Outcome Measurements & Service Performance Review in Acute Surgery

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Acknowledgment: Mr Li Hsee, FRACS
Acute Surgical Unit
Department of Surgery
Overview

- Scope of problems in Acute Surgery
- Review of workload and case volume
- Current ASU structure
- Working principles
- Acute Surgical Patient Pathway
- Key Performance Indicators (KPIs)
- Future directions
Scope of Problems in Acute Surgery

• Access block in ED (delay in surgical assessment)
• Lack of timely access to acute surgical care
  • Generalist vs. Sub-specialist
• Shortage of Surgeons
• ↑ sub-specialisation post fellowship
• Pressure to ↑ elective throughput
• Potential for erosion of surgical skills in emergency surgery
Scope of Problems in Acute Surgery

- Lack of Consultant input in managing acute cases
- Consultant commitment while on call
- Lack of timely access to OR
- Non essential acute work after hours
- Disruption of elective theatres
- Lack of resources, funding and understanding at the government and area district health boards levels
Global Solution in Acute Surgery

- USA: AAST oversight of ACS fellowship
  - Hospital accreditation
  - Fellowship curriculum and training
- Canada: Canadian Association of General Surgeons-Education Committee
  - Developing curriculum in training
- RACS: Position Statement on ES and summit on ES
- Australia: Inaugural ES conference and 12 point plan on ES from GSA
Summary Workload

- Total Admissions
- Acute Cases
- Acute Operative procedures
- Elective Procedures
Acute vs. Elective Cases

Elective vs Acute Surgical Cases
(General Surgery - Cases at ACH and GCC, excludes outsourced cases)
### Acute Operative vs. Non-operative

<table>
<thead>
<tr>
<th>FY Year</th>
<th>Acute-N</th>
<th>Acute-T</th>
<th>Grand Total</th>
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<tbody>
<tr>
<td>2005</td>
<td>2,592</td>
<td>1,375</td>
<td>3,967</td>
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<tr>
<td>2006</td>
<td>2,940</td>
<td>1,487</td>
<td>4,427</td>
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<tr>
<td>2007</td>
<td>3,186</td>
<td>1,493</td>
<td>4,679</td>
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<td>2008</td>
<td>3,212</td>
<td>1,563</td>
<td>4,775</td>
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<tr>
<td>2009</td>
<td>3,212</td>
<td>1,362</td>
<td>4,574</td>
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<tr>
<td>2010</td>
<td>3,558</td>
<td>1,513</td>
<td>5,071</td>
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<tr>
<td>2011(20 Dec 2010)</td>
<td>1,736</td>
<td>828</td>
<td>2,564</td>
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<tr>
<td>Grand Total</td>
<td>20,436</td>
<td>9,621</td>
<td>30,057</td>
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↑ in volume 11%
The NZ Setting

• Recognised as a growing problem to manage acute patients in public hospitals
• Most hospitals manage acute surgical patients differently with no uniformity
• At Auckland City Hospital
  – ACUTE SURGICAL UNIT
ASU Goal

• Aim: Increase timeliness of clinical assessment & management of emergency surgical patients in appropriate time frame
Working Principles of ASU

- Consultant led service
- Dedicated operating theatre
- Separation of acute and elective workloads
- Robust handover process
- Engage the subspecialists for their expertise
- Enhance training for Registrars in ES
- Promote advanced roles of nursing and allied health professionals
12 Point Plan in ES

1. EGS is a continuing core competency
2. ES should be consultant led
3. Dedicated Staff to ES with need for training
4. Separation of ES & elective streams
5. Timely access to OR
6. ES should be done during working hours unless threat to life, limb or organ
7. Consultant should contribute to Mx of OR efficiency
8. Safe hours principles
9. Robust Handover
10. Best practice: KPIs
11. Community need & regional variation
12. Service be valued, resourced and remunerated
# Acute Flow & Distribution

## General Surgery - Acute Flow

*Avg Patients per month*

Note that this chart follows the flow of patients who had left ED under the General Surgery CBU based on 2008, 2009 and 2010 (Aug-10) calendar years.

### Average number of Gen Surgery patients entering acute pathway

<table>
<thead>
<tr>
<th>Referral Source</th>
<th>Admission to AED or APU:</th>
<th>Discharge or Inpatient?</th>
<th>First IP Ward</th>
<th>Theatre?</th>
<th>Surgical Team</th>
<th>Theatre (1st Theatre event only)</th>
<th>Discharge Ward</th>
<th>Discharge Destination</th>
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<td>Self Referral</td>
<td>ED</td>
<td>Send to IP Ward</td>
<td>Theatre</td>
<td>GS Team</td>
<td>GS Ward</td>
<td>17% Outlier Ward</td>
<td>GS Ward</td>
<td>Home</td>
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<td>(Bed Request has been made)</td>
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<td>General Practitioner</td>
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### Notes

- Additional Data:
  - Returns to theatre
  - Avg = 22 per month
  - Number of Acute Gen Surg Discharges
Acute Patient Flow

- 70-100 cases/month
- In patient
- Acute Team
- Acute Trauma
- ED
- GP
- Assessment & Investigations
- OR
- ASU
- Upper GI/HBP
- Colo-Rectal
- Trauma Service
- Breast/Endocrine
Acute Operating Room

- Dedicated operating room for ASU
- Utilise additional OR as available
- On going prioritisation of acute patients
- Meetings with OR coordinator/Aesthetician
- Assign cases to appropriate Registrars
Case-mix in Acute Surgery

- Emergency/Emergent laparotomy
- Cholecystectomy
- Laparoscopy & appendicetomy
- Tracheostomy
- Thoracotomy
- Trauma Laparotomy
- Neck Explorations
- Intermediate and minor cases
Key Performance Indicators

- Defining best practice
- Identifying service deficiencies and area of improvement
- Can be a wide range of checklists, protocols and guidelines
- Start with evaluation of process...meaningful clinical outcome
KPI in ASPP Study

- Aim to evaluate Acute Surgical Patient Pathway and early trend of KPIs
- Patient data identified using ACH electronic medical records: individual details left confidential
- Statistical analysis using Anderson-Darling Normality and Anova tests by statisticians
- In conjunction with ASPP project
Patient arrives at:
AED → APU

KPI

Referred to General Surgery or Discharged

KPI

Gen. Surgery:
Inpatient investigation +/- treatment or discharged (AED/APU)

KPI

No Operation

Operation

KPI

Patient is discharged from ward
KPIs in ASPP

1. Time Elapse between ED/APU patient referral & first been seen by surgical team
   - complying with 6 hour rule (MOH)

2. LOS of non admitted patients
   - in ED/APU

3. Pre-operative LOS
   - decision to operative to OR

4. Acute cases operated on during working hours
   - in vs. out operating hours
KPI: ED/APU Assessment Time

ED Referrals: 41 minutes quicker
APU: Trend is patients being seen quicker
ANOVA test: p<0.005(ED), p=NS(APU)
KPI: LOS Non-admitted Patients
KPI: Pre-operative LOS

- \( P = NS \)

- Possible Hypothesis:
  - Higher Volume cases
  - Pre-emptive booking
  - Shortage of OR staff
  - Shortage of beds
  - More urgent cases displacing minor ones
  - Other emergency cases
KPI: Pre operative LOS

- Appendectomy
  - 2008 median: 6.6 hours
  - 2010 median: 4 hours

- Laparoscopic/open cholecystectomy
  - 2008 median: 16 hours
  - 2010 median: 13 hours
KPI: ‘In’ vs. ‘Out’ operation

Acute Operative Cases by General Surgery - In-Hours vs After-Hrs
(In-Hours between 7am and 7pm, After-Hours between 7pm and 7am)

Number of Cases

Year & Month

200801  200802  200803  200804  200805  200806  200807  200808  200809  200810  200811  200812  200901  200902  200903  200904  200905  200906  200907  200908  200909  200910  200911  200912  201001  201002  201003  201004  201005  201006  201007  201008  201009  201010
Conclusions

- KPIs showed early positive trend of facilitating acute patient flow
- Study support the utility of ASU at Auckland City Hospital
Outcomes of consolidating non-elective surgery: The surgical hospitalist/Acute care surgery model: A systematic review

Kreindler et al

• Results:
• 18 studies
  – USA (10), UK (4), Canada (3), Australia (1)
• Outcomes:
  – Patient access
  – Surgical outcomes
  – Timing of surgery
  – Workload
Outcome measures

Primary:
• Access to non-elective surgery
  – Wait time to non-elective surgery (i.e., time from when patients present to when they receive surgery)
  – Measures of particular segments of the wait (e.g., length of stay in the Emergency Department)
  – Proportion of patients seen or treated within benchmark time.

• Surgical Outcomes
  – Mortality
  – Complications
  – Inpatient LOS

Secondary:
• Staff and patient satisfaction (measured by “pre” and “post” surveys),
• Educational opportunities for residents, and Any unintended impacts and harms.
Conclusions

• Promising indications that the surgical hospitalist/acute care surgery model may improve access to non-elective surgery

• Available studies have too high risk of bias to permit firm conclusions

• Little is known about impacts of consolidation at the regional as opposed to the hospital level
Summary

• Remains an integral part of General Surgery @ACH
• Refine the clinical service in acute surgery
  – Look after acute patients well!!!
  – Maximize current resources
  – Anticipate growth and workload in volume/case mix
• Foster training in acute surgery at all levels
• Provide leadership in the field in the national and regional levels
• Rewarding career pathway in AS
• Further data on clinical outcomes and KPIs
• Review clinical guidelines, protocols and pathway