Improving Radiology Practice Using the DMAIC Approach of Lean Six Sigma
Many methodologies

Accreditation

Model for Improvement

A3 Reporting

Risk Management

Breakthrough Series Collaboratives
• Lean is about the *elimination of waste* and non-value adding work
• Lean was pioneered by Toyota post WWII and became the TPS

• Six Sigma focuses on the understanding, *reduction and control of variation*
• Six Sigma can be traced back to the early 1800’s but is most often associated with Motorola.
The DMAIC Approach

- Identify the problem
- Build the team
- Hear the voice of the customer/patient

- Measurement Plan
- Handover plan

- Identify solutions
- Pilot changes

- Current process maps
- Data collection
- Control charts/Graphs

- Root Cause and hypothesis testing
### Define - Project Charter

**Problem Statement:**
Starship (SS) radiologists are reporting on, or giving second opinions on imaging that have been done by other DHB Radiology departments.

There are currently no defined processes, documentation or funding mechanisms for this work which increases the clinical risk for patients and quality and efficiency issues for ADHB radiologists and resulting in unfunded work.

| Project Goal | By November 2015 there will be a defined and agreed process, documentation and funding model for external requests to Starship radiology. |
### Voice of the Customer

#### Responding Radiology Departments

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<th>Department</th>
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<td>Auckland District Health Board</td>
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<td>Bay of Plenty District Health Board</td>
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<td>Capital and Coast District Health Board</td>
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#### Are you satisfied with the response time to your request?

- Yes: 99.7%
- No: 0.3%

#### Which modalities do you request reports or second opinions on?

- MR: 79.2%
- CT: 47.9%
- Plain Film: 41.1%
- USS: 22.9%
- PET: 4.2%
- Bone Scan: 2.1%
- Nuclear: 0.3%
- Other (please specify): 8.3%
Conference lists (MDM) may take up 44% but we decided to tackle the other sources first.

CMDHB creates the highest demand.

Waikato requests have the most variation in the time taken to report. However, the median is not significantly different from the other DHBs.

77% of reports were not documented.
Analyse – Identifying Potential Root Causes

Hypothesis testing: Null Hypothesis: There is no difference in the number of reports that are not documented against the target of 10%.
We have very strong evidence against the null hypothesis and the p value is 0.001, we can therefore reject the null hypothesis.
We decided to carry out a 10 week pilot of the new documentation process using floating dictation with three radiologists.
Over the 10 week pilot there has been a total of 30 floating dictations completed resulting in documented reports that are accessible and with a potential revenue of $NZ6,000 so far.
Control – handover and lessons learnt

Handover Plan
- The process map and guidelines have been completed
- Training of all Starship radiologists is underway
- We are measuring the numbers of floating dictations weekly
- Roll out across adult radiology is in the planning stage

Lessons Learnt
- Using the DMAIC approach helped maintain some project structure and momentum, and it was clear that one stage fed the next
- There is enough flexibility in the methodology to allow for human behaviour and change management
- Having a common language for improvement projects is useful