**BACKGROUND**

- Nebraska (NE) Infection Control Assessment and Promotion Program (ICAP) is conducted by the Nebraska DHHS Healthcare Associated Infections (HAI) program via a CDC grant and works to assess and improve infection prevention and control programs in all types of healthcare facilities.
- Little is known about infection prevention and control programs in outpatient hemodialysis centers (OHDC). This project examined the frequency of infection control (IC) gaps and the factors associated with them in OHDC.

**METHODS**

- NE ICAP conducted on-site assessments and observations of infection prevention and control programs (IPCP) in 15 OHDC from June 2016 to March 2018.
- The CDC Infection Prevention and Control Assessment Tool for OHDC was used for on-site assessments for hand hygiene, dialysis station cleaning, catheterization—decanulization, catherer connect/disconnect, and dialysate injectable medications.
- A total of 132 questions, 76 of which represented best practice recommendations (BPR) were analyzed in 10 IC domains.
- Gap frequencies were calculated for each BPR. Fisher's exact test was used to study the association of the identified gaps with typical patient census in the facilities (all dialysis patients cared for by facility at time of assessment) and corporate affiliation (CA).

**RESULTS**

- Facility characteristics are displayed in Table 1.
- A median of 64 (range 57-70) of 76 BPR were practiced by OHDC or were non-applicable to them (data not shown). The IC Program and infrastructure domain had the highest frequency of IC gaps (Figure 1).
- 19 of the 76 best practices were lacking in at least 20% of the dialysis centers (Table 2).
- Several factors were significantly associated with presence/absence of specific BPR. None of the OHDC with no corporate affiliation had shared computer charting terminals as compared to 64% of OHDC with CA (p=0.036).
- A higher proportion of smaller OHDC (OHDCIAH) had work exclusion policies that encourage reporting of illnesses without any penalty as compared to larger OHDC (75% vs 0%, p=0.007).
- A higher proportion of OHDC provided space and encouraged persons with symptoms of respiratory infection to sit far away from others as possible in non-clinical areas (63% vs 0%, p=0.033).
- A majority of OHDC with no corporate affiliation provided space and encouraged persons to maintain distance with others when having symptoms of respiratory infection as opposed to the corporate OHDC (98% vs 8%, p<0.001).
- The most frequent recommendations for practice changes needed to improve IC gaps across the 15 OHDC are displayed in Table 3.

**DISCUSSION**

- Important IC gaps exist in OHDC and require mitigation.
- Although 86% OHDC reported their infection preventionist received IC training, none of the 15 OHDC (Ps were certified in infection prevention and control (i.e., CIC).
- Informing OHDC of existing IC gaps may help in BPR implementation.
- Facility characteristics may inform the type of mitigation that is necessary and the strategies used for implementation.
- Larger scale studies should focus on identifying factors that promote success and pose barriers to certain BPR implementation in OHDC.
- NE ICAP is helping OHDC with gap mitigation by development of practice tools and resource sharing through their website and also on one-to-one basis.
- NE ICAP is also partnering with the Nebraska Infection Control Network and the NE DHHS HAI Program to develop and offer a training course on primary infection prevention to all infection preventions and/or designated infection control personnel that will include guidance on promoting best practices in OHDC.

**REFERENCES**

- Centers for Disease Control and Prevention Audit Tools and Checklists https://www.cdc.gov/surveillance-tools/audit-tools.html

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**Table 1. Characteristics of Outpatient Hemodialysis Centers**

<table>
<thead>
<tr>
<th>Facility Characteristics</th>
<th>All Outpatient Hemodialysis Centers</th>
<th>Chain (n = 10)</th>
<th>No Chain (n = 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital affiliation</td>
<td>9 (60)</td>
<td>4 (40)</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Typical patient census</td>
<td>8 (53)</td>
<td>4 (40)</td>
<td>4 (83)</td>
</tr>
<tr>
<td>Typical patient census &gt; 50%</td>
<td>7 (47)</td>
<td>3 (30)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Presence of transient infection prevention</td>
<td>5 (33)</td>
<td>2 (20)</td>
<td>3 (50)</td>
</tr>
</tbody>
</table>

**Table 2. Frequencies of Implementation of Best Practices that were Identified as Lacking in at least 20% of Outpatient Hemodialysis Centers**

- The person in charge of infection control at the facility is not involved in infection control.
- The facility is participating in their ESRD network healthcare-associated infection quality improvement activity.
- The facility is participating in the CDC Dialysis ES Prevention Collaborative.
- In the past 2 years, the facility has participated in other infection prevention programs for use within the facility.
- The facility has a system for early detection and management of potentially infectious persons at critical points of patient encounter.
- There are gaps in patient areas within the facility that encourage patients to take an active role in and express their concerns about facility infection control practices.
- The facility has shared computer charting terminals.

**Table 3. Most Frequent Recommendations Provided to Hemodialysis Centers for Gap Mitigation**

- **Specific Recommendation for Practice Change to Mitigate Infection Control Gaps**
  - Audit hand hygiene with additional training based on HHI gaps observed.
  - Apply antibiotic ointment with dressing changes as a CCR Care Intervention.
  - Audit dialysis station cleaning and prepare training and tools specific to gaps observed.
  - Implement infection prevention exclusion policies.
  - Implement a cleaning protocol for the medication preparation area.
  - Post patient engagement posters relating to infection control.

- **Number of sites where this was implemented**
  - 12 (81)
  - 11 (73)
  - 11 (73)
  - 11 (73)
  - 9 (60)
  - 9 (60)

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**Figure 1. Frequency of Infection Control Gaps within Individual Infection Control Domains**

- Infection Control Program and Infrastructure
  - 76% vs 24% larger OHDC
- Infection Control Training, Competency, and Certification
  - 62% vs 38% larger OHDC
- Healthcare Personnel (HCP) Safety
  - 98% vs 2% larger OHDC
- Surveillance and Disease Reporting
  - 92% vs 8% larger OHDC
- Respiratory Hygiene/Cough Etiquette
  - 98% vs 2% larger OHDC
- Personal Protective Equipment (PPE)
  - 98% vs 2% larger OHDC
- Environmental Cleaning
  - 98% vs 2% larger OHDC
- Hand Hygiene
  - 98% vs 2% larger OHDC
- Catheter and other Vascular Access Care
  - 98% vs 2% larger OHDC
- Injection Safety
  - 81% vs 19% smaller OHDC