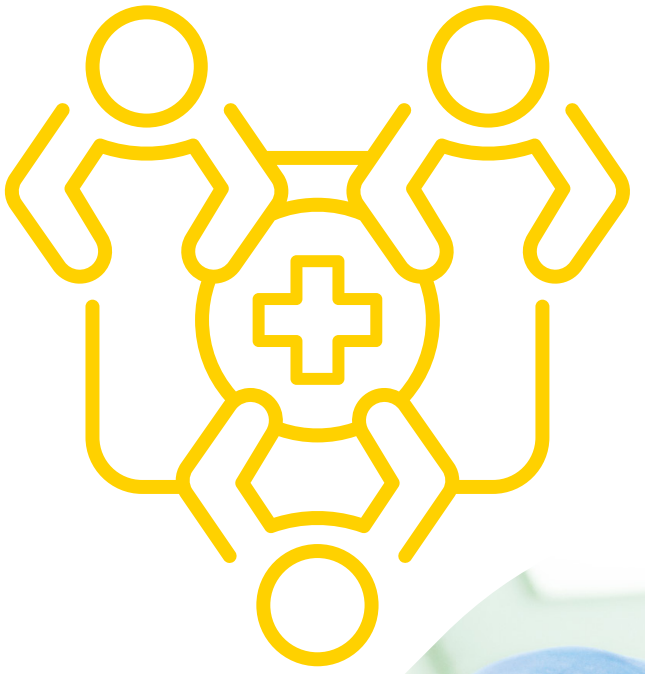
Royal College of Surgeons of England
ADVANCING SURGICAL CARE

CholeQuIC-ER Learning Report

Summary

Cholecystectomy Quality Improvement Collaborative – Extended Reach (CholeQuIC-ER) was The Royal College of Surgeons of England's second Quality Improvement (QI) collaborative. The project aim was to improve the quality of care for patients with acute gallstone disease by reducing variation and time to surgery for this patient group. This report will outline the key project findings.

- 23 sites from 22 trusts/health boards participated in the subscription-based collaborative project: One NHS trust was from Northern Ireland; three health boards were from Wales, and 18 trusts were from England.
- The project launched in July 2019 following an adapted QI collaborative process, with three collaborative meetings, three webinars, two bespoke reports, site visits and email and telephone support.
- Quality improvement and clinical support was provided, following a Theory of Change developed from the first RCS England gallstone collaborative, Chole-QuIC.
- The impact of the COVID-19 pandemic on gallstone care led to adaptations to the project delivery, with the project end extended from June 2020 to December 2020.
- Sites tested and reviewed a range of new processes that provided them with a deeper understanding of the demand and flow through their system, introduced new patient pathways, created new capacity, or built stronger working relationships across clinical staff delivering care.
- The full CholeQuIC-ER cohort improved their 8-day surgery rate and average time to surgery during the collaborative period.
- The cohort's 8-day rate improved from a comparable rate to non-participating sites across England and Wales (control sites) of approximately 15% to 17.6% in March 2020 (compared to the control rate of 14.0%). When gallstone services restarted in July 2020, CholeQuIC-ER sites recovered more quickly than control sites, ending the project in December 2020 with an average 8-day rate of 18.6% (compared to the control rate of 12.4%); see Figure 14.
- The majority of CholeQuIC-ER sites improved their 8-day surgery ranking. One site increased its ranking by 81 places, and the top two 8-day rates across England and Wales are now held by CholeQuIC-ER sites.
- During the course of the project, the cohort's variation was reduced; the average time to surgery dropped from 37 days (July 2019 – Nov 2019) to 15 days by the end of the project.



Contents

1. Background and context

Quality Improvement at RCS England

In 2015 RCS England Council set out the three strategic priorities which underpin the College's vision of Advancing Surgical Care. One of these priorities was to 'Advance standards and reduce the variability of patient outcomes'[1], and as part of this, it was identified that 'The College will take a leading role in delivering quality improvement plans and sharing best practice specific to surgery'. Mr John Abercrombie, RCS England Council Member, is the Quality Improvement in Surgery Clinical Lead for this programme of work.

The three Quality Improvement services that RCS England provides are:

1. **QI Hub**[2] – QI in surgery web pages and resources on the RCS England website to support people who want to #TryQI.
   - Within the hub, you can access two Quality Improvement standards guides[3] that were published in March 2021. One guide outlines basic principles of quality improvement in surgery and includes a case study of the first RCS England QI collaborative, Chole-QuIC. The other guide is a case study of a successful quality improvement project undertaken by a surgical trainee.
2. **QI network** – Supported by The Health Foundation, we scoped the opportunities available for establishing a quality improvement network in surgery. Focus groups across England and Wales took place with members of the surgical care team. For more information, visit the website[4].
3. **QI collaboratives**
   - QI collaboratives involve groups of professionals coming together, either from within an organisation or across multiple organisations, to learn from and motivate each other to improve the quality of health services[5].

Chole-QuIC

The first RCS England QI collaborative, Cholecystectomy Quality Improvement Collaborative (Chole-QuIC)[6], ran from October 2016 to January 2018.

Improving care for patients with acute gallstone disease was chosen as the focus of the project as gallstone-related disease accounts for one third of all emergency general surgery admissions[7]. These conditions can be debilitating, reducing the quality of life for patients awaiting surgery and can potentially lead to serious complications for patients, such as pancreatitis.

The recommended treatment for patients who present with gallstone-related disease is a cholecystectomy (removal of the gallbladder). Current National Institute for Health and Care Excellence (NICE) guidance stipulates that patients should have a laparoscopic cholecystectomy within seven days of diagnosis of acute cholecystitis and during the same hospital admission for pancreatitis[8].

The Getting It Right First Time (GIRFT) General Surgery Report[9] identified that this area of care had variation of care despite NICE guidance. As a result of this variation, acute gallstone disease was chosen as the topic for the collaborative. 13 sites were recruited to take part in the project: 12 trusts from England and one health board from Wales.

The quality improvement goal of the project was for 80% of eligible, admitted patients[10] to receive their cholecystectomy within 8-days of presentation at hospital, in line with NICE guidance[11].

Outcomes

Our published evaluation in BJS Open[12] demonstrated that participating hospitals substantially improved outcomes for patients by significantly reducing time to surgery for those needing an emergency cholecystectomy.

Our linked paper in Implementation Science[13] reports the results of a process evaluation, and provides information on some of the influences on success. The lessons from this work influenced the development of the CholeQuIC-ER project.

CholeQuIC-ER

Chole-QuIC demonstrated that improvements in gallstone care could be achieved in a range of surgical contexts and developed evidence of how these improvements were achieved. The evaluation papers demonstrated that collaborative-based quality improvement is a viable strategy for emergency surgery but that successful improvement relies on a significant short-term commitment from surgical teams, following a particular set of effective clinical and improvement strategies. For improvements to be seen in gallstone care at scale, a structured scaled-up collaborative project was necessary to extend the reach of CholeQuIC. Therefore, Cholecystectomy Quality Improvement Collaborative – Extended Reach (CholeQuIC-ER) was set up with the aim of supporting surgical teams to implement and embed improvement lessons.

2. Design and delivery

Process followed

All trusts/health boards across the UK were invited to join the collaborative and provided with details of the benefits of participation (see Figure 1 below). The project was the first subscription-based collaborative run by RCS England. All project costs were covered by the subscription fee paid by participating trusts/health boards.

In order to join, the project sites were required to pay a one-off subscription fee of £8,000. In addition, trusts/health boards needed to cover their travel and expenses to any in-person meetings. Sites were also asked to ensure there was a commitment from management that the project leads would be allocated at least ½ PA in their job plan to lead the project locally.

The project launched in July 2019 and closed in December 2020. 25 NHS trusts and health boards signed up to join the project; three withdrew early on, so 22 trusts/health boards (23 sites as Royal Free London NHS Foundation Trust was split into two sites) participated in the project. One NHS trust was from Northern Ireland, three health boards were from Wales, and 18 trusts were from England.

Project aim: to reduce variation and improve the quality of care for patients with acute gallstone disease.

Project goal: for 80% of eligible[10], admitted patients to receive their cholecystectomy within 8-days of presentation at hospital, in line with NICE guidance[8].

Sites attended one pre-launch meeting, three national collaborative meetings and three webinars where sites collaborated to share progress and challenges and develop solutions following appropriate quality improvement approaches. Sites were provided with two bespoke reports, a mid-project and end-of-project report. Sites were also offered a site visit as well as telephone and email support. Throughout the project, hospital teams had expert training and coaching from the QI and clinical experts, following an evidence-based theory of change. Teams tested ideas they had to reduce the time to surgery for gallstone patients needing an urgent laparoscopic cholecystectomy and then attempted to implement the changes that worked.

Figure 1: Benefits of joining CholeQuIC-ER for trusts/health boards

- The opportunity to **improve outcomes for gallstone patients**.
- **Support from clinical and QI experts** through coaching sessions, email support and teleconferences.
- Access to a **local data platform**.
- **Peer collaboration** with colleagues at participating sites.
- **Attendance** at webinars and collaborative events.
- **Specially designed project** to meet each trust or health board's specific needs.
- The opportunity to improve emergency gallstone pathways, **relieve pressure on the system** and **save the service money***.

** Analysis from the CholeS study[14] and calculations based upon tariffs suggests a minimum saving of £38,000 per annum (analysis available on request). This is likely to be a conservative estimate as it does not account for savings made from preventing the multiple re-admissions that a third of acute biliary patients suffer pre-surgery.*

Table 1: CholeQuIC-ER sites

1	Aneurin Bevan University Health Board
2	Belfast Health and Social Care Trust
3	Brighton and Sussex University Hospitals NHS Trust
4	Cardiff and Vale University Health Board
5	Croydon Health Services NHS Trust
6	Cwm Taf Morgannwg University Health Board
7	Dartford and Gravesham NHS Trust
8	East Lancashire Hospitals NHS Trust
9	Great Western Hospitals NHS Foundation Trust
10	Imperial College Healthcare NHS Trust
11	Kingston Hospital NHS Foundation Trust
12	Manchester University NHS Foundation Trust
13	North Cumbria University Hospitals NHS Trust
14	North Middlesex University Hospital NHS Trust
15	Royal Devon and Exeter NHS Foundation Trust
16a	Royal Free London NHS Foundation Trust – Barnet Hospital
16b	Royal Free London NHS Foundation Trust – The Royal Free Hospital
17	Royal Surrey County Hospital NHS Foundation Trust
18	The Dudley Group NHS Foundation Trust
19	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
20	United Lincolnshire Hospitals NHS Trust
21	University Hospitals of North Midlands NHS Trust
22	Wrightington, Wigan and Leigh NHS Foundation Trust

Theory of change

A theory of change describes the key mechansims through which improvement interventions are predicted to work. The project followed the theory of change that was developed, tested and refined during the first collaborative, Chole-QuIC.

Figure 2: What we know influences improvement to gallstone services:

1. Colleagues and leadership agree the problem needs fixing

- ✔ Sustained improvement needs active support

2. Surgical lead(s) have a team to support them

- ✔ Resources to support data collection
- ✔ Resources to help understand local issues, plan and try out solutions

3. Combine existing knowledge and data collection to:

- ✔ Understand the true patient pathway
- ✔ What is capacity vs. demand? What impacts flow through the system?

4. Plan and test solutions to fix identified problems e.g.

- ✔ Solutions to improve capacity
- ✔ Solutions to manage flow and additional capacity effectively
- ✔ How will these solutions be tested out before implementing fully?

5. Develop support for further changes

6. Review and learn from results

Based on evidence from multiple improvement evaluations but most specifically "Understanding the influences on successful quality improvement in emergency general surgery: learning from the RCS Chole-QuIC project"[13].

Study design

Informed consent that data from the project could be used for evaluation of the project was obtained from all participants at the point of registration to the project. This data is intended to be used as self-evaluation to share learning of the QI collaborative process, and has been analysed with national hospital episode data following the same methodology used for the Chole-QuIC evaluation.

All participants were asked to complete an end-of-project questionnaire. We received responses from 17 sites out of a possible 23. Participants' feedback and perspectives have been used within this report and will also be used to improve future collaboratives.

Data collection

The project used two data sources: a local data platform and national data sources. The local data platform chosen was Case Capture, run by Net Solving. The platform could be used on smartphones, tablets, laptops and desktops. We streamlined the dataset compared to that of Chole-QuIC; sites were required to collect only four data points which are outlined in Figure 3. The platform automatically produced a number of graphs in real-time, including time-series data of mean time to surgery and weekly rates against 8, 14 and 31 days time to surgery. Sites were able to view their data, the cohort as a whole's data and also compare their data against that of another site. **These data, collected by sites on Case Capture, are referred to as QI data throughout the report.**

National hospital episode data was used to quality assure the local data collected by sites and to compare to the CholeQuIC-ER cohort trusts/health boards that were not part of the collaborative. Aggregated data from the Hospital Episode Statistics (HES) database was used for English trusts, and Patient Episode Database for Wales (PEDW) was used for Welsh health boards. It was not possible to obtain national data for Northern Ireland.

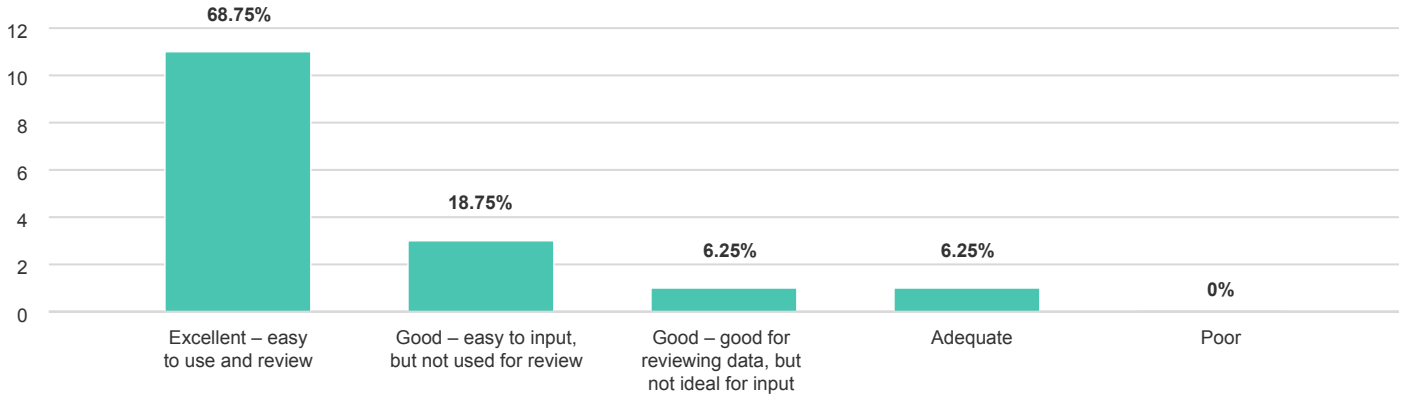
One of the questions in the end of project questionnaire asked 'What has been your experience of using Case Capture?' 93.75% of those that answered this question said that the system was excellent or good (see Figure 4 for a full breakdown of responses).

Figure 3: Data collected on Case Capture

1. Patient hospital number
2. Date of emergency admission
3. Cholecystectomy decision
   - a .Fit and consenting for cholecystectomy – as inpatient
   - b. Fit and consenting for cholecystectomy – discharged before surgery
   - c. CBD stones present
   - d. Temporarily not fit (e.g. pregnancy, patient choice)
   - e. Permanently not fit (e.g. comorbidities)
   - f. Not a gallstone admission (e.g. no gallstones)
4. Cholecystectomy date

One response stated that the platform was 'simple and easy to use', and another said that they were 'very pleased with the ease of use of Case Capture and the fact that it has minimum dataset required, which allows for quick entries'. Data collection for QI is a well-documented challenge in the literature; based on this and our learning from CholeQuIC we view the introduction of a simple, parsimonious data process using Case Capture as a substantial improvement to the experience of running a QI Collaborative. In the questionnaire, we asked how the platform could be further improved. We used this feedback to make slight design changes to Case Capture for the Cholecystectomy Quality Improvement Collaborative 3 (Chole-QuIC3)[15] cohort.

Figure 4: What has been your experience of using Case Capture?



COVID-19

Impact of the pandemic on acute gallstone care

National guidance

The COVID-19 pandemic had a huge impact on surgical services, including emergency gallstone care. From March 2020, following the Intercollegiate General Surgery Guidance on COVID-19[16], most CholeQuIC-ER sites stopped laparoscopic surgery. The guidance at the time stated that surgeons should 'consider laparoscopy only in selected individual cases' and that 'where non-operative management is possible and reasonable (such as for early appendicitis and acute cholecystitis) this should be implemented'. Therefore, most sites stopped laparoscopic surgery and managed patients conservatively using drains or antibiotics.

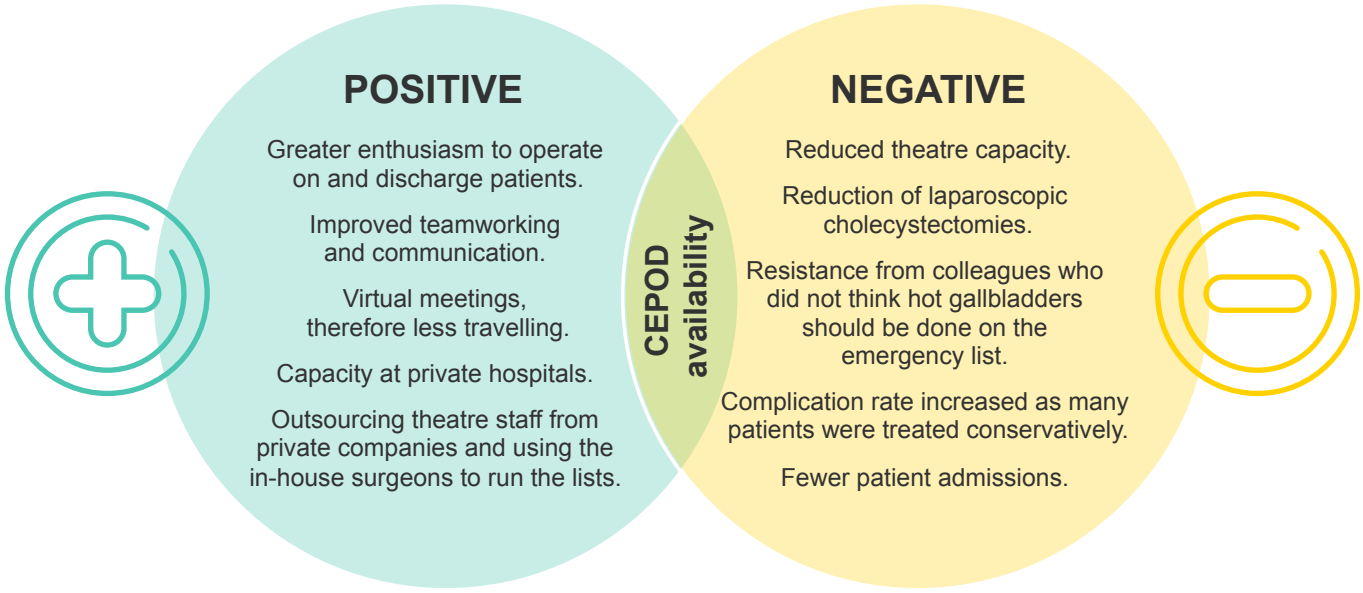
The guidance was updated on 30 May 2020 to support hospitals carrying out laparoscopic surgery, provided all risks were mitigated against, allowing trusts/health boards who had stopped laparoscopic cholecystectomies to restart their acute gallbladder services to carry out laparoscopic cholecystectomies.

Acute gallbladder services

Emergency gallstone services were impacted negatively in a number of ways, especially in the first few months when guidance stated that laparoscopic surgery should be suspended. However, some sites highlighted that they were able to make wide-scale sweeping changes quickly which would not have been possible prior to the pandemic, such as changing the default position of carrying out inpatient emergency laparoscopic cholecystectomies.

Most CholeQuIC-ER units restarted their elective surgery in summer 2020. However, there were different local arrangements around self-isolation and testing. As well as this, many sites had long waiting lists. For some sites, elective surgery was less feasible. Therefore, their default position was to keep eligible patients (i.e. those medically fit for surgery and who consented to have surgery on an urgent basis in hospital), operate on them quickly and then send them home, rather than discharging them, as the patient may have to self-isolate or be added to a long waiting list. Figure 5 provides a summary of the self-reported impact of COVID-19 on sites, collected in October 2020.

Figure 5: Impact of COVID-19 on acute gallstone services of CholeQuIC-ER sites



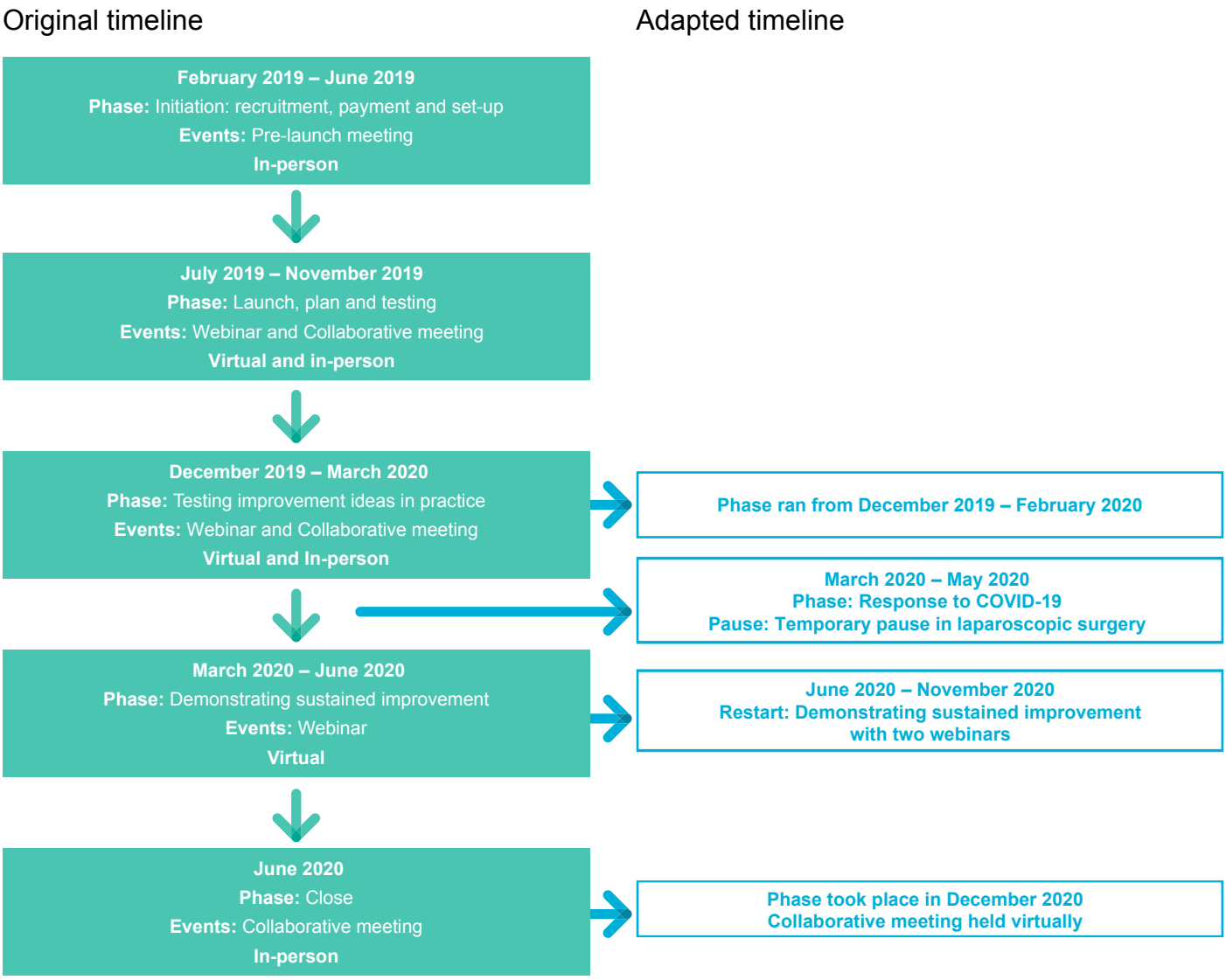
Impact of the pandemic on delivery of the QI collaborative

CholeQuIC-ER was launched in July 2019 and was due to close in June 2020; however, due to COVID-19 and the temporary suspension of laparoscopic surgery, discussions were held with all sites to decide on how to adapt the collaborative design and support provided for sites. The decision was made to extend the project by six months until December 2020.

From March 2020, all in-person site visits were changed to take place virtually. QI support was provided between April and June 2020 for those surgical teams who were still delivering care for patients with acute gallstone disease. The webinar that was planned for April 2020 was postponed to June 2020, and an additional webinar took place in September 2020. Both webinars focused on helping teams restart their gallstone services. The final collaborative meeting in December 2020 was held virtually, not in person as originally planned. The meeting celebrated the cohort's successes and explored what is needed in order to sustain change.

By adapting the model, we were able to continue to deliver CholeQuIC-ER and have learnt that virtual site visits and collaborative meetings can be delivered effectively. For future initiatives, we will consider offering blended collaborative models, where some meetings/site visits are in person, and others are held virtually. We will also consider running fully virtual collaboratives where all support and content is delivered virtually. This model would mean that travel would be reduced, as would be the overall cost of running the collaborative.

Figure 6: The QI collaborative model and how it was adapted



3. Results

Analysis of QI data

Figure 7: Overall numbers for full CholeQuIC-ER cohort

9,902
records inputted

8,557
gallstone admissions between July 2019 and December 2020

5,149
fit and consenting patients for surgery (60% of gallstone admissions)

3,748
patients had an **urgent laparoscopic cholecystectomy** (73% of fit and consenting patients)

2,584
patients had **surgery within 14 days** (50% of fit and consenting)

2,319
patients had **surgery within 8-days** (45% of fit and consenting)

21 of the 23 sites collected data for the majority (more than eight months) of the project. 17 of these sites had good data collection throughout the whole project (from July 2019 to 30 November 2020).

Sites' learning from their own data is a fundamental process needed for successful improvement, as outlined in the Chole-QuIC theory of change (see p10). The real-time dashboards allowed sites to be able to see their progress immediately. Whilst all teams collected and collated data for the project, the perceived importance of this data varied. In most highly successful sites, data were collected, and time was set aside by the team to review and reflect on the data and make amendments to processes where necessary.

The project goal was for 80% of eligible patients (i.e. those medically fit and who consented to have surgery on an urgent basis) who were admitted to hospital to receive their cholecystectomy within 8-days of presentation at hospital, in line with NICE guidance.

As Figure 8 illustrates, the numbers of patients receiving surgery in 8-days – referred to throughout the report as '8-day rate' – was held at a consistent rate pre- and post- the temporary pause of laparoscopic surgery across the full cohort, with a slight increase in November 2020. It is important to understand that there was large variation between sites, some having consistently high 8-day surgery rates (Figure 9), some consistently low 8-day rates (Figure 10), some improved over time (Figure 11), and some had excellent data but then stopped collecting their data (Figure 12).

Figure 8: Monthly mean 8-day rate for the full CholeQuIC-ER cohort

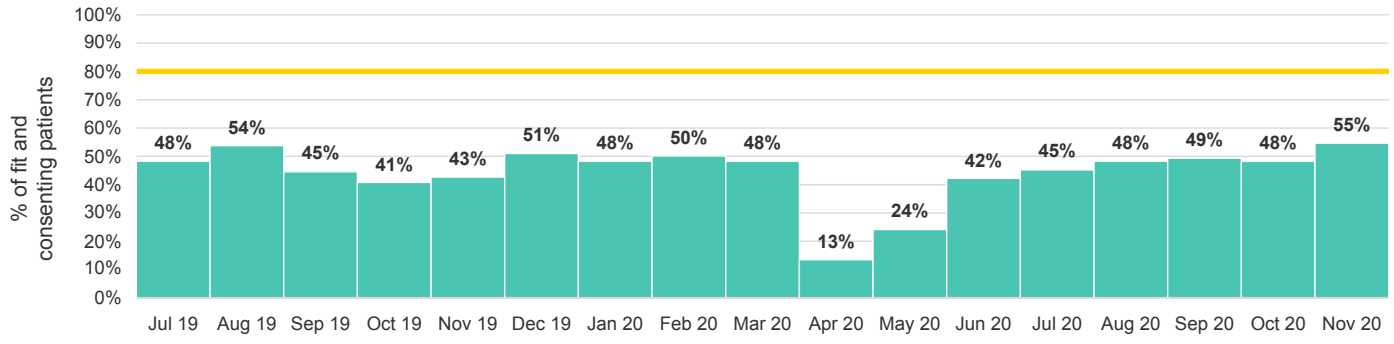


Figure 9: Example site with consistently high 8-day surgery rates

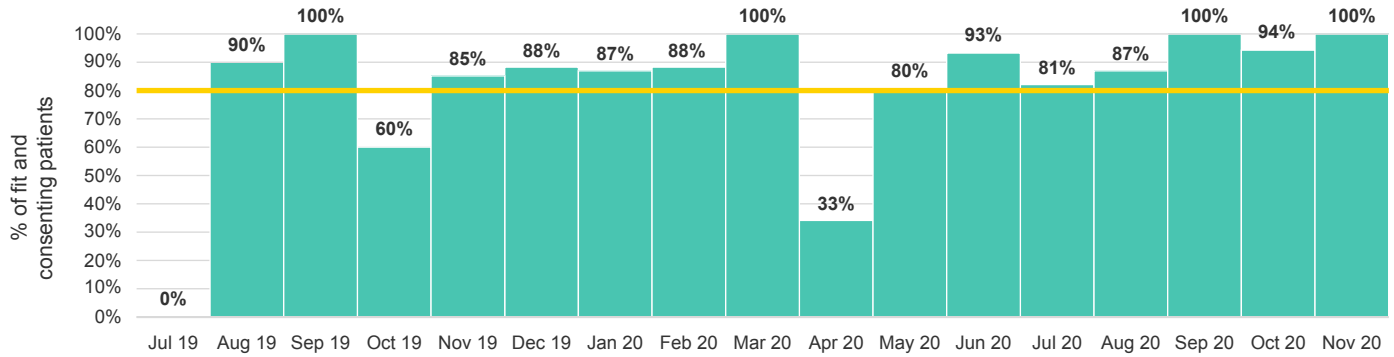


Figure 10: Example site with consistently low 8-day surgery rates

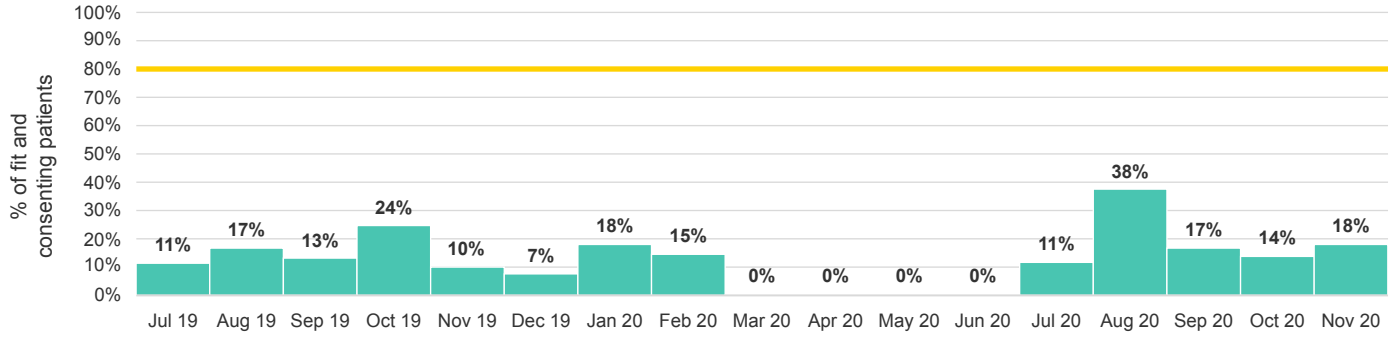


Figure 11: Example site with 8-day surgery rates that improve over time

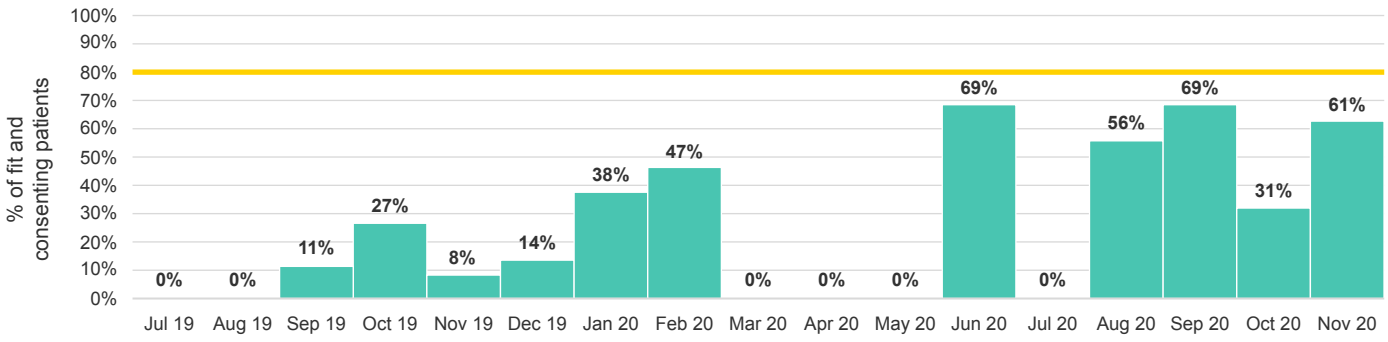
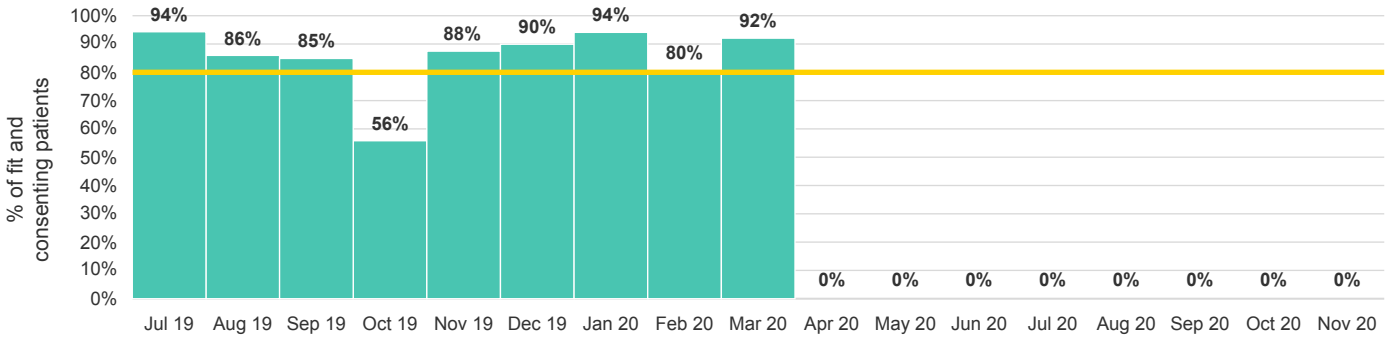


Figure 12: Example site with consistently high 8-day surgery rates, with no data collection after the influence of COVID-19

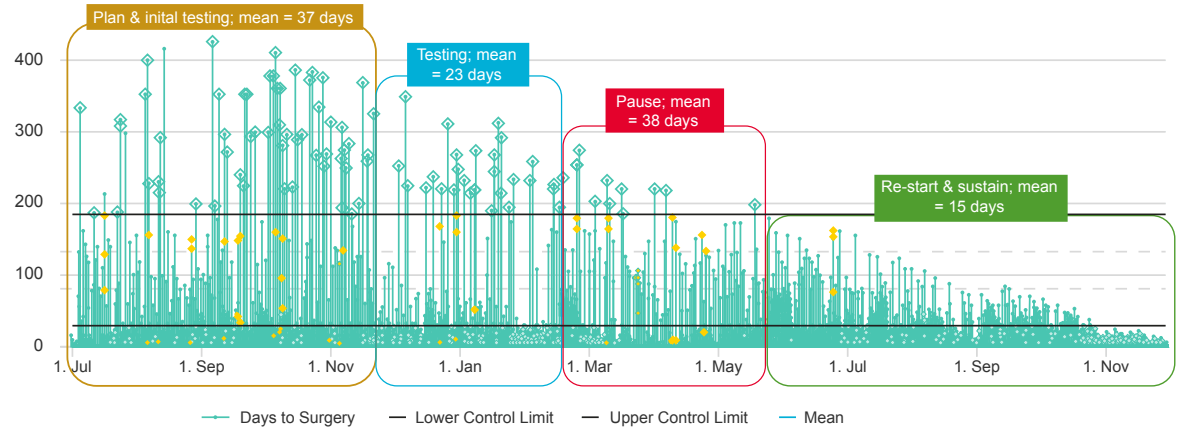


While the primary programme measure was the 8-day surgery rate, it is also important to consider the mean time to surgery as an important measure of success needed to identify meaningful reductions in waiting times that are not captured by the 8-day metric.

The Statistical Process Control (SPC) in Figure 13 outlines that the average time to surgery during the first phase of the project (Plan and initial testing phase) was 37 days; this was reduced to 23 days during the Testing improvement ideas phase. This increased to 38 during the third period when laparoscopic surgery was temporarily suspended (Pause phase) and then reduced to 15 days during the final phase (Restart: Demonstrating sustained improvement phase).

In quality improvement, the clear reduction in variation in time to surgery over the project period is equally important as the reduction in the mean time to surgery. An important aspect of successful quality improvement is to reduce unwarranted variation, and CholeQuIC-ER was able to support teams to reduce this variation across the whole cohort, even during the challenging times of the pandemic during 2020.

Figure 13: Time to surgery – Every admission



Analysis of national data

As well as using our local QI data we used Hospital Episode Statistics (HES) data for English NHS trusts and Patient Episode Database for Wales (PEDW) for Welsh health boards. It was not possible to obtain national data for Northern Ireland.

This national data was used to quality assure the local data that was collected and to compare the CholeQuIC-ER cohort to the control group (all trusts/ health boards in England and Wales that were not part of the project). The denominator for both HES and PEDW data is all patients admitted as an emergency with acute biliary pain, cholecystitis or gallstone pancreatitis (ICD-10 codes K85.0, K85.1, K85.8, K85.9; K80.0, K80.1, K80.2; K81.0, K81.1, K81.8, K81.9; K82.0, K82.1, K82.2, K82.3, K82.4, K82.8, K82.9; R10) who subsequently had a cholecystectomy. Therefore, the 8-day surgery rate for HES or PEDW is very unlikely to rise above 50% as many patients admitted with the above codes will not be eligible for surgery. No trust or health board has a sustained 8-day rate of over 50% (see Figures 14 and 15).

8-day rate

Figure 14 compares English and Welsh CholeQuIC-ER sites (22 sites from 21 trusts/health boards) to all other acute hospitals in England and Wales. 8-day rates are comparable in the two years before the project (July 2017 – June 2019) at approximately 15% of all admissions. The average from control sites (the blue line) stays at this level, then drops radically during the first COVID-19 wave, and then struggles to recover during the second half of 2020. CholeQuIC-ER sites (in yellow) improve steadily after the July 2019 project launch. The 8-day rate drops during the first COVID-19 wave but recovers in July-September 2020 and continues to improve between October 2020 and December 2020, showing improvement over time and resilience in the second half of 2020.

Figure 14: 8-day rate for CholeQuIC-ER sites c.f. controls across England and Wales

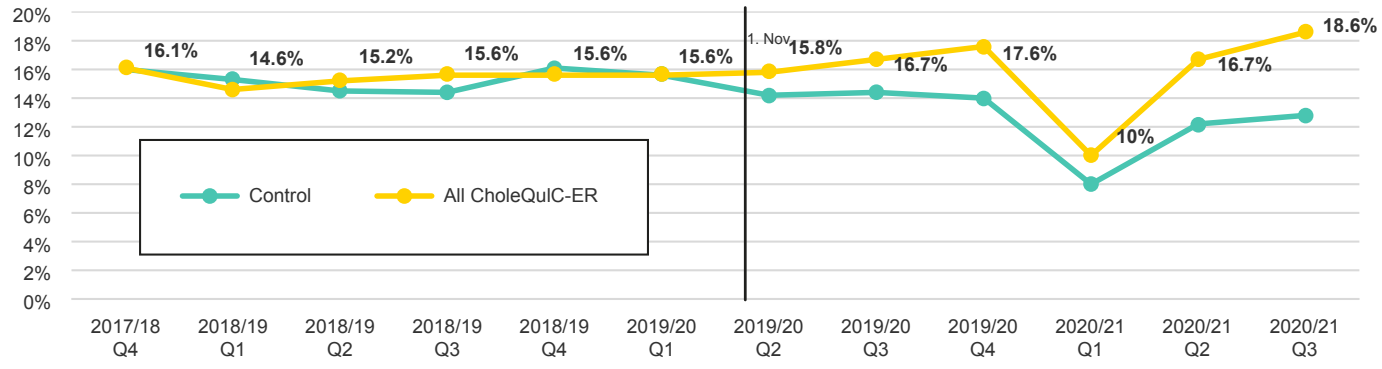


Figure 15: Baseline (July 2018 – June 2019) 8 day rate for all trusts/health boards in England and Wales (HES and PEDW)

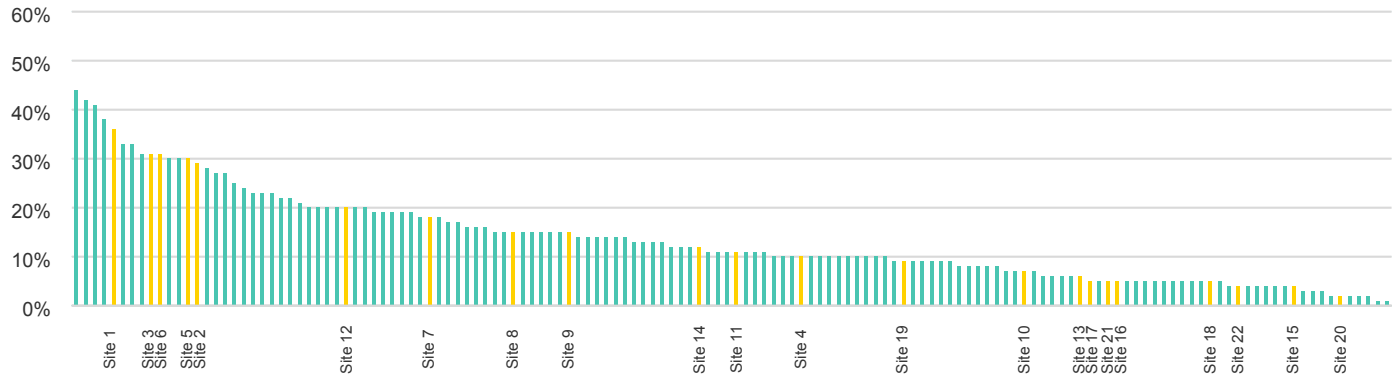
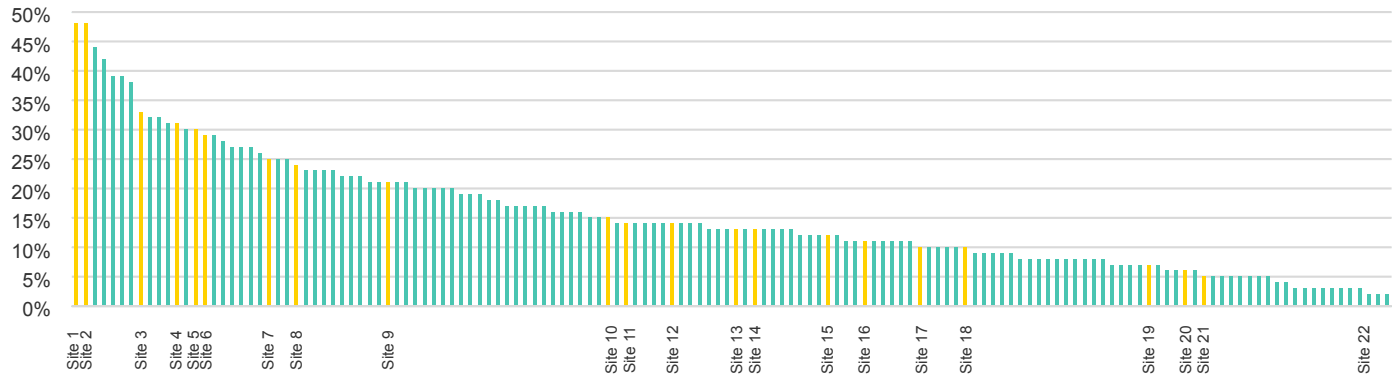
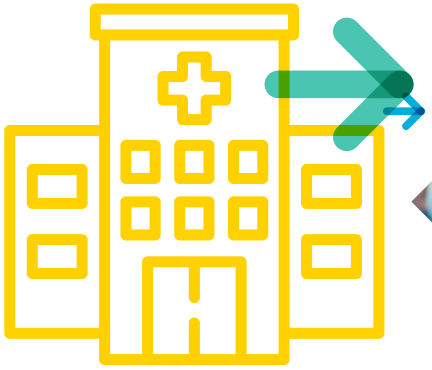


Figure 15 shows all sites in England and Wales ranked by their 8-day rate during the baseline of the project (July 2018 – June 2019), and Figure 16 shows the same sites ranked during the CholeQuIC-ER intervention (July 2019 – December 2020). The majority of CholeQuIC-ER sites (in yellow) improved their ranking (they moved left in the intervention graph). Site 4 increased its ranking by 81 places, and Sites 1 and 2 now have the best 8-day rates across England and Wales.

Figure 16: Intervention (July 2019 – December 2020) 8-day rate for all trusts/ health boards in England and Wales (HES and PEDW)





Relative change of 8-day surgery

Table 2 outlines the mean 8-day rate for the baseline period (July 2018 – June 2019) and intervention period (July 2019 – December 2020). The table is ranked by the mean 8-day rate during the intervention period.

Table 2: 8-day rate before and during CholeQuIC-ER

	Activity – All admissions for biliary disease		% procedures within 8-days (all admissions)		Relative change	Relative change (adjusted for control)
	Baseline	Intervention	Baseline	Intervention		
Control	103,123	106,692	15.3%	12.8%	0.84	
All CholeQuIC-ER	16,178	16,156	15.7%	16.6%	1.05	1.25
Site 1	478	381	38.7%	44.1%	1.14	1.36
Site 2	542	602	29.5%	41.7%	1.41	1.68
Site 5	1,631	1,717	32.4%	31.3%	0.97	1.15
Site 7	668	638	12.3%	30.1%	2.45	2.92
Site 6	822	785	29.7%	29.0%	0.98	1.17
Site 4	720	659	31.8%	27.9%	0.88	1.05
Site 3	355	395	20.3%	22.8%	1.12	1.34
Site 8	644	638	17.1%	21.2%	1.24	1.48
Site 12	637	636	16.5%	19.0%	1.15	1.38
Site 10	792	853	8.3%	13.7%	1.65	1.96
Site 17	998	521	13.4%	13.4%	1.00	1.19
Site 14	988	1,062	22.4%	12.1%	0.54	0.65
Site 11	810	763	7.9%	11.0%	1.39	1.66
Site 16	1,031	938	13.6%	10.6%	0.78	0.93
Site 15	886	979	3.5%	10.0%	2.86	3.41
Site 19	719	687	7.2%	9.6%	1.33	1.58
Site 13	502	514	7.8%	8.8%	1.13	1.34
Site 21	928	1,013	5.4%	8.1%	1.50	1.79
Site 9	671	720	10.7%	5.0%	0.47	0.56
Site 18	706	927	2.5%	4.6%	1.82	2.17
Site 20	1,311	1,394	7.2%	4.6%	0.63	0.76
Site 22	944	980	5.0%	1.6%	0.33	0.39

CholeQuIC-ER sites overall maintained and showed a slight increase in performance against the 8-day goal compared to control sites that showed a decrease in performance (1.05 vs. 0.84). When looking on a site-by-site basis, it is clear that there was variation and heterogeneity across the cohort, which means the result for the cohort overall obscures both significant successes but also some challenges at the site level.

Some sites started from a low baseline and made a large improvement in their 8-day surgery rate. For example, site 15 who originally had an 8-day surgery rate of 3.5%, increased this to 10%.

Some sites were unable to improve their 8-day surgery rate. For example, site 9 had a baseline 8-day surgery rate of 10.7%, which decreased to 5% during the intervention.

Other sites that started from a high 8-day surgery rate were able to maintain this. For example, site 1 had a high 8-day rate of 38.7%, and they were able to maintain and improve upon this, as by the end of the project, their 8-day rate was 44.1%.

Feedback from sites – collaborative process

Overall, teams that were part of CholeQuIC-ER said they had found the experience of being part of the collaborative very positive. Participant feedback was that the collaborative helped them further their understanding of gallstone disease, gave them a structure to focus on improving care for patients and that there was value in working with other trusts/health boards to share challenges and come up with ideas.

Some quotes from participants are included below:

- Overall extremely positive, **provided the impetus for change and accelerated it**.
- CholeQuIC-ER is a very good initiative from RCS England. It has initiated a number of changes and has helped many patients to get operated on in the **same admission**. We would like to be part of **future collaboratives**.
- **Learnt a lot about gallstone disease** – where to refer patients, what investigations need to be done.
- This program gave me and some of my colleagues the opportunity to see that our situation is **not so different than in other trusts**, and we found it very useful **sharing challenges and finding ideas** to improve the service all together during our meetings.
- The support received from your team was absolutely amazing and I only have positive feedback to give you. Very good experience. Organised, helpful, educative, supportive.

Feedback from sites – self-reported outcomes

As well as data outcomes, some sites reported other positive outcomes as a result of being part of the project. Many were around a positive change of culture, which we know is fundamental to quality improvement, but that can often take a prolonged period of time, so it is very encouraging that sites saw this culture change in the space of an 18-month collaborative. One site stated that the 'Tsunami of acceptance of the project dwarfed the waves of opposition!' Teams changed default positions, for example, treating patients within the same admission, and this change of system enabled sites to operate on more patients, more quickly and resulted in patients' quality of life improving. Figure 17 summarises this feedback.

*The project aimed to **improve patient care** for patients with gallbladder disease and a number of sites highlighted that they had received **positive patient feedback**. One team fed back that patients reported being pleased to be discharged with a surgery date and to be given a point of contact at the hospital should they have any queries.*

Figure 17

4. New processes tested and reviewed

Throughout the collaborative, teams were supported to develop and test changes at their hospitals and then attempt to embed those changes that led to improvements.

There was no formal evaluation funded as part of CholeQuIC-ER; however, we summarise the common improvement activities and changes, grouped into four main categories (see Figure 18).

Gaining a deeper understanding of their system. Most sites reviewed their QI data to fully understand their patient flow through their system. As a result, they had a better understanding of patient admissions and more capacity to operate on eligible patients.

Introduction of a new patient pathway or processes. In the end of project questionnaire, 76% of those who answered reported that they developed a new pathway during CholeQuIC-ER (see Figure 19). These pathways were either an adaptation of current pathways at sites, adaptation of the Chole-QuIC pathway (see Figure 20), or development of a totally new pathway. Some sites set up WhatsApp groups or generic email addresses to refer and manage patients for the hot gallbladder list. One site created and trialled a pre-assessment screening questionnaire to improve the process of triaging patients.

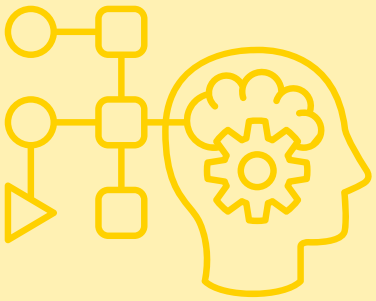
Creating capacity was the key influence on success in the evaluation of CholeQuIC. In CholeQuIC-ER, teams came up with creative solutions to identify or repurpose operating theatre time so that emergency gallstone cases were prioritised. Some sites introduced 'virtual wards', where patients return home under close monitoring prior to surgery. During this period, teams also worked hard to ensure they took advantage of any empty slots, for example, on emergency theatre (CEPOD) lists. Excellent communication with colleagues to ensure they understood why some laparoscopic cholecystectomies needed to be done on an urgent basis was key to ensuring the process continued to work smoothly in the post-pandemic/lockdown period.

Building new relationships with colleagues was the final category that was key to changing culture. The way in which teams did this was to get management support and engage colleagues such as surgeons, trainees, anaesthetists, radiologists, nurses and theatre staff. An important first step for some teams was to identify which surgeons were comfortable and willing to carry out laparoscopic cholecystectomies on these specific patients, as some surgeons historically have considered these cases to be more technically difficult.

Figure 18: Summary of new processes tested and improved

Gained a deeper understanding of hospital system

- Better review of data
- Finance analysis
- Audit

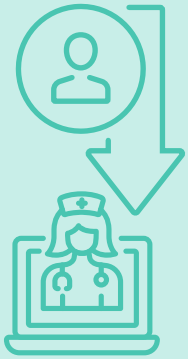


Created new capacity

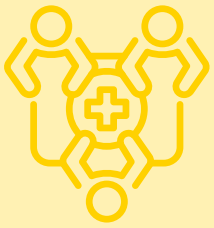
- Increased the numbers kept in as inpatients
- Introduced virtual wards systems
- Dedicated lists
- Slots on the elective lists
- CEPOD
- Private hospitals

New patient pathways/processes

- New/refined pathway – pathway included in induction
- WhatsApp group/email address set to manage the 'Hot List'
- Consenting/booking pre-discharge
- Pre-assessment tool
- Extra ward rounds



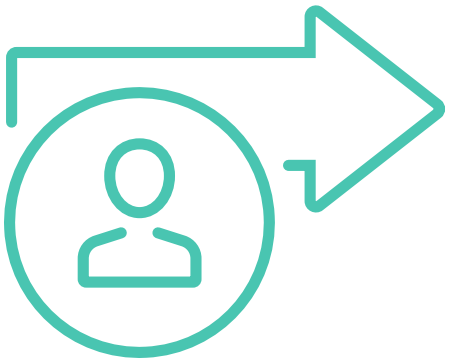
Built new relationships



- Engagement with management
- Promoting project in meetings
- Agreeing which consultants would operate and therefore be included on hot lists/operate on CEPOD
- Engaging colleagues (e.g. surgeons, trainees, anaesthetists, radiologists, nurses, theatre staff)
- Communicating plan to all team members

Figure 19:

*Did you develop a new **patient pathway** as part of the project?*



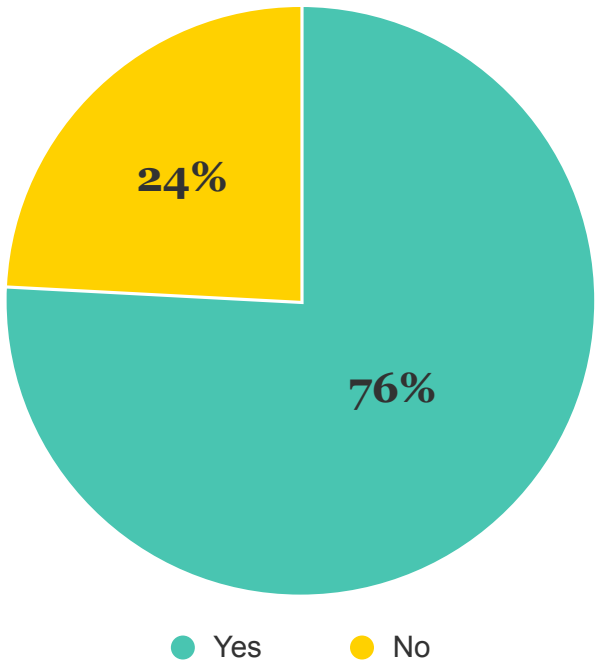
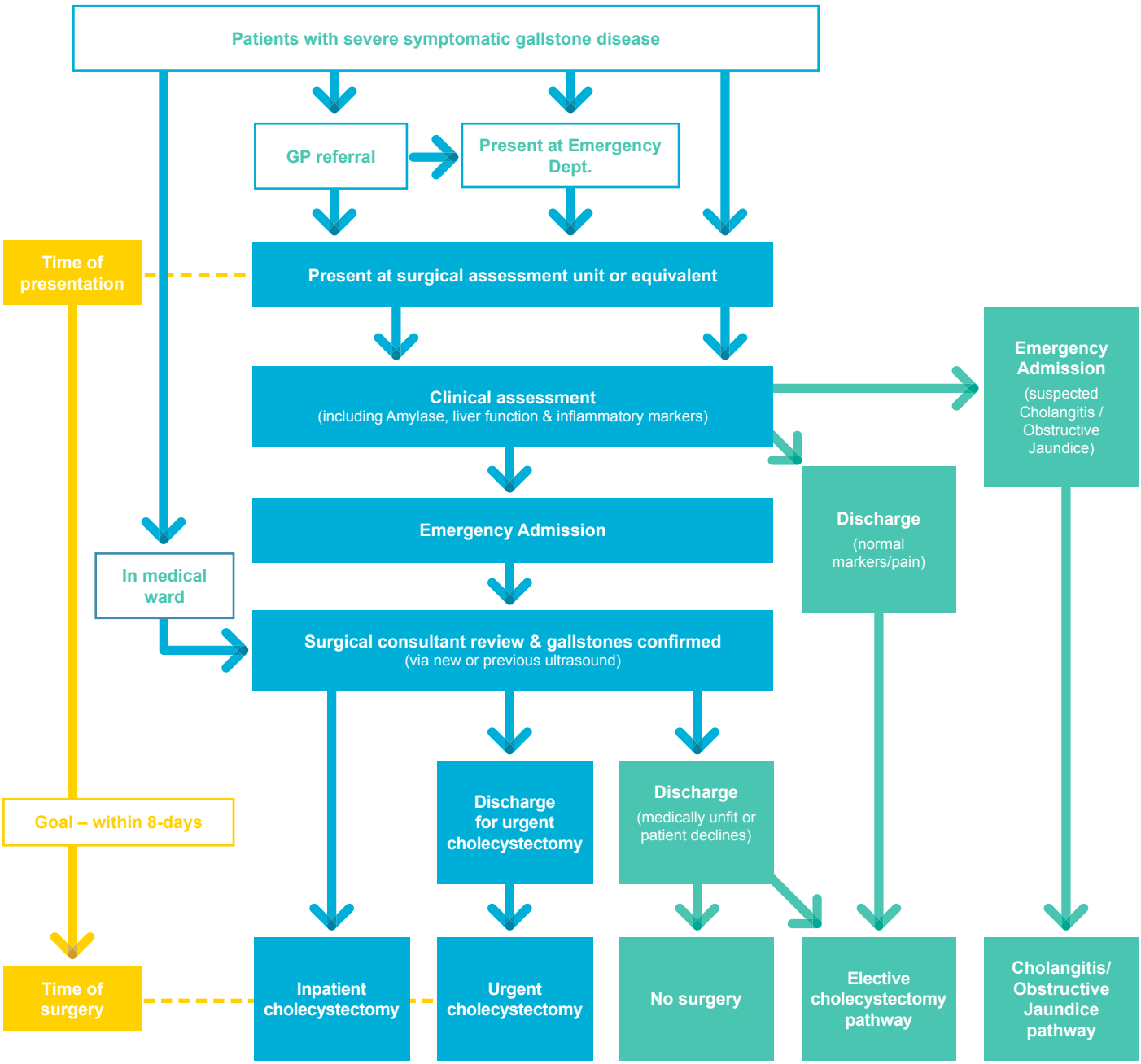


Figure 20: Chole-QuIC pathway:
(Acute Biliary Pain, Cholecystitis or Gallstone Pancreatitis)



5. Case studies

Royal Surrey County Hospital NHS Foundation Trust

Prior to the project, the team had focused a lot of effort into their acute gallstone care and had an excellent 8-day surgery rate of over 30% from HES data, which increased to 50% by the end of the collaborative, giving them the highest rate in England.

The CholeQuIC-ER team was led by two consultant surgeons and supported by members of the surgical care team. They engaged extremely well throughout the project, attending all but one meeting and taking part in a successful site visit in March 2020, where they articulated the pathway (see Figure 21) in theory and in practice.

*The team collected data for the entirety of the project. The team worked on **colleague engagement** and successfully used **CEPOD to operate on inpatients**.*

Impact of COVID-19

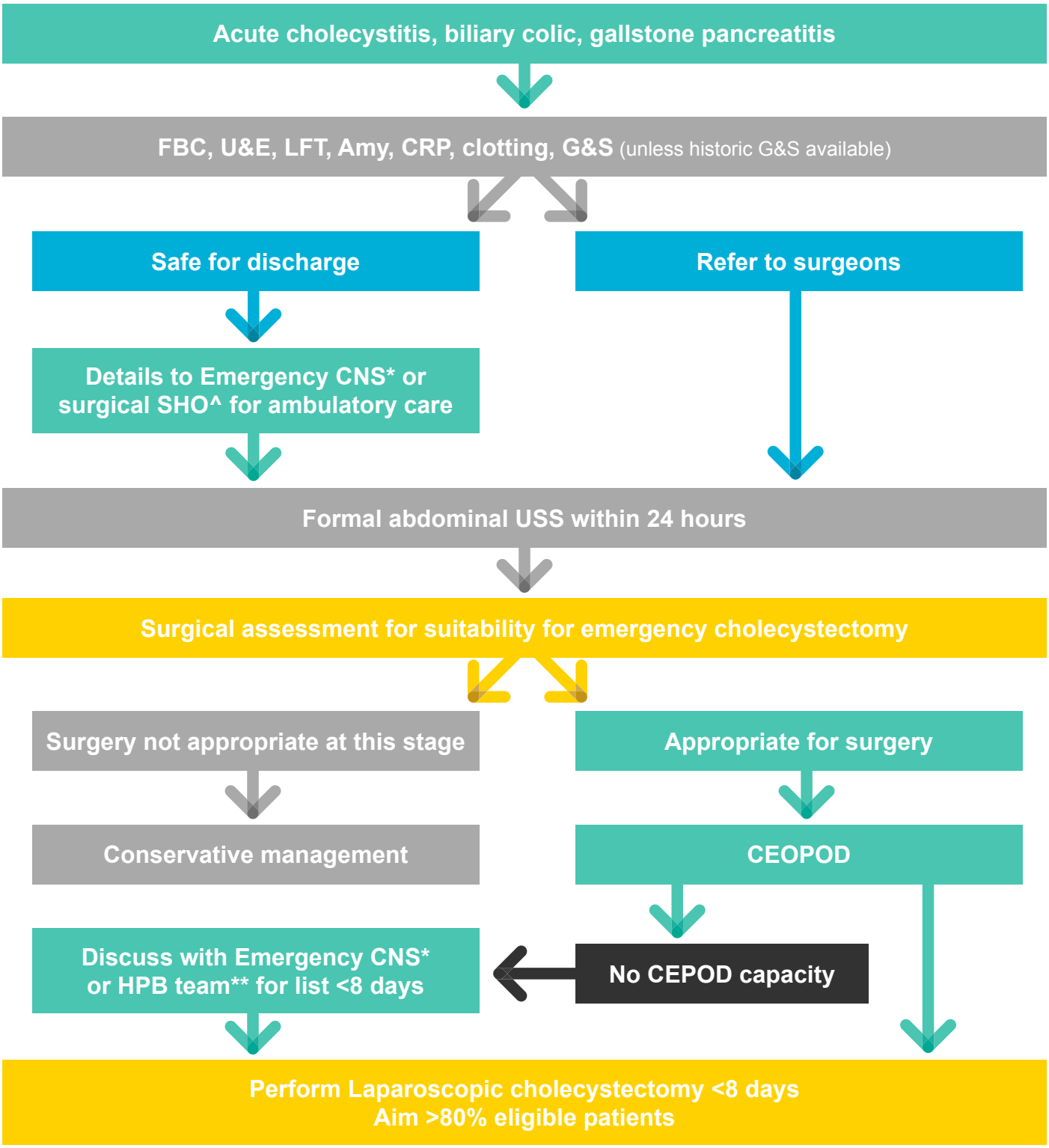
The trust temporarily suspended laparoscopic surgery in line with guidance from late March 2020. During that time, four patients were fitted with cholecystectomy tubes. These patients were very difficult to manage and had repeated admissions; two patients with pancreatitis also presented after being seen with biliary colic. One of the pancreatitis patients had a very poor outcome.

The team had a full discussion of the risks and benefits of surgery and, in view of the difficulties of management of these patients, and particularly the poor outcomes, decided as a unit that they re-establish the acute cholecystectomy project as soon as possible. This enabled a discussion with the anaesthetic team, who were supportive and keen to help.

Since the benefits were clear, this suspension of surgery lasted only three weeks, and the team were able to restart their service and get back up to speed very quickly. The team moved towards a default position of offering acute cholecystectomy as standard, but the timing of the pandemic acted as reinforcement at a time when the service could have taken a back seat to other considerations such as resuming elective work.

*The team achieved **excellent 8-day surgery rates** throughout the project – **86%** during the testing phase and **92%** during the restart period.*

Figure 21: Emergency Cholecystectomy Pathway of Royal Surrey County Hospital NHS Foundation Trust



This pathway is not a substitute for clinical judgement

Figures 21 and 22 show that Royal Surrey made a sustained improvement and was better than the national average.

Figure 22: 8-day rate: HES and QI data

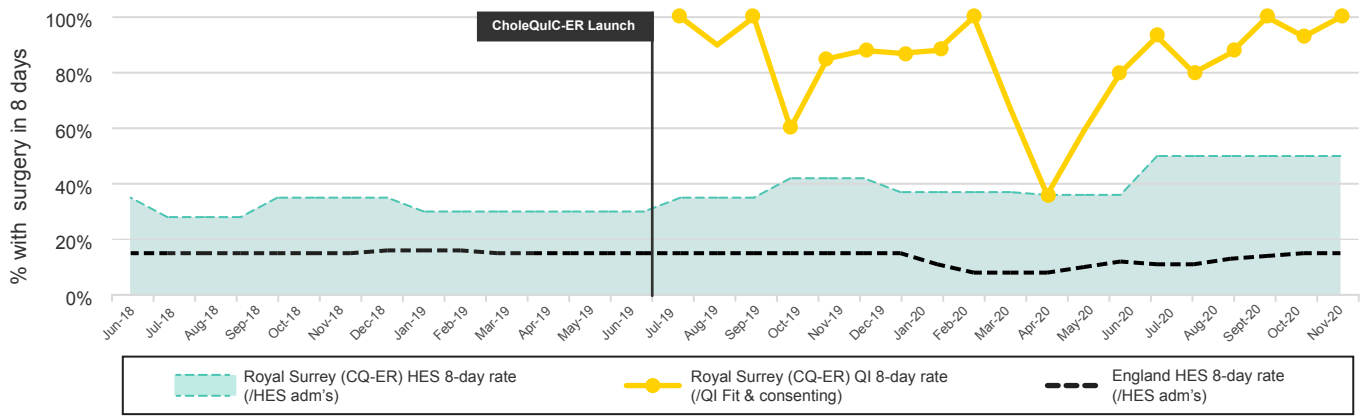
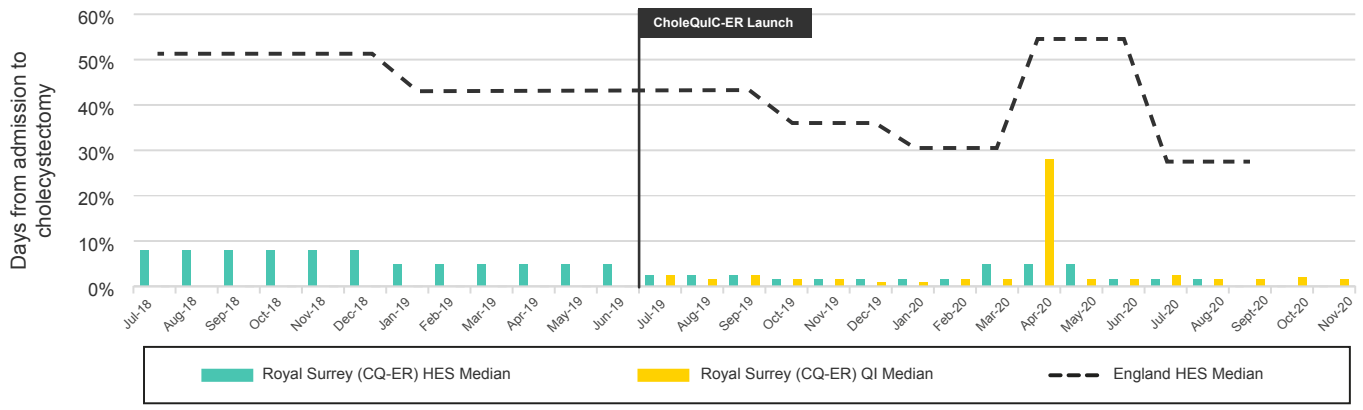


Figure 23: Median time to surgery: HES & QI data



Kingston Hospital NHS Foundation Trust

Prior to the project, the team had an 8-day surgery rate below the national average of 15.3% from HES data. Their 8-day rates increased to over 40% from HES data by early 2020 – and 89% of all eligible patients from QI data – before the impact of the COVID pandemic had an effect. They recovered their rates after the restart of the project to near pre-COVID levels: 29% from HES data, 67% of eligible patients from QI data.

The CholeQuIC-ER team was led by a consultant surgeon and supported by two consultant surgeons and management. The team engaged well, attended all meetings, took part in their site visit (January 2020) and worked extremely hard throughout the project, often giving up their free time to work on it. The team had good engagement from colleagues (surgeons, anaesthetists and trainees) and support from management. The team kept colleagues up to date on the project and shared presentations from collaborative meetings at Surgical Department meetings.

The team collected data for the entirety of the project. The team worked on **testing new ideas collaboratively**, *including* ***improved communication***, *utilising empty* ***CEPOD and elective lists*** *and the use of private lists that were empty.*

Impact of COVID-19

The site temporarily suspended laparoscopic surgery in line with guidance from late March. They restarted their service in June 2020. Their approach was that all patients were operated on as inpatients.

The team aimed for 8-days, but if this was not possible, just concentrated on getting the operations done as soon as possible and didn't get hung up on the 8-day target. The team successfully put forward the case with management that acute gallbladder presentations fall into the 'priority 2 category' (procedures to be performed in less than one month).

CEPOD capacity was limited. The team secured some slots on a weekly basis (UGI elective consultants' lists). Elective Upper GI surgeons had time in their job plans allocated, which meant they were allocated one day a week to carry out hot gallbladders.

They were successful in getting their 8-day surgery rates back to near their pre-COVID-19 levels.

Kingston Hospital is ***leading the South West London Clinical Network for General Surgery****. They meet weekly and work collaboratively to discuss and* ***solve problems*** *regarding elective work, prioritisation and reducing waiting lists, mainly by sharing their thoughts for improvement and by introducing and following the same pathways.*

Figure 24: 8-day rate: HES and QI data

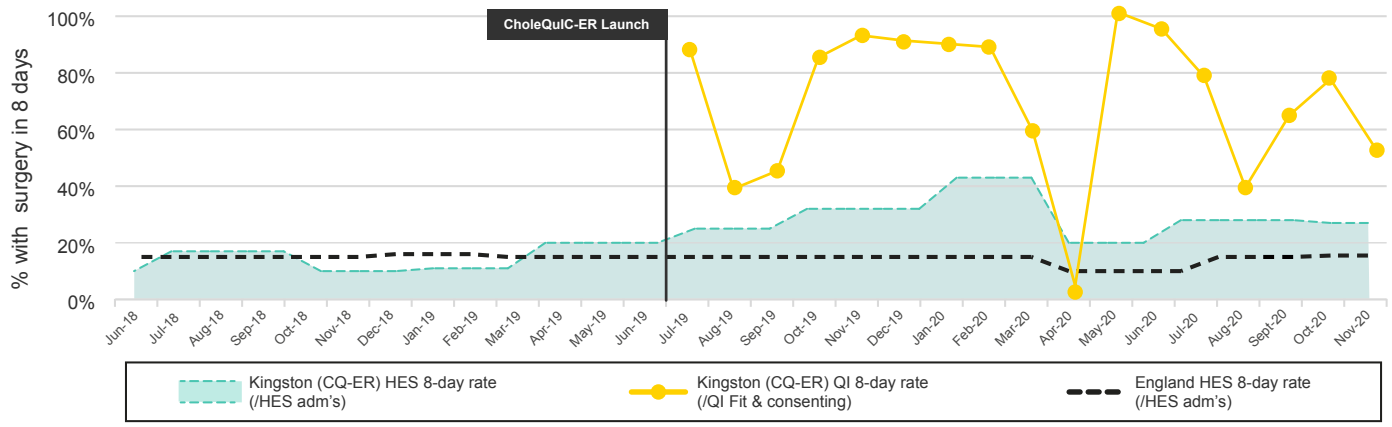
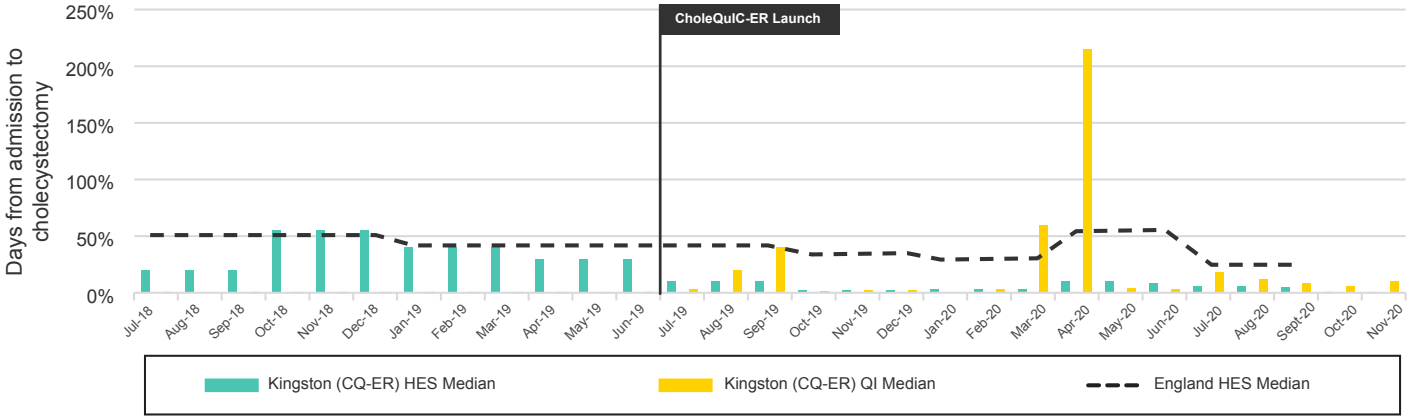


Figure 25: Median time to surgery: HES & QI data



6. Conclusion

Overall the CholeQuIC-ER cohort improved their 8-day surgery and average time to surgery during the collaborative period despite the huge challenges of the COVID-19 pandemic. The majority of CholeQuIC-ER sites improved their 8-day surgery national ranking. One site increased its ranking by 81 places, and the top two 8-day rates across England and Wales are now held by CholeQuIC-ER sites. These results, in conjunction with positive feedback from participants, lead us to conclude that this subscription model for improvement in gallstone services is a successful approach to improve care for patients with gallstone disease across England, Northern Ireland and Wales.

Next steps

Cholecystectomy Quality Improvement Collaborative 3 (Chole-QuIC3) is our third Quality Improvement collaborative that focuses on improving the quality of care for patients with acute gallstone disease. The project aims to improve outcomes for patients with gallstone disease by reducing variation and reducing time to surgery for this patient group. As well as this, it will focus on how teams can improve pathways for emergency gallstone patients. This will not only improve patient care but also relieve pressure on the system.

12 trusts/health boards were recruited to Chole-QuIC3: six new sites and six continuing sites (sites that were part of CholeQuIC-ER).

The project commenced in April 2021 and will close in July 2022.

For more information see: www.rcseng.ac.uk/cholequic3

The CholeQuIC-ER project team

Mr Ian Beckingham, Clinical Lead

Mr Jonathan Bamber, QI Lead

Dr Tim Stephens, QI Adviser

Ms Sheena MacSween, Senior Project Manager (Quality Improvement Projects), RCS England

Mr Ralph Tomlinson, Project Sponsor & Director of Research and Quality Improvement, RCS England

Mr John Abercrombie, RCS England's QI Council Lead

www.rcseng.ac.uk/cholequicer

7. References

[1] *https://www.rcseng.ac.uk/about-the-rcs/about-our-mission/ [last accessed September 2021]*

[2] *https://www.rcseng.ac.uk/qi [last accessed September 2021]*

[3] *https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/good-practice-guides/quality-improvement/ [last accessed September 2021]*

[4] *https://www.rcseng.ac.uk/standards-and-research/support-for-surgeons-and-services/quality-improvement-in-surgery/quality-improvement-network-in-surgery/ [last accessed September 2021]*

[5] *Improvement collaboratives in healthcare, Health Foundation, 2013: http://www.health.org.uk/publication/improvement-collaboratives-health-care. [last accessed October 2021]*

[6] *https://www.rcseng.ac.uk/cholequic [last accessed October 2021]*

[7] *Association of Upper Gastrointestinal Surgeons. Pathway for the Management of Acute Gallstone Diseases; 2015. http://www.augis.org/wpcontent/uploads/2014/05/AcuteGallstonesPathwayFinalSept2015.pdf [last accessed October 2021]*

[8] *National Institute for Health and Care Excellence. Gallstone Disease: Diagnosis and Management. Clinical Guideline CG188; 2014. https://www.nice.org.uk/guidance/cg188 [last accessed October 2021]*

[9] *https://www.gettingitrightfirsttime.co.uk/surgical-specialty/general-surgery/ [last accessed October 2021]*

[10] *Eligible patients defined as – Patients with acute biliary pain/ cholecystitis or gallstone pancreatitis who are assessed as medically fit for surgery and choose to have surgery on an urgent basis.*

[11] *National Institute for Health and Care Excellence, 2015, Gallstone disease: Quality standard (QS104): https://www.nice.org.uk/guidance/qs104 [last accessed October 2021]*

[12] *Bamber JR, Stephens TJ, Cromwell DA, Martin GP, Duncan E, Quiney NF, et al. Effectiveness of a quality improvement collaborative approach in reducing time to surgery for patients requiring emergency cholecystectomy. BJS Open. 2019; 3: 6; 802-811*

[13] *Stephens TJ, Bamber JR, Beckingham IJ, Duncan E, Quiney NF, Martin G. Understanding the influences on successful quality improvement in emergency general surgery: learning from the RCS Chole-QuIC project. Implementation Sci 2019; 14: 84.*

[14] *CholeS Study Group WMRC. Population-based cohort study of variation in the use of emergency cholecystectomy for benign gallbladder diseases. Br J Surg. 2016;103(12):1716–26.*

[15] *https://www.rcseng.ac.uk/cholequic3 [last accessed October 2021]*

[16] *https://www.rcseng.ac.uk/coronavirus/joint-guidance-for-surgeons-v2/ [last accessed April 2022]*

Royal College of Surgeons of England

ADVANCING SURGICAL CARE

The Royal College of Surgeons of England

The RCS England produces a wide range of standards and guidance to support the surgical profession within the areas of team working and leadership, legal and ethical concerns, personal development and service improvement. To find out more about our work visit **www.rcseng.ac.uk/standardsandguidance.**

The Royal College of Surgeons of England
38–43 Lincoln's Inn Fields
London WC2A 3PE

The Royal College of Surgeons of England
The Royal College of Surgeons of England
@ royalcollegeofsurgeons
@RCSnews