Evaluating Occupant Load Factors for Ambulatory Health Care Facilities

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Koffel Associates Inc.

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Koffel Associates Inc.

Overview

- The History
- The Problem
- The Questions
- Spain’s Research
- U.S. Research
- Let’s Compare
- So What?

The History

- 100 ft²/pers (9.3 m²/pers) based on business use occupant load factor.
- 2015 edition changes this to 150 ft²/pers (13 m²/pers) for Ambulatory Health Care use only.
The Problem

• Business Occupancy is an occupancy used for the transaction of business (3.3.188.2.1, NFPA 101 (2012)).

• Ambulatory Health Care Occupancy is an occupancy used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following:
  1. treatment for patients that renders the patients incapable of taking action for self preservation under emergency conditions without the assistance of others;
  2. anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others;
  3. emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. (3.3.188.1, NFPA 101 (2012)).

The Problem

• Similarities:
  • Offices
  • Conference Rooms
  • Consultation Rooms
  • Waiting Areas

• Differences:
  • Operating Rooms
  • Prep Areas
  • Post-Anesthesia Care Unit (PACU)

The Questions

• How are Ambulatory Health Care occupancies being used and by whom?

• How many people are within the space at a time?

• Does the Life Safety Code accurately reflect this usage?
Focus on:
1. Data collection and determining occupant load factors.
2. Design a questionnaire for Ambulatory Health Care Facilities.

Survey Totals:
- 21 Ambulatory Health Care Facilities
- 18 primary care
- 1 urgent care and treatment
- 2 consultation and treatment services
- 1,180,343 ft²

Questionnaire
Focus on:
- Verification of Spain's Research outside of Santander.
- Survey Totals:
  - 8 facilities
  - 3 stand alone
  - 2 surgery floors
  - 3 primary care
  - 111,574 ft²

Survey during "Prime Time"
- 7 a.m. to 12 p.m.
- Occupants split into:
  - Staff
  - Companion
  - Patient
- Gross floor area was used

Occu datapoint Load Factor
- Per area surveyed per hour
- Per area surveyed per facility average
- Per facility average

Companion to Patient Ratio
\[
\text{Ratio}_{\text{Companion/Patient}} = \frac{N_{\text{Companions}}}{N_{\text{Patients}}}
\]

Patient to Staff Ratio
\[
\text{Ratio}_{\text{Patients/Staff}} = \frac{N_{\text{Patients}}}{N_{\text{Staff}}}
\]
### U.S. Research - Results

<table>
<thead>
<tr>
<th>Facility</th>
<th>Average Occupant Load Factor</th>
<th>( \text{ft}^2 / \text{pers} )</th>
<th>( \text{m}^2 / \text{pers} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility 1A</td>
<td>Waiting Room</td>
<td>241</td>
<td>22.4</td>
</tr>
<tr>
<td></td>
<td>Prep</td>
<td>112</td>
<td>10.5</td>
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<td></td>
<td>PACU</td>
<td>207</td>
<td>19.3</td>
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<tr>
<td></td>
<td>Nurse Room</td>
<td>20</td>
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<td>Waiting Room</td>
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<tr>
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<td>Prep</td>
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<td>14.8</td>
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<td></td>
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<td></td>
<td>Offices</td>
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<tr>
<td></td>
<td>Front Desk</td>
<td>313</td>
<td>28.1</td>
</tr>
<tr>
<td></td>
<td>Back Desk</td>
<td>69</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>Prep</td>
<td>174</td>
<td>16.2</td>
</tr>
<tr>
<td></td>
<td>PACU</td>
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<td>20.4</td>
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<td>Waiting Room</td>
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<td>Front Desk</td>
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<td>Back Desk</td>
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<tr>
<td></td>
<td>Patient Rooms</td>
<td>411</td>
<td>38.2</td>
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<td>Waiting Room</td>
<td>214</td>
<td>19.9</td>
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<td>Front Desk</td>
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<td>Facility 3B</td>
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<td>Patient Rooms</td>
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<td>Floor 5</td>
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<td>Floor 6</td>
<td>339</td>
<td>31.5</td>
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* Free standing urgent/treatment AHC Facility
* Primary Care AHC Facility
* Urgent/treatment AHC floor or wing within larger acute care hospital
U.S. Research- Analysis

- 17% of areas were less than 100 ft²/person.
- 83% of areas were greater than 100 ft²/person.
- One outlier facility within data set (Facility 4).
  - 3756 ft²/person
  - 348.9 m²/person

Let’s Compare

<table>
<thead>
<tr>
<th>Country</th>
<th>ft²/pers</th>
<th>m²/pers</th>
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<tbody>
<tr>
<td>USA</td>
<td>Mean</td>
<td>701</td>
</tr>
<tr>
<td>USA</td>
<td>Mean</td>
<td>264</td>
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<tr>
<td>SPAIN</td>
<td>Mean</td>
<td>267</td>
</tr>
</tbody>
</table>

U.S. Occupant Load Factors
- All Facilities
  - Mean: 701 ft²/pers, S.D.: 1244
  - Mean: 264 ft²/pers, S.D.: 163

Spain Occupant Load Factors
- All Facilities
  - Mean: 267 ft²/pers, S.D.: 172

Ratio Companion/Patient

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Companion/Patient</th>
<th>Patient / Consultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.98</td>
<td>0.73</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.73</td>
<td>0.78</td>
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</table>

Spain Ratio Results

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Companion/Patient</th>
<th>Patient / Consultation</th>
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</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.44</td>
<td>1.21</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.27</td>
<td>0.71</td>
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</tbody>
</table>
So What?

- 83% of facilities in U.S. study showed occupant load factors larger than 100 ft²/person (9.3 m²/person).
- Supportive of 2015 Life Safety Code change to 150 ft²/person (13 m²/person).
- Facilities can plan for staff and patients within the Ambulatory Care Areas.
- Facilities cannot plan for companions.
- Companion to Patient ratio may be able to help better predict these numbers.

Questions/Discussion

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