Optimising existing services - Understanding Capacity, Demand and Flow

Lesley Wright – Quality Improvement Consultant
Approaches to optimising services

3 key activities:

- **Understand capacity, demand and flow**
- **Improve data quality**
- **Maximise capacity**

**Academic papers**

Reducing waiting times in the NHS: is lack of capacity the problem?

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85% of the reasons for failure to meet customer expectations are related to deficiencies in systems and process rather than the employee. The role of management is to change the process rather than badgering individuals to do better”

“ If I had to reduce my message for management to just a few words, I’d say it all had to do with reducing variation” – W Edwards Deming

‘Foster wholeheartedly the growth and development of all staff, including their ability and support to improve the processes in which they work’

A promise to learn a commitment to Act:
- Prof. Don Berwick – President, Founder IHI
Understanding Capacity, Demand: definitions

**Capacity:** Resources available to do the work.

   Equipment (kit) AND the skill (people) to do the work.

**Measure:** multiply number of pieces of kit (rooms) and staff available to do procedure in minutes. e.g.

   **2 CT scanners staffed 9am – 5pm (8 hours) = 960 minutes of capacity per day**

**Demand:** Work you are requested to do.

   All the requests / referrals coming from **ALL** sources.

**Measure:** multiply number of patient requests/referrals by the time in minutes to do procedure

   Timings: from the patient entering the examination room to leaving (80% of the time)

   **20 referrals x 15 minutes (time to perform procedure) = 300 minutes demand**

**NB.** Measuring appointment time will over estimate demand.

   **20 referrals given a 20 minute scheduled appointment = 400 minutes demand**
Understanding Capacity, Demand: definitions (2)

**Activity:** Work carried out by staff.

**Measure:** Multiply number of patient requests/referrals by the time in minutes to do procedure.

Timings: from the patient entering the examination room to leaving (80% of the time)

Activity should be measured in same time allocations as demand

1 X 15 minutes demand = 1 x 15 minute activity

**Backlog:** WL: – what you should have done.

Backlog is the demand not dealt with because all appointments are taken. With enough capacity they would have been seen.

**Measure:** Multiply number of patient requests/referrals by the time in minutes it takes to do procedure.

20 referrals waiting x 15 minutes (time taken to perform procedure) = 300 minutes

WL/backlog

**Planned waits/ deferred demand:** are requests that MUST be included in backlog as they will become demand and require capacity
Activity is NOT demand

Source: Imaging & Oncology 2016
Improving data quality

Why is good data important

- Operational management
- Business case development
Vitals Flow Charts ©

Vitlal's Charts for St Elsewhere's Endoscopy Department

- **Demand**
- **Activity**
- **WiP** = cumulative diff

WIP

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Conventional intuitive way request data

Collect: All patients requested after beginning 19/01/15

Examined before end 18/01/16

Information window 19th Jan 2015 – 18th Jan 2016

Want patients below 19/01/2015

Patient 1       Miss: Activity, Demand & WIP
Patient 2       Lead times distorted
Patient 3       Activity
Patient 4       Demand & Activity
Patient 5
Patient 6       Demand

In WIP

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Incorrect (intuitive) data collection
Correct way: Counter-intuitive request

19/01/2014 to 01/11/2016

Information window 19th Jan 2015 – 18th Jan 2016

19/01/2015

18/01/2016

Want patients below

Patient 1
Patient 2
Patient 3
Patient 4
Patient 5
Patient 6

Include:
Activity, Demand & WIP

Lead times reflect reality

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All patients requested before end 18/01/16 and examined after 19/01/15
Correct (counterintuitive data collection)

Homerton CT Patients: Demand, Activity WIP 19th Jan – 31st Jan 2015

CT: Demand, Activity & WIP - 19th Jan 2015 - 18th Jan 2016

CT: Request - Exam wc 19th Jan - 31st Jan 2015
Understanding Flow - Impact of ‘carve out’ on capacity

• Balanced Capacity & Demand will not be sufficient if ‘carve out’ slots or sessions
www.steyn.org.uk/
Impact of ‘carve out’ simulation

For model go to www.steyn.org.uk/models/demand analysis.xls