

Diagnosing poor flow in plain film imaging

Project Aim

To understand the demand for plain film imaging, the work-load this demand produces, the available capacity of the de-partment.

What was the problem/challenges?

- Patients often waiting a long time in waiting room
- Increase in demand for plain film imaging by 23% which indicated a return to pre covid activity
- Lack of room capacity due to an x-ray room with broken equipment being used as a store room
- Variation in the system throughout the day - resulting in patients not being seen in the order in which they arrive

- Existing radiographer resource not matched to demand throughout the day
- Radiographers performing non radiographic tasks
- Clinical leads performing admin tasks

How was diagnosis made?

- Mapped the process with system map, stakeholder map, process map
- Engaged all staff in 4N process to understand the Nuggets, Niggles, Nice If requirements and No Nos
- Manual data capture to measure the patients journey through the department
- Produced CT Vitals Chart® of weekly demand, activity, work in progress and lead times from Radiology Information System (RIS)



SUMMARY OF FINDINGS

- Patients arrive at a rate of 1 per 3.5 minute (demand interval)
- Patients arrive relatively smoothly (with some clusters) but do not leave smoothly and this causes delays
- Inpatients are brought to the department at the busiest times of the day
- The Vitals Charts® show demand closely matches activity.
- The staggered start leads to queues and waits in the department before all staff resources are available
- Resource capacity is lost between 8am and 9am as patients do not arrive every 3.5 minutes in this first hour
- Lead times were in excess of 20 mins for most patients
- Inpatient demand remains relatively stable
- Outpatient demand has returned to pre-covid levels
- GP referrals have increased by a further 10% in excess of pre-covid levels
- 4% of plain film requests are cancelled (800 no longer required & 700 duplicates)

ANALYSIS

To diagnose the issues data was taken from the radiology information system covering (Sept 20—Sept 21). Charts were developed to show the total weekly requests for plain film x-ray & weekly images. They showed Work In Progress (WIP) of 0.5 days.

There was a feeling among staff members that the demand varied and certain days were busier than others. By analysing the demand data by day of week and excluding bank holidays, but the mean demand is very stable and consistent, with low demand at weekend. Charts were produced for each referral source IP, OP and GP Direct Access. This showed an increase in activity as the service returned to "normal" post-covid position, with the GP referrals showing a 10% increase in GP referrals in excess of the return to pre-covid activity.

The charts also showed that patients were waiting throughout the day, and that there was a staggered start at the beginning of the day due to the shift patterns for the radiographers. This sets the day up to fail as there is a lack of resource, by 10am there is already a queue of patients building. The backlog is then reduced but over lunch time there is a reduction in radiographer resource allowing the queue to build again. In addition, in-patients are brought down from wards mid morning and mid afternoon and those patients in effect queue jump. All of these factors contribute to the queue increasing during the day (Each day follows a similar pattern).

WHO WAS INVOLVED?

Colette Hignett, Senior information analyst, Cheshire and Merseyside Imaging Network, CAMRIN
Lorraine Collins ,LHCH improvement facilitator were the Health Care Systems Engineering (HCSE) trainees. Additional support was required from booking staff, clinic lead and radiographers to collect the required data for the project and Lesley Wright, HCSE coach.

FOR MORE INFORMATION

If you would like more information on this CAMRIN case study; please contact: CAMRIN@liverpoolft.nhs.uk

NEXT STEPS

After reviewing the findings with Liverpool Heart and Chest NHS Foundation Trust (LHCH) plain film imaging department they have recognised there are several changes needed to reduce patient waiting times and meet current demand. The following changes have been suggested:

- Trial using a porter from 8am-9am to bring inpatients to the department during this time, to reduce LOS
- Trial a radiographer department assistant to support the radiographers to work to 'top of their licence'
- Trial changes to radiographers shift times with more staff on shift at 9am to meet demand
- Recruit an admin support worker to free up the clinic lead from doing admin work
- Ongoing monitoring of demand and activity using Vital Charts®

