Validation of an Automated System for Monitoring Hand Hygiene Compliance

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Background

- Automated systems for monitoring hand hygiene (HH) behavior have been reported to significantly improve compliance.
- Technical limitations and lack of proven accuracy have prevented widespread acceptance of electronic hand hygiene compliance monitoring.
- Additionally, in order to prove useful as compliance monitors, such systems must be exceptionally reliable and minimally intrusive.
- Thus, there remains an invaluable need to validate the accuracy of such systems.

Methods

- An automated system for monitoring HH was installed in the intensive care units of two academic medical centers.
- Healthcare providers (HCP) wear a badge containing a unique identifier so that each room entry, exit, and HH event can be attributed to a single individual by readers adjacent to each soap and alcohol-based hand rub dispenser.
- For validation of accuracy, participants followed a planned path through the units, entering each room and using each dispenser while wearing a badge.
- Data from the electronic readers were compared to the actual behavior of participants, collected by trained observers, to determine accuracy.

Results

- No interference with medical devices or other technology were detected at either site.
- Accuracy was significantly different if the badge was worn on the lapel compared with badge worn on the lower pocket of a white coat (p<0.001).
- When reaching to the side to use a dispenser, wearing the badge on the ipsilateral lapel was significantly more accurate than wearing it on the contralateral side (p=0.05).
- One badge was found to be non-functional (0 events recorded) and was excluded from the data.

<table>
<thead>
<tr>
<th>Validation of an Automated System</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facing dispenser, badge on upper lapel</td>
<td>99.4% (165/166)</td>
<td>95.3% (205/215)</td>
<td>97.1% (370/381)</td>
</tr>
<tr>
<td>Facing dispenser, badge on lower pocket of white coat</td>
<td>90.2% (111/123)</td>
<td>59.0% (49/83)</td>
<td>77.7% (160/206)</td>
</tr>
<tr>
<td>Side facing dispenser, badge on ipsilateral side</td>
<td>86.3% (69/80)</td>
<td>84.8% (28/33)</td>
<td>85.8% (97/113)</td>
</tr>
<tr>
<td>Side facing dispenser, badge on contralateral side</td>
<td>74.4% (61/82)</td>
<td>77.5% (31/40)</td>
<td>75.4% (92/122)</td>
</tr>
<tr>
<td>Facing dispenser, shorter than 5'3&quot;</td>
<td>87.0% (67/77)</td>
<td>90.0% (160/176)</td>
<td>89.6% (227/253)</td>
</tr>
<tr>
<td>Facing dispenser, taller than 6'1&quot;</td>
<td>90.2% (74/82)</td>
<td>97.5% (38/40)</td>
<td>92.6% (113/122)</td>
</tr>
<tr>
<td>Entry</td>
<td>100.0% (95/95)</td>
<td>100.0% (75/75)</td>
<td>100.0% (170/170)</td>
</tr>
<tr>
<td>Exit</td>
<td>100.0% (95/95)</td>
<td>100.0% (75/75)</td>
<td>100.0% (170/170)</td>
</tr>
</tbody>
</table>

Conclusions

- Automated HH monitoring systems may offer a safe and reliable method of monitoring individual hand hygiene compliance.
- However, accuracy can be affected by a number of factors including badge placement.
- The discovery of a dysfunctional badge is further evidence that validation testing must be done prior to implementation of such systems.
- Use of inaccurate data could affect outcomes of intervention studies or tolerability by healthcare providers.

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Disclosure: Dr. Landon Mawdsley has spoken about the Proventix nGage system on behalf of Proventix. Technical support for this project was provided by Proventix.