

Trauma and Orthopaedic Evaluation: Pre and Post Pilot - Draft

Executive Summary

The Trauma and Orthopaedic pilot was introduced on 20th October 2017. The pilot centralised all trauma surgery to GRH and the majority of elective orthopaedic surgery to CGH.

Trauma and Orthopaedic inpatient services have been part of the recent Fit for the Future (FFTF) public consultation focussing on the medium and long term future of specialist hospital services at Cheltenham General Hospital and Gloucestershire Royal Hospital. The consultation proposal was to maintain two 'centres of excellence' for Trauma at Gloucestershire Royal Hospital and Orthopaedics at Cheltenham General Hospital.

As part of the FFTF programme details including the clinical evidence for this proposal (both desktop and from the pilot), patient and staff (including junior doctor quality panels) experience, an options appraisal assessing the pilot vs. reverting to the previous configuration and benefits realisation information were included in the FFTF Pre-Consultation Business Case (PCBC). The proposal was also assessed as part of the South West Clinical Senate review.

The purpose of this report is to provide a systematic evaluation of the Trauma and Orthopaedic pilot to be included as part of the FFTF decision making process as well as additional performance information. The report is structured around the 10 key objectives of the pilot (using the latest available data sets) and latest performance is summarised below:

- 6 of 10 objectives have been achieved
- 3 of 10 objectives show much improved performance
- 1 of 10 objectives has not been achieved.

#	Pilot objective	Description	Current position	Outcome
1.	Co-location of arthroplasty (joint replacement) surgery	To improve standardisation of pathways.	All arthroplasty at CGH and ERAS pathway and standardisation of prostheses	Achieved
2.	Reduced cancellation of elective patients for trauma patients	Cancellations frequent, particularly when complex sub-specialty surgery was required	There are still cancellations when there are peaks in trauma demand but significantly fewer	Much improved
3.	Reduced cancellation of elective patients when beds used for other specialties	Elective patients were often cancelled when the hospitals had periods of high demand.	There are still cancellations in times of high demand but significantly fewer	Much improved
4.	Timely review of trauma patients by a senior decision maker to reduce wait times in ED	On call consultant and registrar could be scheduled to work either in theatre or clinic at the same time.	Now there is a consultant and registrar as well as a foundation doctor to give an immediate response	Achieved
5.	Timely review of admitted trauma	On call consultant and registrar could be	There is now an on-call consultant and Registrar	Achieved

#	Pilot objective	Description	Current position	Outcome
	patients by a senior decision maker	scheduled elsewhere and were not always available for immediate consultation	who do not have other duties and so are available for immediate consultation	
6.	Implement regular senior review for trauma inpatients	There was no routine Ward/Board Round for trauma patients which meant delay for review	Now there is a 7 day a week Ward/Board round for all trauma patients	Achieved
7.	Respond to rapid increase in trauma referrals to fracture clinic	Increase in demand just prior to the pilot leading to unacceptable delays	New trauma triage service in place to assist with growing demand	Much Improved
8.	Improve time to theatre for trauma patients	There was a delay in getting some patients to theatre, especially during peaks in demand	Although the care for trauma patients is now standardised, this remains an issue to be resolved.	Not achieved
9.	Address poor junior doctor feedback	Access to senior colleagues was difficult as timetables prevented regular supervision	There is now a consultant and registrar available for supervision and regular training sessions	Achieved
10.	Improve junior doctor recruitment	Filling junior doctor posts was often difficult	The service is now fully staffed	Achieved

The main section of the report provides the context, data and details underpinning the assessment for each of the objectives but it is worth noting that:

- Given the length of the pilot period (over 3 years), there have been significant external changes which have impacted on the service and these are explained in the report.
- Despite work to increase the efficiency of the trauma service, the increase in demand has exacerbated the difficulty of 'time to operation' especially when there are peaks in demand.
- Patients with fractured neck of femur will be (correctly) prioritised for surgery before those with wrist fractures. However this increase leads to a pressure on theatre resource particularly as each fractured neck of femur patient will require 2 to 3 hours in the operating theatre. Growth in hip fractures since 2009 has grown 21% an average year on year increase of 3.8%.
- The trauma team have been working to maximise theatre efficiency and also convert some theatre lists from elective to trauma. More theatre lists have been made available at Cirencester Hospital and some non-complex trauma surgery is undertaken there. In addition more day cases from the remaining elective work at GRH have been transferred to Cirencester Hospital to create more theatre space within GRH theatres for Trauma patients. There is a further plan to utilise one of the new day surgery theatres at CGH that are to be developed as part of the £39.5M Strategic Site Development Programme for orthopaedics. This will enable the service to further reorganise elective lists and create theatre space at GRH for additional trauma surgery.

In summary, the pilot achieved the vast majority of its objectives and has made a positive impact on patients. The team are working to achieve all objectives, to make the best use of the opportunities provided by the Strategic Site programme and to continuously improve the service. The report also includes lessons learned and recommendations for future implementation monitoring and evaluation.

Introduction

Background

The Trauma and Orthopaedic (T&O) pilot was introduced on 20th October 2017. Prior to the pilot service change, both trauma surgery and planned orthopaedic surgery was carried out at Gloucestershire Royal Hospital (GRH) and Cheltenham General Hospital (CGH).

Under the pilot, all orthopaedic trauma surgery is now carried out at GRH and as much planned orthopaedic surgery as possible e.g. hip and knee replacements is carried out at CGH. The T&O service has sole use of 8 Theatres (4 at CGH and 4 at GRH) all of which have laminar flow (special high flow air conditioning which minimises the incidence of deep joint infection). As the theatre infrastructure was fixed, all elective (planned) arthroplasty (joint replacement surgery) was transferred to CGH however approximately 30% of elective orthopaedic surgery remains at GRH. The paediatric (children's) wards are in GRH and therefore paediatric surgery must remain there. There are some sub-specialties where there are links with trauma surgery. As the transfer of the remaining elective surgery is dependent on suitable theatre provision at CGH, there are plans in place to utilise one of the new day surgery theatres at CGH that are to be developed as part of the £39.5M Strategic Site Development Programme for orthopaedics. This will enable the service to undertake all elective adult day surgery at CGH and create theatre space at GRH for additional trauma surgery.

Fit for the Future

Trauma and Orthopaedic inpatient services have been part of the recent Fit for the Future (FFTF) public consultation focussing on the medium and long term future of specialist hospital services at Cheltenham General Hospital and Gloucestershire Royal Hospital. The consultation proposal was to maintain two 'centres of excellence' for Trauma at Gloucestershire Royal Hospital and Orthopaedics at Cheltenham General Hospital.

The FFTF Pre-Consultation Business Case (PCBC) provided extensive information on the performance of the pilot, including:

- Published clinical evidence
- T&O service key performance indicators
- T&O service improvements
- Lessons learnt and areas for improvement
- Patient and staff experience including junior doctor quality panels
- Results of the options appraisal assessing the T&O pilot vs. reverting back to the previous configuration and,
- Benefits realisation information

The proposal was also assessed as part of the South West Clinical Senate review of all FFTF proposals; in summary the senate stated that:

- The pilot has shown that the service works, with clear pathways in place and good staffing, since 2017.
- There is an effective handover and regular ward round at GRH. On call consultant provides support to any out of hours issues at CGH and over weekend.

All documents can be found at [Fit for the Future: Developing specialist hospital services in Gloucestershire – OneGloucestershire.net](https://www.onegloucestershire.net).

Purpose of the Report

The purpose of this report is to provide a systematic evaluation of the Trauma and Orthopaedic pilot to be included as part of the FFTF decision making process as well as additional performance information. The report is structured around the 10 key objectives of the pilot, using the latest available data sets. Given the length of the pilot period (now over 3 years), it is worth noting there have been significant changes which have impacted on the service and these are explained in the sections below.

The objective of the pilot was to address the following areas:

- Co-location of arthroplasty (joint replacement) surgery to allow standardisation of pathways.
- Elective patients were often cancelled for emergency (trauma) patients; particularly when complex sub-specialty surgery was required.
- Elective patients were often cancelled when the hospitals had periods of high demand.
- Trauma patients did not always receive a timely review by a senior decision maker in ED because the on call consultant and registrar could be scheduled to work either in theatre or clinic at the same time. This exacerbated wait times in ED and at the time of implementation of the pilot Gloucestershire Hospitals were in special measures for poor performance in achieving the 4 hour ED target.
- Once admitted the senior review of trauma patients was variable (depending on the admitting consultant's timetable); this often led to patients staying in hospital longer than necessary.
- There was no routine Ward/Board Round for trauma patients which meant delay for patients but also lost opportunity for supervision of junior doctors with poor trainee feedback.
- Junior doctor training, feedback was variable with better supervision and workload
- Junior doctor recruitment was problematic

Three of the pilot KPIs performance form part of the Trust's Quality Performance Report that is presented monthly at Trust Public Board; performance against the national 4 hour ED standard, the percentage of fractured neck of femur patients treated with 36 hours and the percentage of fractured neck of femur patients meeting best practice criteria.

Governance and Assurance

This report was drafted by the T&O team with support from the FFTF Programme Team.

A draft of the report has been reviewed by the GHNHSFT Surgical Board.

Members of the T&O Board received an updated draft of the report and their comments are incorporated.

The report will be presented and reviewed in public at both the GHNHSFT Board and Gloucestershire Clinical Commissioning Group (CCG) Governing Body; prior to formal FFTF decision making. A copy of the final report will be provided at <https://www.onegloucestershire.net/yoursay/>

The report will also be provided to the Gloucestershire Health Overview & Scrutiny Committee, who last had a T&O update in May 2019.

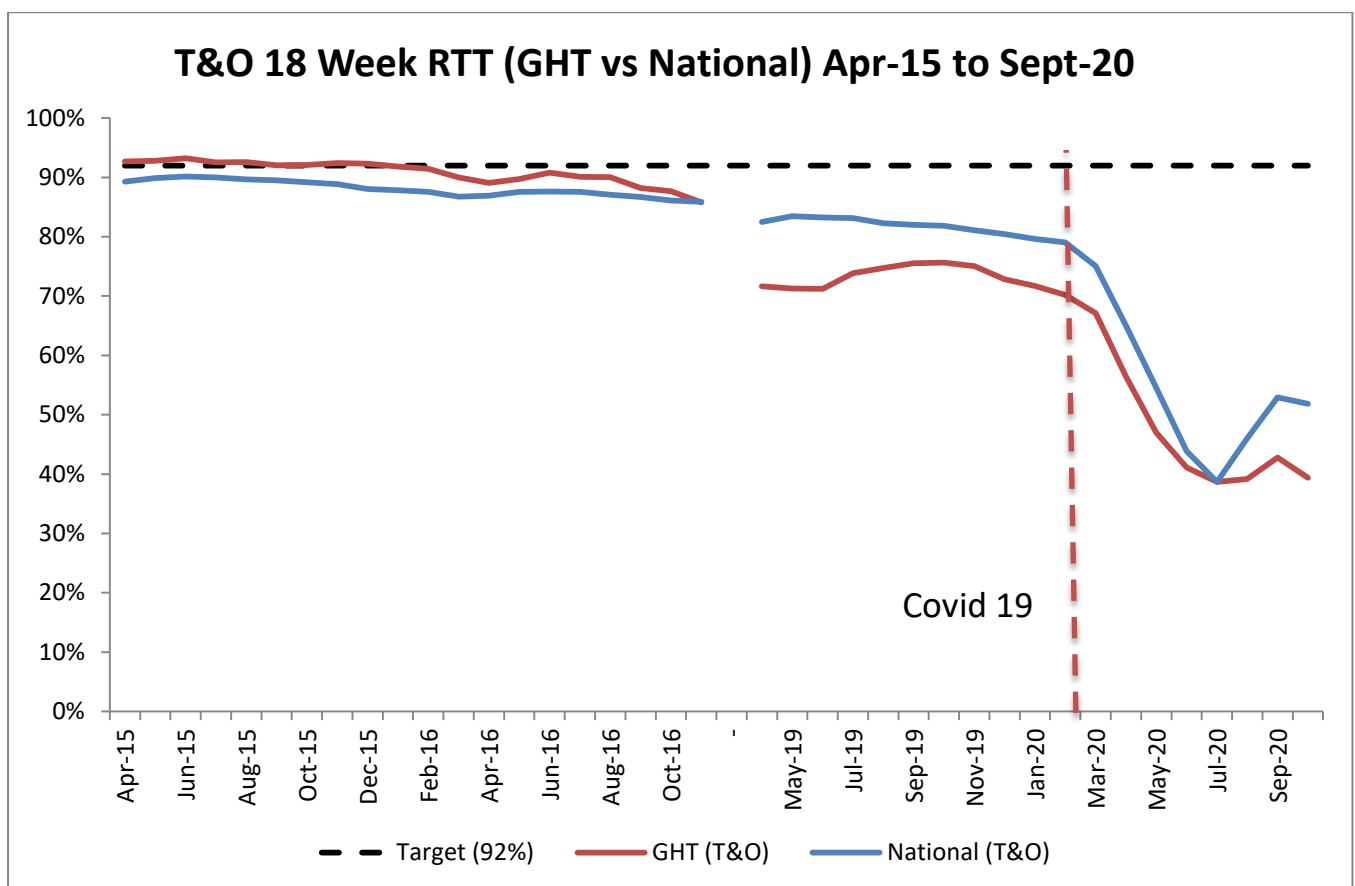
Elective Orthopaedic Data

Over the past three years since the beginning of the pilot there have been many changes, including implementation of a new Patient Administration System (PAS), a six month refurbishment of one of the laminar flow theatres at CGH, a new referral system and the impact of the COVID 19 pandemic in 2020 which has resulted in elective work being reduced and orthopaedic staff diverted to treat patients with COVID 19 and support non-COVID areas at CGH and GRH.

When the new PAS was implemented not all data links to the Business Intelligence team were completed and it was very difficult to obtain data and in particular to go back a year before the start of the pilot to establish a performance baseline. A new pre-pilot dataset is now available which has closed some of these gaps and is included in the sections below.

18 week target:

There is a national 18 week target from referral to treatment for all elective surgery, detailed in the graph below. Before the pilot and it can be seen that the orthopaedic service was achieving the target (95%) during 2015 but dropped to 85.8% by the end of 2016. This was due to closure of elective wards during peaks of high activity (bed pressures).

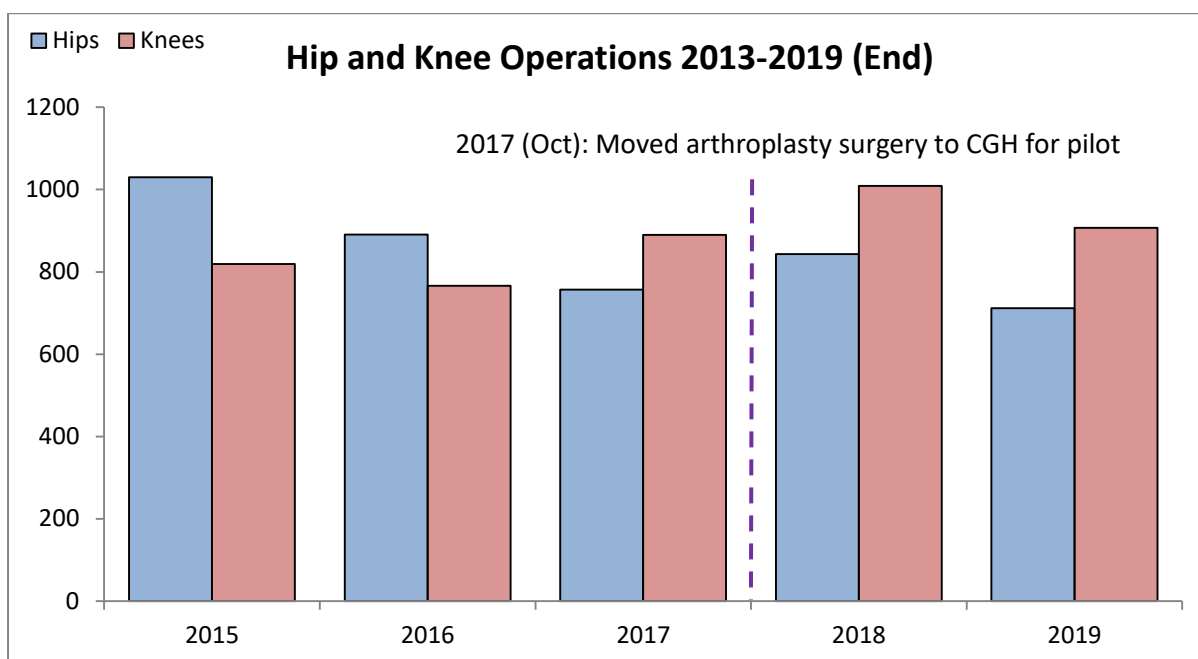


It should be noted that from November 2016 to April 2019 the Trust was unable to report the 18 week target data. A new IT system was implemented and during this time the data was not deemed sufficiently reliable.

Hip and Knee Arthroplasty Replacement Surgery:

This data has been presented by the BI team who have identified patients who have elective arthroplasty surgery. **It should be noted that during 2019 the service were without one of the arthroplasty theatres for 6 months whilst it was refurbished (*).**

Type of operation	2015	2016	(20 th Oct pilot) 2017	2018	2019
Hips	1030	891	757	843	712
Knees	819	766	890	1009	907
Grand Total	1849	1657	1647	1852	*1619



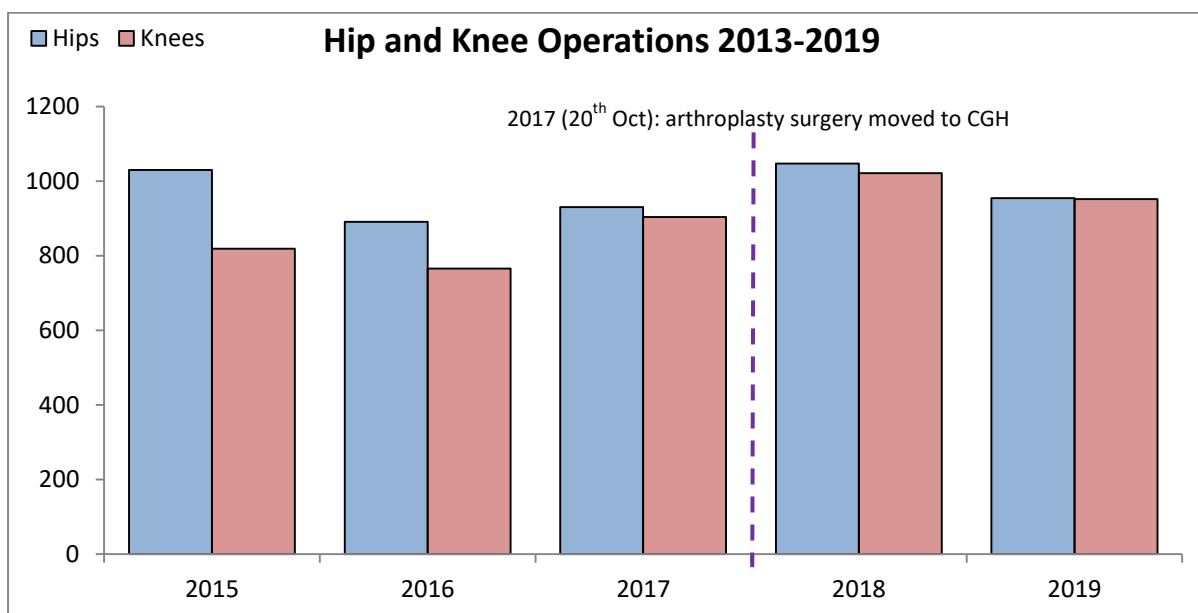
2018/19: On block contract

2018: One theatre at CGH close for refurbishment (6 months) and 3 theatres (3 weeks)

Hip and Knee Operations recorded by the National Joint Registry:

It will be noted that these are different from those in the report compiled by the BI team however they include hip arthroplasty undertaken for trauma patients as well as elective surgery.

Type of operation	2015	2016	(20 th Oct h/c split) 2017	2018	2019
Hips	1030	891	931	1047	955
Knees	819	766	904	1022	952
Grand Total	1849	1657	1835	2069	1907



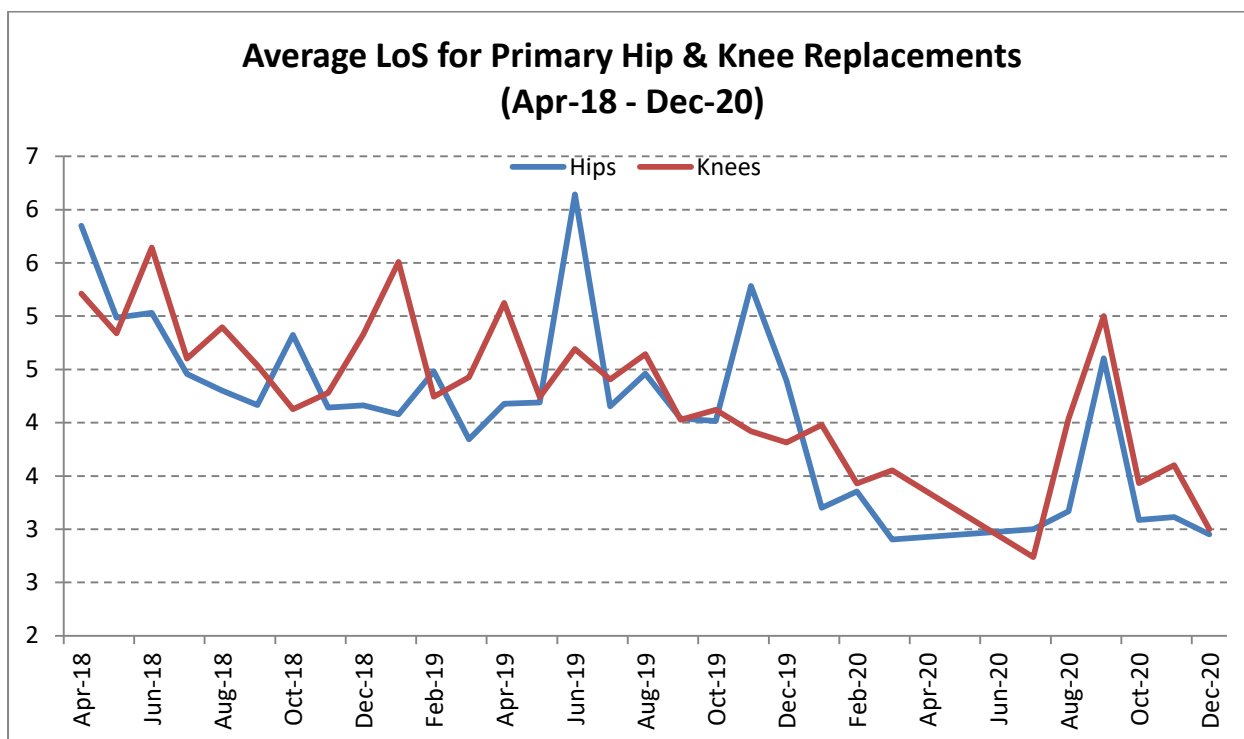
Objective #1: Enhanced Recovery after Surgery (ERAS)

#	Issue	Description	Current position	Outcome
1.	Co-location of arthroplasty (joint replacement) surgery	To improve standardisation of pathways.	All arthroplasty at CGH and ERAS pathway and standardisation of prostheses	Achieved

By relocating the arthroplasty (joint replacement) surgery on one site the service established a multidisciplinary ERAS working group in 2018. In a year they were able to save 1741 bed days, 726 days after hip arthroplasty and 1015 after knee arthroplasty by:

- Establishing an audit programme
- Link nurses for ERAS established in all departments
- Starting Pre-op Carbohydrate drinks
- Monthly review of readmissions to look for trends
- Increased patient involvement
- Patients have access to a post op advice line/ wound service which is well utilised
- Established staff education programmes
- Working with infection control team to produce a new protocol for post-op wound care
- Stopped using Diamorphine in spinal anaesthetic which reduces the incidence of nausea /vomiting and post-op dizziness.

Length of Stay¹



¹ Data source: ERAS reporting – orthopaedic dashboard.

Length of Stay

Type	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Hips Ave. LoS	5.9	5.0	5.0	4.5	4.3	4.2	4.8	4.1	4.2	4.1	4.5	3.8
Knees Ave. LoS	5.2	4.8	5.6	4.6	4.9	4.5	4.1	4.3	4.8	5.5	4.2	4.4
Total primary Hip/Knee	112	137	124	151	127	125	159	146	108	97	105	120

Type	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20
Hips Ave. LoS	4.2	4.2	6.1	4.2	4.5	4.0	4.0	5.3	4.4	3.2	3.4	2.9
Knees Ave. LoS	5.1	4.2	4.7	4.4	4.6	4.0	4.1	3.9	3.8	4.0	3.4	3.6
Total primary Hip/Knee	112	132	61	123	124	122	138	110	86	105	87	50

Type	Apr-20 ²	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Hips Ave. LoS	-	-	-	3.0	3.2	4.6	3.1	3.1	3.0
Knees Ave. LoS	-	-	-	2.7	4.0	5.0	3.4	3.6	3.0
Total primary Hip/Knee	0	0	0	55	64	62	67	51	37

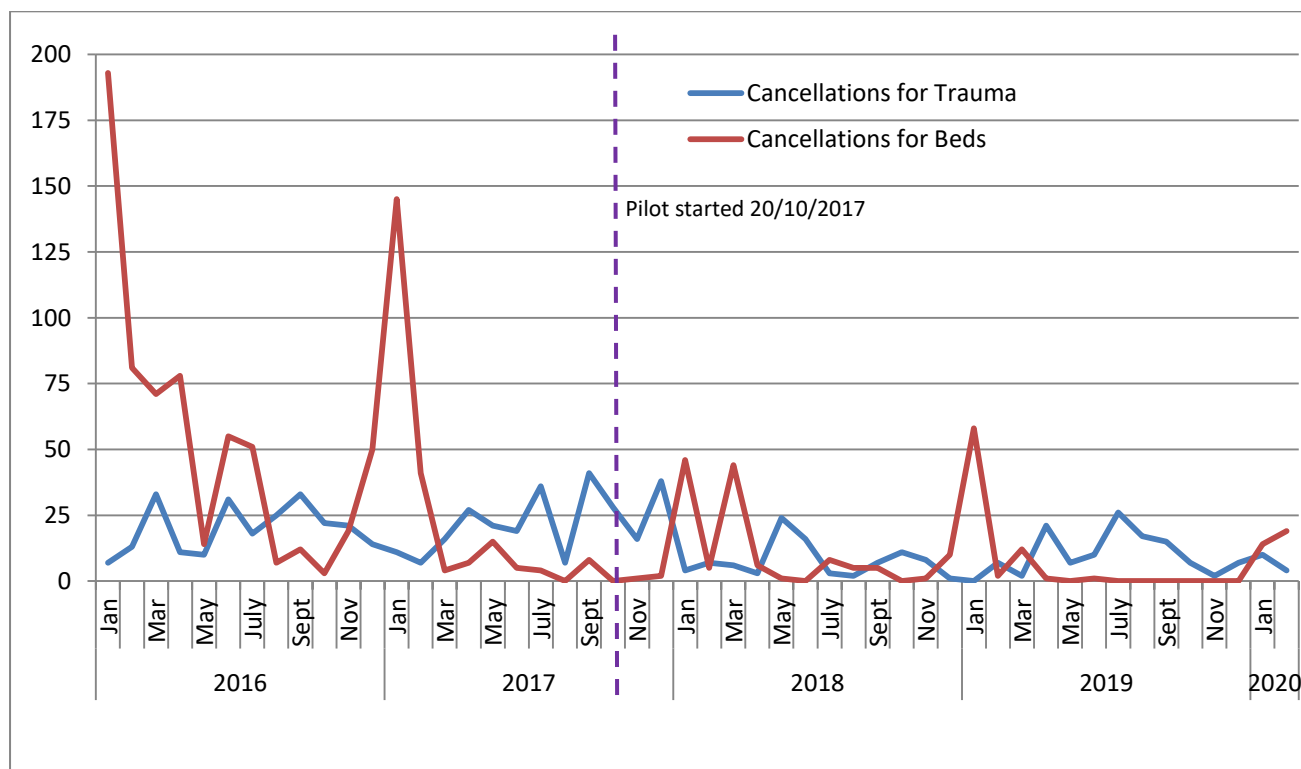
² No activity recorded Apr20-Jun20 as a result of Covid-19

Objectives #2 & #3: Cancellation of Elective operations

#	Issue	Description	Current position	Outcome
2.	Cancellation of elective patients for trauma patients	Cancellations frequent particularly when complex sub-specialty surgery was required	There are still cancellations when there are peaks in trauma demand but significantly fewer	Much improved
3.	Cancellation of elective patients when beds used for other specialties	Elective patients were often cancelled when the hospitals had periods of high demand.	There are still cancellations in times of high demand but significantly fewer	Much improved

There are a number of reasons why elective surgery is cancelled but by far the most common are because there is an emergency (trauma) or urgent case or in times of high activity when there are bed pressures. Data can be taken from the system but only cancellation on the day of surgery is recorded and this was started in 2017. This data is not particularly helpful as the service makes every effort to cancel before the day of surgery if they are aware that surgery cannot go ahead to try and reduce the impact on patients as much as possible. To find these figures an audit of the manual system has been carried out.

Cancellation of orthopaedic surgery (by hospital) for either trauma/urgent case or bed pressures:



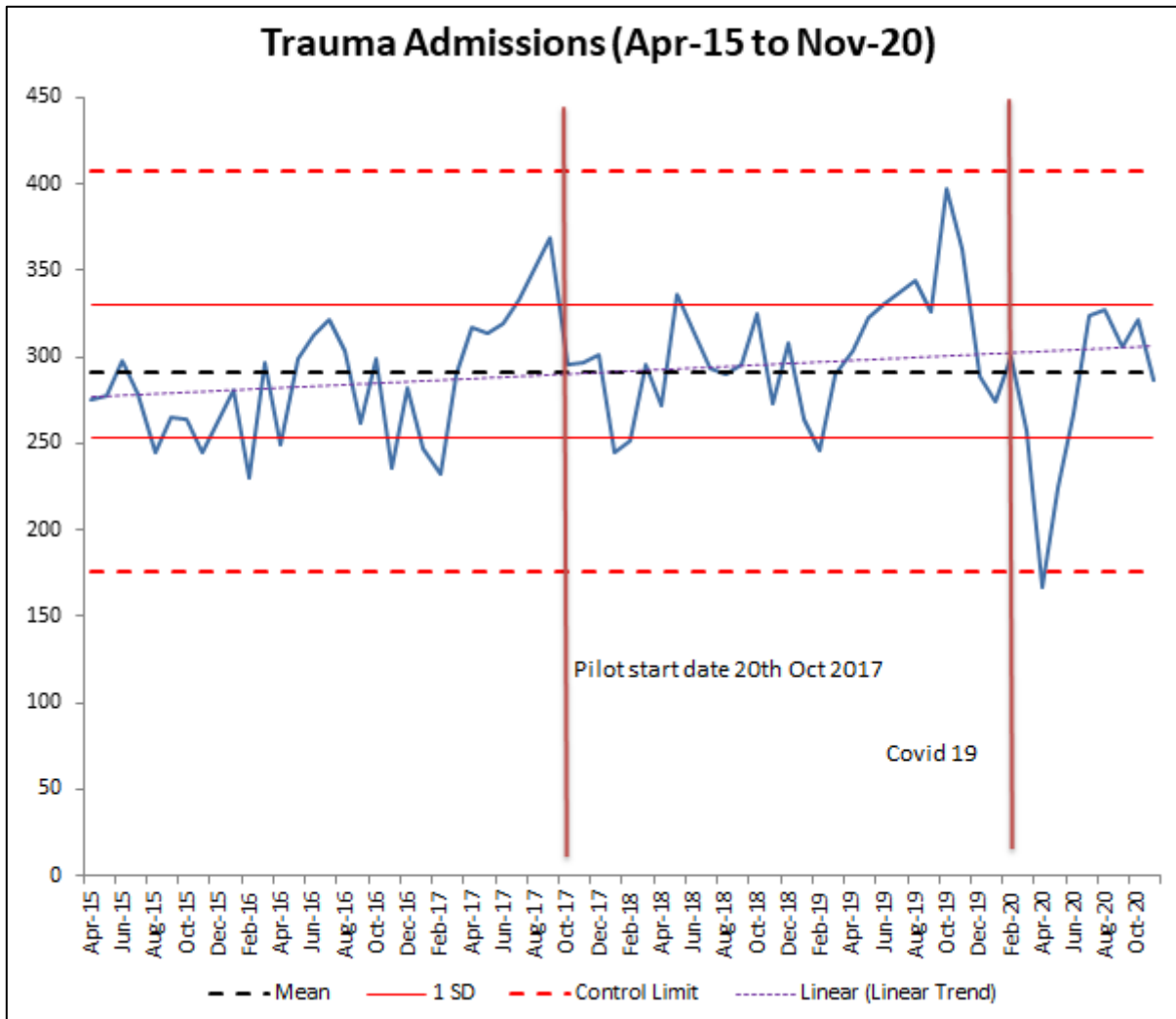
The red line shows cancellation for beds and although there are still peaks where bed pressures necessitate the reallocation of wards, the trend is positive. Likewise the cancellations for trauma, shown in blue, decreased although the chart shows a rise in 2019. It should be noted that this data includes cancellations for urgent elective (planned) patients as well as emergency trauma patients. 2020 data has not been shown as the service has been significantly affected by the COVID 19 pandemic and comparison would not be appropriate.

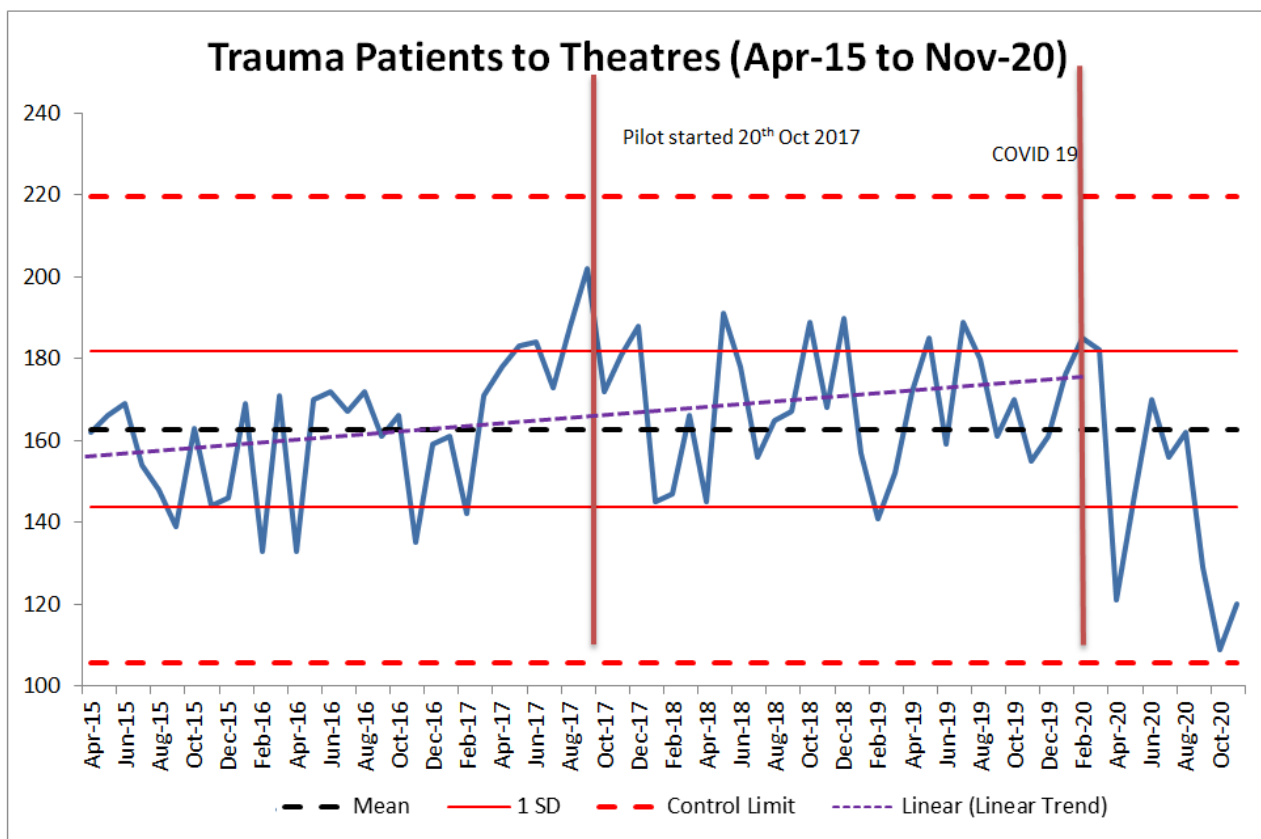
Objective #4: Trauma

#	Issue	Description	Current position	Outcome
4.	Trauma patients did not always receive a timely review by a senior decision maker which exacerbated wait times in ED	On call consultant and registrar could be scheduled to work either in theatre or clinic at the same time.	Now there is a consultant and registrar as well as a foundation doctor to give an immediate response	Achieved

Trauma Admissions:

Trauma admissions have always fluctuated throughout the year but the gradual trend has been an increase apart from a marked drop in attendances during the COVID 19 lockdown from March to July 2020. The linear admission growth since the beginning of 2017 can be seen in the graphs below the first giving numbers of admissions and the second the growth rates (the red line until the end of 2019 and the blue line including the COVID 19 drop in patient presentation).





The graph above shows changes over the years in the number of trauma patients who required surgery.

Objectives #5 & #6: Senior Review

#	Issue	Description	Current position	Outcome
5.	The senior review of admitted trauma patients from ED was variable	On call consultant and registrar could be scheduled elsewhere and were not always available for immediate consultation	There is now an on-call consultant and Registrar who do not have other duties and so are available for immediate consultation	Achieved
6.	Regular senior review for trauma patients	There was no routine Ward/Board Round for trauma patients which meant delay for review	Now there is a 7 day a week Ward/Board round for all trauma patients	Achieved

Objective #7: Trauma Triage

#	Issue	Description	Current position	Outcome
7.	Inability to cope with trauma referrals to fracture clinic	Increase in demand just prior to the pilot leading to unacceptable delays	Now new trauma triage service in place to assist with growing demand	Much Improved

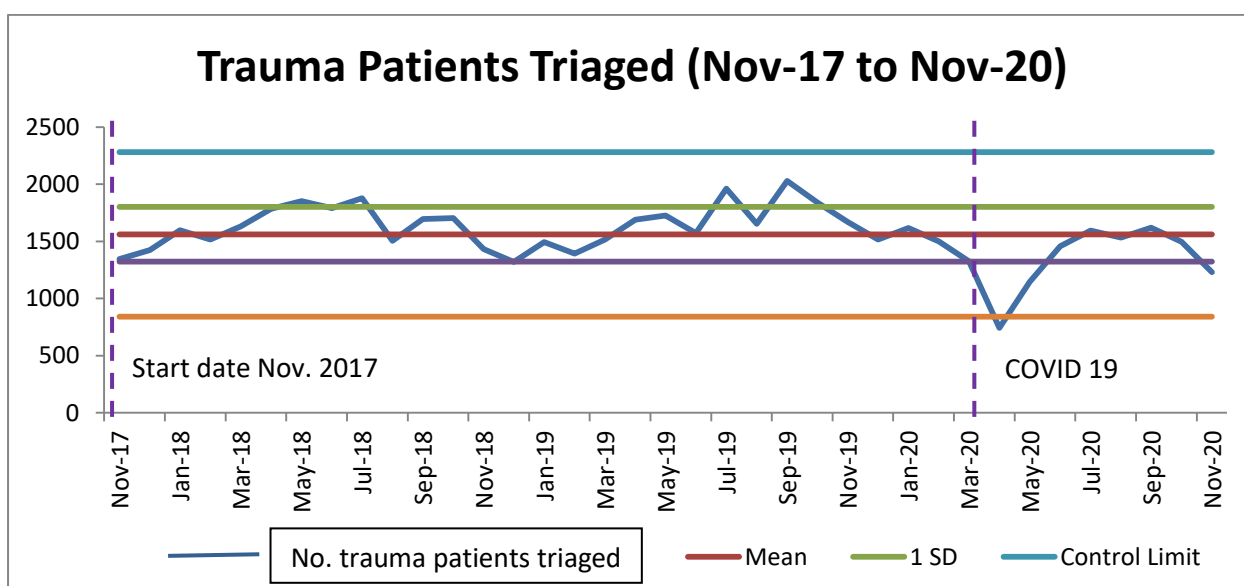
At the beginning of 2017 the number of trauma patients requiring opinion from the orthopaedic surgeons had risen, this was in part due to the retirement of the specialist who oversaw the community hospitals minor injury units (MIU) team and there was insufficient pre-planning to take account of the likely impact as a result of a change in the pathway.

The system prior to the pilot was that all patients that came into the ED and were not immediately admitted but referred on to the orthopaedic team and (from 2017) community MIUs were given an appointment in fracture clinic. Ideally this was within 48 hours; at this appointment the surgeons would assess whether surgery was required and plan the treatment regime. However the demand on this service was unsustainable with an increasing number of referrals resulting in a longer wait for an appointment in fracture clinic which could mean that the decision of whether surgery was needed was delayed and the resulting surgery.

In order to resolve this concern a trauma triage system was set up. In this service all patients who would be previously referred to the fracture clinic were referred into a virtual clinic. Every day the on-call trauma team review the referrals and allocates patients to either be admitted immediately, seen at fracture clinic immediately or if that is not necessary at an appropriate interval.

There are also patients who do not need to come into fracture clinic, these patients are telephoned by the specialist nurse trauma co-ordinators who advise on the best management; these patients are also given a number to call an open appointment in case they have concerns. In this way we can insure that those who require immediate treatment receive it and also minimise unnecessary visits to hospital.

The trauma triage started in November 2017 when **1,344** patients were triaged. As all trauma numbers do fluctuate but there was a marked rise in referrals towards the end of 2019 with a peak in September 2019 of **2,018** referrals.



Objective #8: Trauma waiting times

#	Issue	Description	Current position	Outcome
8.	Improve time to theatre for trauma patients	There was a delay in getting some patients to theatre, especially during peaks in demand	Although the care for trauma patients is now standardised, this remains an issue to be resolved.	Not achieved

There is a daily meeting of all trauma staff, on call team, operating team, trauma co-ordinators, junior doctors and Theatre staff. At this meeting the patients awaiting surgery are prioritised and allocated a theatre slot. Upper limb trauma was chosen as a metric for the pilot as many patients in this group will wait at home and be admitted when there is a theatre slot.

Guidance from the BSSH (British Society for Surgery of the Hand) is that all hand injuries should be triaged within 72 hours and be taken to surgery within 7 days. For specific fractures of the distal radius the British Orthopaedic Association Audit Standards for Orthopaedics gives a 72 hour target for review and surgical intervention, if appropriate.

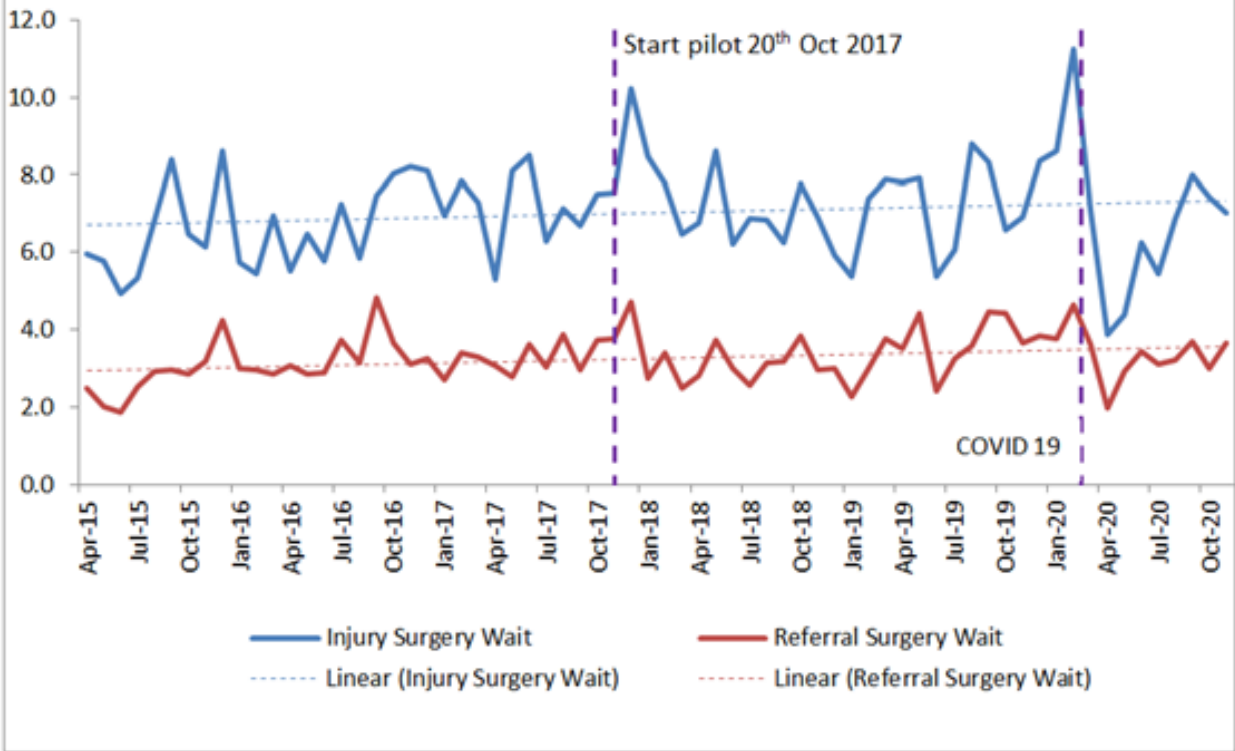
Using the British Society for Surgery of the Hand (BSSH) standard of 7 days for surgery as the benchmark, and assessing performance for upper limb trauma, the BSSH standard was achieved:

- In 1 of the 4 quarters (25%) pre pilot (October to September 2017)
- In 4 of the 9 quarters (44%) post pilot, but pre Covid-19 (October 2017 to January 2020)
- In 2 of the 4 quarters (50%) post Covid-19

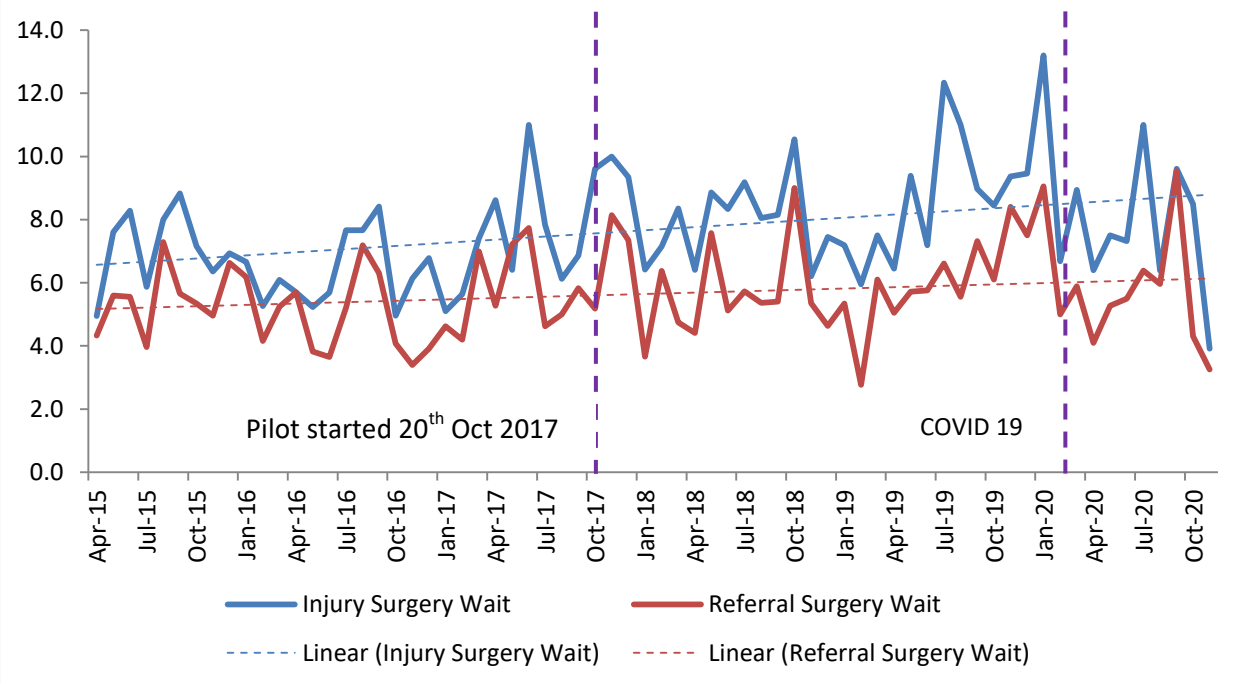
Although not part of the original set of pilot objectives, time to surgery for wrist fractures is now included on the monthly orthopaedic dashboard for monitoring.

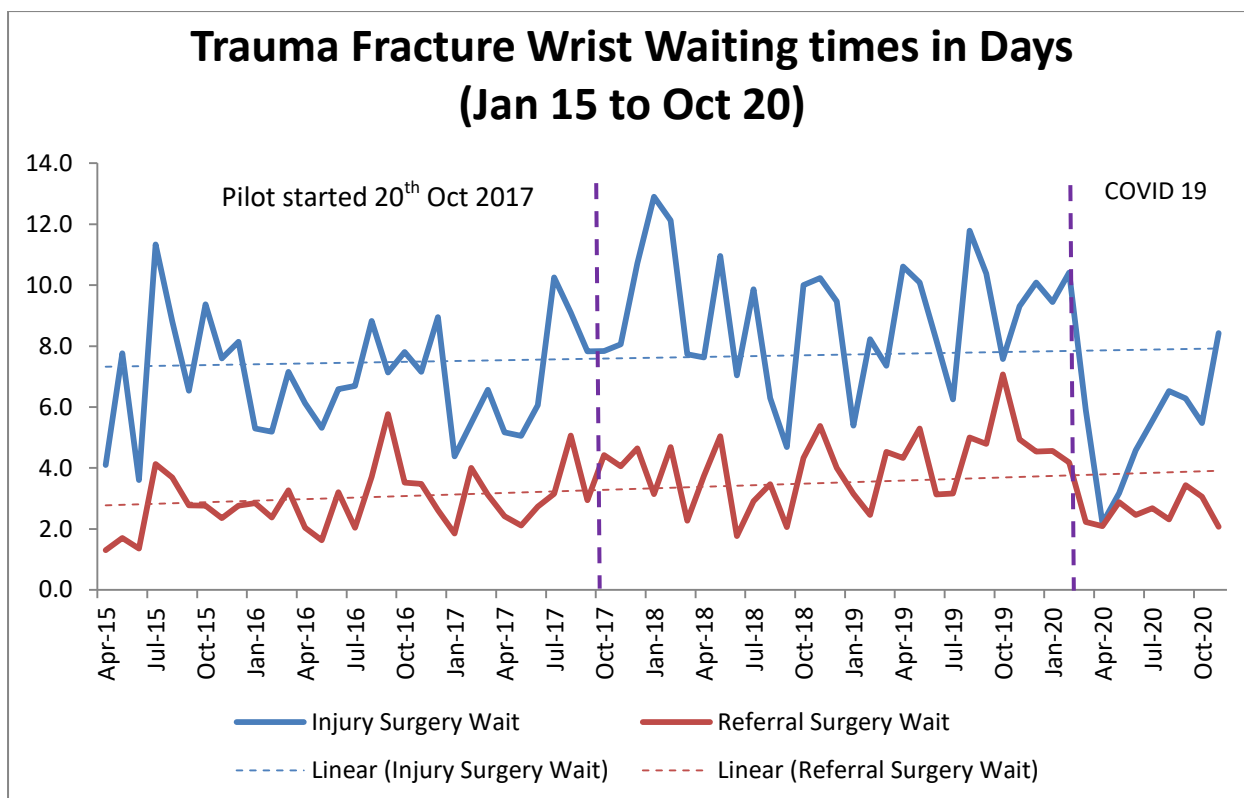
The trauma team have been working to maximise theatre efficiency and also convert some theatre lists from elective to trauma. There is a plan to utilise one of the new day surgery theatres at CGH that are to be developed as part of the strategic site development programme for orthopaedics. This will enable the service to undertake all elective adult day surgery at CGH and create theatre space at GRH for additional trauma surgery.

Trauma Upper Limb Waiting times in Days (Jan 15 to Oct 20)



Trauma Fracture Ankles Waiting times in Days (Jan 15 to Oct 20)





Objectives #9 & #10: Junior Doctors

#	Issue	Description	Current position	Outcome
9.	Poor junior doctor feedback	Access to senior colleagues was difficult as timetables prevented regular supervision	There is now a consultant and registrar available for supervision and regular training sessions	Achieved
10.	Junior doctor recruitment	Filling junior doctor posts was often difficult	The service is now fully staffed	Achieved

Performance measures outside of pilot objectives

In addition to the 10 Objectives that were key drivers for change in the original Pilot (described above), there are a number of additional performance metrics associated with the Trauma and Orthopaedic services and these are described below.

Fractured Neck of Femur Data

There is a national database to record data for people suffering from fractured neck of femur. This is because hip fracture is very common – almost 68,000 people were admitted into hospital with a fractured hip last year. The majority of these patients are very frail and suffering from complex medical conditions. The database was set up due to a national variation in quality and outcomes. Up to a third of people who fractured their hip died within the year and a third of patients did not return to their previous place of residence i.e. their own home or care home within 30 days of discharge from hospital.

The national data base was set up as there was national variation in mortality (deaths within 30 days of admission to hospital). High quality, safe care requires the coordinated approach of a multidisciplinary team who are committed to implementing care that research has shown will produce the best outcomes. All data shown is published nationally.

Care of fractured neck of femur patients was undertaken at both CGH and GRH hospitals until October 2017. Although after 2013 when CGH ED became 24/7 A&E (nurse-led 8pm–8am), all patients who were brought by ambulance would be taken to GRH. Ambulance is the usual way for these patients to arrive at hospital.

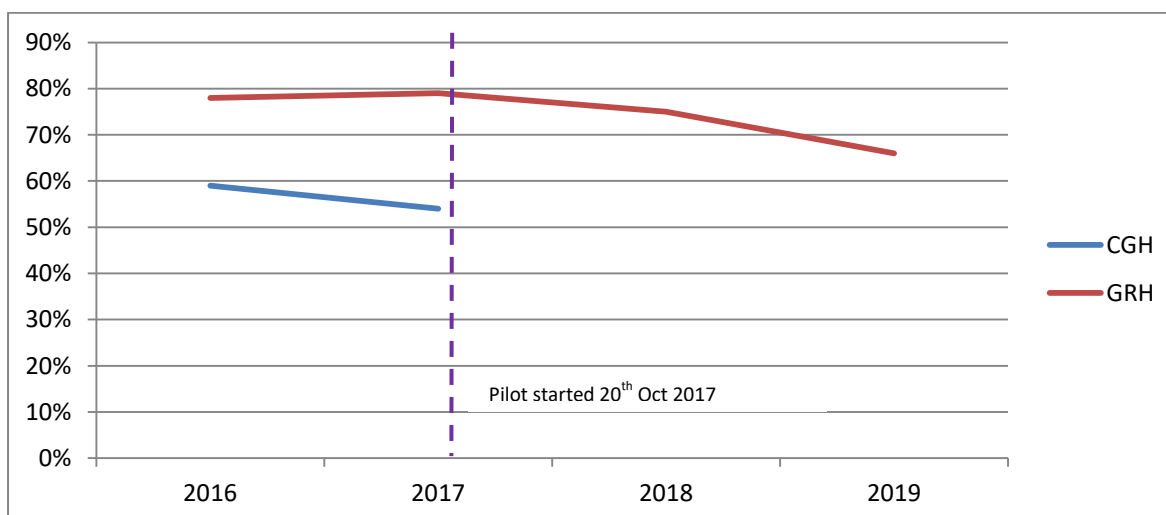
We have publicly committed to the future of the Accident and Emergency (A&E) Department in Cheltenham. Once the COVID-19 temporary changes are reversed the service will remain consultant led and there will be no change to the pre-COVID opening hours.

Best Practice Tariff (fracture neck of femur):

A national ‘Best practice tariff’ was also implemented which is achieved if individual patient care complies with the following key performance indicators:

- Surgery within 36 hours of admission
- Assessment by senior member of the Care of the Elderly Team (consultant/SAS/ST3+)
- AMTS on admission (a nationally validated assessment of mental cognition)
- Delirium assessment undertaken post operatively
- Nutrition assessment undertaken
- Falls assessment undertaken.
- Bone protection medication reviewed

Achievement of Best Practice tariff at Gloucestershire Hospitals 2016-2019³



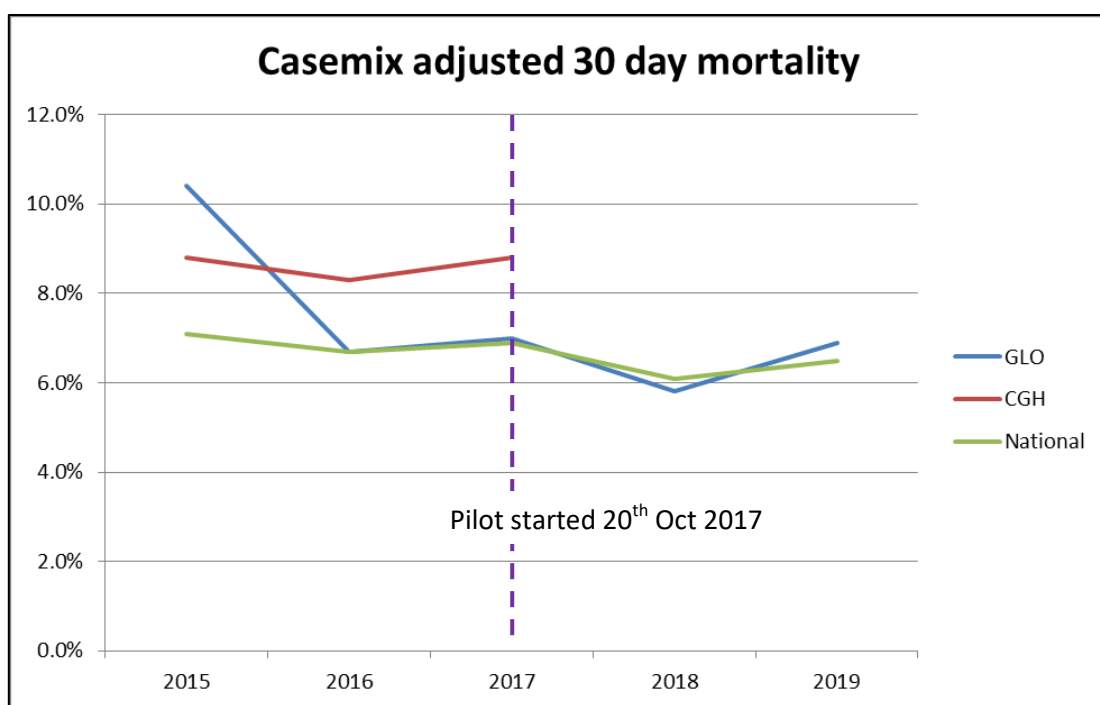
³ Data for 2020 not yet available due to end of year adjusted mortality rate validated by national team

The achievement of the best practice tariff required co-ordination from a dedicated multidisciplinary team which was difficult to provide on two sites as there is a national shortage of ortho-geriatricians. The impact of theatre capacity on performance is dealt with elsewhere in the report.

Mortality

The National Hip Fracture database collects data to show the percentage of deaths within 30 days of admission to hospital with a fracture neck of femur. The raw data is collected and is then validated and case mix adjusted to indicate the level of medical complexity for each patient. This may mean that the raw data percentage rises if complexity is low and drops if complexity is high. This is done to enable equitable benchmarking between organisations. Validation is completed by the national group at the end of each year

Mortality within 30 days for fractured neck of femur patients in Gloucestershire:⁴



Year	GRH	CGH	National
2015	10.4%	8.8%	7.1%
2016	6.7%	8.3%	6.7%
2017	7.0%	8.8%	6.9%
2018	5.8%	0	6.1%
2019	6.9%	0	6.5%

It will be noted that the mortality percentage was high and reached a peak in 2015 at GRH (10.4%) and at CGH levels were lower (8.8%) but above national average (7.1%). A considerable amount of work was commenced to resolve this issue. A multidisciplinary team was established in

⁴ Data for 2020 not yet available due to end of year adjusted mortality rate validated by national team

Gloucestershire including the Orthopaedic Trauma Lead Consultant, Care of the Elderly Consultant, Anaesthetic Consultant, ED Consultant, Nursing ANP, Ward Nurses, Physiotherapists, Junior Doctors, Pharmacists and General Manager to address the issues. The team also joined the Scaling up for safety National project to share the lessons learnt from a hip fracture quality improvement programme.

The improvement team undertook a pathway review, altering processes in ED, Anaesthetic protocols, surgical implants used and management on the wards, including a dedicated nutritional nurse. As a result of this work the mortality rate at GRH dropped to 6.7% the national level for that year whilst CGH was 8.3%.

This improvement took place before the reconfiguration pilot. However one of the aims was to bring the improved service to all patients and maintain the improvements in care. In 2018 the year after pilot was initiated mortality for all fractured neck of femur patients had improved even further to 5.8% better than the national average at 6.1% (see table above).

The overall validated mortality percentage rose to 6.9% in 2019 slightly higher than the national average at 6.5%. However it was noted that the percentage increased sharply towards the end of the year and there was concern within the service, the reason for this rise is multifactorial and not always easy to identify but there was concern that that it may be due to competition for theatre space.

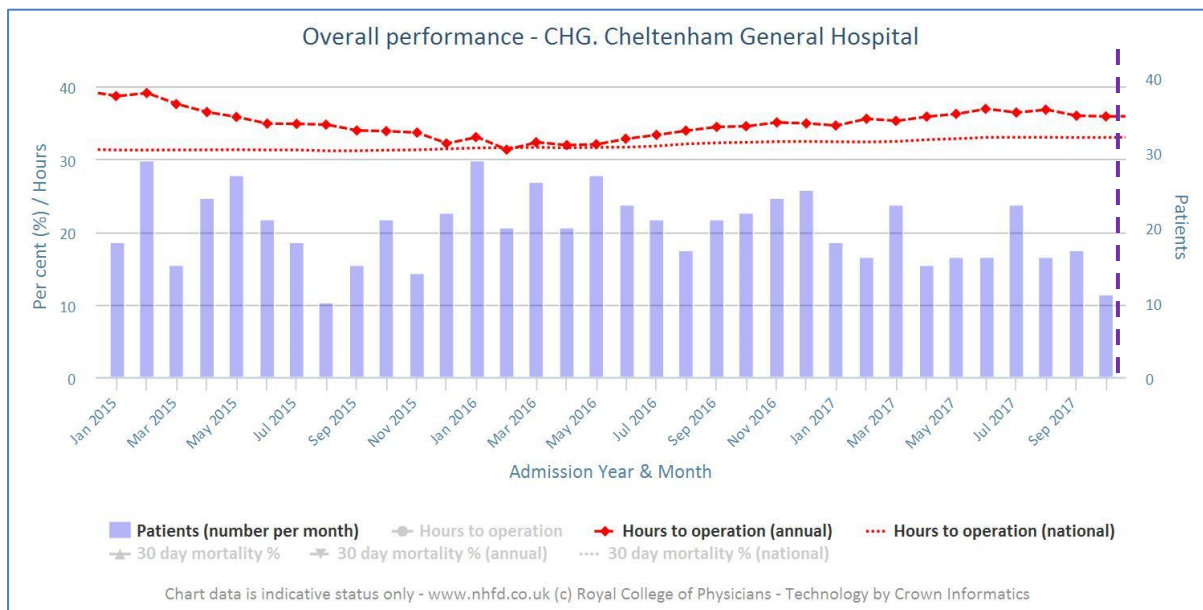
Validated data for 2020 is not yet available and figures for this year will be affected by the *March and November/December* COVID spikes. Over the last few months 30 day crude mortality has plateaued at approx. 7%

Length of time to Theatre

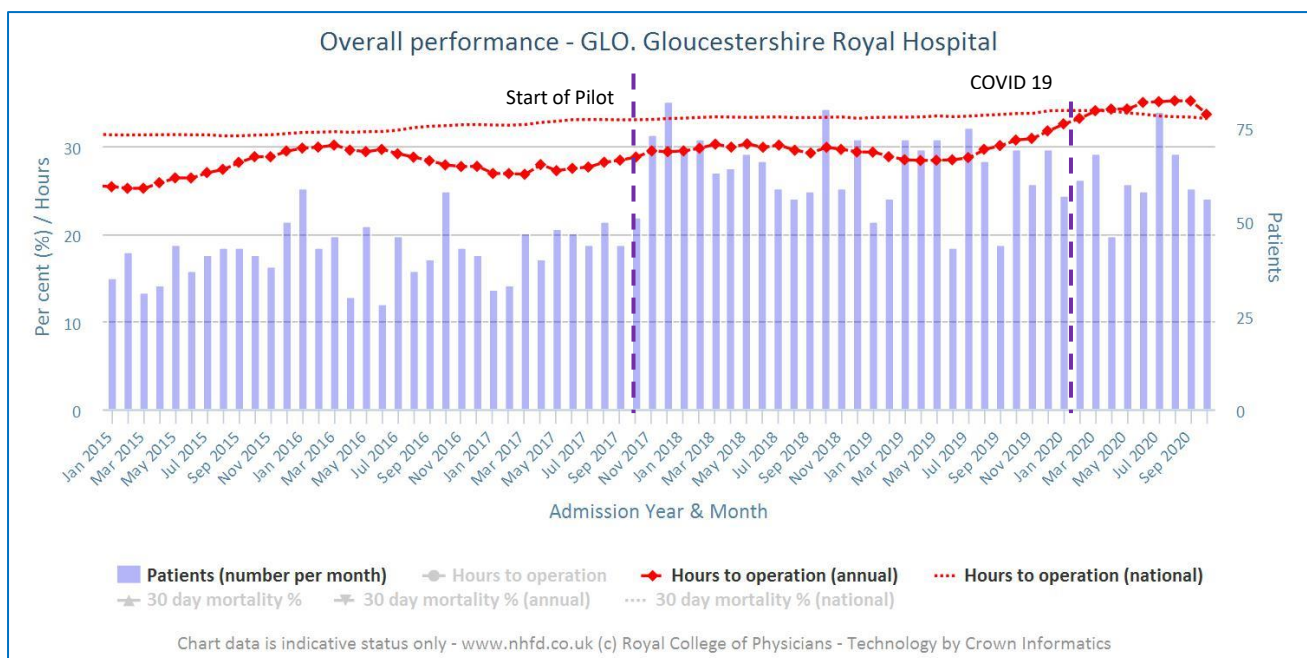
This information reflects the length of time from admission to surgery; the target is within 36 hours. The reason that early surgery is important is that research shows better mortality and morbidity outcomes. Also surgical intervention is a good form of pain control. The majority of patients receive a fascia iliac local block (local anaesthetic is injected into the hip area) in ED which gives good pain control for up to 24 hours, if patients do not go to theatre within this time they are assessed and a second block is given if appropriate. This was part of the pilot and has been very effective. There will be a small percentage of patients who after assessment are not taken to theatre, this will only be in cases where death is imminent and the surgical intervention would be inappropriate.

The two graphs below are taken from the nationally published data, the block graphs show the number of patients admitted with Fractured Neck of femur. The diamond line graph shows the average length of time for patients to be taken to theatre and the dotted line shows the national average time to take patients to theatre.

Graph to show the number of patients and time to Theatre at CGH 2015-2017 (until 20th October 2017):



Graph to show the number of patients and Time to Theatre at GRH 2015-2020:



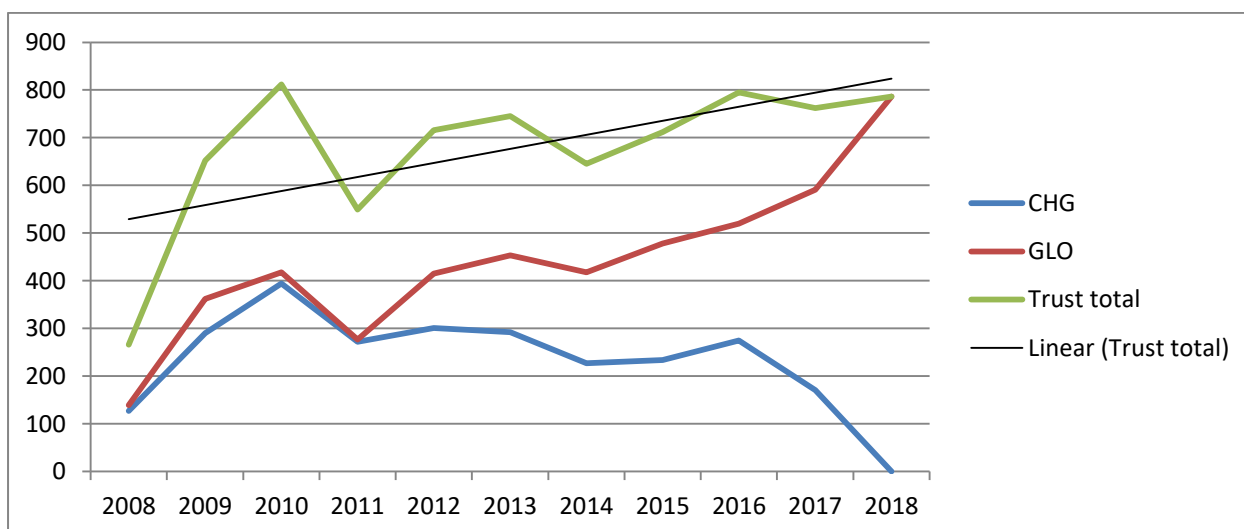
As demonstrated, the time to theatre at CGH was consistently longer than the national average. There were two reasons for this; before the pilot there was only one half day list at CGH and the trauma surgery was carried out by a timetabled surgeon, this did not provide the flexibility to provide sub-specialty care. For example if the surgeon that day was a specialty in upper limb procedures they may not be best placed to operate on a patient with a hip fracture and the hip fracture patient would have to wait until a suitable surgeon was rostered or cancel a patient who was booked to undergo an elective procedure on the list of a surgeon with appropriate sub-specialty.

In the pilot there are a minimum of two full day trauma theatre lists every day, 7 days a week and the lists are structured in a way to ensure that there is access to complex sub-specialty surgery as required.

The graphs show that whilst we were unable to get patients with fractured neck of femur to theatre within the target timescale at CGH, since the start of the pilot it has been possible to maintain a time to surgery that is better than the national average. There was an adverse rise towards the end of 2019 and 2020 as mentioned above (in mortality) and measures have been taken to re-allocated theatre lists, the improvement is also charted.

As previously mentioned, more theatre lists have been made available at Cirencester Hospital and some non-complex trauma surgery is undertaken there. In addition more day cases from the remaining elective work at GRH have been transferred to Cirencester Hospital to create more theatre space within GRH theatres for Trauma patients. There is a further plan to utilise one of the new day surgery theatres at CGH that are to be developed as part of the £39.5M Strategic Site Development Programme for orthopaedics. This will enable the service to further reorganise elective lists and create theatre space at GRH for additional trauma surgery.

Growth in referrals for Fractured Neck of Femur



Continuous Improvement

A physical service move will not solve all issues but will provide a building block for change. Over the last three years there have been a number of new innovations.

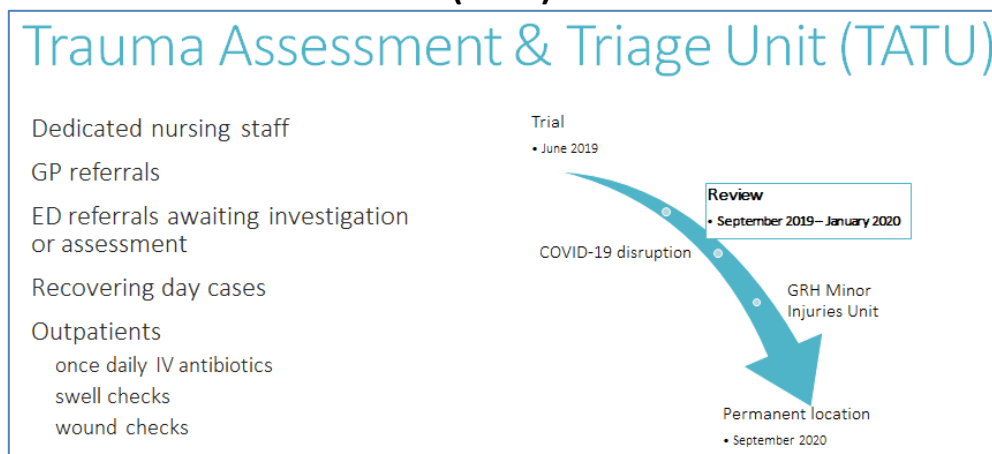
- Within the elective service a ward round was set up at CGH to support the junior doctors and work is ongoing with ERAS and standardisation in surgery.
- Wards at CGH have been ring-fenced in accordance with infection control regulations and further work to undertake pre-operative testing for MSSA in addition to MRSA has been set up.
- The anaesthetic team have set up a new cell salvage service to enhance patient care.
- Theatre lists are well utilised although the service was without an elective theatre for six months in 2019 whilst necessary refurbishment was carried out and as part of the same refurbishment without three theatres for 3 weeks.
- A musculoskeletal triage service was put in place in July 2019. This is going well with regular MDTs between advanced practitioners and surgeons. As a result, and as expected, this has

resulted in a lower number of referrals to outpatients but a higher conversion rate. The lower referral rate has allowed the service to undertake the delayed follow ups that had accumulated during the difficult IT system implementation; although unfortunately there will be significant delays in treatment in after the COVID 19 Pandemic.

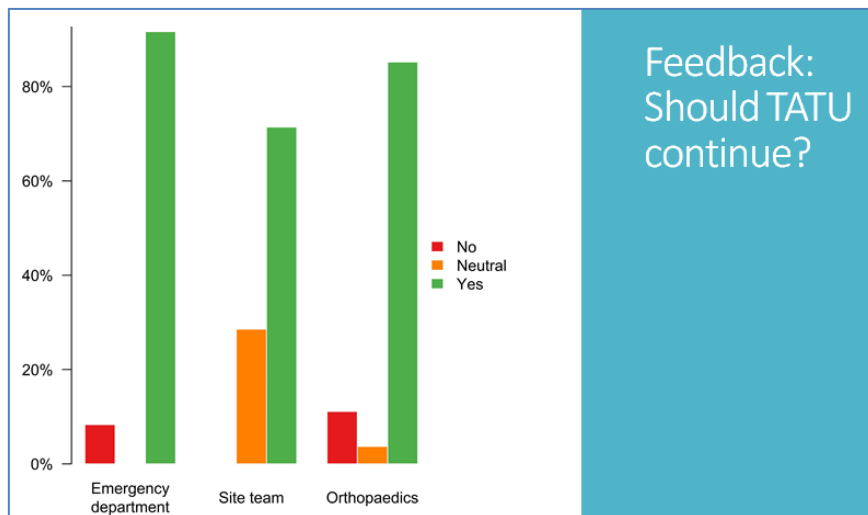
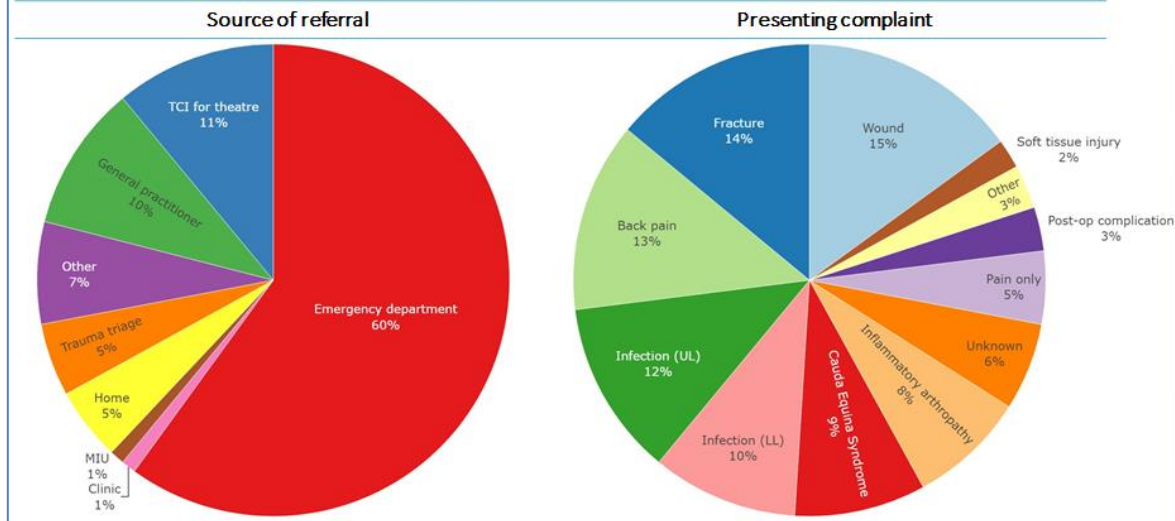
- Within the Trauma service we have seen a significant rise in demand which has shown a pressure in 2019 with a delay to theatre recorded and a rise in cancellations for trauma cases.
- There have been a number of innovative changes with a Trauma Assessment & Treatment unit now in place to help patient flow from ED. Details and feedback of this trial are recorded below:

Despite work to increase the efficiency of the trauma service, the increase in demand has exacerbated the difficulty of time to operation especially when there are peaks in demand. Growth in demand is in particular for fractured neck of femur and wrist fractures; patients with fractured neck of femur will be (correctly) prioritised for surgery before those with wrist fractures. However the increase leads to a pressure on theatre resource particularly as each fractured neck of femur patient will require 2 to 3 hours in the operating theatre. With this in mind a simple comparison of data may not tell the whole story but work is ongoing to review theatre requirements and ensure that theatre utilisation and productivity are optimised.

Trauma Assessment & Treatment Unit (TATU)



Patients attending TATU



TATU has now been made permanent and has made a major contribution to keeping the service running throughout the COVID pandemic.

COVID 19 Changes

Another change undertaken during the COVID pandemic is that orthopaedic staff have worked within the minor injuries area at GRH. The benefits have been:

- A reduction of the 1st on call workload
- An ability to access a second senior decision maker immediately and process referrals to trauma triage by ANPs immediately
- The availability to undertake minor ops (freeing up valuable time / resources from main theatres)
- The ability to triage to come back to fracture clinic e.g. at 10days instead of within 72hrs.

Whether this continues after the COVID pandemic is to be reviewed.

Lessons Learned

- **Theatre modelling:** The modelling for the required theatre time in GRH for trauma did not fully identify the ongoing requirement and this resulted in sub-optimal capacity and did not enable all the expected benefits to be realised.
- **Monitoring of the Pilot:** the monitoring processes in place did not create a sufficiently robust feedback loop so that deliverability issues⁵, for example ring fenced beds for elective orthopaedic care, waiting times and repatriation of work lost to the independent sector, were not addressed during the pilot period.

Recommendations

As demonstrated in the report, the Trauma and Orthopaedic pilot had a set of clear objectives that aimed to improve patient outcomes and experience, respond to increasing demand, support recruitment and retention and improve efficiency; and the T&O team continue to develop the service and innovate. It is recognised, however, that the monitoring of the pilot could have been enhanced and a list of considerations for future service change implementation governance is listed below:

- Apply Plan-Do-Study-Act (PDSA) approach to ensure expected benefits are monitored and reviewed and actions taken to rectify
- Identify evaluation forum which receive regular updates (e.g. quarterly) and where deliverability issues are resolved / escalated to e.g. Specialty Board, Divisional Board, TLT etc.
- Confirm the performance metrics to be used to assess success and present in easily understood format e.g. dashboard and to include quality metrics pre and post pilot
- Allocate responsibility for evaluation to nominated clinical, operational and programme staff.

⁵ A number of these are addressed in the report