Creating A Centralised Operations Centre

Achieving the Outcomes of a High Reliability Organisation

Paul B. Davenport RN, BSN, NREMT-P(ret.), MBA, CMTE
Carilion Clinic, Roanoke, VA US
Multi-Hospital Healthcare System
Carilion Clinic Overview
Carilion Clinic by Numbers

- Physician Group: 600+
- Hospitals: 6
- Practice Sites: 220
- Employees: 11,400
- Licensed beds *(excluding 60 NICU beds)*: 1,187
- Admissions: 50,311
- Revenue: $1.4 B
- A&E visits: 183,000
- Integrated Transport System:
  - 3 Helicopters, 44 ambulances
  - 40K transports per year

Community benefit (FY '13, per IRS guidelines)

- $138.8 Million
  - Total community benefit

PLUS

- $38.9 Million
  - In other uncompensated care
- $22.3 Million
  - In professional health education
- $4.2 Million
  - In community outreach
- $1.3 Million
  - In funding for research

Including $72.1 Million in charity care

Note: Data from financial year 2013
Aim & Objectives

- Review the common elements of a high reliability organisations (HRO) and how to ensure healthcare systems are designed for HRO outcomes
- Understand that significant role technology solutions play in achieving high level performance results
- Review the significant operational performance results at Carilion Clinic (Roanoke, VA) using TeleTracking solutions incorporated with an operations centre
Critical need to deliver quality outcomes

Develop efficient delivery systems

Ensure safe care of the patient
Hallmarks of HROs (1/2)

- Operational sensitivity
- Situational awareness
- Hyper-acute use of technology
- Transforming data into actionable information
Managing The Unexpected
- “HROs organise themselves in such a way that they are better able to notice the unexpected in the making and halt its development”
- Sensitivity to operations
- Leverage technology use
- “HROs have well developed situational awareness”
- All HRO examples have organised control centres
Common Element of HROs
When you are managing logistics across an enterprise there is a lot to keep an eye on.
Considerations for the operations team

- Eliminate coordination gaps
- One location with data / information
- Elimination of wasted hours on complaint investigation / events
- Elimination of wasted hours on chasing requests, making orders and care
- Elimination of variations (Drift)
- Increased referral satisfaction
- Nerve centre for operations
- Allows immediate decision making
- Significant improvement in diversion hours
Consideration of the leadership team

- Efficiency maximise current resources
- Increase throughput
- Increase appropriate admissions
- Right patient, right place, right time
- Real-time referral information
- Diversion time reduction

“To decrease harm related to human error, design the system so a human can use it and have the best opportunity not to make a mistake.” Dr. Sarah Parker, Virginia Tech Carilion School of Medicine, Human Factors Director
Typical Transfer Centre

- Multiple calls
- Information is segmented
- Human error designed system
- **Separate departments:** Dependent on phone communication, electronic methods....no face to face (or line of sight)
- Variation on processes by department and technology
- Simply, are not speaking a common language using a common platform (software)
What It Should Feel Like
Operational Intelligence

- How is the facility or system doing today?
- Single point of contact, information (data), and situational operational awareness
- What is your one call for your operations? Do you have to call?
Carilion Clinic’s Operations Center (CTaC)
Project History

**Transfer Centre developed in Nursing**
- Bed placement and transfer acceptance
- No real connections with services, MEC, administration
- No quality measures, reporting, protocols, or risk management connection

**Transfer Task Force created**
- Stakeholder membership
- 3 months of intensive sessions
- Assessment of patient feedback—what do they want from a Transfer Centre?

**Transitioned to CCPT Leader-ship (Air & Ground Transport)**

**Integrated Mission Control Centre Built**
(Know as CTaC—Carilion Transfer and Communications Centre)

**2011- Emergency Services Division created:**
- CTaC
- CCPT
- EM physician group
- EM Residency
- Urgent Care
- CRMH ED operations
Goal: Complete oversight and management of system throughput (Operational Control)

- Leverage technology solutions (TeleTracking) to transform data into actionable information
- Management of all hospital/healthcare system patient throughput
- Real-time reporting of capacity status and incoming placement needs
- Predictive capabilities capacity, admissions, and discharges
The “Heart” of the Organisation

Carilion Operations Centre

- Hospital Administration
- Environmental Services
- IP Rehab
- Facilities Services
- Emergency Department
- MEC
- Cardiology
- Trauma
- Neurosurgery
- Emergency Management
- Hospitalist
- Neurology
- Urology
- Vascular Surgery
- OR Services
- Regulatory-Risk Mgmt
- NICU
- OBGYN
- Paediatrics
- Internal Medicine
Mission Control Components

- Key Throughput Areas
  - Bed Placement
  - Patient Transportation Communications Centre
  - Environmental Services (House-keeping)
  - In-house transport dispatch (Porters)
  - Others to consider:
    - Case Management/Social Work
    - Utilisation Management
    - Nursing “house supervisors”

- Other Key Components
  - Medical Director
  - Quality Management team/process
  - Emergency/Disaster Management connection
Best Practices

- **Technology**
  - TeleTracking’s implementation full Capacity Management Suite and Transfer Center modules
- **Situational Awareness**
  - Use of large screen monitors (for real-time capacity and transportation updates)
  - TeleTracking Custom Dashboards
  - Provides executive team with real-time information of operations at a glance
- **Information center-Fully leveraging Teletracking Reporting**
  - Transform data into information
  - Transparency of information
  - Relevant score cards for every level up of the organisation
## May 2016 Transfer Center Dashboard

### Patient Movements

<table>
<thead>
<tr>
<th>Admit From</th>
<th>ICU</th>
<th>Med/Surg</th>
<th>Total</th>
<th>% Change from April</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>174</td>
<td>1,070</td>
<td>1,244</td>
<td>-12%</td>
</tr>
<tr>
<td>Non-ED</td>
<td>317</td>
<td>88</td>
<td>315</td>
<td>-14%</td>
</tr>
<tr>
<td>Surgical</td>
<td>98</td>
<td>115</td>
<td>213</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>387</td>
<td>1,242</td>
<td>1,629</td>
<td>-10%</td>
</tr>
</tbody>
</table>

### % Change from April

<table>
<thead>
<tr>
<th>Admit From</th>
<th>ICU</th>
<th>Med/Surg</th>
<th>Total</th>
<th>% Change from April</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED</td>
<td>-12%</td>
<td>-12%</td>
<td>-24%</td>
<td></td>
</tr>
<tr>
<td>Non-ED</td>
<td>-14%</td>
<td>-14%</td>
<td>-28%</td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>10%</td>
<td>-10%</td>
<td>-20%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-8%</td>
<td>10%</td>
<td>-9%</td>
<td></td>
</tr>
</tbody>
</table>

### Bed Time (Less than 24 Hours ICU)

<table>
<thead>
<tr>
<th>Month (Hrs)</th>
<th>FY Month (Hrs)</th>
<th>Month (Hrs)</th>
<th>FY Month (Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU</td>
<td>6.95</td>
<td>6.99</td>
<td>6.96</td>
</tr>
<tr>
<td>Med/Surg</td>
<td>7.31</td>
<td>7.80</td>
<td>7.80</td>
</tr>
</tbody>
</table>

### Wait Time (Less than 24 Hours Med/Surg)

<table>
<thead>
<tr>
<th>Month (Hrs)</th>
<th>FY Month (Hrs)</th>
<th>Month (Hrs)</th>
<th>FY Month (Hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Med/Surg</td>
<td>-21%</td>
<td>-10%</td>
<td>-1%</td>
</tr>
</tbody>
</table>

### Declines & Cancellations

<table>
<thead>
<tr>
<th>Admit From</th>
<th>ICU</th>
<th>PCU</th>
<th>Med/Surg</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martinsville Memorial Hospital</td>
<td>12</td>
<td>2</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Carilion New River Valley MC</td>
<td>4</td>
<td>12</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Princeton Community Hospital</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>CMH</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Bluefield Regional Medical Center</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Greenbrier Valley Medical Center</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Wythe County Community Hospital</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Remaining</td>
<td>24</td>
<td>16</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>73</td>
<td>23</td>
<td>149</td>
</tr>
</tbody>
</table>

### Admits

<table>
<thead>
<tr>
<th>Admit From</th>
<th>ICU</th>
<th>PCU</th>
<th>Med/Surg</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluefield Regional Medical Center</td>
<td>7</td>
<td>11</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Carilion New River Valley MC</td>
<td>2</td>
<td>12</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Martinsville Memorial Hospital</td>
<td>5</td>
<td>8</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Montgomery Regional Hospital-LG</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Danville Regional Hospital</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>CTOC</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Remaining</td>
<td>12</td>
<td>19</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>89</td>
<td>11</td>
<td>165</td>
</tr>
</tbody>
</table>
Scorecard (3/3)
CTaC: Carillion Clinic’s 24/7 Mission Control
Mission Control Layout
CTaC: Carilion Clinic’s 24/7 Mission Control

EVS
(Housekeeping) CNRV Hospital Ops

CRMH Hospital Ops

Flight Com

Ground Com
Centralisation: Improvements

- Daily throughput planning
  - Use of TeleTracking’s Pending / Confirmed discharge feature
    - Customisable Discharge Milestones
  - Use of TeleTracking’s Projected Census feature
    - Allows for better coordination of throughput
    - Prioritisation of all discharge transportation scheduling
    - Real-time updates of any patient delays
Increased Discharge Efficiencies

- **Unit based accountability**: custom reports auto-emailed to nursing leadership daily (TeleTracking Custom reports module)
- Focus on early discharges (TeleTracking Discharge Milestones, and Pending / Confirmed Discharges features)
- **Unit Based Bedboards**: real-time awareness on every unit, visible to nursing leadership, physicians, and support staff (TeleTracking Portal views)
Outcomes
Outcomes

- **Increase Transfer Volumes (maximise system capacity)**
  - Year over year increases of transfer volumes

- **Decreased Intensive Care Length of Stay**
  - 2013-2015, 0.3 days decreased in ICU LOS
  - Decreasing ICU LOS increases availability of ICU capacity
Custom Reports

- Extensive use of custom reporting module
  - Daily reports 10-20 depending on area
- Provide feedback to transfer centre staff
  - Customer service metrics
  - Call documentation reviews
- Situation Awareness:
  - End of Shift report: mass e-mail distributed q 12 hours to all departmental leaders
  - Q 4 hour Census and Throughput email updates
### Process Improvements

<table>
<thead>
<tr>
<th>Central Source of Throughput Data</th>
<th>Increased Discharge Efficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to provide a wealth of throughput data to the Sr. Executive teams</td>
<td>Unit based accountability: custom reports auto-emailed to nursing leadership daily (Teletracking Custom reports module)</td>
</tr>
<tr>
<td>Dashboard views available for all leadership</td>
<td>Focus on discharges before noon (Teletracking Discharge Milestones, and Pending/Confirmed Discharges features)</td>
</tr>
<tr>
<td>Better ability to identify throughput hurdles, as well as needed resources</td>
<td>Unit Based Bedboards: real-time awareness on every unit, visible to nursing leadership, physicians, and support staff (Teletracking Portal views)</td>
</tr>
<tr>
<td></td>
<td>Proactive scheduling of all discharge transportation needs</td>
</tr>
</tbody>
</table>
ED Origin Unit

OCCUPIED TIMER

Minutes

May 2014: Bed-board monitors introduced to units to provide increased visibility.

28% decrease calculated from average 2014 times and 2016 times.
ICU Transfers

ICU TRANSFERS – REQUEST TO OCCUPY TIMES
Minutes

23% decrease calculated from average of 2014 times and average of 2016 times
ICU Transfer – Assigned and Cleaned to Occupy Times

ICU TRANSFERS TO LOWER LEVEL OF CARE: ASSIGN & CLEAN TILL OCCUPY

Minutes

21% decrease calculated from average of 2014 times and average of 2016 times
Dead Bed Time

Minutes

Total
CARILION ROANOKE MEMORIAL HOSPITAL (Level One Trauma Centre)—
YEAR OVER YEAR PATIENT TRANSFER GROWTH

2013 Patient Transfer Growth  2014 Patient Transfer Growth  2015 Patient Transfer Growth

Only 12 beds added
Maintaining Market Share & Efficiently Using Resources

- **Demand exceeds capacity**
  - Facility regularly operates at a 95-98% capacity
  - Growth in transfers, ED volumes, and overall hospital admissions
  - Allows for system and facility capacity planning
  - Operational controls to achieve system goals and plans
  - Systems designed to identify the “unexpected”, keep situationally aware, and transform data into operationally sensitive information.
### Overall goal:
“Right patient, right physician, right bed, and right mode of transport” = optimal patient outcomes

<table>
<thead>
<tr>
<th>Operation centres are designed for 100% reliability and unexpected event identification (HRO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TeleTracking enables actionable information for HRO results (Information based organisation) (HRO)</td>
</tr>
<tr>
<td>Situational awareness (HRO)</td>
</tr>
<tr>
<td>“One Call Does it All” philosophy</td>
</tr>
<tr>
<td>Seamless patient entry into the system</td>
</tr>
<tr>
<td>Collaborative transfer acceptance and patient transportation model</td>
</tr>
<tr>
<td>Centralised throughput command centre</td>
</tr>
<tr>
<td>Eliminates non value add tasks to reduce LOS and dead bed time</td>
</tr>
</tbody>
</table>