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Elective Recovery with Patient Flow Analytics:

Update on progress and findings

About this paper:

This paper aims to provide a high-level overview of how patient flow analytics e.g. process mining can be used to support elective recovery and the associated improvements required.

Executive Summary:

Elective care recovery remains a significant challenge in the National Health Service (NHS) and existing analytics may not be contributing to this effort. One of the reasons for this is the lack of insights on patient flow.

Patient flow analytics should provide insights for each patient journey. For every patient journey, you will have insights on the activities within one or more processes e.g. e-Referral advice and guidance flow or Referral-to-Treatment flow. The most powerful insights will show you where genuine bottlenecks are, how fast or slow activities take to complete, how each hand-off is managed and enable individuals to uncover unwarranted variations.

Logan Tod & Co worked closely with the NHS over the last four years to develop advanced patient flow analytics. NHS England have now built the first and most advanced community of practice leading in the use of process mining to generate patient flow insights via AnalystX.

In this article, Qian Huang (Process Mining lead for AnalystX) and Ruby Nicholls (Senior Analytical Manager – Elective Improvement) share the key insights from our experience and the latest East of England (EoE) Pathway Efficiency programme of work. These have all been discovered in real data from Trusts and National sources, and insights are worked through with NHS Trust and Regional level clinical and non-clinical experts to try to understand the root causes and potential impact on recovery.

Root Causes identified:

DNAs: Multiple referrals for the same condition (“Scatter gun” approach)

Referrers like General Practitioners (GPs) are making referrals for the same patient and condition to 2 or more Trusts in the hope that one of the Trusts will see the patient sooner. Preventing this practice has the opportunity to reduce overall DNA and unnecessary appointments.

Recovery Impact 1: If 20% of GPs make two referrals for the same patient and condition, there would be 40,000 appointments of which 50% (20,000) would be unwanted appointments.

Inappropriate referrals: GPs training or guidelines needs to be updated

There is a noticeable variance in rates of referral from GP and the quality of those referrals. Using Patient flow insights to visualise the patients discharged at Triage, the GP Practices can be identified which provides an opportunity for Trusts and GPs to work together on better guidance and/or training to reduce unnecessary referrals.

Recovery Impact 2: 1% of referrals ended at ‘Triage’ in one Trust, when applied across EoE this would release 2,000 triage slots.

Utilisation of resources: Unnecessary rework in referral services

In some circumstances, outpatient referral guidelines are not followed, leading to significant rework e.g. multiple ‘Advice’ for one A&G requests and converted A&G requests going through a secondary triage process before an appointment is given.

Recovery Impact 3: 27% of referrals had rework e.g. two or more repeats of clinical and non-clinical activity, generating additional 2.4x activities per referral. When applied across EoE this would release 129,600 clinical and non-clinical capacity.

Utilisation of resources: High volume of predictable 'unwanted' activities, including DNA

Patients who wait for a long time with no communication from a Trust are more likely to DNA or have planned activities cancelled because the patient is not well prepared (See below). Trusts not validating in real time are unable to fill last minute cancellations with the most appropriate patients.

Recovery Impact 4: 35% of referrals in one Trust generated 1.2x of 'unwanted' clinical and non-clinical activities relating to DNAs or cancellations in both Trust and Primary Care settings. Across EoE, this could release 84,000 clinical and non-clinical activities.

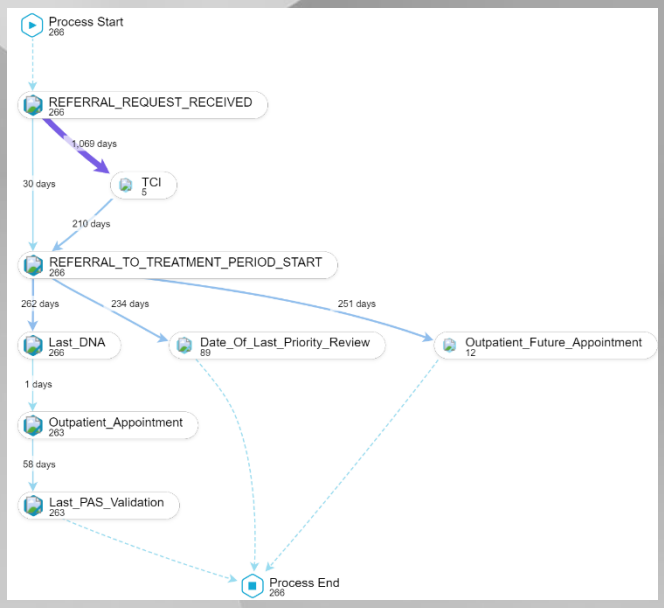

Figure 1: Sampe of National Waiting List Minimum Dataset filtered for referrals with Last_DNA

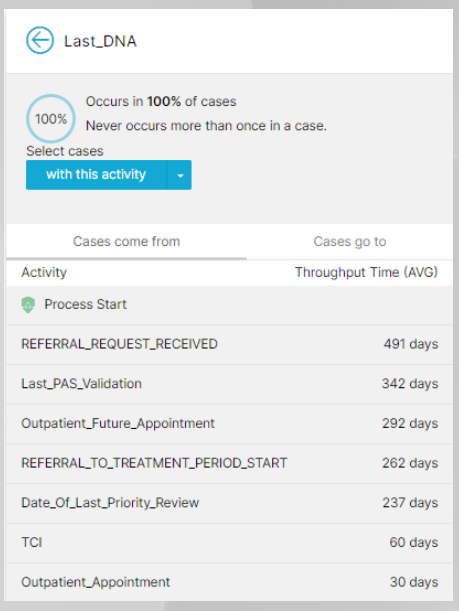

Figure 2: Illustrates the Process Activities before Last_DNA

Utilisation of resources: Inappropriate Clinician allocation

Patients are sometimes sent to the next available, rather than the most suitable clinician for their condition or booked into the wrong clinic for their clinical presentation. For example, ENT patients requiring an Ear specialist is booked into a clinic with a Throat specialist. These events leads to rework ie utilising two appointment slots for first appointment.

Recovery Impact 5: 6% of referrals were recorded as inappropriate in one Trust of which 1% had appointments booked or rebooked. When applied across EoE could release 12,120 appointment capacity.

Utilisation of resources: Rethinking follow-ups and PIFU

Patients can be booked into an Outpatient slot to be delivered via remote consultation for follow-up, when they actually require a face-to-face consultation. The impact of Patient Initiated Follow Up (PIFU) and an associated reduction in follow up activity is yet to be seen across all Trusts due to follow up activity being used to tackle the backlog. Patient flow insights identified significant variation (25%) across referral processes with opportunities to reduce potentially unnecessary follow-ups.

Recovery Impact 6: Virtual clinics booked for Face-to-Face only appointments was discovered in one Trust for one specialty. If 1% of all clinical capacity were wasted in the same way, EoE could release 2,000 appointment capacity.

Utilisation of resources: Un-coordinated scans and tests

Necessary scans or tests are not being completed prior to appointments due to poor co-ordination is a significant bottleneck.

Recovery Impact 7: 5% of referrals cancelled because scans and tests were not completed equates to 10,000 appointment capacity.

Clinical management: Validation capabilities

We found evidence that some Trusts are still relying on spreadsheets to validate vast amount of patient pathways, in some cases taking over 6 months. It is difficult for Trusts to accurately prioritise patient needs as they do not always have up-to-date information on the patient's condition. Patients who are advised they will be monitored or reviewed may not initiate contact to provide updates on their condition. We found patients who have not interacted with the referral service for more than 12 months. Some of these patients may not require further clinical interventions and can be discharged from the waiting list back to their GP. There is also a risk that patients are deteriorating while waiting.

Recovery Impact 8: In one Trust, 9% of patients waiting hadn't been seen in the last 12 months, if these patients no longer requiring treatment it will reduce EoE waiting list (for RTT Pathways and Non-RTT Pathways) by approximately 311,760 pathways.

Conclusion:

Patient flow analytics provide a clear picture of the existing opportunities in elective recovery. Unlike existing KPIs and targets that often drive unwanted 'activity maximising' behaviours rather than impact maximising behaviour, smarter analytics enables the NHS to address the root causes which will generate sustainable recovery.

Methodology

All figures are based on an average (rounded up) of 200,000 referrals per month. Each opportunity represents a saving for 1 months referrals.

Source: E-Referral Data, date range: 2023 and 2024.

Root cause	Recovery Impact	Capacity released in a month
DNAs: Multiple referrals for the same condition ("Scatter gun" approach)	If 20% of GPs make two referrals for the same patient and condition, there would be 40,000 appointments of which 50% (20,000) would be unwanted appointments.	**20,000** 20% of 200,000 = 40,000, 50% of 40,000 = 20,000
Inappropriate referrals: GPs training or guidelines needs to be updated	1% of referrals ended at 'Triage' in one Trust, when applied across EoE this would release 2,000 triage slots.	**2,000** 1% of 200,000 = 2,000
Utilisation of resources: Unnecessary rework in referral services	27% of referrals had rework e.g. two or more repeats of clinical and non-clinical activity, generating additional 2.4x activities per referral. When applied across EoE this would release 129,600 clinical and non-clinical capacity.	**129,600** 27% of referrals is 54,000, 54,000 x 2.4 = 129,600
Utilisation of resources: High volume of predictable 'unwanted' activities, including DNA	35% of referrals in one Trust generated 1.2x of 'unwanted' clinical and non-clinical activities relating to DNAs or cancellations in both Trust and Primary Care settings. Across EoE, this could release 84,000 clinical and non-clinical activities.	**84,000** 35% of 200,000 = 70,000. 70,000 x 1.2 = 84,000
Utilisation of resources: Inappropriate Clinician allocation	6% of referrals were recorded as inappropriate in one Trust of which 1% had appointments booked or rebooked. When applied across EoE could release 12,120 appointment capacity.	**12,120** 6% = 12,000 + 1% of 12,000 = 120 12,000 + 120 = 12,120.
Utilisation of resources: Un-coordinated scans and tests	5% of referrals cancelled because scans and tests were not completed equates to 10,000 appointment capacity.	**10,000** 5% of 200,000 = 10,000
Clinical management: Validation capabilities	In one Trust, 9% of patients waiting hadn't been seen in the last 12 months, these patients no longer requiring treatment it will reduce EoE waiting list by c.326,000 pathways. (as of 4 February 2024)	**866,162 active** RTT Pathways as of December 2023 published statistics for Region Code Y61. Assume there are 4 x the volume on a review list due to long term condition management = 3,464,000 9% of 3,464,000= 311,760.