Risk of Surgical Site Infection Following Carpal Tunnel Release in the Operating Room Versus Clinic-based Procedure Room within a Veterans Affairs Medical Center
Amanda Silvis, MPH, V. Franklin Schreist II, MD,1 Amy Gravely, MA,2 Aaron S. DeVries, MD, MPH1
1Veterans Affairs Medical Center

Abstract
Background: A clinic-based procedure room (PR) is a less restrictive environment compared to the traditional operating room (OR). PRs are increasingly being used for minor surgical procedures. Carpal tunnel release (CTR) is one of the most common surgical procedures in the US veteran population. It is unknown if there is a difference in the rate of surgical site infection (SSI) among patients who undergo CTR in the PR versus OR.

Methods: Patient records were queried using Current Procedure Terminology codes from a single Veterans Affairs Medical Center that underwent clean, elective CTR from 10/2014 through 4/2017. Other studies have found that preoperative environmental changes can modify risk factors such as blood glucose control, smoking status and weight, which may influence SSI rates. There were transition periods within this study: a period where only the OR was used, an interim period where PRs were used, and the final period in which both the OR and PR were available. The mean total cost of CTR in the OR was $4,254 as compared to the PR total cost of $417.

Conclusions: Results showed that ORs are increasingly being used for minor surgical procedures. Capral tunnel release (CTR) is one of the most common surgical procedures in the US veteran population. It is unknown if there is a difference in the rate of SSI between the OR and PR. All patients undergoing CTR are required to wear a and mask, which is a standard of care. The mean total cost of CTR in the OR was $4,254 as compared to the PR total cost of $417.

Table 1. Operating Environment for CTR and their Characteristics over the Five Time Periods

<table>
<thead>
<tr>
<th>Time Period Category</th>
<th>Characteristic</th>
<th>OR Used</th>
<th>Temporary PR Used</th>
<th>Permanent PR Used</th>
<th>PR Cleaning SOP Followed</th>
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</thead>
<tbody>
<tr>
<td>10/14-12/31/15 (mo)</td>
<td>Y N Y</td>
<td>Y N Y</td>
<td>Y N N</td>
<td>Y N</td>
<td>Y N</td>
</tr>
<tr>
<td>2/15/15-3/20/15</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
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<tr>
<td>3/15-3/31/16</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
</tr>
<tr>
<td>4/15-10/31/16</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
</tr>
<tr>
<td>11/16-1/31/17</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
<td>Y N</td>
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</tbody>
</table>

Note: The rate of SSI following primary and revision CTR in a high morbidity US Veteran population was 2.3%, much higher than in non-veteran populations with lower mortality. Other studies have found that preoperative environmental changes can modify risk factors such as blood glucose control, smoking status and weight, which may influence SSI rates. There were transition periods within this study: a period where only the OR was used, an interim period where PRs were used, and the final period in which both the OR and PR were available. The mean total cost of CTR in the OR was $4,254 as compared to the PR total cost of $417.

Conclusions: Results showed that ORs are increasingly being used for minor surgical procedures. Capral tunnel release (CTR) is one of the most common surgical procedures in the US veteran population. It is unknown if there is a difference in the rate of SSI between the OR and PR. All patients undergoing CTR are required to wear a and mask, which is a standard of care. The mean total cost of CTR in the OR was $4,254 as compared to the PR total cost of $417.

Table 2. Characteristics of CTR Patients by Room Type

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>OR (n=322)</th>
<th>PR (n=310)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD, years</td>
<td>62.9 ± 12.3</td>
<td>62.9 ± 11.8</td>
<td>0.90</td>
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<tr>
<td>Male sex</td>
<td>276 (88.5)</td>
<td>201 (91.0)</td>
<td>75 (82.4)</td>
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<tr>
<td>Smoking</td>
<td>67 (21.5)</td>
<td>45 (22.4)</td>
<td>24 (22.7)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>80 (25.6)</td>
<td>55 (24.9)</td>
<td>25 (27.5)</td>
</tr>
<tr>
<td>BMI, mean ± SD, kg/m²</td>
<td>32.9 ± 6.3</td>
<td>35.0 ± 5.8</td>
<td>32.8 ± 7.5</td>
</tr>
</tbody>
</table>

Note: BMI, body mass index; CTR, carpal tunnel release surgery performed at a Veterans Affairs Medical Center.

Acknowledgements

References

Figure 2. Procedure Room Environmental Features

- Air changes per hour – temporary, permanent, 17 percent
- Positive pressure
- Ceilings – non-porous
- Sink location – hand sink located in room
- Gases – None
- Vacuum, oxygen, medical air, waste gas disposal
- Access – unrestricted hallway used by patients and staff
- Personnel attire – street clothes
- Cleaning – Clinic standard operating procedure, then procedure room standard operating procedure started 4/16/16 (see Table 2)

Figure 3. Operating Room Environmental Features

- Air changes per hour – 20
- Positive pressure
- Ceilings – non-porous
- Sink location – sink located outside of the room
- Gases – Oxygen, medical air, waste gas disposal
- Access – only through a semi-restricted hallway
- Personnel attire – scrubs
- Cleaning – OR standard operating procedure including case and end of day cleaning process

Figure 4. Study inclusion flow diagram

352 CTR procedures
40 CTR procedures excluded
33 (1) hand surgery, wash operating room, 3 state per day procedure
2 Traumatic/surgical injuries
3 no matching carpal tunnel diagnosis
1 Missing procedure note
1 Loss to follow up

312 CTR procedures analyzed