutlu & Forlizzi, 2008)

Critical Need: Understand night shift nurses preferences and requirements for a drowsy driving mitigation technology

2. DATA COLLECTION

Interviews with Night Shift Nurses
- 30 night shift nurses were recruited from a large teaching hospital in South Texas
- Age: M = 36.1; STD = 11.27; Range = 22-64
- 1-20+ years of experience
- 9 different areas including ICU, CCU, IMU, Surgery
- Interviews were transcribed and validated.

3. INTERVIEW ANALYSIS

<table>
<thead>
<tr>
<th>Code Development</th>
<th>Initial Coding</th>
<th>Focused Coding</th>
<th>Code Discussion</th>
<th>Report Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review protocol and create codes based on themes and topics</td>
<td>Categorize segments of text into codes</td>
<td>Review initial codes</td>
<td>Discuss code creation and coding process</td>
<td>Create visualizations based off of relations between codes, quotes and themes</td>
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<tr>
<td>Create new codes as necessary</td>
<td>Create more specific subcodes</td>
<td>Discuss thematic elements</td>
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<td></td>
</tr>
</tbody>
</table>

The visualization represents two major themes: Nurses’ preferences for drowsy driving mitigation devices (top) and nurses’ experience of drowsy driving (bottom right). Quotes from participants are presented below, attached to their corresponding code.

4. RESULTS

Technology Feedback

- **Audio**: "I’d be veering out of the lane and running up behind somebody"
- **Tactile**: "I’ll roll down the window"
- **Visual**: "Every time I work"
- **Voice**: "I have my mom call me or my sister call me. I’ll be on the phone"
- **Music**: "I’m going to the service and I have to wake up to that song"
- **Vibration**: "I usually have to wake up from a buzz or vibration"
- **Visual or Tactile**: "I put on my sunglasses and I’ll wake up"
- **Light (Visual)**: "It’s like I’m driving on a light bulb"
- **Notification**: "I’ll roll over, sometimes I actually do roll over"
- **Soft light (Visual)**: "I’ll let my head go on my dashboard or something"
- **"a warning sign" (Notification)**: "I’m not sure if it would actually stimulate you"
- **"a notification on my dashboard" (Notification)**: "Like a vibration I would say... like your phone vibrating"
- **"like maybe something on my a light goes off on my dashboard or something" (Notification)**: "But I can’t tell you what to do and guide you"
- **"Tell you what to do and guide you" (Notification)**: "I think it would be interesting if it could talk to you"
- **"Maybe something like rap or hip hop or whatever something you sing along to keep you up" (Music)**: "Maybe something like rap or hip hop or whatever something you sing along to keep you up"
- **"An audible alert whether it’s a beeping or a voice" (Tactile)**: "Or a shock"
- **"Pinch you" (Tactile)**: "I get more educated of the way to approach someone"
- **"Because I take a nap in my car before I leave here." (Tactile)**: "I wake up more"
- **"I guess I drink a lot of coffee" (Tactile)**: "You’re pretty exhausted, physically and emotionally and mentally"

Investigating Night Shift Nurse Preferences for a Drowsy Driving Mitigation Device

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