Measured Implementation of an Accelerated Chest Pain Diagnostic Pathway in Rural Practice

Proof of concept
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Conflicts of Interest

No significant conflicts of interest

• Funding for this project comes from:
  Heart Foundation New Zealand,
  Waikato Medical Research Foundation
  Abbots Point of Care provided POCT and consumables for trial.

• Dr Martin Than: Consultancy & Speaker fees from Abbots, Roche, Alere
How it started!

2 hours drive
6 hrs in ED, Dx home
2 hours drive
What did general practice want?

- A tool to identify of low risk chest pain presentations
- Protocol supporting chest pain and POCT.
- Access to decision making diagnostic serology in a timely fashion
- Safe funded management of low risk patients in general practice.
Key Problem

- Chest Pain: Top 3 ED presentation complaint
- Top Ambulatory Sensitive Hospitalisation (ASH)

- For low risk chest pain presentation:
  - Unnecessary travel.
  - Increased resources transferring to local emergency department.
  - Increased resources managing presentations in already busy emergency departments.

- Variation in clinical management of chest pain presentations in general practice.
Patients with potential ACS

<table>
<thead>
<tr>
<th>Time</th>
<th>ACS 20%</th>
<th>Non-ACS 80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>4</td>
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<td>6</td>
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<td>8</td>
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<td>10</td>
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<td>12+</td>
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Low Risk 35%
Intermediate Risk 25%
Highest Risk 20%
Baseline Data / Current Situation

All MNH Chest Pain Presentation to Waikato Regional ED by Practice/Year/by practice hours 2009 to 2015

Count of NHI for each Arrival Date Time Year. Color shows details about Practice Hours. The marks are labeled by count of NHI. The data is filtered on MNH Locality Name, Hospital Description, Chest pain presentations and Practice Name. The MNH Locality Name filter keeps 6 of 13 members. The Hospital Description filter keeps Taumarunui, Te Kuiti, Thames, Tokoroa and Waikato. The Chest pain presentations filter keeps 6 members. The Practice Name filter keeps 21 of 119 members.
Baseline Data / Current Situation
Hypothesis

• That an accelerated chest pain diagnostic pathway and POCT-cTn, specifically created for rural use will:
  A) Facilitate and improve consistency in the management of patients who present to general practices in the midland region with possible cardiac chest pain and
  B) Safely reduce the need for transfer to hospital for assessment and/or admission.
Aim of this Innovation

• To implement a model of care (RACPP), using POCT cardiac troponin I, to support chest pain assessment in the rural Midlands region.

• To evaluate the feasibility, safety, effectiveness, and acceptability of RACPP implementation for rule-out of:
  A. Acute myocardial infarction
  B. 30 day Major Adverse Cardiac Events (MACE)
Can we actually do this?
Conceptual Pathway for Rural Accelerated Chest Pain Pathway
EDACS
What did general practice want?

- A tool to identify of low risk chest pain presentations
- Protocol supporting chest pain and POCT.
- Access to decision making diagnostic serology in a timely fashion
- Safe funded management of low risk patients in general practice.
First attempt.

6 people in a room to discuss and plan rollout. How hard could it be?
Hindsight !
First Attempt = Fail, “lack of buy in”

Fail fast.

Outcome : Go bigger
“Buy in” the second attempt

- Meet with all clinicians from the identified practices.
- Invitation to be involved but requires commitment attending conference, research etc (well prepared).
- Conference
- Pitch: doesn’t rule out clinical judgement
- Risk
- Protocol
- Roll out plan
- GP education CME points, Gerry did scenarios
- On site training from Abbotts
- Safety
- Promotion, radio, articles etc
Key Changes Implemented

- **Design:** New standard of care for management of chest pain
- **Number of Centres:** 12 General Practices in rural Midland region
- **Number of Patients:** 500 patients with possible cardiac chest pain.
- **Estimated Duration:** Up to 18 months.
- **Patient Follow-up:** 1 month after GP presentation
- **Data Capture:** Recorded prospectively and assessed retrospectively. Tool to collect reporting
- **Reports:** To GPs during the RACPP implementation
- **Results:** Report results to GPs via Quarterly newsletter
The Journey
9 months to Go Live
Problems
Patients presenting to General Practice with possible cardiac chest pain, who would usually be transferred to hospital for further cardiac work up

Screening
- STEMI or other serious differential diagnosis?
  - YES: Not eligible for pathways
  - NO:
    - RED FLAGS: New ischaemic changes on 0h ECG? History strongly suggestive of Crescendo angina? Haemodynamically unstable?
      - NO:
        - EDACS ≥ 16?
          - NO:
            - 0h i-STAT troponin ≥ 0.04 μg/L?
              - NO:
                - Clinically deteriorating? STEMI? New ischaemic changes on 2h ECG?
                  - NO:
                    - 2h i-STAT troponin ≥ 0.04 μg/L?
                      - YES: NOT LOW RISK
                      - NO: Managed in the community
                      - LOW RISK
                  - YES: Managed by referral to hospital
                - YES: NOT LOW RISK
            - YES: Managed by referral to hospital
          - YES: Managed by referral to hospital
      - YES: Managed by referral to hospital
    - YES: Managed by referral to hospital
### General

**Review Status Vs. Number of Consultations**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Excluded from pathway</th>
<th>Low risk, completed pathway, sent home per protocol</th>
<th>Not low risk, referred to hospital per protocol</th>
<th>Protocol deviation - Low risk, did not complete pathway, and sent home</th>
<th>Protocol deviation - Not low risk, but sent home</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>142</td>
<td>22 15.49%</td>
<td>61 42.96%</td>
<td>45 31.69%</td>
<td>2 1.41%</td>
<td>12 8.45%</td>
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### Enrolled Patients

<table>
<thead>
<tr>
<th>Enrolled Patients</th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td>Total Chest Pain Presentations</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>Total Excluded Patients</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Total Patients Entering RACPP</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Total Low Risk Patients Remaining In General Practice</td>
<td>61</td>
<td>50.83</td>
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<tr>
<td>Total Patient Referred As Non-Low Risk Appropriately</td>
<td>45</td>
<td>37.50</td>
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<tr>
<td>Total Protocol Deviation</td>
<td>14</td>
<td>11.67</td>
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Reason For Pathway Exclusion

- Normally refer = "No", not eligible for pathway
- Patient previously enrolled = "Yes", not eligible for pathway
- Possible serious differential diagnosis = "Yes", not eligible for pathway
- STEMI, not eligible for pathway

Sample sizes and percentages:
- 19 patients (70.4%)
- 6 patients (22.2%)
- 3 patients (7.4%)
Recruitment

Cumulative Recruitment Vs. Time
Effect on ED Presentations

- Difficult to prove as low cohort
- 61 patients did not present (up to Nov 1)
- 61 avoidable transfers
  - Ambulance time
  - Crew time
  - Rural cover from neighbouring towns
- Non Tangible
  - Family travel and accommodation cost
  - Patient managed closer to home

<table>
<thead>
<tr>
<th>Low risk, completed pathway, sent home per protocol</th>
<th>Not low risk, referred to hospital per protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>Number of Patients With MACE at 30 Days</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>61</td>
<td>0</td>
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Lessons Learned

• The combination of EDACS and POCT testing, currently shows that patients are safely managed in the community.

• ED Presentations show that there has been no re-presentation of a low risk patient managed in primary care.

• There have been no MACE events for the low risk cohort to date.

• 7 (15%) MACE event has occurred with the not low risk cohort referred to hospital to date.

• Subjective themes:

• General practice is now speaking the same clinical language as our secondary partners therefore easier referral process.

• Standardised approach to the assessment of chest pain appears to be effective, however deviation from protocol remains challenging.
Questions
Acknowledgments
References

• 5. Department of Health, Grampians Region Cardiac Framework. 2014. *