Imaging Demand and Capacity - A Case Study - Bradford Teaching Hospitals NHS Foundation Trust

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Radiology Demand and Capacity Model

The model helps you to:

• Understand your diagnostic imaging demand and also the variation in demand
• Understand the current service
• Understand the core capacity you genuinely have available to see patients and the ad hoc/flexible capacity you rely on to deliver the service

The model will provide:

• An estimate of the capacity you need to meet your demand
• An estimate of the backlog that may need to be cleared to sustainably deliver national, and locally agreed, waiting times standards
IST Support to Bradford

• Significant programme of support to Bradford Hospitals

• Two periods of elective care support spanning 2 ½ years

• Successful programme of demand and capacity modelling at the Trust especially in relation to Radiology

• Number of different models completed, in relation to all modalities and reporting capacity

• Assurance of the work completed by the Trust in relation to the capacity requirements within Radiology- Work led by the Trust

• Lack of or variation in demand and capacity modelling that is completed across elective care is a common issue across organisations
The Real World
Diagnostics Directorate
Imaging Department

Consultants 22
- General Radiologists
- Special interests
  - Neurology
  - Head and Neck
  - Thoracic and Cardiac
  - Upper Gastrointestinal
  - Lower Gastrointestinal
  - Hepato-Biliary
  - Urology
  - Gynaecology
  - Paediatric
  - Musculoskeletal
  - Vascular
  - Breast

Radiographers 159
Modalities
- Plain Film
- Fluoroscopy
- Ultrasound
- MRI
- Vascular Intervention
- Nuclear Medicine/PET
- Breast Screening

CT
- 64 MDCT
- Aquilion ONE
- Aquilion PRIME
National Picture
Changes in Demand

Before examining waiting times, it is important to put some context around the changes in demand per modality.

The most significant average growth in the past three years has been in CT activity—an average increase of 18% over 2 years; MR activity has increased by 15% over the same period, US (combined obstetric and general) by 10% and PET by 11%.
Bradford Teaching Hospitals

CT

Demand

Month

2012

2013
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CT Increase 11.5%
MRI Increase 6%
Governance Structure

- Operational Management Group
- Business case Review Group
- Clinical Executive Group
- Board Sign off
What is important and what is measured?

Waiting times to examination

- 6 Week Diagnostic Target
- Fast Track TAT 14 Days
- Urgent's 7 Days
- IP 2 day
- IP Urgent same session
- AQP Targets

Report turnaround times
Demand & Capacity Tool

Microsoft Excel Worksheet
THE FUTURE

Just doing more of the same, however efficiently, will not provide a solution.
CT Deficit

Options appraisal

• External sourcing
• Internal sourcing
• Managed Service Contract
MRI Deficit

Capital investment

• New OP Facility
• Estate Development
• Capital investment for MRI scanner
• On Going revenue investment
Now

CT

Demand

Month

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2013
2014
2015
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14/15 CT increase 9.5%
14/15 MRI increase 22.5%
Now 16/17 CT

<table>
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<th>Indicator</th>
<th>Patients</th>
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<td>Mean Requests</td>
<td>419 requests</td>
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<td>Mean Core Capacity minus emergencies</td>
<td>339 slots</td>
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<td>Mean Additional Capacity</td>
<td>24 slots</td>
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<tr>
<td>Total Elective Capacity</td>
<td>363 slots</td>
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<td>Required Capacity at the 65th to 85th percentile per week</td>
<td>Between 578 and 629 slots</td>
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<td>Capacity surplus / deficit per week</td>
<td>Deficit of between 239 and 290 slots</td>
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<td>NET weekly waiting list change</td>
<td>+ 86 patients</td>
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<td>WL consistent with delivery</td>
<td>Between 610 and 674</td>
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<td>Current waiting list size</td>
<td>850</td>
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<td>Backlog clearance required</td>
<td>Between 176 and 241</td>
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Therefore the service has a weekly deficit of between 239 and 290 slots per week for CT at the 65th to 85th percentile respectively which is currently being bridged through additional adhoc sessions. In addition, there is a backlog clearance of between 176 and 241 slots required per week.
### Now 16/17 MRI

<table>
<thead>
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<th>Indicator</th>
<th>Patients</th>
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<tbody>
<tr>
<td>Mean Requests</td>
<td>294 requests</td>
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<tr>
<td>Mean Core Capacity minus emergencies</td>
<td>240 slots</td>
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<td>Mean Additional Capacity</td>
<td>55 slots</td>
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<tr>
<td>Total Elective Capacity</td>
<td>295 slots</td>
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<tr>
<td>Required Capacity at the 65th to 85th percentile per week</td>
<td>Between 323 and 378 slots</td>
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<td>Capacity surplus / deficit per week</td>
<td>Deficit of between 28 and 83 slots</td>
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<td>NET weekly waiting list change</td>
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<td>WL consistent with delivery</td>
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<td>Current waiting list size</td>
<td>484</td>
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<tr>
<td>Backlog clearance required</td>
<td>No clearance required</td>
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</table>

Therefore the service has a weekly deficit of between 28 and 83 slots per week for MRI at the 65th to 85th percentile respectively. There is currently no backlog of patients to clear.
Conclusion

We have demonstrated by measuring demand, capacity, activity and backlog enables capacity problems to be resolved at the appropriate point of the system. By clearly understanding these four measures and identifying the bottleneck and its constraint you can:

- Manage and plan work in all Modalities
- Increase throughput by reducing variation and /or matching variations in capacity and demand at the bottleneck.
- Focus improvement effort in the place (bottleneck) where throughput can be increased.
- Identify modalities where capital investment and alternate working solutions can be justified.
- Justify the Importance of external validation
Thank you