South West Wales Cancer Centre uses Health Care Systems Engineering (HCSE) Tools and Methodology to Deliver Better Services for Patients

Organisations: South West Wales Cancer Centre and Abertawe Bro Morgannwg University Health Board

Profile:

The South West Wales Cancer Centre covers a wide geographic area with a population of 900,000.

Currently, cancer patients receiving parenteral chemotherapy treatment within the day case setting in Abertawe Bro Morgannwg University Health Board (ABMUHB), attend the Chemotherapy Day Unit (CDU) at the Singleton Hospital site in Swansea.

This unit treats on average 40 patients per day Monday to Friday and delivers approximately 1,500 Systemic Anti-Cancer Therapy (SACT) treatments each year.

Headline Improvements:

Average patient waiting time reduced from 45 minutes to 18 minutes

Monday average waiting times reduced from 60 minutes to 20 minutes

19% Increase in average patients seen each week – an extra 17 patients per week

Detailed Journal Articles:

A series of three detailed articles are available which give the full story of the analysis and changes made by the Chemotherapy team.

"We are convinced that the HCSE approach works. For us it has delivered *exactly what it said on the tin* and a lot more besides. We are starting to embed this learning into all of our main departments within our bigger system in an attempt to embed continual improvement into everything we do."

Chris Jones, Improvement Science Practitioner for Cancer Services, Singleton Hospital, Swansea

"I've been delighted with the improvements that our team has designed and implemented using the HCSE tools and approach. The feedback we have had with our newly designed service has been excellent. I'm now also doing the Improvement Science Practitioner Certificate and finding it very enlightening."

Dr Delia Pudney, Consultant Clinical Oncologist, Abertawe Bro Morgannwg University Health Board

The Chemotherapy team within the South West Wales Cancer Network sought to improve the service it provided for its patients by reducing waiting times and enabling more patients to be treated without increasing costs. Now the team have successfully eliminated most of the 'waste' in their system and for the first time their service is stable enough that they can start looking at how they can more efficiently schedule patients for their treatment.

Service Needs

Cancer survival in the UK has doubled in the last 40 years from 24-50%. Much of the improvement in survival is down to the availability of better diagnosis and treatment options of the disease. As people are living longer, the demand for ongoing treatment with parenteral chemotherapy is increasing in parallel with this.

Not all treatment is curative and many patients receive palliative chemotherapy aimed at prolonging life and reducing symptoms of the disease.

Administration of chemotherapy to patients within a day case setting is a mainstay of successful cancer treatment.

The service delivery model was under considerable stress with increasing waiting lists to receive treatment driven by improved outcomes and longer survival rates.

The current system has significant variation in the length of time taken to complete the steps of the process as the patient passes through the different stages.

The goal of the entire service is to ensure that a patient's chemotherapy is ready and waiting prior to the start of their allocated appointment time.

There should be no avoidable delays because this is vital for optimising the amount of curative and palliative treatment that can be delivered and ensuring that palliative patients can make the most of the time they have left.

However, the number one cause for patient complaints within the CDU was that the patient's chemotherapy was not ready for them at the start of their allocated appointment time.

Using Systems Engineering Tools

Following the HCSE approach, Chris and his colleagues mapped out all the steps involved in the patient's journey through the Chemotherapy service. The key steps in the process are designed to ensure patient safety and include

- a blood test that must have been performed within previous 72 hours (for patients on 3 week cycle)
- blood test results authorised
- Pharmacy team authorise the manufacture of the required chemotherapy drugs to meet specific patient prescription.

The team collected data on the time taken by patients to get through each of these steps, this enabled them to accurately measure how their service was performing.

A special data analysis tool called BaseLine© was used to help them see that there were significant variations in performance on different days of the week. Mondays were the worst day with patients waiting the longest times.

This was drawn up as a Gantt chart with colour coding to enable the team to easily identify where the bottlenecks were in the system.

The initial diagnosis showed that patients on Mondays were having to wait for their drugs to be manufactured as there had not been time to get this done since their blood had been taken on Friday.

The first change designed by the team was to arrange for weekend manufacture of drugs.

Reviewing the performance data after this change was made showed that the waits on Mondays had reduced but Tuesday was now the worst performing day and there was still significant variation across the week. They had freed up manufacturing time on Mondays but the bottleneck that showed up now was that the blood results weren't ready in time to enable manufacturing to start.

Chris Jones had discovered the principles of Health Care Systems Engineering (HCSE) when he had attended a Patient Flow Workshop in June 2014.

"I was hooked when I found there was a science based approach to solving the issues that I was seeing in the health system. I completed my Foundation course and did my Improvement Science Practitioner Level 1 Certificate. I was looking for a project to use to support my Level 2 Certificate and in discussion with my coach we agreed that tackling the waits in the Chemotherapy service would be a great opportunity."

Further mapping of the Phlebotomy Service and gathering more data allowed the team to measure and diagnose that there were problems in getting the blood samples to the lab in time to get the tests done and allow more time for drug manufacture.

The team arranged booked appointment times for blood tests to be done either at the CDU on weekdays or Ward 11 at the weekend. It was explained to patients that this would help to reduce their waiting time when they came for their Chemotherapy treatment.

The analysis of this intervention again showed an improvement with waiting times reducing and the variations on different days of the week also showing an improvement.

A third analysis identified that there were additional improvements that could be made to the authorisation of blood results and to the delivery times for blood samples from patients living in more rural areas. It didn't make sense for these patients to come all the way to Swansea for their blood test. The voluntary group, Blood Bikes Wales, were used to collect samples from each of the rural satellite units and hand deliver the samples directly into the lab every Friday morning, matching the in-house service.

Getting these final changes made required everyone in the Chemotherapy service to get more involved and to fully understand how their role fit within the bigger picture.

Benefits

The final analysis now showed that they had managed to design and implement a system that was now stable across the week.

Patient waiting times had reduced on average from 45 minutes to 18 minutes.

More patients were now being treated – an extra 17 per week represented a 19% productivity improvement – with no extra staff or chemo chairs.

Perhaps the most striking measure for success observed by staff and patients alike is the empty waiting room each morning.

Chris and the team are now looking forward to the next improvement challenge, better scheduling usage of the Chemotherapy chairs to enable even more patients to be treated.