A mixed surgical ward case management platform to reduce hospital length of stay

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Department of Surgery
Princess Margaret Hospital
Background

The first mixed surgical ward in PMH (opened in NOV 2017)
Multi-specialty Environment

- Complex medical round
- Coordination of operation among specialties

Multiple Consultations
- Inter-specialty consultation
- Transfer/ takeover

Communication
- Inter-specialty communication
Perception on Service Challenge

1. Handle inter-specialty communication
   - Strongly Agree: 0%
   - Agree: 0%
   - Neutral: 7%
   - Disagree: 7%
   - Strongly Disagree: 86%

2. Handle inter-specialty consultation
   - Strongly Agree: 0%
   - Agree: 7%
   - Neutral: 7%
   - Disagree: 20%
   - Strongly Disagree: 60%

3. Inter-specialty transfer/take over
   - Strongly Agree: 0%
   - Agree: 40%
   - Neutral: 46%
   - Disagree: 7%
   - Strongly Disagree: 7%

4. Arrange rehabilitation/discharge
   - Strongly Agree: 0%
   - Agree: 0%
   - Neutral: 7%
   - Disagree: 7%
   - Strongly Disagree: 46%

5. Coordination of operations among specialties
   - Strongly Agree: 0%
   - Agree: 13%
   - Neutral: 53%
   - Disagree: 7%
   - Strongly Disagree: 7%

6. Overall management of patient with multi-specialties from admission to discharge
   - Strongly Agree: 0%
   - Agree: 0%
   - Neutral: 20%
   - Disagree: 60%
   - Strongly Disagree: 20%
Perception on Service Challenge

Scale: 1- Strongly Disagree to 5- Strongly Agree

- Handle inter-specialty communication
- Handle inter-specialty consultation
- Inter-specialty transfer / take over
- Arrange rehabilitation / discharge

Overall management of Patient with multi-specialities from admission to discharge
Coordination of operations among specialties

Experience 0-4 years
Experience > 4 years
Traumatic Admission for General Surgery

No. of patient


Surgical ward A-D
Mixed Surgical Ward (New)
WHAT CAN WE DO MORE?
Our Team

MILLENNIALS
Objective

To setup an electronic platform with the capacity of real time communication on patient's parent specialties and status of consultations under the multidisciplinary Environment.

Aimed at reducing hospital length of stay.
Case Management System

- Real time electronic communication platform
- Web-based and accessible on HA network
New Case

Input Demographic
<table>
<thead>
<tr>
<th>HN Number</th>
<th>Surname</th>
<th>Bed No</th>
<th>Cubicle</th>
<th>Admission Time</th>
<th>Parent specialty</th>
<th>2nd specialty</th>
<th>SUR Active Consultation</th>
<th>NS Active Consultation</th>
<th>ORT Active Consultation</th>
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<tbody>
<tr>
<td>HN121</td>
<td>Leung</td>
<td>5</td>
<td>Cubicle A</td>
<td>3/10/2017 0:00</td>
<td>ORT1</td>
<td>URGENT</td>
<td>No</td>
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<td>So</td>
<td>6</td>
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<td>3/10/2017 0:00</td>
<td>NS</td>
<td>ROUTINE</td>
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<td>URGENT; Team 2</td>
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<td>HN123</td>
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<td>9</td>
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<td>HN170</td>
<td>Yip</td>
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<td>ORT3</td>
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<td>HN171</td>
<td>Kazim</td>
<td>17</td>
<td>Cubicle C</td>
<td>21/9/2017 13:45</td>
<td>ORT1; SUR</td>
<td>ROUTINE</td>
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<td>URGENT; Team 2</td>
<td>No</td>
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<tr>
<td>HN172</td>
<td>Zhou</td>
<td>18</td>
<td>Cubicle C</td>
<td>20/9/2017 19:00</td>
<td>NS; ORT2</td>
<td>ROUTINE</td>
<td>No</td>
<td>URGENT; Team 2</td>
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<tr>
<td>HN125</td>
<td>Ng</td>
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<td>ROUTINE</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>HN173</td>
<td>Wong</td>
<td>22</td>
<td>Cubicle C</td>
<td>17/10/2017 0:00</td>
<td>NS</td>
<td>No</td>
<td>No</td>
<td>URGENT; Team 2</td>
<td>No</td>
</tr>
</tbody>
</table>

NS, ORT consultation update, urgent marked with red
Mixed Surgical Case Management System Workflow
Accessibility

HA network

Authorized person
Colleague’s Perception

- Easy to access by authorized staff
- The information in case management system is accurate and current
- The information is useful for doctor
- Overall, the System is helpful

Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree
The System is Helpful? How?

The information in case management system is accurate and current.

Facilitate the handover between staff.

Easy to access by authorized staff.

Easy to reach the consultation information of patients.

System layout is clear and systematic.

Easy to learn how to use.

User friendly in data entry.

The information is useful for doctor.

$$r = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{n} (y_i - \bar{y})^2}}$$
### Length of Stay

#### Injury severity score (ISS)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>P-value</th>
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<td>Non mixed surgical ward admission</td>
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<td>3.9</td>
<td>6.5</td>
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<td><strong>ISS&gt;4</strong></td>
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<td>Mixed surgical ward admission</td>
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<td>3.8</td>
<td>1.9</td>
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</tbody>
</table>

**T** = \( \frac{Mean_{A2} - Mean_{Non A2}}{\sqrt{\frac{(SD_{A2})^2}{N_{A2}} + \frac{(SD_{Non A2})^2}{N_{Non A2}}}} \)
Comparison of mixed surgical and general orthopaedics ward

By principal diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Non mixed surgical ward admission</th>
<th>Mixed surgical ward admission</th>
</tr>
</thead>
<tbody>
<tr>
<td># base femoral neck - closed</td>
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</tr>
<tr>
<td>820.03:0</td>
<td></td>
<td></td>
</tr>
<tr>
<td># Femur greater trochanter</td>
<td>12.00</td>
<td>10.00</td>
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<tr>
<td>820.20:1</td>
<td></td>
<td></td>
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<tr>
<td># Femur Subtrochanteric</td>
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<td>12.00</td>
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<tr>
<td>820.22:0</td>
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<td></td>
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<tr>
<td># femur trochanter - closed</td>
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<td>10.00</td>
</tr>
<tr>
<td>820.20:0</td>
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</tbody>
</table>
Conclusion

Positive comments have been received from users' interview.

Well acceptance from medical and nursing colleague.

High system ownership and incredibly easy to use.

Evidenced in reducing unnecessary length of stay.

Enhanced communication among different specialties.
FUTURE PLANNING

1. Customized display for different specialties
2. Link up with nursing activities
3. Integrated information for nursing handover e.g. out-standing consultation
4. Longitudinal evaluation
ACKNOWLEDGEMENT

Multidisciplinary mixed surgical ward task group
“Coming together is a beginning. Keeping together is progress. Working together is success.”

Henry Ford

Thank you

Mixed Surgical Ward, PMH
References


Satisfaction Survey

For enhancing our service and facilitate collaboration, could we seek your perception on the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Service challenge, extra time is needed to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1A. Handle inter-specialty communication</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1B. Handle inter-specialty consultation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1C. Inter-specialty transfer / take over</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1D. Arrange rehabilitation / discharge</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1E. Coordination of operations among specialties</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>1F. Overall management of patient with multi-specialties from admission to discharge</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. Following the case management platform, could we seek your perception:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2A. User-friendly in data entry</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2B. Easy to learn how to use</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2C. System layout is clear and systematic</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2D. Easy to reach the consultation information of patients</td>
<td>1 2 3 4 5</td>
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<td>2E. Easy to access by authorized staff</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2F. Facilitate the handover between staff</td>
<td>1 2 3 4 5</td>
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<tr>
<td>2G. The information in the case management system is accurate and current</td>
<td>1 2 3 4 5</td>
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<tr>
<td>2H. The information is useful for doctor</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2I. Overall, the system is helpful</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2J. For further development, would you have interest to join the development team</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. Would you believe the case management system could facilitate:</td>
<td></td>
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<tr>
<td>3A. Inter-specialty communication</td>
<td>1 2 3 4 5</td>
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</tr>
<tr>
<td>3B. Inter-specialty consultation</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3C. Inter-specialty transfer / take over</td>
<td>1 2 3 4 5</td>
<td></td>
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<td></td>
</tr>
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<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>3F. Overall management of patient with multi-specialties from admission to discharge</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3G. Also helpful for allied health staff such as physio, occup, clinical psy</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3H. Helpful for reducing LOS</td>
<td>1 2 3 4 5</td>
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</tbody>
</table>

Other Suggestions:

____________________________________________________________________________________________________________________________