

HandsFirst Learning Report



Summary

The HandsFirst Quality Improvement Collaborative is The Royal College of Surgeons of England's fourth Quality Improvement (QI) collaborative and first to focus on hand trauma care. RCS England recognised significant changes had transpired over the last 25-30 years in the landscape of hand trauma care. Hands affect livelihoods. Good surgical outcomes have wide ranging health and socio-economic impacts. This changing landscape coupled with the recognition that hands play an important role in a person's level of independence, standard of living and the ease by which a person can realise their potential were driving factors leading RCS England and the British Society for Surgery of the Hand (BSSH) to establish the collaborative. The project aimed to improve the quality of care for hand trauma patients by reducing variation and time to surgery for this patient group in line with three of The British Society for Surgery of the Hand (BSSH) standards.¹ Specifically, these were time from injury to surgery for patients presenting within 24 hours of injury to any service with closed hand fractures, open joints or open fractures of the hand and all other open hand injuries. This report outlines the key project findings.



“Being in Ukraine, I am reminded of the importance of timely surgery. Many of the patients I am seeing and operating on have been delayed for weeks and weeks from when they had their injury to when they have their definitive surgery. It's definitely going to affect the outcome for these patients. It is great that we are able to address these issues so clearly and so comprehensively within the NHS and England and Wales.”

Mrs Sarah Tucker, Clinical Lead RCS England
from the opening address to celebrants HandsFirst
Collaborative 24 March 2023



Launching in November 2021, the project used a modified version of the IHI Breakthrough Series collaborative approach.² The project also followed the Theory of Change developed from the first RCS England gallstone collaborative, Cholecystectomy Quality Improvement Collaborative (Chole-QulC)³ drawing on complementary methods across the quality continuum. The collaborative delivered remarkable achievements in a relentlessly challenging context. The ongoing impacts of the COVID-19 pandemic were compounded by the outbreak of war in Ukraine, an onslaught of multiple winter pressures including further outbreaks of COVID-19, influenza, respiratory syncytial virus, a cost-of-living crisis not rivalled for at least 40 years, and the resultant industrial action arising from it. These compounding factors led to necessary adaptations to project delivery and an additional meeting was added to the programme, a celebration event in March 2023.

Under the best of circumstances, Quality improvement requires compassionate leadership, tenacity, teamwork, and time to meet, think, plan and test out new ideas. Of the 25 sites participating within the collaborative, no site withdrew participation despite these challenges. This is a testament to the commitment of the professionals drawn from multiple specialties and professional disciplines who took part in the collaborative. The continued participation of sites in an already fragile and recovering system represents a massive achievement. Participants included:

- 25 trusts and health boards from England and Wales.
 - 24 of these sites were trusts from England, with one Women's and Children's NHS Foundation Trust; and
- One health board from Wales

Professionals were a mix of:

- Plastics and Orthopaedic Surgeons
- Doctors in training
- Hand Trauma Coordinators
- Advanced Care Practitioners
- Hand Therapists
- Occupational Therapists; and
- Divisional, Business and Service Managers

Despite challenging circumstances, key achievements included:

- Creating the largest known national database on hand trauma from time of injury to surgery (9,028 records)
- Establishing the first BSSH standards for children
- Realising improvements against those new children's standards during the span of the collaborative
- 14 sites improved against at least one of the categories of injury
- One site improved in all three categories of injury
- Three sites maintained excellent levels of performance throughout the life of the collaborative
- Although only 45% of adult patients aged >16 years or more met the 24-hour BSSH standard for open joints and open fractures, compliance improved by 23% in the period following the Interim Report (16 August 2022 - 31 December 2022)
- The collaborative met the 80% compliance goal for the 4-day BSSH standard in adults aged >16 years for all other open injuries of the hand in the period following the Interim Report

Over the course of eight national meetings, sites within the collaborative realised a wide breadth and depth of change. This ranged from developing better and more meaningful relationships across team, departmental and organisational boundaries, to streamlining care pathways, leveraging technology, releasing and creating new capacity.



National meetings provided sites with the opportunities to:

- Learn quality improvement theory and tools to turn theory into practice
- Share pathways and models of care
- Discuss progress and challenges; and
- Explore and develop solutions across the collaborative

Data informs action in improvement. Between national meetings sites received monthly whole collaborative updates as the database grew. Quality improvement and clinical support was provided throughout via multiple virtual site visits, email and telephone support.

Information gleaned from this data set proved fundamental in providing sites with the granular detail needed to interrogate current practice and assess the nature of the challenges within their care pathways. Sites identified opportunities and were able to manifest impactful change. For the sites involved, the HandsFirst database will allow them to continue to make changes long into the future as they continue to address limiting factors and constraints.

Moreover, this rich data set provides the UK with a robust picture of current practice, an understanding of variation within the system, insights into those factors which constitute best practice and introduces possibilities for realising improvement at local, regional and national scales through wider participation with partners such as Getting It Right First Time (GIRFT).

During the life of the collaborative, the database enabled sites to prioritise areas for change within their own system, informing testing and supporting a range of practices to reduce variation, improve time to surgery and invited valuable peer-to-peer connections to ultimately improve patient flow throughout the entire system.

Sites gathered change ideas, created PDSA plans, reviewed the effectiveness of tests, built team knowledge and shared their learning. Many of these are summarised on the HandsFirst change ideas webpage:

<https://www.rcseng.ac.uk/standards-and-research/standards-and-guidance/service-standards/handsfirst-qi-collaborative/handsfirst-change-ideas/>

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See Appendix A for HandsFirst Quality Improvement Collaborative project team's biographies.

We would like to thank the HandsFirst Quality Improvement Collaborative sites for their participation and contributions to HandsFirst, see Appendix D for more information.



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1. Background and context

The Royal College of Surgeons of England's vision is "to see excellent surgical care for everyone." One of the strategic aims to achieve this mission is to improve practice.⁴ Quality Improvement is one methodology which teams can use to continually improve practice and drive improvements in patient care.

There are free Quality Improvement resources on the QI Hub which is located on the RCS England website. These resources have been designed to support members of the surgical care team who want to #TryQI.

QI Collaboratives

RCS England QI collaboratives follow an adapted version of the Institute for Healthcare Improvement's Breakthrough Series collaborative approach; defined as a short-term learning approach that brings together teams from many hospitals across the UK to seek improvement in a focused topic area.⁵

Chole-QulC

(October 2016 - January 2018)

Our first collaborative, Cholecystectomy Quality Improvement Collaborative (Chole-QulC) ran from October 2016 to January 2018.⁶

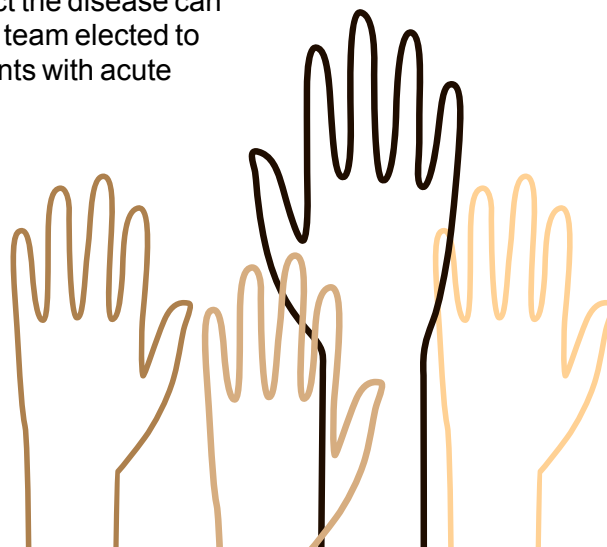
The project was born out of concerns raised in the Getting It Right First Time (GIRFT) General Surgery Report which identified wide variation in the care provided to patients with acute gallstone disease across the UK.⁷ These conditions can be debilitating. Not only do they reduce the quality of life for patients awaiting surgery, but they can also lead to serious complications such as pancreatitis. With gallstone-related disease accounting for one third of all emergency general surgery admissions, the opportunity to make a positive difference to the lives of many was high.⁸ Given the wide variation of care affecting a large number of patients and the impact the disease can have on quality of life, the project team elected to focus on improving care for patients with acute gallstone disease.

What is quality improvement and what does it improve?

Quality improvement empowers members of the surgical care team to deliver positive changes for patients. It supports people to work in a structured way to identify a problem, explore the options for addressing it, to implement changes in a planned way, and use these changes to improve care.

www.rcseng.ac.uk/qi

Our quality improvement goal set in line with NICE guidance,⁹ was that 80% of eligible, admitted patients¹⁰ should receive their cholecystectomy within 8-days of presentation at hospital.



Chole-QulC Outcomes

The Cholecystectomy Quality Improvement Collaborative (Chole-QulC) substantially improved outcomes for patients requiring an emergency cholecystectomy by significantly reducing time to surgery (Bamber et al, 2022).¹¹ Chole-QulC demonstrated that improvements in gallstone care could be achieved in a range of surgical contexts. In total, 13 sites took part in the project: 12 trusts from England and one health board from Wales. We undertook a process evaluation to identify key success factors from the collaborative (Stephens et al, 2019).¹² Chole-QulC proved collaborative-based quality improvement is a viable strategy for emergency surgery. Following a particular set of effective clinical and improvement strategies in tandem with a significant short-term commitment from surgical teams yields high impact change. Lessons learned from the process evaluation informed our next collaborative, CholeQulC-ER.

CholeQulC-ER

(July 2019 to December 2020)

In order to improve gallstone care at scale, RCS England designed a structured scaled-up collaborative project to extend the reach of CholeQulC. Our second collaborative, Cholecystectomy Quality Improvement Collaborative – Extended Reach (CholeQulC-ER) was established with the aim of supporting surgical teams to implement and embed improvement lessons.¹³ The majority of CholeQulC-ER sites improved their 8-day surgery ranking compared with all trusts/health boards across England and Wales recovering more quickly from the suspension of laparoscopic surgery during the first wave of the COVID-19 pandemic.¹⁴

Chole-QulC3

(April 2021 to July 2022)

During the third iteration of the project, Chole-QulC3 saw 12 sites participate. Hospital Episode Statistics data is currently being analysed. Early indications from equivalent QI data for the cohort from April 2021 to July 2022 shows similarly positive results to previous rounds of the project.¹⁵

HandsFirst Quality Improvement Collaborative

Throughout our Chole-QulC project, we successfully demonstrated that a collaborative approach could be used to enhance patient outcomes in gallstone disease by reducing variation and time to surgery, which subsequently led us apply this knowledge to another area of patient care.

Recognising the importance of the timeliness of surgical intervention for patients with hand trauma, RCS England and the British Society of Surgery of the Hand (BSSH) established the collaborative because of the inextricable link hands hold between lives and livelihoods. From the moment we are born until the day we die our hands play an integral part in our humanity – so much so that there is a long tradition of hand portraiture in the history of Art. Indeed, the UNESCO World Heritage site, Cueva de las Manos or Cave of the Hands in Río Pinturas, is filled with stencilled outlines of human hands created between 13,000 and 9,500 years ago.¹⁶ As young children, we begin to learn about the world through touch, developing fine and gross motor skills. These explorations and the accompanying hand-eye co-ordination is linked to early literacy.¹⁷ Through Braille, hands may serve as the reading eyes for blind and visually impaired people. Braille with its tactile combination of raised dots representing the alphabet, words, numbers and punctuation expand worlds and opportunities as touch decodes text.¹⁸ Hands signal and gesture and can ‘speak’ across distance. As we near our final hours, research tells us that the touch of the hand can convey love and comfort when we need it most.¹⁹ Hands are vital tools that we rely on to carry out our daily activities of living, and to have productive working lives regardless of our line of work.



So while hand trauma is not considered a matter of life or death, it is often a case of lives and livelihoods. The likelihood of a positive outcome following hand trauma significantly deteriorates in relation to the time elapsed from injury to surgery. Poor outcomes have wide-ranging health and socio-economic impacts. Too often surgery is delayed due to system pressures and persistent perspectives that hand trauma is minor. Yet outcomes impact individuals throughout their lifetimes.

On 5 July 1948 when the NHS was founded, doctors seldom considered their clinical practice and outcomes. Death was the clearest measurable outcome, but comparisons of different types of treatment and treatment pathways were few and far between. The NHS, at its inception, was primarily set up to prevent death. As we celebrate the 75th anniversary of the NHS, measured outcomes reflect the breadth and depth of service that has evolved. Delivering consistent high-quality care, helping patients live well with disease and long-term conditions and preserving quality of life in care are now familiar focal points of measure. Yet, today's NHS lacks sufficient capacity to deal effectively and efficiently for aspects of its emergency and trauma care. Most patients with traumatic hand injuries have a low risk of serious harm. Hand trauma rarely equates to a loss of life or limb. Therefore, patients with these injuries tend to be slotted in between the demand of other emergency cases particularly during the weekends. The exception being cases of revascularisation, replants and patients presenting with major complex injuries.

In the short-term, from a system perspective, patients presenting with traumatic hand injuries to pressured Emergency Departments with a low risk of serious harm can wait. Not a matter of life and limb, hand injuries are often a matter of lives and livelihoods and the cost to individuals waiting in pain is high from many perspectives. Within the HandsFirst database, the majority of patients presenting were between 16 and 60 years of age.²⁰ A delay in treatment often equates to a delay in return to work. Many patients of working age have parental or carer responsibilities. Many may find themselves requiring a level of care because their injury has reduced their ability to independently carry out the daily activities of living. From a system perspective the cost of initial delays compounds exponentially as the biology of the wound changes continuously. As time elapses, infection and adhesion becomes more common. Surgery becomes more difficult, more complex.

This results in higher rates of return to theatre for complications such as malunion, infection, and stiffness. Complications require more follow-up care over longer periods with more visits to hand therapy. Ultimately, patient outcomes are poorer. For patients, poor outcomes can be career limiting, career redefining or career ending. In the mid and long-term, the socio-economic impacts of these delays are costly indeed. Just as prompt and effective wound care reduces the likelihood of a surgical site infection, so too timely surgical intervention yields hidden financial benefits. Better care is often cheaper. To patients waiting in pain, timely care is not a luxury – it is an absolute necessity.

Therefore, the aim of the HandsFirst QI Collaborative was to improve outcomes for patients with traumatic hand injuries by reducing variation and reducing time to surgery so that 80% of patients presenting to any service on the day of injury²¹ and requiring surgical intervention would have their first operation within the timeframe specified in BSSH hand trauma standards.²² These are specifically:

- **24 hours for open joints and open fractures**
- **4 days for all other open hand injuries**
- **7 days for closed hand fracture**

Jointly commissioned by RCS England with BSSH, the collaborative brought together two specialities, Orthopaedic Surgery and Plastic Surgery and the professional disciplines that support delivery.



2. Design and delivery

Process followed

All trusts/health boards across UK were invited to join HandsFirst. Recruitment followed the subscription-based model used during CholeQuIC-ER and Chole-QuIC3. In order to register to join the project, trusts/health boards agreed to pay a one-off subscription fee of £5,000. This fee was to cover the costs of running the project. Sites agreed to cover the costs of their travel and expenses to any in-person meetings. In addition, registration required the site's management team to confirm they supported the required changes to improve the pathway of care for these patient cohorts.

25 trusts and health boards registered and joined the project. This included one health board from Wales and 24 trusts from England, one of which was a Women and Children's NHS Foundation Trust. See Table 1 for full list of sites.

Proposed project aim: to reduce variation and improve the quality of care for patients with hand trauma

Project goal: That 80% of hand injuries that present to any service on the day of injury and require surgical intervention should have their first operation within the timeframe given in the BSSH hand trauma standards.

These are specifically:

- Within 24 hours for open joints and open fractures;
- Within four days for all other open hand injuries;
- Within seven days for closed hand fractures.

Limb-threatening injuries requiring more urgent intervention are excluded. For example:

- Where revascularisation is required;
- Compartment syndrome;
- Where there is infection or risk of infection from e.g. bite wounds.



Table 1: HandsFirst sites

1	Ashford and St. Peter's Hospitals NHS Foundation Trust
2	Betsi Cadwaladr University Health Board
3	Birmingham Women's and Children's NHS Foundation Trust
4	Cambridge University Hospitals NHS Foundation Trust
5	Chelsea and Westminster Hospital Foundation NHS Trust
6	East Lancashire Hospitals NHS Trust
7	Gloucestershire Hospitals NHS Foundation Trust
8	Guy's and St Thomas' NHS Foundation Trust
9	Hull University Teaching Hospitals NHS Trust
10	Lancashire Teaching Hospitals NHS Foundation Trust
11	Manchester University NHS Foundation Trust
12	The Newcastle upon Tyne Hospitals NHS Foundation Trust
13	Norfolk and Norwich University Hospitals NHS Foundation Trust
14	North Tees and Hartlepool NHS Foundation Trust
15	Northumbria Healthcare NHS Foundation Trust
16	Oxford University Hospitals NHS Foundation Trust
17	Portsmouth Hospitals University NHS Trust
18	Sheffield Teaching Hospitals NHS Foundation Trust
19	South Tees Hospitals NHS Foundation Trust
20	University Hospitals of Derby and Burton NHS Foundation Trust: The Pulvertaft Hand Centre
21	University Hospitals Coventry and Warwickshire NHS Trust
22	University Hospital Southampton NHS Foundation Trust
23	University Hospitals Birmingham NHS Foundation Trust
24	University Hospitals Dorset NHS Foundation Trust
25	University Hospitals of North Midlands NHS Trust



Project Timeline

Recruitment for sites went live in April 2021 and the cohort met for the first time in October 2021 at the Pre-Launch meeting. The project was launched in November 2021. Teams collected data from January 2022 - December 2022 when the project closed. The final celebration event was held in March 2023.

The Pre-Launch meeting outlined:

- The current landscape of hand trauma care
- Introduced the theory of change employed within the collaborative and explained in detail what would be expected of sites throughout the project
- The process for data collection; and
- Enabled sites to discuss their successes and challenges

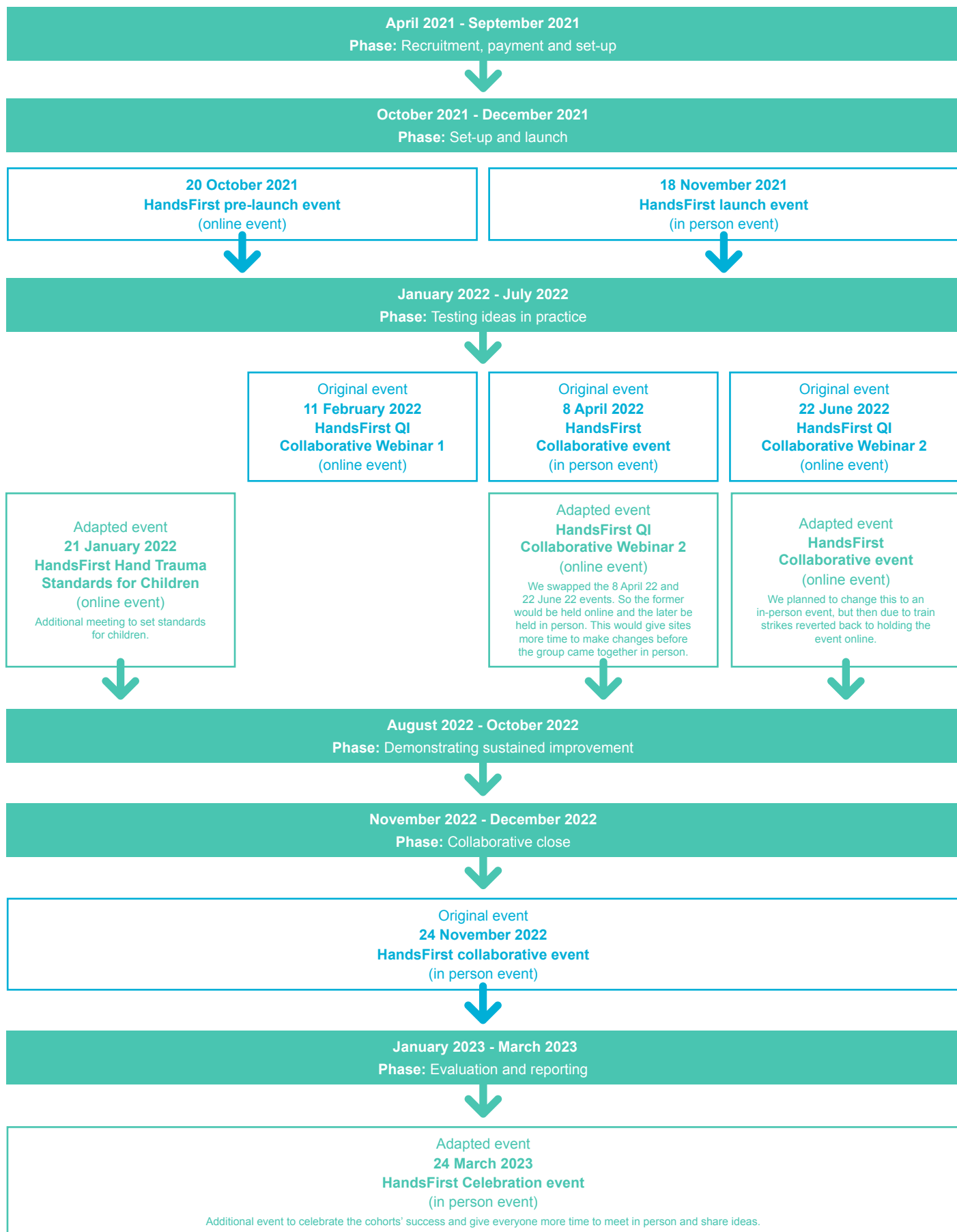
Sites were also provided with a Ready for Launch Checklist to ensure they could make the most of networking opportunities at the face-to-face launch event on 18 November 2021.

Adapted delivery of the QI collaborative

Originally, we had planned to hold six meetings with three online meetings and three in person. We reconfigured the plan and held eight meetings; five online meetings and three in person meetings. At the launch event it became clear that the project would benefit from a working group that would look into standards for children. We held an additional meeting date to allow this (see section 3.4. Introduction of Children's Standards). The 8 April meeting was due to be an in-person meeting and the subsequent 22 June meeting was to be held online. We decided to change the format of these meetings; to hold the April meeting online and the June meeting in person. Our thinking was based on feedback from sites that it took longer than they expected to collect data and test changes. We were mindful of not bringing the group together in person too soon, to ensure when we did, the day would have maximum value. The 8 April meeting took place online. The June meeting had to be moved online due to industrial action. As a result of this, we decided to add an additional meeting, the Celebration Event, which took place on 24 March 2023. We understood from meeting feedback how much value there was in bringing everyone together in person to network and discuss challenges and share solutions. See Table 2 for full timeline including adaptations to the planned timeline.



Table 2. Project timeline with adaptations



In total sites attended eight national meetings; one pre-launch meeting, one launch meeting, one meeting to propose children's standards, two webinars, two collaborative meetings and one celebration meeting. Events were designed to blend a mix of quality improvement science and complementary practice, highlight potential for practical application, share learning and offer opportunities for formal and informal networking. For full list of meetings that took place see Figure 1.

Figure 1. Schedule of whole collaborative events that took place

20 October 2021

HandsFirst Pre-Launch Meeting
(online meeting)

18 November 2021

HandsFirst Launch Meeting
(in person meeting)

21 January 2022

HandsFirst Hand Trauma Standards for Children
(online meeting)

11 February 2022

HandsFirst QI Collaborative Webinar 1
(online meeting)

8 April 2022

HandsFirst QI Collaborative Webinar 2
(online meeting)

22 June 2022

HandsFirst Collaborative Meeting
(online meeting)

24 November 2022

Hands First Collaborative Meeting
(in person meeting)

24 March 2023

HandsFirst Celebration Event
(in person meeting)

These meetings allowed sites to share successes and challenges associated with making changes to their hand trauma services. Each site received two site reports, an interim report along with a final site report. Both reports gave an outline of the cohort's achievements including a bespoke section in the report detailing each site's progress and suggested improvement actions. In addition, sites had ongoing telephone and email support and coaching from the RCS England HandsFirst QI Project Team. The project team was made up of clinical experts, quality improvement specialists and Senior Project Manager and Director of Research and QI from RCS England (See Appendix A the RCS England HandsFirst QI Project Team).

Project Benefits

The Chole-QuIC collaborative clearly demonstrated that following a particular set of effective clinical and improvement strategies in conjunction with a significant short-term commitment from surgical teams yields high impact change. Being part of a collaborative provides sites with a structure and access to quality improvement experts to support change. Successful improvement takes time and focus. The October 2021, HandsFirst Pre-Launch meeting identified two key areas for improvement with the potential for high yields:

- Improving theatre utilisation by identifying which cases can be managed in alternative facilities
- Increasing patient flow by utilising more efficient and agreed pathways to ensure patients are treated in the right place, by clinicians with the right skills at the right time

These service changes are likely to improve time to surgery resulting in benefits such as:

- Improved outcomes
- Increased patient satisfaction
- Fewer complications arising from delayed surgery
- Fewer complaints



Equally, they are highly likely to result in:

- A release of theatre capacity associated with
 - More cases being managed in procedures rooms
 - Fewer patients requiring surgical revision for preventable complications
- Reduced pressure on emergency departments and assessment clinics
- Cost savings associated with:
 - Fewer patients occupying hospital beds while awaiting surgery
 - A lower risk of litigation due to preventable complications or hospital acquired harm associated with prolonged service delays

Participation in a national collaborative can yield benefits for organisations and staff including:

- Creating a supportive atmosphere which encourages positive relationships
- Raising the profile of hand surgery within the local healthcare economy
- The chance to collaborate with multidisciplinary professionals who represent the nation's best across the hand surgery community
- Taking an active part in shaping the future of hand surgery
- Developing a data driven evidence base which yields a depth of understanding of actual patient pathways including;
 - Pressure points within the system
 - Variation in service between categories of injuries
 - Seasonal variation
 - Any mismatches in demand and capacity, skills mix
 - Clear metrics to inform service redesign
 - Highlighting opportunities for high-impact change

“I thought I knew what went on in my hospital. I didn’t.”

Team Lead
24 March 2023

- Learning techniques to produce change using QI science and complementary disciplines on the improvement continuum thereby;
 - Leveraging the relationship between audit and improvement science to close gaps
 - Increasing QI capacity and capability within your organisation
 - Embedding QI knowledge and skills within clinical and front-line teams
 - Putting teams in a stronger position to work more effectively and more efficiently
- Bringing Plastic Surgery and Orthopaedic Surgery together at sites where the disciplines have not previously had history of working together in serving patients with hand trauma
- Connecting with clinicians who share your values across organisational boundaries
- Accelerating the spread of best practice in hand surgery across the UK and beyond
- Contributing to a culture of continuous learning and innovation
- Gaining recognition for being part of a national initiative
- Establishing the concept of GIRFT within hand surgery

All of the above contributes to improved staff morale, better working across team, departmental and organisation boundaries. With that comes the potential to improve staff recruitment and retention rates.

Peer-to-peer support, opportunities to network, share ideas and experiences – all were recurrent themes in participant feedback throughout the collaborative. Participants felt inspired, motivated, and renewed from collaborative events and site visits.

Figure 2: Benefits of joining HandsFirst for trusts/health boards

- The opportunity to **improve outcomes for hand trauma patients**.
- **Support from clinical and QI experts** through coaching sessions, email and telephone support.
- 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 your hand trauma pathways, **relieve pressure on the system** and **save the service money***.



** Analysis from the CholeS study¹⁴ 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.*

Impacts of the pandemic on hand trauma services

Although the World Health Organisation has declared that COVID-19 is no longer a “global health emergency”²³ its effects on services and the individuals who deliver them remain manifold and far reaching. Teams worked under constantly extraordinary and evolving conditions with their lives directly under threat from a new and deadly virus. Service delivery changed radically in an attempt to limit the threat. Elective surgery was suspended. COVID-19 testing protocols and social distancing measures were introduced. Surgeons and theatre teams were redeployed to medical wards. At times, they were placed into situations which did not complement their expertise. Staff faced shortfalls of personal protective equipment. Others had no choice but to make do with available but inadequate equipment. Some staff experienced a loss of identity associated with their specialty and team. Staff came to work terrified that they might bring the deadly virus home and spread it to loved ones. Staff with families abroad never felt the distance more acutely. These changes led to a sense of isolation. Though all were surrounded by a sea of COVID-19, each person's boat was different. Day in and day out teams coped with the onslaught and immediacy of these changes. But in the background staff were also acutely aware of the quiet burden of ever-growing waiting lists for elective surgery, outpatient appointments, a population sitting on all but the most urgent health care needs. Patients had worse outcomes resulting in delays, deterioration, pain and suffering.

The Royal College of Psychiatrists in its leaflet, *Coping after a traumatic event*, describes a traumatic event as one in which a person sees someone die or thinks that they, themselves are going to die, an event in which there is a personal risk of being seriously injured or an event in which an individual experiences sexual violence.²⁴ Without a doubt, the early waves of the pandemic constitute a prolonged traumatic event. Such events can have lasting impacts which may lay dormant for a period.

Changes in working conditions led to higher levels of stress in the workforce, resulting in sickness absence, fatigue, moral distress and moral injury. Unsurprisingly, some staff re-evaluated their priorities. Some answered the call to come out of retirement and serve. Others left careers in health and social care. From March to April 2021, the British Medical Association (BMA) conducted a survey of all doctors throughout the UK on the issue of moral distress and moral injury. A staggering 86% of respondents experienced moral distress in relation to their ability to provide care during the pandemic.²⁵ Sites within the collaborative were no exception. During the course of the project, one trust suffered the loss of their divisional manager along with the entirety of their hand trauma secretarial staff.



Staffing challenges existed in the health service before the pandemic. They were, however, doubtless exacerbated by it. According to the Office of National Statistics (ONS) in 2022:

- The highest sickness absence rates were amongst workers in caring, leisure and other service occupations
- Sickness absence rates are consistently higher for public sector employees; and

- Respiratory conditions overtook mental health conditions as the fourth most common reason for sickness absence, accounting for more than twice the proportion of occurrences they did before the pandemic²⁶

Staffing is but one of many impacts of COVID-19, albeit a crucial one. When the collaborative launched, a number of COVID-19 protocols continued to operate causing significant operational impacts, (see Table 3, High level operational impacts arising from the COVID-19 pandemic). To say these factors represent challenging circumstances is an understatement at best.

Table 3. High level operational impacts arising from the COVID-19 pandemic table

COVID-19 screening	<p>A necessary safety measure designed to limit the spread of COVID-19 and protect vulnerable patients, relatives, carers and staff, COVID-19 screening:</p> <ul style="list-style-type: none"> • Extended pre-assessment pathways • Delayed theatre start times when on the day PCR results were required or when lists needed to change due to patients testing positive for -19 • Increased the number of cancelled operations • Resulted in staff shortages and redeployment due to staff testing positive for COVID-19 • Created a substantial amount of rework within the system
Social distancing	<p>The continued need to maintain social distancing reduced the number of patients in waiting areas and limited the ability for sites capacity to deliver one-stop clinics.</p>
COVID-19 Restore and Recovery plans	<p>Restore and Recover challenges impacted sites creating constraints in core areas for change. This translates into challenges with systems, processes and physical estate. Theatre utilisation and protocols underwent significant changes during the pandemic such as the suspension of elective lists. Sites reallocated trauma resources including theatres to accommodate the needs of the wider service. When services were reinstated, they did not necessarily return to prior allocations. This was frequently reported as disadvantaging the operational efficiency of Hand Trauma services.</p> <p>Throughout the course of the collaborative, teams have come under increasing pressure. Many found it hard to prioritise the HandsFirst work while meeting the demands of operational recovery.</p>
Normalisation of COVID-19 working patterns	<p>A normalisation of COVID-19 protocols restricted activity. At times this was reflected by psychological and behavioural change. Teams reported theatre staff being unwilling to consider early starts, late finishes or proposals to extend lists to weekend working. Teams often described the 'Bank of Goodwill' as having run dry during the pandemic.</p>
Human factors	<p>COVID-19 meets the definition of a traumatic event especially before an effective vaccine was available. This prolonged exposure reduced concentration, motivation, increased levels of fatigue, and impacted staff energy levels, behaviours, leadership styles, professional relationships and organisational cultures.</p>

Staff wellbeing	<p>Decisions and actions taken throughout the pandemic resulted in significant change in the fundamental way the NHS operates. This, coupled with personal stresses brought on by the pandemic increased incidence levels of staff experiencing moral distress or moral injury.²⁷ This often translated into high levels of 'presenteeism' or sickness presence, where staff show up for work without being productive, generally because ill-health or mental fatigue are preventing it.</p> <p>The 2022 NHS annual survey revealed that a staggering 44.8 % of staff reported feeling unwell due to work-related stress. According to NHS Employers, levels of stress-related sickness were higher among NHS staff compared to all other job sectors in the country last year.²⁸</p>
Knowledge drain	<p>Knowledge drain resulted from high levels of staff turnover due to staff retiring, rotating to other organisations or leaving a career in healthcare entirely. Sites reported a number of staff leaving who were not replaced quickly. Replacements were often staff with less experience.</p>
Sickness absence rates	<p>COVID-19 continued to disrupt services and project teams and caused a large number of staff absences.</p>
Recruitment and retention	<p>A number of sites reported significant changes in the wider clinical and non-clinical teams including the turnover or reorganisation of senior operational managers and critical administrative support staff. Several sites highlighted that their staffing establishment was inadequate given increased demand over the years which was exacerbated by COVID-19.</p> <p>All of the above constrained recruitment and retention and limited teams' capacity to participate.</p>
Supplies and logistics	<p>Global manufacturing and transport chains have not yet recovered from the effects of lockdown on workforce. Industry has not yet returned to pre-pandemic levels of output and services regularly encounter supply shortfalls and delays.</p>

Perhaps the most visible lingering impact of COVID-19 is in the vast numbers of patients with no criteria to reside who are trapped in hospital beds. The resultant ambulance queues reflect the effects of the pandemic across the whole health and social care landscape. No one wants to spend a day in hospital when they do not need to. Patients stuck in hospital beds impede system flow. Attempts to remedy the situation absorb a considerable amount of operational focus across the entire system. Over a year later, these pressures have shown no sign of easing. It can be argued that most hand trauma patients do not require a bed. Nevertheless, leadership and management attention is needed to enable complex change and that lack of capacity impacts hand trauma care. Sites reported a number of direct impacts affecting their ability to deliver efficient and effective hand trauma services (see Table 4, Site reported impacts of the COVID-19 pandemic). Most were negative. However, sites did report some gains.

Ongoing system pressures combined with the lack of a national target for hand surgery such as those provided by best practice targets, a specialty GIRFT report or Commissioning for Quality and Innovation (CQUIN) targets, do little to secure necessary leadership and managerial engagement. Even with powerful drivers, the effects of COVID-19 will persist. Considerable time and effort must be expended before stability can be achieved which is precisely why participating in a national collaborative is supportive and restorative for members. The HandsFirst QI Collaborative helps to bridge the gap.



Table 4. Site reported impacts of the COVID-19 pandemic

Positive impacts
<p>Clinic capacity:</p> <ul style="list-style-type: none"> Initially a greater capacity to see and treat patients due to stoppage of elective work Increased number of trauma slots in clinic
<p>Anaesthetic changes:</p> <ul style="list-style-type: none"> Increased use of local anaesthesia Move towards regional anaesthetic initiated by the anaesthetic team There has been a shift where most patients are now treated with WALANT with very few having GA operations
<p>Pathways:</p> <ul style="list-style-type: none"> Swifter move to e-referrals and triaging and “see and treat” model Introduced consultant led one-stop walk-in LA/WALANT cases when resource allowed Pathways redesigned to reduce unnecessary patient follow up Setting up a regional block unit Provided an excellent service for hand injuries as we were separated from the general hospital providing care within the small hospital, dealing patients from the Minor Injuries Unit to theatre and discharge. Flow and times were brilliant.
<p>Theatre capacity</p> <ul style="list-style-type: none"> Introduced dedicated upper limb lists on an ad hoc basis to start with which have now become regular When elective surgery paused for 12 months we moved from a model of mixed elective-trauma service which managed all trauma cases within 12 mixed hand surgery lists per week to a model which supported an additional ten lists of pure hand trauma cases. Over the next 12 months brought back a much smaller elective footprint
<p>Hand Therapy:</p> <ul style="list-style-type: none"> Service took on trauma cases where previously only dedicated elective cases Successful business case secured a dedicated trauma hand therapist
Negative impacts
<p>Staff wellbeing:</p> <ul style="list-style-type: none"> Turnover of new staff is very high Morale throughout the hospital, but particularly in our theatres, is very, very low post COVID. Over 50% of one trust’s theatre team working in hand trauma had left or were reported to be in the process of leaving
<p>Clinic capacity:</p> <ul style="list-style-type: none"> Demand and activity reduced during the pandemic; teams are struggling to meet previous service levels since demand has returned Lack of support at clinic and hand therapy
<p>Reduced theatre capacity:</p> <ul style="list-style-type: none"> Lack of available lists Loss of lists that have not been reinstated Loss of lists to post-COVID recovery of elective work Demand and activity reduced during the pandemic; teams are struggling to meet previous service levels since demand has returned

Reduced theatre utilisation:

- Fewer cases done per list because of the extra logistical barriers required to safely get patients to theatre
- Atypical “separation” of the teams has resulted in lists losing their “dedicated” character with every list becoming a trauma list
- Poor consultant level cover for general anaesthesia (GA) lists due to changes made for COVID-19
- There has been a mind-set change in theatre making it very hard to return to pre-COVID number of cases per list
- Hard to run lists efficiently with brand new staff who lack experience in our specific procedures
- Cancelled procedures and lists due to patients / staff testing positive for COVID-19

Pathways:

- Increased demand
- Normalisation of COVID-19 working patterns designed to offset pressures in Emergency Department during the pandemic has never been reversed
- Accident and Emergency Departments and other regional hospitals are sending much more hand trauma to offset their capacity having grown used to our increase in support during the pandemic.
- Planned minor operations suites (MOPS) delayed
- Need for COVID-19 swabs and screening has introduced logistical challenges
- Clinically urgent cases would go before isolation window ended but were placed last on a list
- Patients who tested positive and were deemed ‘non-urgent’ waiting 10 days or more for surgery, breaching BSSH targets

Hand Therapy:

- Lack of hand therapy capacity to triage and take on new hand injuries not needing surgery.

Location:

- Different services took over areas of the estate. Space has not been returned, impeding service delivery
- Our block service as anaesthetic team has been reallocated to GA lists

Management:

- Reduced management capacity as COVID-19 pulled managerial resource away from developing ambulatory trauma pathways to other issues (e.g. staffing, space, bed management, elective waiting lists)
- Recruitment delays
- Extreme pressure to recover elective surgery backlog resulted in elective access increasing at the expense of trauma
- Day Surgery Unit (DSU) management changed to a different department leading to less prioritisation of hand surgery
- Despite increases in demand, allocation of resource has reduced
- Suboptimal Trust guidelines to accommodate patients requiring surgery



Figure 3. Theory of change

(1) Contextual factors sufficiently conducive for the potential to improve leg sufficient staff and theatre capacity to carry out emergency surgery)

(2) Full participation in a well designed quality improvement project

[Based on evidence from multiple improvement evaluations but most specifically: Stephens *et al.* Understanding the influences on successful quality improvement in emergency general surgery: learning from the RCS Chole-QulC project, Implement Sci 2019; 14: 84]

(3) Following Chole-QulC logic model

- 1) Support from senior management and colleagues:
 - (a) Agreement that the problem needs to be fixed
 - (b) **Provision of active support** (eg releasing resource or supporting new capacity)

- 2) Resourced team – surgical leads have resources to create and sustain:
 - (a) **Improvement team** to help understand local issues, and to plan and test out solutions
 - (b) **Data collection lead/team** resulting in
 - (c) **consistent data collection**

- 3) Understand the system – data collection and system knowledge used to understand
 - (a) True **patient pathway**
 - (b) True **demand and capacity** (numbers week to week)
 - (c) **Factors that affect flow** through the system

- 4) Plan and test solutions to fix identified problems, aiming to:
 - (a) Improve or **increase capacity**
 - (b) Efficiently **manage flow** and additional capacity
 - (c) Improve **engagement and support for change**

Review and learn from results

Normalise change

Throughout the collaborative, teams designed and implemented change ideas and then tested the impact of these changes on their hand trauma service.

Support from senior management and colleagues

Sites outlined organisational support commitment to the project by providing details of internal stakeholders and named individuals including a surgical lead and individuals in support roles as part of the registration process.

Resourced team

Participating sites provided assurance of confirmed agreement that team members were allocated time to commit to the project.

Data Collection

Data informs quality improvement. It is a fundamental component. W. Edwards Deming, often known as the father of improvement, introduced the 'system of profound knowledge' to describe the skills and knowledge required in service improvement. His system consisted of four interrelated areas or lenses typically described as:

- appreciating a system
- understanding variation
- psychology; and
- the theory of knowledge²⁹

Data is a prerequisite to understanding or appreciating a system and it's the common variation within it. Coupled with existing knowledge of the other lenses, data is used to understand the true patient pathway, demand and capacity, system capability and identify the factors that impact flow through the system.

One of the first hurdles members of the HandsFirst QI Collaborative had to clear was a lack of available data. The project team first looked to the Hospital Episode Statistics (HES) database which contains details about admissions, outpatient appointments and Accident and Emergency (A&E) attendances. Derived from the NHS Data Model and Dictionary, HES is a robust data. However, neither both HES and the NHS Data Model and Dictionary capture the date and time of injury – a key determinant in assessing whether BSSH standards are met.³⁰ Our outcome measure was time to surgery where:

Time to surgery = (Date/Time of operation) – (Date/Time of injury)

With no local, regional or national database capturing time of injury to time of first surgical intervention to interrogate, the collaborative had to build one.

The HandsFirst Database

RCS England choose the Research Electronic Data Capture (REDCap)³¹ secure web-based application to build and manage its secure HandsFirst QI Collaborative database. REDCap is designed to support online and offline data capture for research studies by non-profit organisations. During the Launch Meeting, proposed data fields were discussed. Members of the collaborative agreed:

- to include distal radius fractures
- to include closed soft tissue injuries;
- to introduce patient age categories

Patients with distal radius fractures were included at the request of orthopaedic consultant surgeons due to the anticipated volume of patients and perception that patients' waiting times from injury to surgery were excessive. Closed soft tissue injuries are a common reason patients present to Emergency Departments in the UK. Approximately 10-15% of patients are referred onward to hand specialists (Dorani, B., 2020).³²

Formal data collection was open from 1 January 2022 through to 31 December 2022 to allow sites to capture 12 months of data. Database beta testing was carried out throughout December 2021. A HandsFirst Child Standards working group met on 21 January 2022 which resulted in the addition of age categories for children. Final age categories were:

- Very young children aged 0<5 years
- Young children aged 5 -10 years of age
- Older children aged >10-16 years of age
- People of working age, those aged >16 - <60 years; and
- Older people, those aged >60 years

Members of the collaborative acknowledged that other age range categorisation exists within NHS data sets. However, to facilitate early data collection it was agreed that these age categories would adequately serve the collaborative for the purpose of data analysis.

Sites were able to clean and validate data in REDCap. Each month, the HandsFirst Project Team exported data from REDCap into Microsoft Power BI to facilitate data analysis. Monthly reports incorporated:

- An extract of all site data (see Figure 4 Data collected on REDCap)
- Power BI graphs for each category of injury (open joints and fractures, all other open hand injuries, and closed fractures) including:
 - Time to presentation, presentation to decision presented in hours
 - Date of presentation, date of procedure also presented as days of the week
 - Category of injury and whether the BSSH standard was met (including variation in meeting BSSH standard by day of week)
 - Detail of contributory factors (location, grade, delay categories)
 - Complete vs. Incomplete records (Record ID)



Figure 4. Data collected on REDCap

Field	Choices
Record ID (automatically generated)	
Hospital number	
Age (N.B. Standards may differ for children and adults)	1. <5 years, 2. 5-10 years, 3. >10-16 years, 4. >16 - <60 years, 5. >60 years
Date and time of injury	
Date and time of first coming to any form of medical attention such as an Emergency Department	
Date and time of decision to treat operatively	
Date and time of start of operation	
Operation title	
Hospital site where operation took place	
Mechanism of injury	1. Accidental, 2. Violence or assault, 3. Intentional self-harm
Type of accidental injury	1. Occupational, 2. Transport related, 3. Sport related, 4. DIY, 5. Leisure and other
Other accidental injury	
Category of injury	1. Open fracture or joint, 2. Open wound, 3. Closed fracture, 4. Distal radius fracture, 5. Closed soft tissue injury
Subcategory of structures repaired, tick as many as relevant	1. Extensor tendon, 2. Flexor tendon, 3. Nerve, 4. Soft tissue loss
Anaesthetic	1. GA, 2. Regional, 3. WALANT, 4. LA without adrenaline
Level of sterile draping used	1. Field sterility of at least 40cm around the wound but not full draping of patient, 2. Full standard draping, 3. Other
Other level of draping	
Location of procedure	1. Theatre with laminar flow, 2. Theatre without laminar flow, 3. MOPS room (a room designated for sterile procedures) with enhanced air changes, 4. MOPS room (a room designated for sterile procedures) with no additional air changes as compared to the ward or outpatient area, 5. Clinical room with natural ventilation (e.g. window that can open), 6. Clinical room with no natural ventilation

Grade of primary surgeon performing the procedure (see next question for supervision)	1. Consultant Hand surgeon, 2. Consultant other, 3. Hand Fellow, 4. Trust Fellow (registrar level), 5. Specialist Registrar, 6. Trust Fellow (SHO level), 7. Core Trainee, 8. Foundation Trainee
If surgeon was supervised; level of the supervising surgeon	1. Consultant Hand surgeon, 2. Consultant other, 3. Hand Fellow, 4. Trust Fellow (registrar level), 5. Specialist Registrar, 6. Trust Fellow (SHO level), 7. Core Trainee
What was the patients COVID testing status at the time of surgery?	1. Negative PCR result from testing at primary place treating facility (e.g. ED or MIU), 2. Negative PCR result from testing in this unit, 3. Positive PCR result, 4. PCR result not known but negative result from other test, 5. PCR result not known but positive result from other test, 6. Operation proceeded without COVID status being known, 7. Other
Other COVID testing status at the time of surgery	
Did any of the following cause a delay in the patient having their surgical procedure? (please select all that apply)	1. Available theatre time, 2. Anaesthetic cover, 3. Patient availability, 4. Awaiting pre-operative investigations, 5. Bed capacity, 6. Need for appropriately trained surgeon, 7. Other, 8. No delay
Other cause of delay to surgical procedure	
Any other information or comments	

The first of its kind, the HandsFirst Database is unique nationally and internationally. It holds great potential to help people globally. Up until this point, hand surgery has not been modelled by the NHS. For this reason, patients with hand trauma often end up at the back of the queue. The database provides us with a powerful lens with which we may begin to put into focus the long-term socio-economic impacts of those delays. Most patients within the database are of working age. From January to March 2023, 33 million people aged 16+ were in employment in the UK with the employment rate of 75.9% for people aged 16-64 years.³³



3. Results analysis

In establishing a national database, the HandsFirst QI Collaborative sought to drive improvement by informing what ‘good’ looks like. The database is a platform for identifying positive outliers and sharing best practice. Some sites, like The Pulvertaft Hand Centre,³⁴ joined the collaborative firm in the knowledge that they are recognised leaders in the field of research or hand surgery.

Others joined compelled by the moral injury that accompanies a sure but not fully quantified knowledge that patients with closed fractures were languishing weeks on waiting lists while teams struggled to fit them onto Major Trauma lists, worried that all BSSH standards all too often went unmet.

How was the database useful?

Establishing the first national database for hand trauma is the first benefit the collaborative realised. With its 9,028 records we have a rich data set to mine. Quality improvement science requires a baseline to illuminate opportunities for change. For the first time we have some breadth and depth of insight as to the levels of variation across hand trauma services across the nation. Through this we have begun to explore some of the key success factors from sites which are positive outliers. The data set has been equally important in supporting sites to understand their system, its capabilities and variation. As teams interrogated their data set, they naturally extended engagement activities to include those enabling and supporting services to lessen the impact of constraints and remove barriers to patient flow.

“We had a fairly good idea from the outset about our patient numbers and flow. Looking in more detail at the data has enabled us to see bottle necks at the A&E stage and also recognise that we are not achieving BSSH targets as frequently as we thought we were.”

Delegate feedback
22 November 2022

“We are still trialling an alternative to current practice with regard to open joints and fractures, as we are still not meeting our targets as regularly as we should. This focuses on time of injury and provides an “algorithmic” approach to what the team should do out of hours if one is referred i.e. when and where the patient should attend in order to optimise timeframe to surgery.”

Delegate feedback
14 November 2022

Measures for the BSSH standards within the HandsFirst QI Collaborative apply from the time of injury to the time of surgery. High level data analysis helped sites home in and decide where to expend their efforts. Some chose to focus on a particular category of injury such as closed fractures while others focused on improving time from decision to surgery concentrating on making gains in theatre efficiencies. Monthly Power BI reports which provided a national picture as well as detail of individual site performance against the standard supported early decision making. Site specific data extracts empowered sites to drill into the detail and explore contributing factors such as their use of anaesthetic or location of procedures to inform improvement efforts.

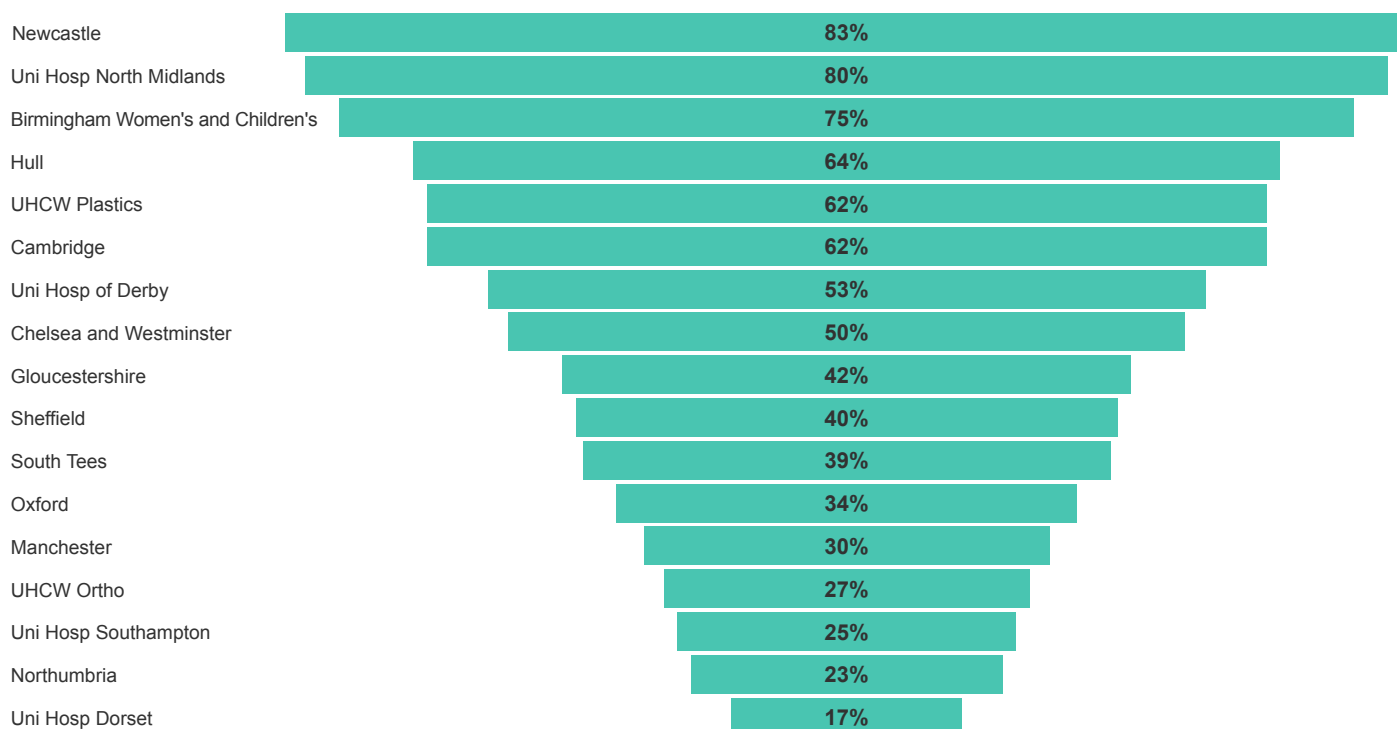


3.1. Open joints and open fractures (Category 1) Adults >16 years

Representing 13% of activity captured across the collaborative the 24-hour BSSH standard for patients with an open fracture or open joint hand injury proved incredibly challenging for trusts and health board to meet. Two trusts, The Newcastle Upon Tyne Hospitals NHS Foundation Trust and University Hospitals of North Midlands NHS Trust met the 24-hour BSSH standard at the close of the collaborative (see Figure 5).

Figure 5. Percentage of patients with open joints and open fractures that met the 24-hour BSSH standard by trust or health board

Cumulative percentage open joints and open fractures that met the 24 hour BSSH standard Category 1



Confounding factors at sites facing the longest delays:

- Lack of regular dedicated hand trauma lists
- 5-day, weekday theatre lists only;
- Sites operating as Major Trauma Centres which were required to slot hand trauma patients amongst lists prioritising complex trauma, fractured neck of femurs and other NCEPOD events.

"Patients always 'dropped off' the lists in order for hips to take priority."

Delegate feedback
24 October 2022

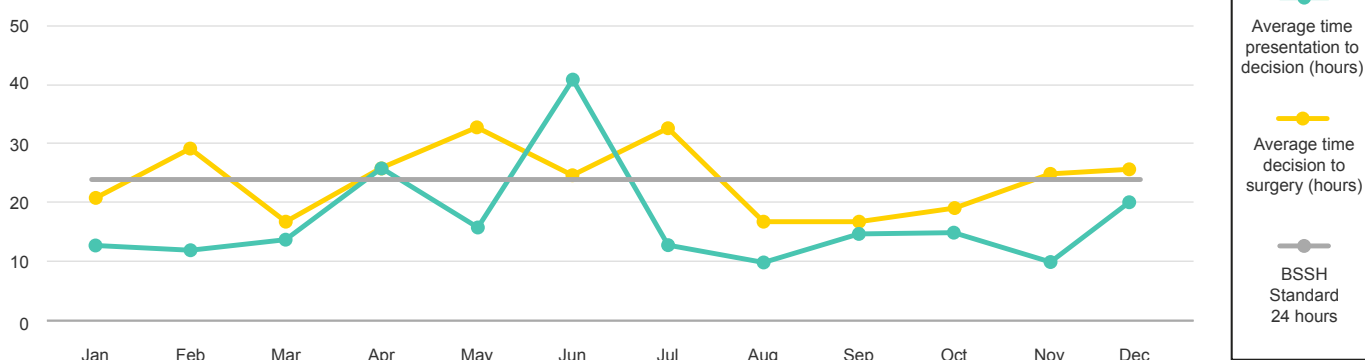


During the project, 45% of adult patients aged >16 years old met the BSSH 24-hour standard. This is a challenging target to meet given the standard is to have surgery within 24 hours and all patients that present within 24 hours are included in the cohort. Frustrated by persistent low compliance levels, teams questioned the feasibility of the target. However, members of the collaborative recognised that the impeding issues had more to do with system challenges, such as access to hot clinics and theatre, rather than an unrealistic or irrelevant target. Teams acknowledged that 24 hours from injury to surgery is an appropriate target from a patient perspective and necessary to reduce the likelihood of infection in the wound.

What was encouraging was the median time of 26 hours from injury to surgery across the whole collaborative. When sites received the Interim Report which detailed data collected up to and including 15 August 2022, the whole collaborative mean was 42 hours from injury to surgery for patients presenting within 24 hours of injury. Sites recognised that their gift of influence was likely to be greatest in reducing time from presentation to decision. Therefore, most focused efforts on changes designed to facilitate earlier decision-making (see Figure 6).

Figure 6. Average time in hours from presentation to decision and time from decision to surgery for patients with open joints and open fractures – whole collaborative view

Adult 16+ years. Open joints and open fractures



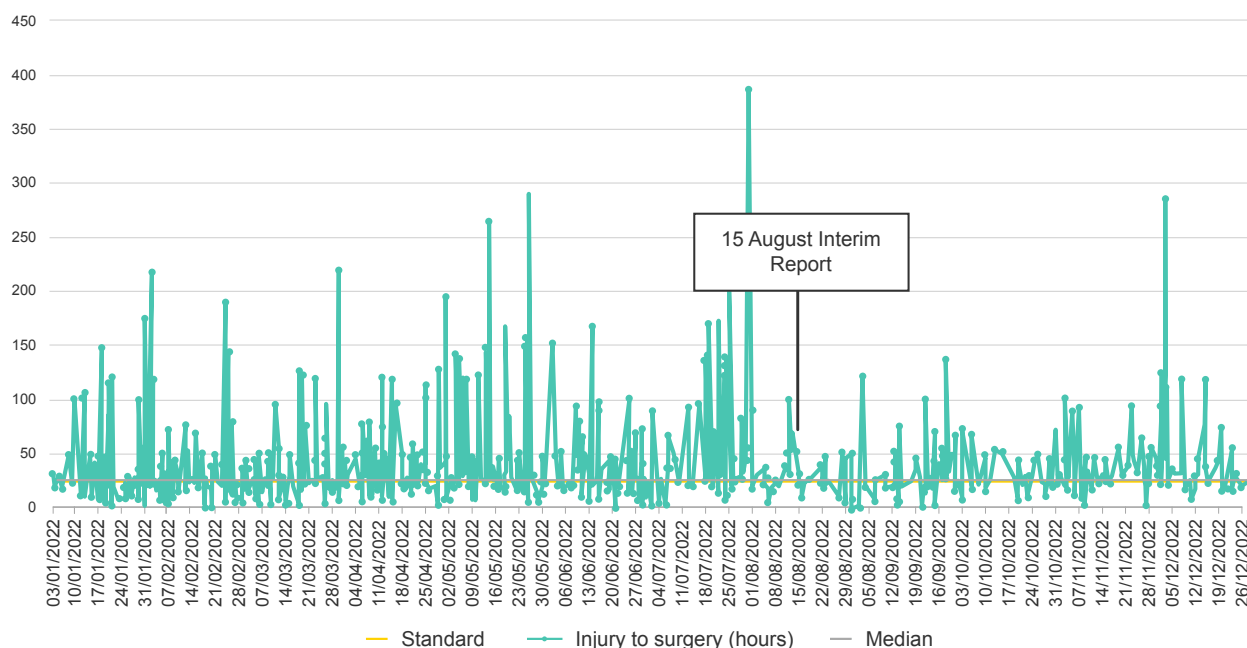
The whole cohort mean average time from presentation to decision in 2022 was 18 hours, from decision to surgery it was 25 hours and the mean time from injury to surgery stood at 41 hours.

Despite multiple simultaneous winter pressures, trusts and health boards succeeded in reducing the mean time from injury to surgery by 4 hours in the period following the Interim Report, 16 August 2022 to 31 December 2022. In turn, performance improved by 23% to 68% (see Figure 7).



Figure 7. Adults aged >16 years: Open joints and open fractures (Category 1)

Adult >16 years. Open joints and open fractures (Category 1) 24 hour standard



Success Factors

High performing trusts recommended:

- Having a pathway specific to open fractures and open joints
- Prioritising assessment and surgery operating on trauma lists where possible
- Investing in resource to ensure availability and accessibility
- Training across departmental boundaries; and
- Remember the importance of taking the time to communicate effectively

They cautioned against seeing patients routinely as with other open injuries. They advised that procedures should not be done under GA unless necessary and warned against the dangers of prioritising time to surgery over surgical experience.

3.2. All other open injuries (Category 2) Adults >16 years

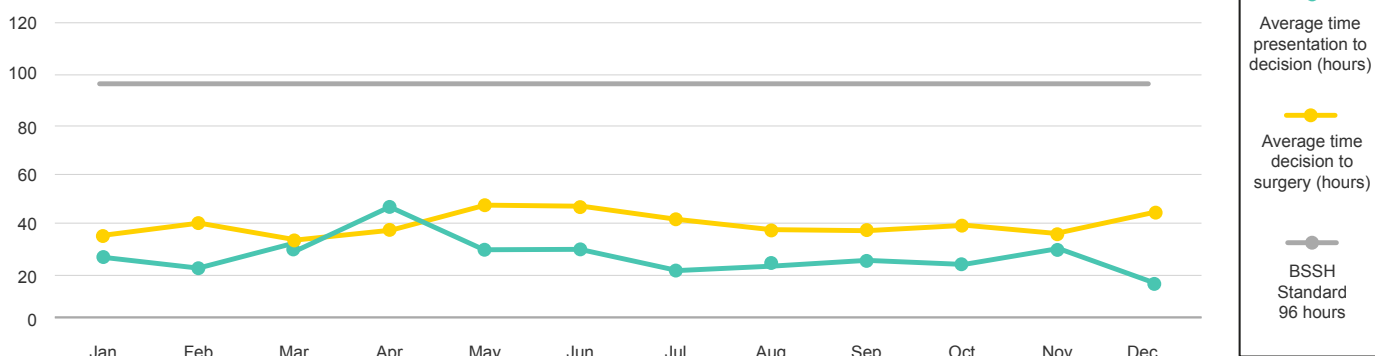
The BSSH standard for all other open hand injuries for patients presenting within 24 hours of injury is 4 days or 96 hours. These injuries represented 65% of the activity captured across the three injury categories.

The average time from presentation to decision for the whole cohort across 2022 was 28 hours. For the year ending 31 December 2022, the average time from decision to surgery was 40 hours and from injury to surgery was 67 hours.



Figure 8. Average time in hours from presentation to decision and time from decision to surgery for patients with all other open injuries – whole collaborative view

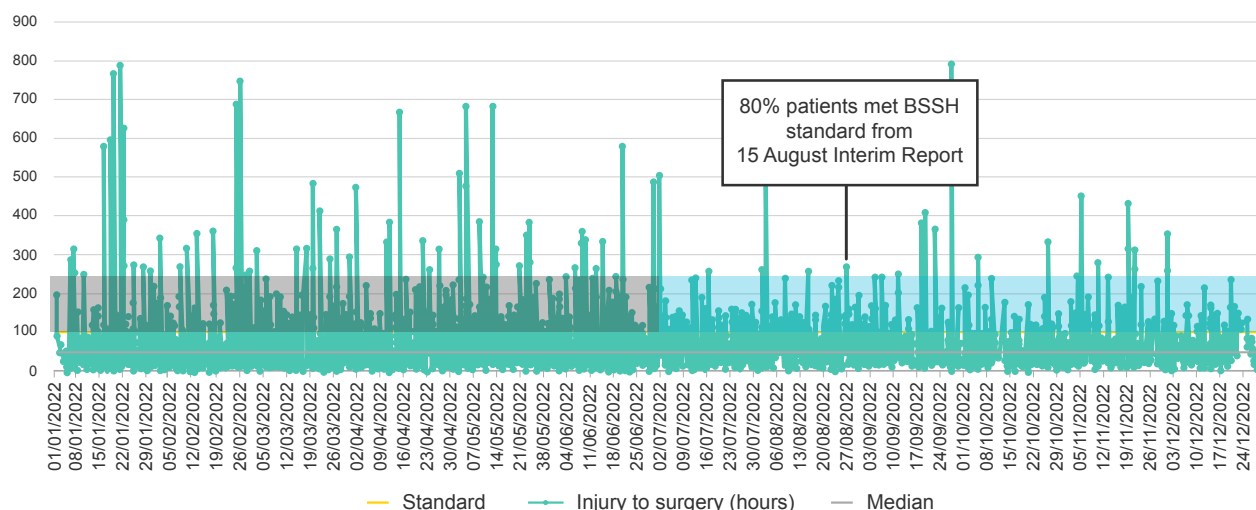
Adult 16+ years. All other open injuries



The mean average time from injury to surgery was 69 hours from 1 January 2022 through 15 August 2022, the data collection cut-off date for the Interim Report. In that period 78% of patients met the BSSH standard. The mean time from injury to surgery reduced by 4 hours from the 16 August to the close of project 31 December 2022. This improvement translated into 80% of adult patients meeting the 96-hour BSSH standard for that period. Service variation also reduced after the release of the Interim Report with fewer patients waiting more than 250 hours. The number of patients waiting in excess of 500 hours also reduced considerably.

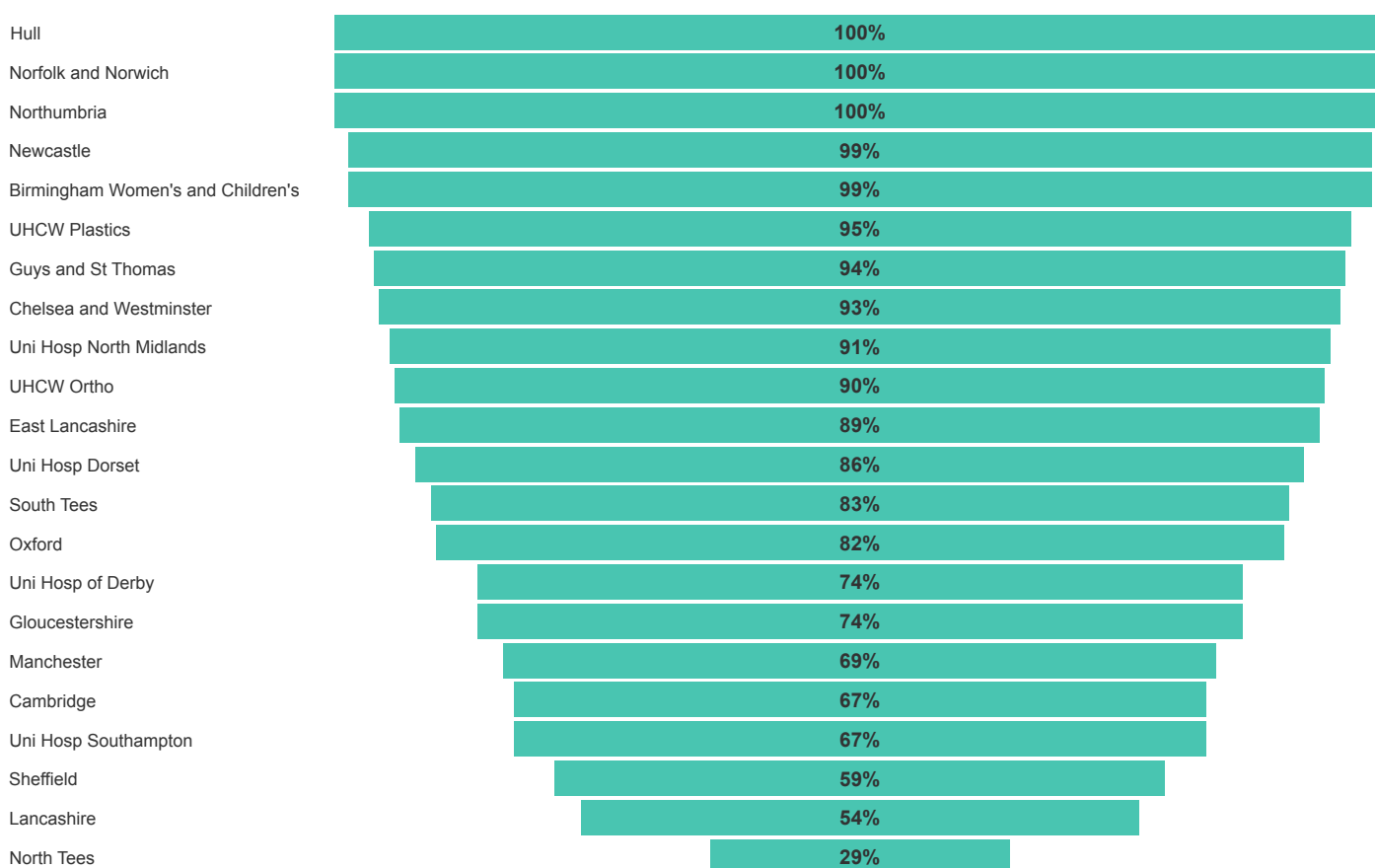
Figure 9. Adults aged >16 years: All other open injuries

Adult >16 years. Open joints and open fractures (Category 2) 4-day, 96 hour standard



At the close of the collaborative, 14 trusts and health boards reached a cumulative performance of 80 percent or more against the 4-day, 96-hour BSSH standard for all other hand injuries (see Figure 10). Five of these sites met the standard 99-100% of the time.

Figure 10. Percentage of patients with all other open hand injuries meeting 4-Day BSSH standard by trust or health board



Success Factors

Those trusts which consistently achieved the BSSH standards 80% or more had these top tips:

- Locate your own local anaesthetic minor operations facility in or next to the trauma clinic, staff and use it part of every day
- Do not limit trauma clinics and theatre to 5-day working, operate 7 days per week
- Run hot clinics 7 days per week in MOPS
- Run hand trauma as a 'see and treat' service
- Management decision making should take place at the point of referral
- Do not list everything.
 - Use MOPS (e.g., for simple wounds, foreign bodies, nail beds, some extensor tendons)
 - Direct suitable patients direct to hand therapy (e.g., mallet, volar plate injuries etc.)
- Do not bring patients into your trauma clinic unnecessarily, educate patients, referring units and your staff and agree treatment pathways ensuring referrals are triaged correctly
- Have all day protected Hand Trauma theatre lists Monday through to Friday and aim for a 7-day service
- Assume the worst. Do not leave it to others to quality assure



3.3. Closed fractures (Category 3) Adults >16 years

Four trusts met the 7-day BSSH time from injury to treatment standard for closed fractures (see Figure 11). Hull University Teaching Hospitals NHS Trust and the Newcastle upon Tyne Hospitals NHS Foundation Trust were positive outliers, meeting the standard 100% of the time. Although meeting the BSSH standard for closed fractures posed a significant challenge for the collaborative, 44% of sites realised an improvement. The mean average time from injury to surgery reduced by 30 hours to 192 hours for the period following the Interim Report through to the end of project. Cumulative performance on 15 August 2022 was at 49% in relation to the 7-day, 168-hour standard.

From 16 August 2022 through 31 December 2022, the median time from injury to surgery reduced by 29 hours from 173 hours to 144 hours resulting in 8% improvement in patients meeting the BSSH standard (see Figure 13).

“It has been helpful to see the monthly data ‘snapshots’ to see how we are improving to reach BSSH targets”

Delegate feedback
22 November 2022

Figure 11. Percentage of patients with closed fractures meeting 7-Day BSSH standard by trust or health board

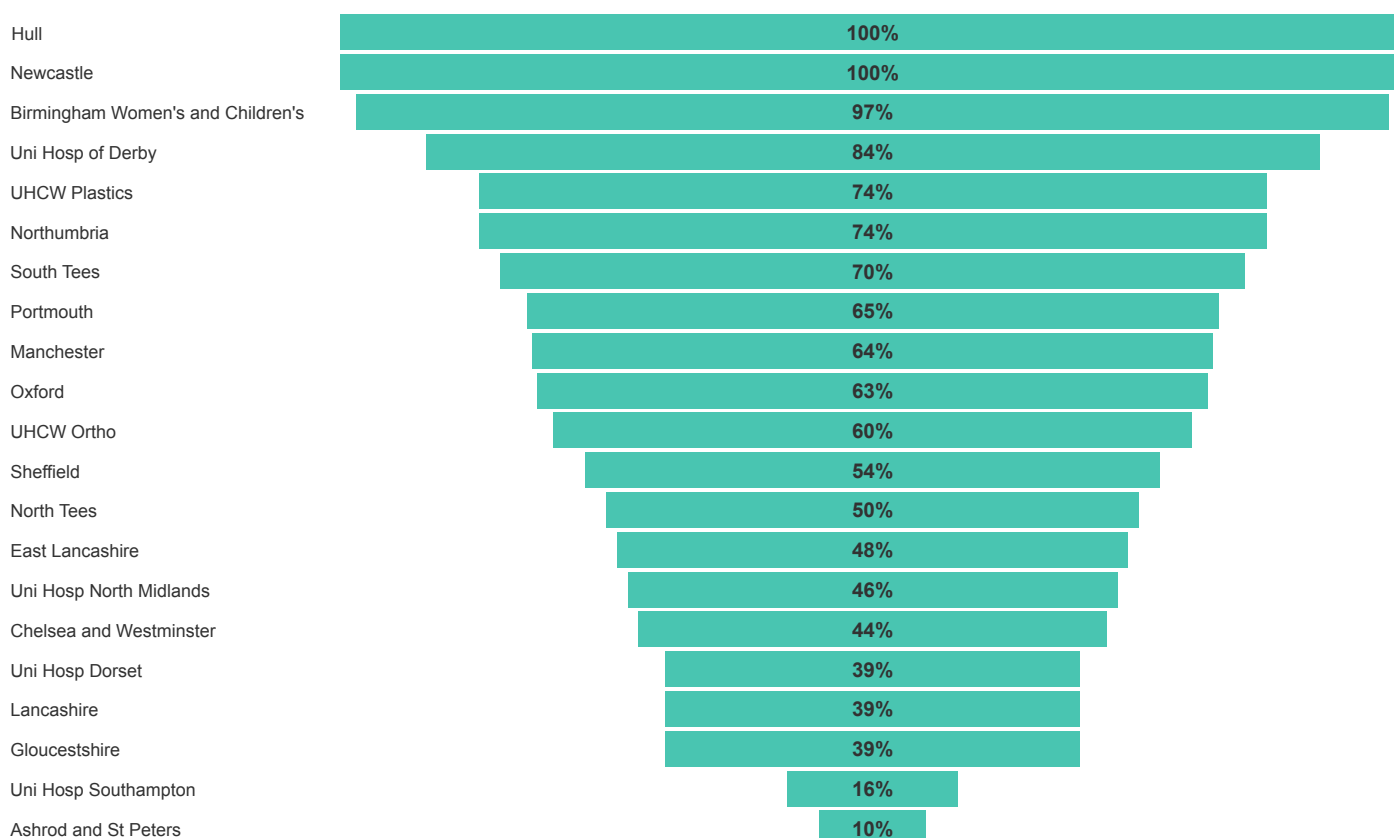


Figure 12. Adults aged >16 years: Closed fractures

Adult >16 years. Closed fractures (Category 3) 7-day, 168 hour standard

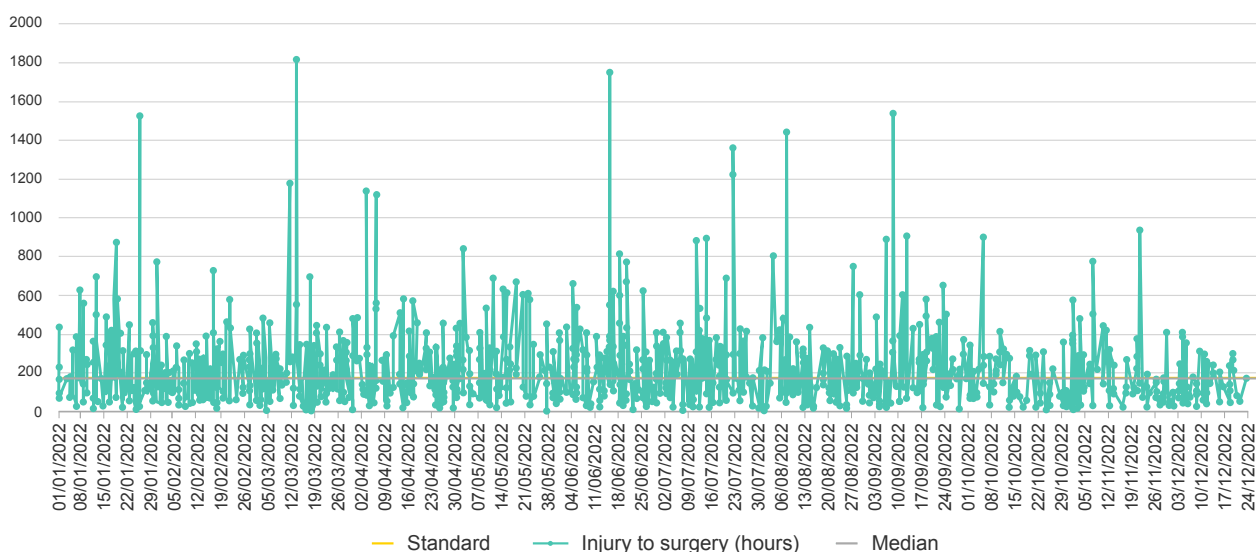
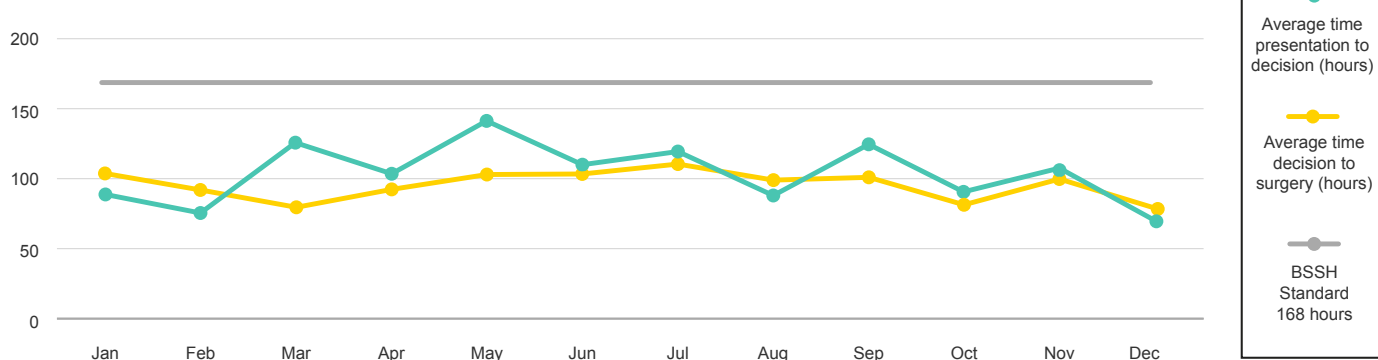


Figure 13. Average time in hours from presentation to decision and time from decision to surgery for patients with closed fractures – whole collaborative view

Adult 16+ years. Closed fractures



Closed fractures of the hand are by nature less visible, less gory. Because they are a closed injury, they are less prone to infection. This can lead to a reduced sense of urgency and conservative treatment, hence delay. For trusts without dedicated hand trauma lists, closed fractures often posed a significant challenge considering a constant supply of more clinically urgent injuries.

Success Factors

Top performing trusts across the collaborative shared their insights into their service and key success factors.

- See the patient at the first available opportunity and ensure that is by an appropriately trained individual
- Optimise use of theatre time available.
 - Do not postpone, prioritising open injuries
 - Do not plan surgery when kit is not available
- Train anaesthetics to deliver regional blocks
- Mini C-arm in clinics and theatre enables 40% of our hand fractures to be manipulated under anaesthetic in outpatient clinic
- Do not over-complicate the referral route. Give Emergency Departments easy access to clinic slots (zero resistance)
- Provide clinic near the Emergency Department
- Educate staff
 - Empower Emergency Departments through regular teaching
 - Clinic nurses can facilitate closed reductions
 - Hand therapy team to assist with bespoke splints.
- Maintain constant communication on all levels
- Do not think that you need to do it all yourself
- Do not hesitate to go to the top

3.4. Introduction of Children's Standards

The usual course teams take when embarking on a quality improvement project is to set an improvement aim aligned to an existing standard which may be proving challenging. Hence, the HandsFirst QI Collaborative's aim that 80% of patients presenting with 24 hours of injury received the needed surgical interventions within the BSSH timeframes.

Another common approach is an aim to reduce the level of variation within a system. It is a far rarer path to set new more challenging standards to aspire towards. This tends to happen when teams recognise that existing standards and service provision falls short of the patient need that they witness in their clinical experience. Such shortfalls create a moral tension if not a moral injury, igniting a compelling passion for improvement. This was the case driving the creation and inclusion of children's standards within the life of the collaborative.

At the 18 November 2021 HandsFirst QI Collaborative Launch Event, significant concerns were raised that children merited separate standards due to more rapid healing rates associated with growth. Andrea Jester of Birmingham Women's and Children's NHS Foundation Trust led a brief discussion of key issues. Subsequently, the collaborative created a working group. On 21 January 2022, new children's standards were proposed and adopted by the BSSH. The timeframes for children up to 10 years of age from injury to first surgical intervention for patients presenting within 24 hours are:

- Open joints and open fractures within 24 hours
- Other open hand injuries within three days (72 hours)
- Closed fracture of the hand within four days (96 hours)

3.4.1. Children's standards: open joints and open fractures (Category 1)

Regardless of the age of patients presenting with an open joint or open fracture of the hands, the 24-hour standard proved challenging to meet. At the close of the project, for children:

- Aged 0-10 years of age compliance reached 63%, a 2% improvement
- Aged >10-16 years of age compliance reached 76%, a 6% improvement from the August Interim Report

Since the August Interim Report the mean time from injury to surgery reduced by 3 hours in children 0-10 years of age. It reduced by 10 hours in children aged >10-16 years with the mean time from presentation to decision reducing by 7 hours and the mean time from decision to surgery reducing by 4 hours.

3.4.2. Children's standards: all other open hand injuries (Category 2)

The highest volume of recorded activity in children within the HandsFirst REDCap database was all other open hand injuries. The new children's standards were promoted at each collaborative event from February 2022 onwards. Throughout the life of the project, the 72-hour standard for all other open hand injury was 88% met for children 0-10 years old. Topics at the 22 June 2022 Collaborative meeting included:

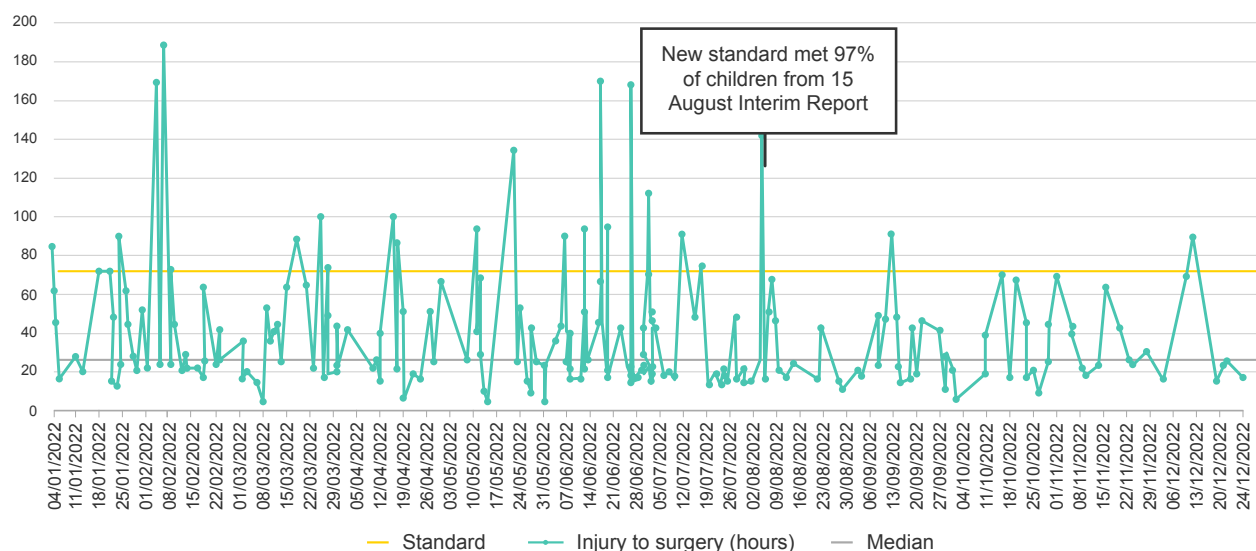
- Marginal gains
- Tips on facilitating an 'ideas harvesting' engagement event
- Presentations of change ideas and PDSA cycles from sites; and
- The role of human psychology and behavioural in realising change

Sites from the collaborative shared successes to date. Birmingham Women's and Children's NHS Foundation Trust highlighted their use of technology, the TriVice³⁵ application to triage and expedite referrals, provide advice to Emergency Department colleagues and support parents and carers with patient information. Birmingham Women's and Children's NHS Foundation Trust also spoke to how they developed a close working relationship with their Emergency Department providing opportunities for regular horizontal learning. Overtime, Birmingham Women's and Children's NHS Foundation Trust's Emergency Department team became confident in treating many hand injuries within the department, which improved access for those children who truly needed the expertise of the paediatric hand consultant team.

Children's standards were regularly communicated to teams. From the 15 August Interim Report, the 72-hour standard for all other open hand injuries was met in 96% of children aged 0-10 years.

Figure 14. All other open hand injuries in children aged 0-10 years (72-hour standard)

Children aged 0-10 years. All other open hand injuries (Category 2) 72-hour standard



For children >10-16 years with all other open injuries the standard remained at 96 hours from time of injury to surgery for patients presenting within 24 hours of injury. This standard was met for 90% of children across the collaborative.

3.4.3. Children's standards: closed fractures (Category 3)

At the Pre-Launch meeting and first virtual site meetings, teams were most concerned that patients with closed fractures had excessive waits. Many anticipated poor compliance with the 7-day BSSH standard for closed fractures. The standard for children 0-10 years of age reduced the timeframe from injury to treatment to 4 days or 96 hours. By the close of the collaborative cumulative performance improved 2% to 72%. The 7-day standard remained in place for older children with 75% receiving treatment within 168 hours. The mean time to from injury to surgery for this patient cohort was 124 hours. Although the mean time from presentation to decision reduced by 15 hours for children >10-16 years old, this was offset by a 13 hour increase from decision to surgery which related to increasing difficulties accessing theatres with the onset of winter pressures. Winter pressures resulted in a 15% decrease in the children >10-16 years old meeting the 7-Day BSSH standard.

3.5. Children vs. Adult Access

Overall, access to services for children considerably exceeds access for patients >16 years of age across the pathways (see Table 5). However, in some trusts/ health boards children can get a rough deal. This can happen where access to paediatric surgeons is limited or in cases where smaller cases are pushed out due to high demand for complex trauma.

Table 5. Mean time from injury to surgery in hours by age

Open fractures and open joints (Category 1)	
Age	Mean (hours)
0 - 10 years	27
>10-16 years	29
>16 years	40
All other open wounds (Category 2)	
0 - 10 years	40
>10-16 years	51
>16 years	68
Closed fractures (Category 3)	
0 - 10 years	69
>10-16 years	124
>16 years	214

The HandsFirst database has revealed considerable variation across treatment pathways nationally. It is hoped that this database will be the springboard to change and that RCS England and BSSH may work in close collaboration with GIRFT to deliver HandsFirst2 and in subsequent initiatives.

3.6. Contributory Factors

Anaesthetic

There was considerable variation in the use of anaesthetic across the collaborative. Some sites used a general anaesthetic almost exclusively. Others recognised that regional blocks, use of local anaesthetic or WALANT in minor operations suites (MOPS) rooms presented an opportunity to release theatre capacity too good to miss.

Table 6 illustrates the cumulative use of anaesthetic for all procedures captured in the HandsFirst database.



Table 6. Whole collaborative: anaesthetic use breakdown by type

Whole Collaborative anaesthetic use	
Type	Percentage
General anaesthetic (GA)	40%
Local anaesthetic (LA) without adrenaline	25%
Regional anaesthetic	24%
Wide awake local anaesthesia no tourniquet (WALANT) technique	11%
Total	100%

Location of procedure

One of the top tips for success shared by the high performing team at Hull University Teaching hospitals was to locate your own minor operations suite (MOPS) in or next to the trauma clinic, staffing and using it part of every day. One of the common constraints for sites with low levels of compliance with the BSSH standards was the lack of a MOPS. MOPS with a C-arm portable x-ray machine with good access to staff trained to administer regional blocks were better placed to meet standards due to reduced demand on laminar flow theatres.

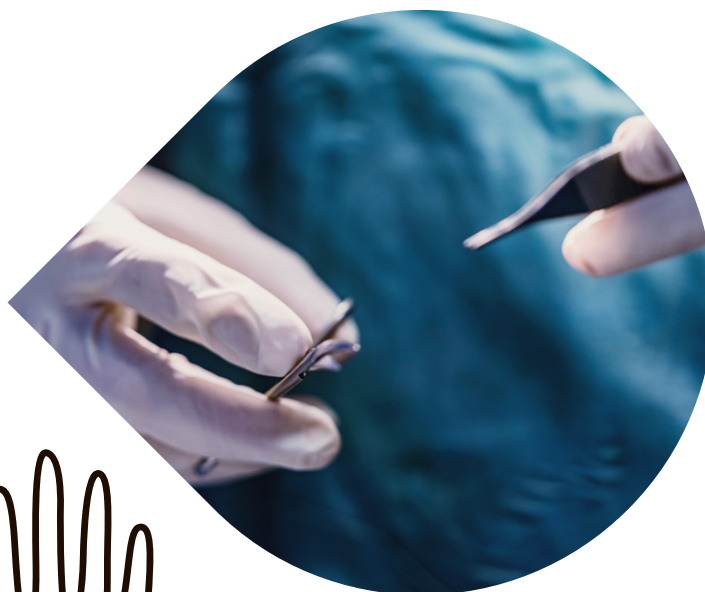
University Hospitals of Derby and Burton NHS Foundation Trusts: Pulvertaft Hand Centre employs a mix of anaesthetic to great advantage. Unlike many trusts in the collaborative, the team are not overly reliant on general anaesthetic (GA). Regional anaesthetic is used in the majority of their procedures (53%) with local anaesthetic (LA) without adrenaline used in 35% of cases. Procedures with GA make up just under 9% of their cases compared to 40% in the wider collaborative. Choice of anaesthetic is a matter of patient safety as well as system efficiency.

Table 7. Location of procedure

Location of Procedure	
Type	Percentage
Clinical room with natural ventilation	1%
Clinical room with no natural ventilation	2%
MOPS room (designated for sterile procedures) with enhanced air changes	3%
MOPS room or outpatient area	6%
Theatre with laminar flow	51%
Theatre without laminar flow	37%
Total	100%

“The quality and style of presentations and presenters kept things lively and interesting. It was refreshing when there is so much change fatigue!”

Delegate feedback
24 November 2021



3.7. Site feedback

Feedback from sites after each meeting was used to evaluate the immediate impact of the meeting as well as informing topics for subsequent events.

Delegates valued:

- The opportunity to network and hear other people's ideas and experience from other regions
- Sharing information and ideas
- Working together in small groups to do something positive about hand trauma
- Feeling inspired by coming together in the collaborative
- Reflecting on shared experiences (e.g., wastes in the system)
- Clinical discussions led by RCS Council Lead and Clinical Lead
- Presentations from the QI consultants:
 - Diagnostic tools
 - Scenarios to support practical ways to progress the project

“You managed to lift the spirits of our group of delegates in the room. I think everyone came out feeling energised, empowered and motivated to work on our mutual goals”

Delegate feedback
22 November 2022

“We definitely have attained a much better unit awareness of time to surgery. I would like to say it was fairly well indoctrinated within the established surgeons, but certainly for the junior doctors it has now become a definite focus. This has probably been most obvious WRT management of open fractures/joints, or recognition of probable open joint/fracture, e.g., the knife laceration overlying the MCPJs on the hand – an open joint until proven otherwise so take it to the procedure room and wash it out...!”

Paul Malone, University Hospitals Birmingham
NHS Foundation Trust

“This has been an extremely worthwhile project. It is the first time that we have been able to generate real-time quality data that actually allows us to understand the issues around hand injury management. More importantly, data that demonstrates areas of poor practice in such a way as to produce a business case. Whilst that case might not get funded – certainly not in the short term. This is a first. The impetus and engagement from the HandsFirst Team here, which includes our own improvement expert, will continue. We already have the next two PDSA cycles planned. Being part of a national project with expectations, deadlines and reports is very motivating. I have personally felt proud to have been involved.”

Delegate feedback
22 November 2022



4. New processes tested and reviewed

The October 2021, HandsFirst Pre-Launch meeting identified two key areas for improvement with the potential for high yields:

- Improving theatre utilisation by identifying which cases can be managed in alternative facilities
- Increasing patient flow by utilising more efficient and agreed pathways to ensure patients are treated in the right place, by clinicians with the right skills at the right time

Changes can be grouped into six broad categories:

Diagnostic a deeper understanding of hospital system	Creating new capacity	New patient pathways/ processes	Reducing Waste	Improving patients' experiences	Communicating with colleagues & building new relationships
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4.1. Diagnostic exercises

Diagnostic exercises were designed to help sites gain a deeper understanding of hospital systems. Sites got a baseline view of their efficiency by monitoring theatre lists, reviewing the number of 'planned' vs 'actual' cases that took place, and using QI approaches such as process mapping to measure the length of time taken for patients to move through stages of the pathway. Process mapping helped sites identify aspects of their pathway which were adding value and those which were not so that they increased their depth of understanding in relation to barriers and could prioritise areas for improvement. Teams identified the potential need for and value of additional training and education for staff members related to HandsFirst and hand trauma.

4.2. Creating and releasing capacity

The Model for Improvement is comprised of three key questions:

1. What are we trying to accomplish?
2. How will we know a change is an improvement?
and
3. What changes can we make that will result in an improvement?

The answer to the final question is sought via small, controlled tests of change known as Plan-Do-Study-Act (PDSA) cycles.³⁶

“We released hand trauma capacity with the introduction of a hot clinic for post hand injury follow ups,”

Delegate feedback
15 November 2022

For most trusts and health boards, creating and releasing capacity was their primary aim towards achieving the BSSH standard for at least one category of hand injury. The percentage of patients treated within the timeframe outlined by the BSSH standard was the primary measure of success. But to know what changes to make to realise improvement sites needed to understand contributory factors. There are a huge range of factors that contribute to delays in time to surgery. Many teams struggle to find the manpower to carry out often laborious work to try to understand the causes that underlie emergent problems e.g., peripheral hospitals would seem to be referring most of their hand injuries to the local hand centre. Without deeper understanding, it is likely that only limited improvements will be possible.

Sites employed a range of strategies:

- Maximising the use of existing facilities (extending lists, golden patient initiatives, reinstating MOPS)
- Securing new facilities and equipment (introducing new clinics, regular dedicated hand trauma and upper limb lists, establishing regional block service, MOPS, securing a Mini-C arm for imaging, adding extra trauma clinic slots)
- Devising new ways of working (introducing dedicated lists, relocating activity within the estate other theatres, procedure rooms and clinic spaces)
- Reviewing staffing (revising job plans, recruiting new staff, trialling new roles and upskilling existing team members)

Specific examples from across the collaborative

East Lancashire Hospitals NHS Trust trialled introducing a hand therapist into clinic and data collection to explore why some complex fractures are denied surgery.

Lancashire Teaching Hospitals NHS Trust shared comprehensive plans to determine the value of therapy led hand fracture clinics and earlier intervention by hand therapists, while also reducing inappropriate referrals to trauma clinic.

Ashford and St. Peter's Hospitals NHS Foundation Trust introduced a weekly upper-limb list and successful bid for additional resource in hand therapy.

Golden patient

Sustainability and spread are two core tenants of improvement science. The concept of the golden patient is nothing new. In 2009, it grew out of a desire to improve theatre utilisation in Trauma and Orthopaedic theatres.³⁷ Originally the golden patient was a pre-selected patient scheduled as first on the following day's theatre list. This would be a medically fit patient with a clear surgical plan, seen in advance by the anaesthetist and sent for early on the day of surgery. Improving theatre start times by having a patient ready would then have a positive knock-on effect throughout the day resulting in fewer cancelled patients on the list.

"We are working on extra capacity for non-GA/non-block cases in a room, that is currently being used for storage, in main theatre but which has increased air changes"

Delegate feedback
14 November 2022

Several sites within the collaborative began efforts to increase theatre efficiencies by introducing or reinvigorating a golden patient initiative. Some sites extended the concept, Specific examples included:

- Confirming a careful and appropriate choice of golden patient has been made the day before
- Adding the golden patient to booking form so the patient appears on printed out lists
- Having the night Registrar review and consent the patient before the morning trauma meeting
- Bringing the golden patient in 30 minutes earlier
- Calling earlier for the patient i.e., at the start of the team brief, rather than at the end
- Walking the patient from the ward to theatre and using a wheelchair post-operatively to reduce reliance on portering services (identified as a limiting factor)
- Identifying medically fit patients such as those with short procedures whose operation could be done with a regional block or local anaesthetic as golden patients to finish lists

Oxford University Hospitals NHS Foundation Trust calculated that for every golden patient case there is a cost savings of £200. Even if a golden patient case takes place only two to three times a week, there is the potential savings of £20,800 - £31,200 per year.



Seamless Start

Paul Malone and the team at University Hospitals Birmingham NHS Foundation Trust took the opportunity to reintroduce Seamless Starts an initiative that had traction across theatre teams at University Hospitals Birmingham NHS Foundation Trust prior to COVID-19. The team introduced daily list planning multidisciplinary team meetings discussing the next day's list. This resulted in:

- A reduced likelihood of on the day cancellations
- Better list planning in terms of ordering patients, communicating about complexities, and ensuring appropriate equipment

Skills Mix

The Queen Elizabeth Hospital Birmingham is looking to develop their Theatre Team by exploring support roles such as employing a Scrub Assistants and a whole-time equivalent Physician's Assistant.

Clinic changes

Double booked new patient appointments in cold clinic and ACP hand therapist led clinics. They increased dressings clinic appointments to take the pressure off hot clinic for follow ups. Changed telephone slots in cold clinic to new appointments.

“One thing that has come out for me quite powerfully from the work we have done together so far is the heterogeneity of the hand trauma set ups around the country such that it would be difficult to be too didactic about specifying pathways/facilities etc. However, there are some approaches that clearly do work.”

Professor Vivien Lees,
Council Member, Trustee and Vice-President,
Royal College of Surgeons of England

4.3. New patient pathways / processes

One of the obvious, but nevertheless biggest advantages to participating in a national collaborative is the opportunity to learn how other sites deliver care. Leveraging that learning led several sites to change working practices by taking key principles from other sites to adapt and test within their context. At some point, every part of the patient pathway was re-evaluated within the collaborative.

48% of sites lacked a 'direct to hand therapy' pathway from their Accident and Emergency Department for at least some of their hand trauma patients.³⁸

Key strategies included:

- Joint working
 - Working with local hospitals to create a regional approach or pathway
 - Improving the referral system by making better use of technology such as introducing an online referral system, use of generic email addresses, triage and referral applications, virtual fracture clinics
- Improving existing pathways (reducing time from presentation to decision making which was particularly intolerable for patients with closed fractures)
- Creating new pathways. For example, introducing:
 - Pathways for early and easy pre-assessment often with a focus on early decision making from the start
 - Direct access to hand therapists and immediate escalation directly to hand surgeons or SAS Registrar with an interest in hands; and
 - Fast-tracking patients to surgery
- Establishing new services
 - A therapist-led hand fracture clinic
 - Virtual fracture clinic
 - A regional block service



- Enhancing capabilities e.g., introducing x-ray facilities in clinic
- Reducing variation by
 - Standardising operational processes
 - Creating guidelines
- Introducing new ways of working
 - An algorithm for triaging referrals to the service
 - Daily handover meeting
 - Theatre debriefs

Examples from across the collaborative

South Tees Hospitals NHS Foundation Trust assessed the awareness of hand trauma pathways across differing staff groups, ahead of holding a “drop-in session” aimed at troubleshooting and encouraging feedback from Urgent Care Centre and Emergency Department clinicians.

The University Hospitals Birmingham NHS Foundation Trust team introduced a 4-weekly theatre working group billed as a friendly Hands User Group (HUG) to discuss all elements relating to the smooth and efficient running of hand theatres. Discussions emphasise hand trauma and patient flows between the University Hospitals Birmingham NHS Foundation Trust front-of-house Hot Hand Clinic (HHC) and Ambulatory Care Hand Theatres. Meetings have resulted in:

- Better team cohesion
- Diffused tensions through regular collaborative working across team and departmental boundaries
- Fewer on the day cancellations as list planning improved. Enabling factors are believed to be:
 - Discussions about the ordering of patients on the list
 - Better communication about complexities
 - More thorough shared understanding of equipment requirements
- Introduction and refresh of standard operating procedures

“Sending patients to theatre when they could be treated in a MOPS is an own goal when it comes to theatre utilisation.”

Member of the collaborative

Alternatives to general anaesthetic

The national data set revealed massive variations in choice of anaesthesia. Teams were able to learn from one higher achieving trust that had developed their service so that patients who required surgery were operated on under regional block. The high achieving trust started by carefully managing patient expectations. As well as being able to achieve consistently high levels of compliance with the national standards, they reported high levels of patient satisfaction and service efficiency.

Confronted with tales of successful alternatives to general anaesthetic by leading sites challenged trusts which were using GA by assumption. Those sites that began to challenge the assumption that patients want their procedure under GA found that was not necessarily the case. GA by assumption is costly in a number of ways. Moving to a regional block service done in MOPS releases of valuable theatre space and reduces the risks to patients associated with GA. Other trusts opted for a change of practice by increasing their use of WALANT or administering LA for WALANT pre-theatre.

Making the most of MOPS

At the Pulvertaft Hand Centre the team introduced regular minor ops room lists and a laminated sheet of triage categories at the nurses’ station to assist with the appropriate streamlining referrals appropriately. This helped maintain full staff awareness of the impact on triage urgency and the importance of the BSSH standards.



4.4. Reducing waste and inefficiency

Sites began to look at the ecology of their service. Some were able to locate treatment rooms together to increase efficiency. Others recognised that there was no need to transport most hand trauma patients to theatre in a wheelchair, thus freeing portering capacity and enabling earlier list starts. Some reduced their use of instruments and single use plastics. Another site began running a minor procedures area alongside its trauma clinic.

4.5. Improving patients' experience

Sites which were consistently meeting BSSH standards took the opportunity to explore patients' experience of care. Birmingham Women's and Children's NHS Foundation Trust introduced a patient experience questionnaire which they pushed out to patients via their electronic application, TriVice, after first running a paper based PDSA cycle with inpatients. Other sites took the opportunity to produce or improve patient information.

4.6. Communicate with colleagues and build new relationships

The collaborative provided ample opportunities for teams to communicate with colleagues and build new relationships. Most sites increased their interaction with hand therapy teams, Emergency Departments and theatre teams. Sites created and shared:

- Guidance on standards, referrals, treatment and pathways;
- Strategies for raising awareness of the project with colleagues to improve buy in
- Job descriptions for enabling roles such as hand trauma coordinators, hand therapists, scrub assistants

The relationship between RCS England, BSSH and GIRFT is certainly one of the most valuable relationships that has grown.

"Involvement in the project was instrumental in creating a new culture of cooperation between the orthopaedic and plastics hand teams"

Delegate feedback
14 November 2022



5. Case studies

5.1. Going green in theatre

In March 2022, the HandsFirst Database provided the team at the Newcastle upon Tyne Hospitals NHS Foundation Trust with the assurance that they were consistently meeting BSSH standards across the three injury categories. Confident that they would continue to meet the standards, Susan Stevenson and the team decided to turn their minds to supporting the 'green agenda' by reducing waste in theatre and clinics.

The team considered a number of approaches such as carrying out more of their minor procedures without drapes and reducing their usage of single use plastic. Ultimately, they decided to focus on equipment waste choosing a Plastics tray which was frequently used. Taking a Lean approach, the team sought to reduce unnecessary inventory in their Plastics 'basic' tray by running a series of Plan-Do-Study-Act (PDSA) cycles. The result? They nearly halved the tray in size. This new Plastics 'minor' tray is good for most procedures. Now, the team maintain a Plastics 'extra' tray for those occasions when something more is needed.

By reducing the tray inventory, the team has increased storage capacity while reducing time and costs associated with the reusable surgical instrument cycle (e.g. cleaning, disinfection, inspection, packaging, sterilization, transport and storage).³⁹ Reduced kit equates to reduced consumables and it supports NHS England's Greener NHS ambition, Delivering a net zero NHS.⁴⁰ See Appendix B for instrument inventory and photographs of each tray.

What makes Newcastle upon Tyne Hospitals NHS Foundation Trust such a success?

Service configuration

- They offer a consultant-led and delivered clinic
- There is a bed trauma list with access to two-three teachers, meaning that 10-12 patients can be seen on two afternoons
- There is also a parallel hand therapy clinic
- They have good access to regional anaesthetics support
- They enjoy some dedicated hand theatre time
- The efficiency of their service has been built over the last 15 years

5.2. HUGs and seamless starts at University Hospitals Birmingham NHS Foundation Trust

Getting involved QI is a natural springboard for teams hoping to develop a culture of continuous learning and innovation. Paul Malone and the team at University Hospitals Birmingham NHS Foundation Trust began a journey of cultural transformation in their endeavour to improve theatre efficiencies. From the very off at the Launch Event, Darren Chester, Jill Webb and Paul realised they needed to engage with nursing, anaesthetic, theatre teams and ward staff.

They saw HandsFirst as an opportunity to build on Seamless Starts, an initiative that had enjoyed success in other specialties before the pandemic. Reminding teams of their prior success is always a smart strategy when it comes to motivation.

The University Hospitals Birmingham NHS Foundation Trust team enjoyed a relatively early success introducing golden patients at the start of the lists. In November 2021, before the team began work on Seamless Start and the golden patient initiative, 4% of patients were being sent for before 08:30 am. By March 2022, this had risen to 48%.



Keen to continue these rapid gains, the team met with anaesthetic colleagues and theatre staff to open a regular dialogue discussing everything from start and finish times to differences in team cultures and perception. They introduced a friendly Hands Users Group or HUG which meets 4-weekly to discuss the smooth and efficient running of Hand Theatres. Conversations have a particular emphasis on hand trauma and the patient flows between their front-of-house Hot Hand Clinic (HHC) and Ambulatory Care Hand Theatres.

Improvement ideas abound in this multidisciplinary group meeting. The teams have:

- Looked at reducing the gaps between cases as well having earlier starts and considering extended days
- Developed policies for escalating potential on-the-day cancellations
- Done some myth busting around issues around things like equipment sterility issues, finding the problem is far less impactful than persistent perceptions
- Reviewed equipment needs and resolved issues
- Reinvigorated the end-of-day team debrief
- Introduced a daily Hand Surgery trauma list MDT and theatre checklist

5.3. The power of the PDSA

East Lancashire Hospitals NHS Trust began by imagining their ideal pathway though admittedly the team felt that they were 'a million miles away.' They were struggling to meet. Without any current state data, the team knew instinctively to focus on patients with the closed fractures being managed conservatively. There was a lot of anecdotal evidence that there was wide variation across this pathway.

Over the course of four PDSA cycles they developed, promoted and implemented use of an Orthopaedic Hand Injury Referral (OHIR) proforma which was scanned and sent to the Fracture Clinic mailbox. They initiated a triage step to identify fractures needing hand surgery. This has since evolved into an MDT. Thereafter followed an agreement to allow two protected slots per hand surgery list for closed fractures.

They took a project management approach establishing key stakeholders which included involving an East Lancashire Hospitals NHS improvement coach. Data collection formed part of developing their dedicated administrative processes. They created a pathway to refer urgent care centre patients to Hand Therapy Services for screening and collection.

They also created a pathway to refer Urgent Care Centre (UCC) patients to Hand Therapy Services (HTS) for screening assessment and prescription. Monthly meetings were held with constant communication to share learning between.

From their third PDSA cycle which focused on Triage, the team agreed three possible outcomes:

- Expedite
- Leave with existing appointment; or
- Refer directly to **Hand Therapy Services** (cancelling closed fracture appointment)

The average time for triage reduced from seven minutes over the first seven weeks to two minutes.

In their fourth PDSA cycle the team introduced direct referrals to the Hand Therapy Service. Hand Therapy Services would provide:

- A screening call within 48 hours of referral
- Assessment to determine if face to face or patient initiated follow up
- Telephone advice and answer patient questions
- Sending patients injury education

The average call took 15 minutes including administration and was deemed unsustainable within available resources.



Key learning:

- Just under 50% of patients required hand therapy
- The team discovered 27 patients required an urgent appointment with a hand consultant
 - 19 were fractures and 13 had surgery within 24 hours of injury

PDSA cycles proved a powerful tool for moving the team towards best practice. They clearly demonstrated that what was best for the patient was being seen by the right clinician at the right time. The team had evidenced through their small cycle of change that getting the right resources in place would lead to a huge reduction in risk of suboptimal injury management.

Using multiple PDSA cycles, Mr Fizan Younis, Miriam Parkinson, Alex Buckley and the whole team at East Lancashire Hospitals NHS Trust established what best practice looked like at the trust. Some key achievements:

- Injuries needing a specialist opinion get picked up more quickly with an increased chance of meeting the 7-day standard if surgery needed or early access to HTS
- Improved resource management
- A supportive, collaborative MDT with intradisciplinary working
- Protected fracture clinic slots
- Increased effective use of patient initiated follow up
- Creating an auditable trail for patient journeys and clinical outcomes

5.4. Improvement shorts

Working within a limited scope

One team demonstrated that even when the scope for improvement is defined by very narrow parameters, great benefits can be realised. The team was able to substantially reduce time to surgery for patients with closed fractures by introducing a highly effective consultant-led triage system.

Wise leadership

Many teams wrestled with competing priorities. One dynamic consultant took advantage of her trust's culture of competitiveness. She employed a series of 'carrots and sticks' to incentivise data collection and entry and planned a 'Dragon's Den' event to gather change ideas from her doctors in training.



6. Lessons Learned

Variation might be the spice of life but as Dr W. Edwards Deming said, “Uncontrolled variation is the enemy of quality.”⁴¹ One thing that soon became abundantly clear early in the course of the collaborative is that variation across sites is vast. Key areas include:

- Compliance with the BSSH standards
- Numbers of cases being treated
- Awareness and use of the national BSSH hand triage pathways
- Percentage of triaging decisions on injuries reviewed by a consultant
- Referral pathways and processes
- Whether sites operated a dedicated on-call hand trauma rota
- Level of access to theatres in general and access to protected operating theatres with full anaesthetic support
- Availability of Facilities and MOPS
- Proximity of clinics to theatres and MOPS
- Size and skill mix of teams (including hand therapists, hand trauma coordinators)
- Team cohesion
- Engagement of the necessary clinical team members
- Engagement of the necessary managers
- Use of technology

Across the collaborative, 7-day working is still very much the exception rather than the rule. All sites held a morning trauma meeting on weekdays. Only 22% of morning trauma meetings benefitted from having an anaesthetist presence. 19% of morning trauma meetings lacked a consultant surgeon presence. 74% of sites had a Saturday morning trauma meeting and 70% held a Sunday morning trauma meeting. Weekend dedicated hand trauma lists were far scarcer. Trauma co-ordinators and hand therapists added value particularly when the hand therapy clinic ran in parallel to consultant-led and delivered clinics as seen at The Newcastle Upon Tyne NHS Trust.

Triage pathways

At the end of the project, only 39% of sites were using the BSSH national Hand triage pathways despite the BSSH Hand Injury Triage (HIT) guidelines being available as an application downloadable for iOS devices (<https://handinjurytriageapp.bssh.ac.uk/home>).

At 63% of sites within the collaborative triaging decisions on open injuries are reviewed by a consultant. This dropped to 56% for closed fractures.

“If we can continue to apply the changes made from our PDSA cycles around triage and data collection, in time, we stand to gain a much better grasp of patient journeys and detect unstable fracture patterns early enough to meet Category 3 [closed fractures].”

Delegate feedback
14 November 2022

Referral pathways and processes

At most sites, the on-call team are contacted by telephone (96%). 29% of sites operated a dedicated on-call hand trauma rota. The quality and appropriateness of referrals was a recurrent theme. Less so at trusts like Birmingham Women's and Children's Hospital NHS Foundation Trust and University Hospitals Birmingham NHS Foundation Trust, both of whom have electronic referral and triage systems. Elsewhere, the pace of electronic innovation is clearly a barrier. 46% of sites and health boards had an electronic referral process. However only 11% of those had built in automated early decision-making tools.



The type and capability of electronic referrals varied significantly. Examples included:

- Handwritten referrals being scanned and sent electronically
- Via virtual fracture clinics
- Custom built systems
- TriVice
- Oxford Acute Referral Service (OARS)
- e-Hands
- Network of On-call Referral Services (NORSE)
- Epic Chat Messenger

See and treat pathways

Minor case ‘see and treat’ pathways for hand trauma were in place at 54% of trusts in the collaborative. However only 18% of sites had a see and treat pathway in place for all cases.

Direct access to hand therapy clinics

52% of sites had a ‘direct to hand therapy’ pathway from their Accident and Emergency or Emergency Department. There was considerable variation in what injuries could be referred.

- Mallet injuries only
- Mallets, sprains, fifth metacarpals
- Mallet and volar plate injuries
- Mallet injuries, relocated PIP joint dislocations
- Mallet, volar plates, closed collateral ligament injuries/reduced dislocations
- Closed hand fractures
- All closed hand trauma

Access to theatre

On average sites had access to protected operating theatre with full anaesthetic support 4 days per week. Patients attending sites which served as Major Trauma Centres (MTCs) without a dedicated hand trauma list and sites without hand trauma coordinators regularly experienced the longest waiting times from injury to surgery.

Facilities and MOPS

Wide variation extended to the facilities available for carrying out procedures and operations.

Table 8. Access to facilities for procedures and operations across the collaborative

Access to facility by type	
Type	Percentage
Laminar flow theatres	89%
Non laminar flow theatres	71%
Procedure room with enhanced air changes	14%
Procedure room with standard air changes – i.e., same as a clinic room or ward area	50%
Procedure room with opportunity for open ventilation e.g., a window	18%
Procedure room with no ventilation – e.g., closed room with no windows and no air flow management or air conditioning	14%
Total	100%

“Patient experience of MOPS theatre has been excellent.”

Delegate feedback
29 October 2022



Data dilemmas

Prohibitive policies

The REDCap platform is an externally hosted internet-based platform. As a result, several sites faced resistance from internal Information Governance and IT Service teams due to local information governance policies.

The issue of consent

In the absence of a viable national database, early efforts focussed on setting up the HandsFirst database. So, an early focus for local teams was establishing, reviewing and refining their data collection processes. Many sites had to establish or revise processes and documentation around obtaining and evidencing patient consent for data collection. This introduced delays to data collection due to the need to secure approval from their local Information Governance team and Caldecott Guardian. Sites encountering the least resistance usually had a pre-existing generic statement of consent which allowed for anonymised data collection to support clinical audit, quality improvement and service redesign.

Whose job is it anyway?

One of the early debates for each site was to establish effective processes to enable data capture and collection. Patient consent presented the first hurdle to overcome. Some sites had patient consent forms which incorporated generic statements that encompassed data capture for audit or improvement purposes. Other sites had to introduce a new process or amend an existing process and seek approvals from clinical governance and information governance teams. The pandemic has put every staff group and professional discipline under added pressure, so each staff group mounted some resistance to taking on the task of data collection. As an internet-based application, REDCap offered ease of access so that data capture could happen in near real-time or be done retrospectively. Due to the nature of information required, the operating surgeon or assisting surgeon was best placed for prospective data collection. Due to the nature of information required, the operating surgeon or assisting surgeon was best placed for prospective data collection. In the some sites, surgeons entered the data in the system. In others, other members of the surgical care team managed data collection, for example hand therapists.

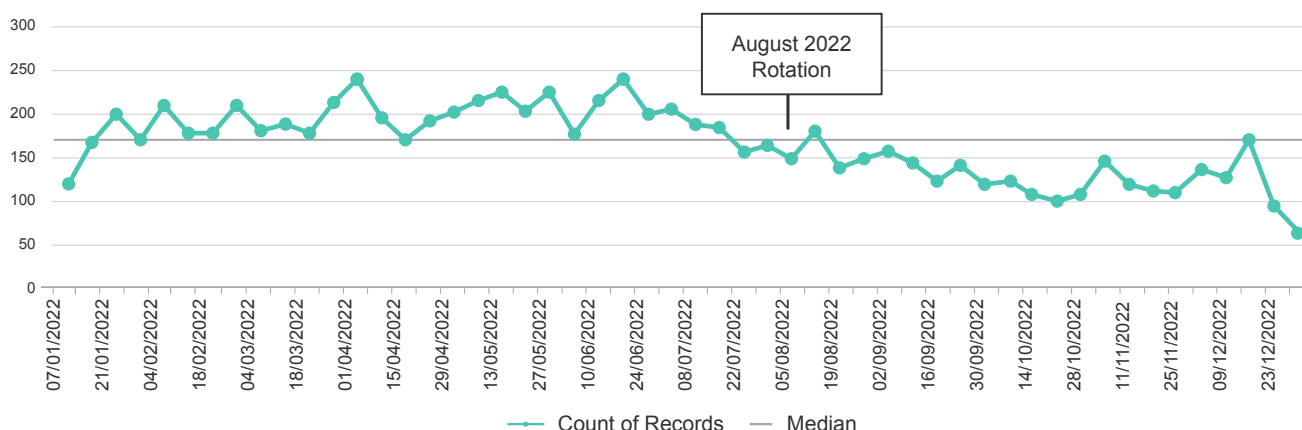
Retrospective data collection in trusts and health boards proved far more resource intensive as information to complete a record exists in multiple systems often requiring multiple sign-ins. In the absence of data collectors, most sites opted to collect prospectively immediately following surgery.

The case of the disappearing doctors

Almost without exception the August 2022 surgical rotation created difficulties for sites as the vast majority engaged Senior Registrars, Fellows as key stakeholders within their project teams. Some of these surgeons rotated to new organisations others secured consultant posts elsewhere. In some instances, the departing surgeon had a pivotal role actively engaging wider teams and managing service redesign. Many sites held engagement events specifically targeting Registrars on the basis that this group of surgeons moves frequently between trusts and therefore brings valuable contributions having exposure to many models of care. Their loss proved quite challenging; however it has led sites to consider how they could engage with specialty and specialist (SAS) doctors to recognise the value this group of experienced doctors bring while providing continuity in keeping with the NHS Employers drive to support and encourage this group of staff.⁴²



HandsFirst Data Collection



Over production and over processing

QI asks us to gather ‘just enough data’ ... but for some this was challenging. A number of teams struggled to establish robust systems for on-going data collection and were consequently unable to interrogate their findings at any level of depth. Others fell into the trap of focusing ensuring ALL their data was entered and cleansed – at the expense of using it to drive improvement.

Why does this happen? We are surrounded by data in the NHS. Data for research. Data for audit and quality assurance. Data for performance. We are regularly held to account with performance data which measures all available data in relation to an agreed standard and often rightly or wrongly benchmarked against others whose context and population demographics vary significantly from our own. On the other hand, data for research, in its quest for new knowledge has the broadest and deepest dataset of all to ensure new treatments are safe and effective. Regular exposure compels us to gather any available evidence. But improvement science asks that we collect ‘just enough’ data. Just enough data, in our context, to tell us if the changes we are introducing are moving us towards our intended destination, at the required pace, without introducing unintended and unacceptable consequences.

We are so familiar with data for quality assurance or performance in the NHS, for data in clinical trials, that it is easy to forget this key tenant of improvement. When we forget, we quickly fall into the trap of overproduction and over processing, two of the eight wastes of healthcare in the Lean discipline. Lean principles centre on improving productivity and flow through our system by eliminating and reducing waste.⁴³ Collecting too much data because it might be useful or would be interesting to know is a form of overproduction. Data takes time and effort to collect. It becomes over processing due to the time expended to validate and analyse data which may have no bearing on what we are trying to achieve. Teams have a tough challenge trying to forge the time to meet, think, plan, design, implement and study tests of change. The burden of excessive data collection and the danger of being subsumed by the resulting analysis paralysis can be ill-afforded.

Nevertheless, we rely on data to evidence outcomes and justify our efforts. It is easy to get caught up trying to collect all available data. Much harder to recognise when we have collected a sufficient representative sample to identify where in our patient pathways we want to test and illicit change for the better.

During the course of the collaborative a number of sites got caught in one data dilemma or another. Occasionally, well intentioned sites invited their QI Consultant to join them in their pursuit of the perfect dataset. One of the key lessons learned for sites and QI Consultants is to have the tenacity to stop feeding our inner perfectionists and remind ourselves and our teams that we collected is good enough to enable us to move into meaningful action.

The trusts and health boards within the HandsFirst QI Collaborative have provided us with a dataset of 9,028 records. They have given one another along with RCS England, BSSH, the team at GIRFT and the wider nation, a rich new landscape to explore.

Rigidly adhering to the first goal you set

People who are drawn to a career in surgery are often high achievers determined to meet or exceed the goals they are set or that they set themselves. This is not necessarily the best strategy for improvement especially when working with an emergent database. Teams can change their local goal. For example, teams doing well in one area might be wise to focus efforts on developing another area. Teams can work with their QI consultants to re-define their local goal, though some were reluctant to do so once they declared an aim.

“We are now able to push data from our digital referral app directly into REDCap, so that manual inputting is significantly reduced.”

Andrea Jester
Birmingham Women’s and Children’s Hospital NHS Foundation Trust
14 November 2022

Best practice

To avoid the rework associated with data validation, ensuring good data entry is a must. Having a shared operational understanding of data definitions is a great start. Two key tests of an operational definition are reproducibility and repeatability.⁴⁴ To encourage consistency of data entry, seasoned Researcher and Post-graduate Manager, Dr Anna Selby at the Pulvertaft Hand Centre, assembled her team and together they entered a patient onto REDCap. This provided a valuable opportunity for the team to discuss their interpretation of the fields and decide how to make the best use of the free text fields to suit lines of inquiry. Dr Selby motivated her team of Hand Surgery Fellows around being part of this national collaboration at a time when many would be looking for a competitive edge applying for consultant roles. Dr Selby highlighted that at interview simply demonstrating data entry is insufficient. To stand out, applicants need to illustrate how data informed improvement ideas that they contributed to and were taken forward.

The team at Birmingham Women’s and Children’s NHS Foundation Trust created a communications plan and package of assets to make data collect easy. This included:

- Creating a video which detailed the importance of HandsFirst, REDCap registration instructions, showing examples of data input and a QR code linked to the database
- Holding face to face REDCap training sessions and providing a guide to data collection and entry
- Giving Registrars key chains with a QR code to REDCap
- Putting up posters with the QR code in strategic locations to take surgeons directly to REDCap

By the end of the collaborative, Birmingham Women’s and Children’s NHS Foundation Trust liaised with the developer of their referral application, TriVice, pushing data into REDCap to minimise data collection efforts.

Other mechanisms to encourage data entry employed across the collaborative:

- Public recognition within team meetings including certificates from RCS England
- Regular reminders and coaching through data entry
- Maintaining lists of missed patients naming the personal responsible for entry alongside setting the expectation that data must be entered. Entering data immediately postoperatively is in the best interest of the surgeon given how much longer it takes retrospectively.
- Using existing feedback structures such as team and departmental meetings to discuss progress, highlight issues or ask questions or raise concerns
- Simple, informal and regular rewards such as the regular provision of snacks to acknowledge ongoing efforts



Power BI and the big bad benchmark

Despite being gently reminded at every national meeting that sites were part of a collaborative not a competition. Whole collaborative monthly reporting was arranged so that sites which had the highest percentage of patients meeting the BSSH standard appeared at the top of the graph. An unintended consequence was that the Power BI graphs within monthly reports had the familiar shape of benchmarking reports (see Figure 15). Therefore, sites tended to respond in kind, as if they were

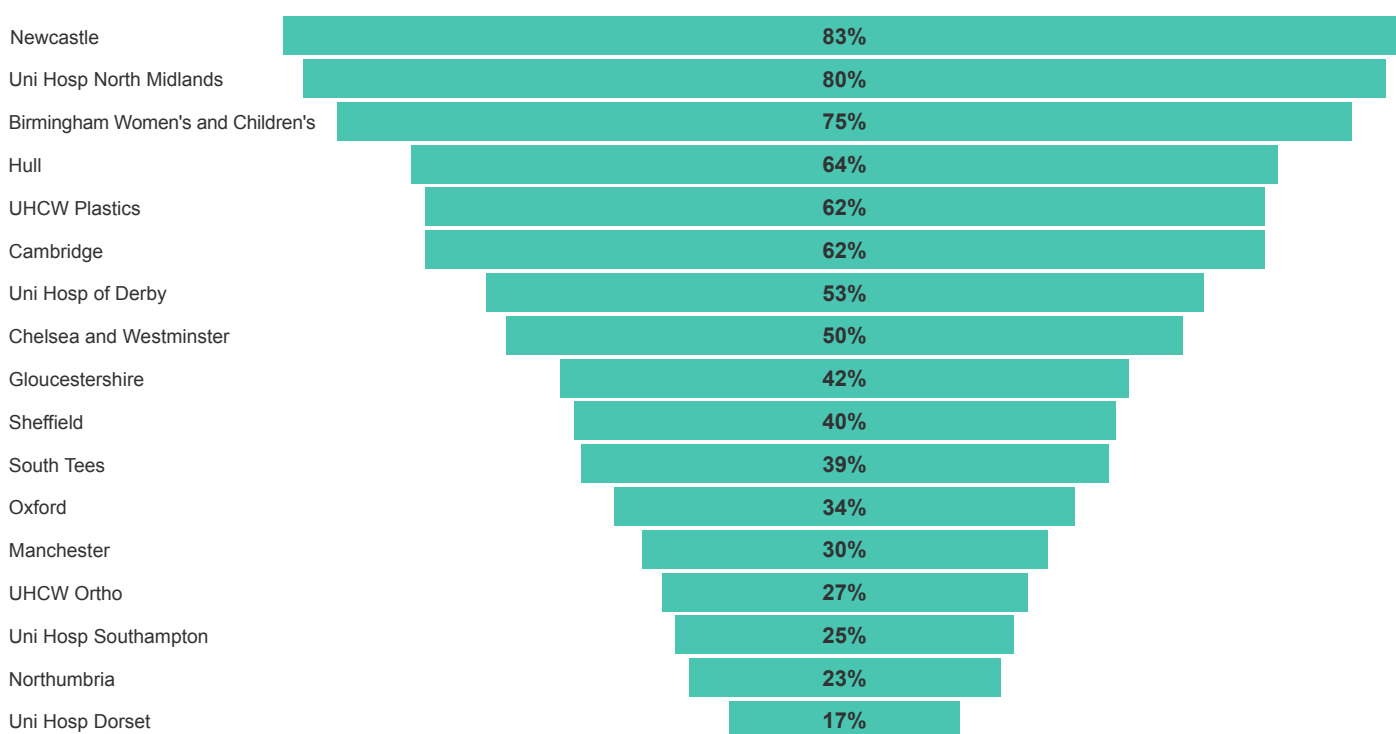
being ranked against one another on a new national league table. Sites were reminded that the purpose of the monthly reports was not benchmarking but to demonstrate month on month that the collaborative was travelling forward visibly in several respects.

In virtual site meetings, QI Consultants regularly prompted sites to focus on understanding their data in their context in order when setting improvement trajectories. Sites were actively dissuaded from treating graphs as a league table because the context of each setting varied so much one from another as did the level of data collection particularly during early months of the collaborative.

Figure 15: Power BI graph for open fracture or joint showing cumulative percentage of patients treated within the 24-hour BSSH standard

Category 1 (Open fracture or joint)

Overall % of injuries that have met the standard



The RCS England HandsFirst Project Team augmented the Power BI Charts to include a count of records. This helped discourage direct site comparison while encouraging sites to contact positive outliers.

The inclusion of the count of records invited sites to reach out to colleagues for early discussion and spread of best practice around data capture

and collection. The juxtaposition of percentage of injuries meeting a BSSH standard with the count of records was useful in determining which sites were true positive outliers as opposed to sites which had little data capture and therefore could not provide assurance that standards were consistently met (see Figure 16a and b).

Figure 16a: Percentage of patients with open joints and open fractures that met the 24-hour BSSH standard by trust or health board

Category 1 (Open fracture or joint)

Overall % of injuries that have met the standard

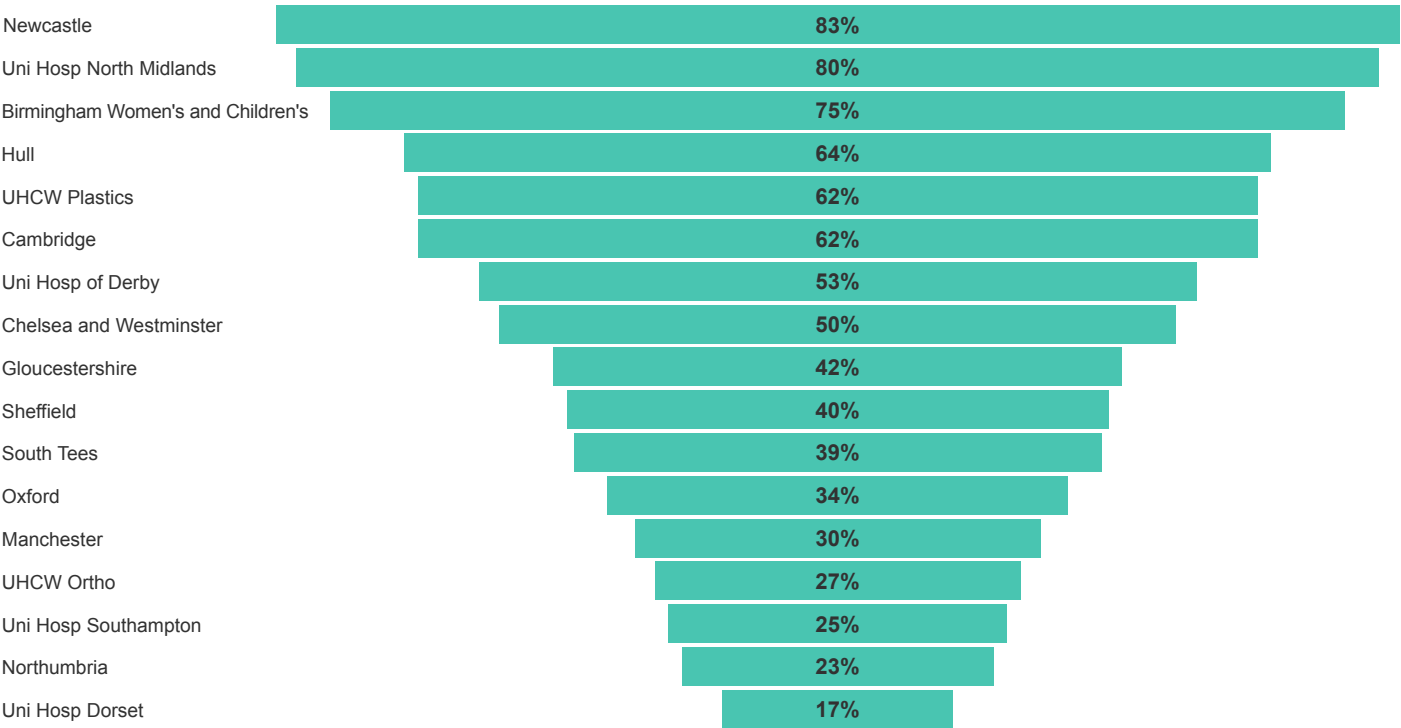
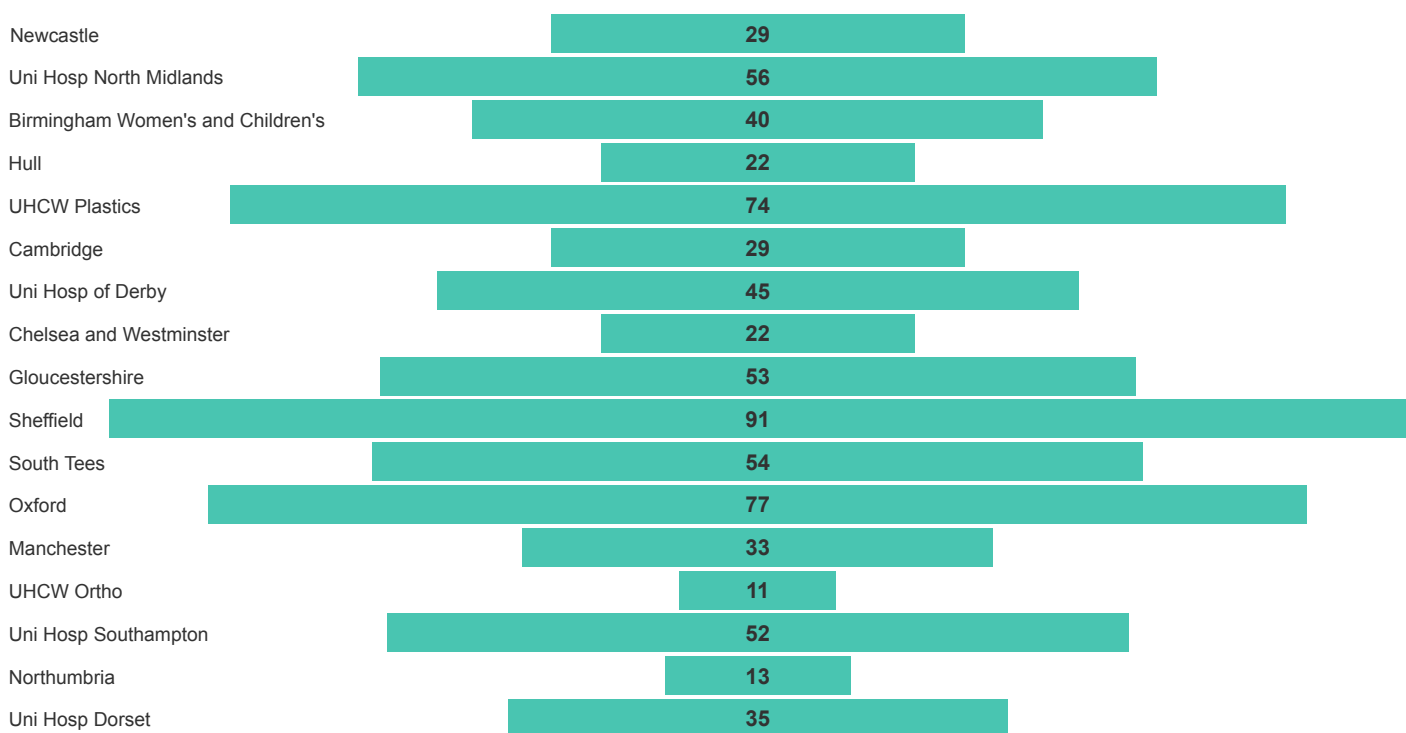


Figure 16b: Power BI graph percentage standard met and count of record

Category 1 (Open fracture or joint)

of injuries



Contributory factors and constructive comparison

The direct comparison of contributory factors was encouraged, particularly around use of anaesthetics and location of procedure. These were valued avenues for productive discourse especially around releasing theatre capacity.

Early engagement leads to early wins

Teams that expanded the membership of their project membership across departmental boundaries tended to move into action and were less likely to get stuck in analysis paralysis. What is more, the more disciplines and departments they engaged with the more possibilities they came up with to explore and make a real difference.

Regular communication with referrers yields big wins. Time and time again member of the collaborative spoke about going to their Emergency Department and talking about any hand injury whether a simple nail bed injury to the most complex trauma. Each conversation is an opportunity for horizontal learning. Some trusts, such as Birmingham Women's and Children's NHS Foundation Trust have made a successful case for ED teams to see and treat appropriate injuries. After all, it often takes less time for a confident ED consultant to treat a minor hand trauma than to reach a hand trauma Registrar, Fellow or consultant surgeon.



7. Conclusion

Members of the collaborative consistently valued the opportunity to meet peers and connect with the HandsFirst Project Team face to face. They frequently commented on the power of the collective to support them in their efforts.

These meetings served to invigorate them, renew a sense of purpose and passion for delivering better care and maintain momentum. Others were grateful of the opportunity to share practical ideas. Several highlighted the importance of connecting with others in their field as the importance of the specialty can be dismissed in times of operational pressure and in the absence of key drivers such as GIRFT, CQUINs or other national regulatory monitoring at Trust / Board Level. This was particularly true of sites operating as Major Trauma Centres, especially those lacking dedicated hand trauma lists.

By coming together in the national collaborative, site teams became pattern shapers in their local systems but at the national level as well. As well as working to improve the structures and processes within their services, these clinicians and their efforts actively shifted mindsets – elevating the profile of their discipline. As signal generators, their enthusiasm and behaviours are contagious. They have set the tone for improving standards for hand surgery nationally and begun to open a conversation globally.

These clinicians have behaved openly and transparently throughout the course of the project. They have let their passion shine, inviting others to join them in the hopes that they too will be compelled to act.

As a project team, we have witnessed first-hand the importance of peer-to-peer support across trusts and health boards – particularly for individuals who feel they are a lone voice advocating for hand trauma patients. The collective wisdom that has been brought together through this collective; the clinical, managerial and leadership expertise is staggering. With that comes a real opportunity to accelerate positive change. Having created this first national database with its rich picture of the state of hand surgery, we now share a collective responsibility as experts to use that to good effect for the populations we serve. To use this learning, reducing variation as well as time to surgery, will surely be an expectation going forward.

“This has been a fantastic project which has really allowed us to look at our current practice in detail and identify ways in which the service can be improved. The support from Ruth has been excellent, and there has been very good insight into the problems that we are facing at the trust”

Delegate feedback
22 November 2022

“Groups without standards will satisfice at the lowest level. Standards without groups, not accepted by the group as realistic for them, are meaningless.”

Charles Handy, CBE
Former chairman of the Royal Society of Arts,
Specialist in organisational behaviour and
management in Understanding Organizations
(4th Ed.)



Advantages of continued participation

The biggest barrier to project delivery is often people. Whether that comes down to communication failures or self-limiting thinking like falling victim to our one's own assumptions. Teams participating in multiple iterations of Chole-QulC reported being in a stronger position to accelerate the pace of change as teams' learning curves flattened.⁴⁵ The active listening which is characteristic within the collaborative fosters understanding and empathy. We have seen how drawing people together across teams and disciplines can turn marginal gains into real wins. Improvement takes time. It takes a mindset dependent on people building teams and fostering relationships. HandsFirst2 provides a structure and schedule of opportunity for the seed of those all-important conversations to take place hold. Several teams have already signed up for HandsFirst2, keen to continue learning and build on their success. After all, improved compliance to BSSH standards is a proxy measure used toward achieving the ultimate goal, the best possible outcomes for patients.

“In 22 years of practice this is one of the most worthwhile things I have ever done, which is why I have been so personally willing to invest so much into it and I know the rest of the team are excited about it too.”

Delegate feedback

having the support of their collaborative colleagues, their QI consultants, Clinical leadership from Clinical Lead and RCS England Council Lead and the backing of RCS England. It seems only fitting that team members from the sites should have the final word. Here's what they had to say at the end of site survey and at the Celebration Event in March 2023.

“Data shocked my trust into action.”

“Very fruitful. Made a difference in my department.”

“Developing and working through PDSA cycles and having taken the time to understand the issues has been extremely helpful. Advice/support has made an enormous difference to the project. Also having the project multidisciplinary and collaborative from the outset has also made a big difference.”

“A valuable experience on a practical level.”

“Fascinating. So, so interesting. Learned a huge amount about our service, our team, hand trauma and myself! Very enlightening. Met several fantastic people.”

“Excellent, has enabled me to drive forward changes ... data”

The final word

Was participation in the collaborative worthwhile? Unequivocally so. Not only did the collaborative result in the first national database for hand surgery of its kind and set new standards; the collaborative made significant improvements against those standards. They did so in the most challenging of circumstances. Throughout the life of the project one thing was absolutely clear to the RCS England Project Team and that was the sheer determination, professionalism and commitment these surgeons displayed, persisting against the odds to do what was right for the patients in their care. Throughout the journey, collaborative members stated explicitly time and time again just how much they have valued



Appendix A

The RCS England HandsFirst QI Project Team



**Mrs
Sarah Tucker,
Clinical Lead**

Sarah Tucker is the clinical lead for the project. She has developed an interest in hand trauma from early in her training and is keen to facilitate improvements in service

through collaborative learning and strategic change.

She graduated in medicine from Bristol University in 1992 and went on to do her early surgical training in South Wales. Her interest in hand trauma developed initially as a junior surgeon in orthopaedic hand surgery then moved on to Plastic Surgery in order to gain an increase in training on soft tissue injuries of the hand. She went on to train fully in Plastic Surgery in the South West followed by a Hand Fellowship at Oxford where she went on to take a Consultant Post with a specific focus on developing the trauma service.

She completed a Masters in Clinical Education in 2006 and a Postgraduate Certificate in Strategic Leadership and Change management in 2013. She has served as the Chair of the trauma committee for BSSH from 2019 to 2022, leading the development of 9 Key standards in hand trauma care and a consensus on triage standards now embedded into national practise with an App. She is currently on the trauma committee for the Federation of European Societies for Surgery of the Hand and the Clinical Lead of the Plastic Surgery Department at Oxford.

Her other interests include global surgery where she has provided training through regular visits to Nepal over 15 years and more recently in Ukraine.



**Professor
Vivien Lees,
RCS England
Council Lead**

Professor Lees was elected to RCS England College Council in 2014 and was elected as Vice President from 2023. She is Professor of Plastic Surgery at

Wythenshawe Hospital, Manchester where she has clinical interests in hand surgery including wrist and the rheumatoid hand. Her principal scientific interests are in functional anatomy of the distal radioulnar joint/forearm biomechanics (Hunterian Oration 2010) and peripheral nerve injury. She is past joint Editor of the European Journal of Hand Surgery. Professor Lees was an undergraduate in Oxford and undertook clinical studies in Cambridge qualifying in 1985. She underwent plastic surgery training in Cambridge, Billerica, Leeds/Bradford and Louisville, Kentucky. Having previously served as Chair of the SAC Plastic Surgery and Examiner for FRCS(Plast) Professor Lees has been an active member of the Councils of BAPRAS, BSSH and BAAPS. She served as President of the British Society for Surgery of the Hand (BSSH) for 2015. She has particular interests in the development of educational programmes, and led the development of the Postgraduate Diploma in Hand Surgery and MSc Hand Surgery and reconfigured/rewritten the Plastic Surgery Curriculum in its current modular format. On Council she has had particular involvement with the Emerging Leaders and SAFE OR programmes and Cosmetic Certification/credentialling. She has latterly held responsibility for the HandsFirst QI initiative. Recreations include pottery, hill walking, lake swimming, and history.





**Ralph Tomlinson,
Director of
Research
and Quality
Improvement**

Ralph Tomlinson is proud to be Director of Research and Quality Improvement at RCS England.

He is passionate about working with all members of the surgical care team to improve the care that they provide. He does this by leading teams that set standards, fund research, lead trials, deliver audits, assure safety, improve quality and accredit excellence. He believes that when working at their best surgical care teams do amazing things that change lives, and he enjoys helping them to achieve the best outcomes they can for their patients.



**Sheena
MacSween,
Senior Project
Manager, RCS
England**

I work within the Research and Quality Improvement directorate and manage Quality

Improvement collaboratives for RCS England.

These collaboratives have huge potential to improve the quality of care for patients. HandsFirst was collaborative from the outset as it was set up by RCS England and BSSH. It has also been the first collaborative to work across multiple specialties (plastic surgery and orthopaedic surgery) and the sites that joined up were made up of multi-disciplinary teams. It's been a privilege to work with the project team and the participating sites on this area of work. There has been fantastic engagement throughout the collaborative, and such positive energy at our meetings and events, as everyone worked together with the common purpose of improving care for hand trauma patients. I'm excited to continue being part of this the team that will deliver HandsFirst2.





Maureen McGeorge, QI Consultant

I spent many years with the Royal College of Psychiatrists, initially as a researcher, then I moved into quality assurance – developing many national audit and

accreditation programmes, and then finally after completing the IHI's IAPD course, I began my role as a QI consultant. Since leaving my substantive role there in 2013, I have applied the skills and learning in various consultant roles with the Patients' Association and the King's Fund. I currently have contacts with the RCPsych – where I support improvement activities around their programme of national audits, and I lead on QI Training with the Yorkshire & Humber Improvement Academy.

Maureen's reflections

I have very much enjoyed the Hands First project.

At the outset, I was struck by how low down the 'pecking order' of priority this highly specialised branch sits – given the immeasurable value that our hands play in so many aspects of our lives. If this caused me pain as an observer, I cannot imagine how much strength is required to deal with this reality on a day-to-day basis. This was coupled with a sheer dearth of data to support teams to argue for improvements to the services they were able to offer.

The journey the teams came on has been at times painful, and others exhilarating. For most, having established a baseline understanding of where and why their current systems are failing them, and gathered not only ideas for improvement but also ideas about what is possible, they are at a point where they can really begin to realise improvements. I very much hope that sites are able to join us for HandsFirst 2.



Ruth Colville, QI Consultant

Since 2004, I have worked in a variety of settings practicing improvement science which has led to a strong interest in occupational and behavioural psychology. I support

front line teams to deliver large-scale change and improvement projects, providing improvement training to staff and regional trainees. An honorary lecturer for the Hull York Medical School, I designed, created and delivered the school's first online QI module with simulated QI scenarios to minimise the disruption to undergraduate medical education during the pandemic. Subsequently, I designed and delivered the postgraduate Supervising Quality Improvement course for the Yorkshire and Humber Health Education School of Medicine. Now an Organisational Development Manager at Hull University Teaching Hospitals NHS Trust, I have the programme management lead for our Leadership Programmes. I am a member of the Yorkshire & Humber Improvement Academy's QI Training Network, a member of the Health Foundation Q Community and a Mary Seacole Facilitator for the NHS North East & Yorkshire Leadership Academy.

Ruth's reflections

I don't so much have a career path, as a career meander. I qualified in 1992 as a fine artist – a painter and printmaker having dabbled a bit with sculpture along the way. Before joining the NHS, I was a graphic designer and communications specialist running the design arm of a government consulting firm with nine offices across North America. I've made my living through the use of my hands. One of my children was non-verbal until the age of three and a half. Knowing we were moving to the UK, my family learned British Sign Language in order to speak with our child. Our hands became the very bridge to understanding and unlocked worlds. Having a child who required heightened levels of care drove me to a career of service in our NHS. Likewise, it drove my partner to take up teaching. Through her, I have come to know that so much of our development, our early years learning, relies on touch and on our hands.

Suffice it to say, this collaborative really resonated with me. What has struck me throughout, is the relentless commitment of the professionals during the life of the project. It is a vast understatement to say that 2022/23 was a challenging year. We had COVID. We had COVID backlogs to address while we still had COVID. We literally had COVID. There is the war in Ukraine – bringing into sharp focus the need for this work. Along came the cost of living crisis, influenza, RSV, strike action. And everyone, everywhere was tired. Tired of change. Tired of the endless onslaught of yet another thing to adapt to. Still, the professionals in this collaborative kept showing up – often with bags under their eyes having worked another 15 hour shift to give just that bit more in the face of overwhelming need.

In 2004, I joined the NHS as part of a Cancer Services Improvement Partnership. At that time, the unwritten rule was that teams needed sufficient capacity before they could even spare the thinking effort required by improvement. When working with a ward, our measure was that ward needed to be running at no more than 82% bed occupancy. I've not seen that sort of capacity for at least five years anywhere and certainly not in the past three years. For this collaborative to have achieved what it has in the present context is more than commendable. Frankly, it's extraordinary. Dare I say, unprecedented? It's been my very great honour to witness their accomplishments. I can only imagine the positive ripples they have made in the lives of their patients.



Mark Fuller, QI Consultant

After studying law at the University of Durham, I spent a decade managing private hospitals for individuals with mental health, substance misuse and / or learning difficulties. This was followed by a

governance-based role in what is now NHSI, during which time I was introduced to quality improvement methodology. The position entailed supporting Trusts across the North of England and led to my current role as Improvement & Transformation Manager at Harrogate & District NHSFT. I authored the Trusts 5-Year Improvement Strategy; design and deliver all QI training (from beginner to advanced); support students to realise their own QI projects; manage and facilitate an annual schedule of improvement events and provide ad hoc support as capacity permits. Passionate about CPD, I have gained additional qualifications related to quality improvement, teaching, human resources, health and safety and project management. I am also a member of the Chartered Management Institute, having recently completed an MSc in Senior Leadership.



Appendix B

The Newcastle upon Tyne Hospitals NHS Foundation Trust: Reducing waste in frequently used Plastics trays

The Plastics Basic Tray had an inventory of 56 instruments. By running successive tests, the team nearly halved the number of instruments to 31 in the new Plastics Minor Tray.



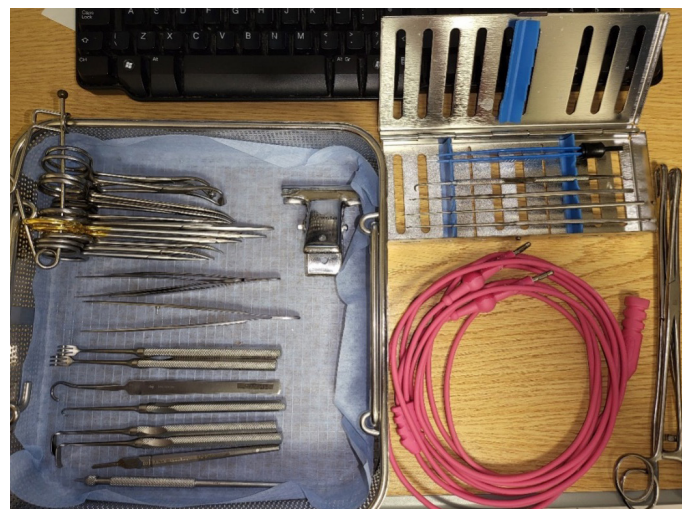
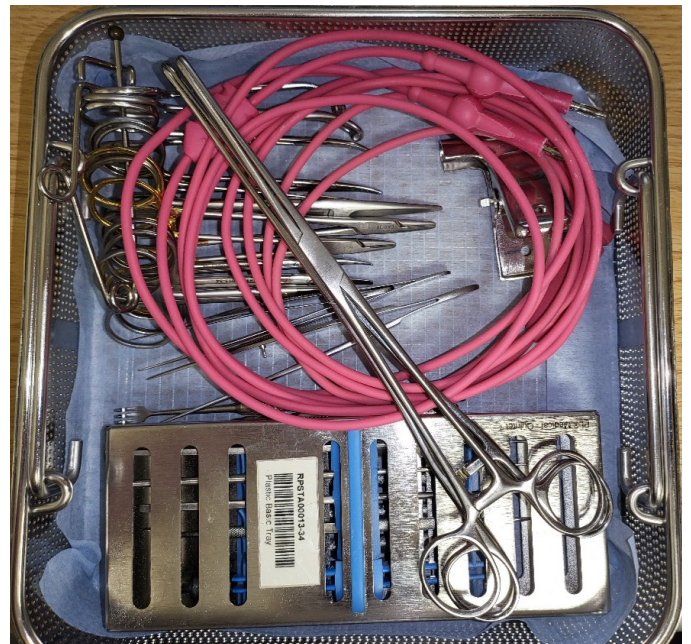
56 Instrument Plastics Basic Tray

Instrument	Amount
Mayo scissor	1
Lawrence needle holder	2
Halsey needle holder	2
Metzenbaum dissecting scissor	1
Dissecting scissor	1
Kilner scissor	1
Little's scissor	1
Delicate scissor	1
Converse periosteal elevator OR double ended Freer dissector	1
Mitchell trimmer/ cleft palate dissector	1
Langenbeck retractor	2
Blunt hook (tendon hook)	1
Cat's paw retractor	2
Nerve retractor (hook)	1
McIndoe dissecting forceps (non toothed)	2
Gillies dissecting forceps (toothed)	2
Bi polar forceps	1
Adson forceps (toothed)	2
Steel ruler	1
Somerland pen	1
Baron knife handle	2
Allis tissue forceps	4
Kochers forceps	1
Mosquito artery forceps	10
Sponge holding forceps	2
Ball and socket towel clip	5
Gillies skin hooks	3
Bi polar lead	1
Bag clip	1
Total	56

The new 31 instrument Plastics Minor tray is suitable for the majority of minor procedures. The new tray represents considerable savings in terms of wastes associated with decontamination and sterilisation processes. There are also savings associated with equipment storage and ease of use (i.e. marginal gains in handing instruments to surgeons with fewer items to visual scan and select).

31 Instrument New Plastics Minor Tray

Instrument	Amount
Sponge holding forcep	2
On pin:	
Iris scissor	1
Kilner scissor	1
Littler scissor	1
Halsey needle holder	1
Lawrence needle holder	1
Mayo scissor	1
Mosquito artery forceps	3
Ball and socket towel clip	2
Somerland pen	1
Barron knife handle	1
Langenbeck retractor	2
Cats paw retractor	2
Blunt hook	1
Nerve hook	1
McIndoe non toothed forceps	1
Adson fine toothed forceps	1
Adson toothed forceps	1
Bag clip	1
Bi-polar lead	1
In tin:	
Skin hooks	3
Mitchels trimmer	1
Bipolar forceps	1
Total	31



The Plastics Extras Tray is readily available for occasional procedures when additional instruments are needed.

25 Instrument Plastics Extras Tray

Instrument	Amount
On pin:	
Ball and socket towel clip	3
Mosquito artery forceps	7
Kochers forceps	1
Alice tissue forceps	4
Lawrence needle holder	1
Halsey needle holder	1
McIndoe scissor	1
Dissecting scissor	1
Steel ruler	1
Converse Periosteal Elevator Or Double Ended Freer Dissector	1
McIndoe non toothed forcep	1
Gillies toothed forcep	2
Barron knife handle	1
Total	25



Appendix C

Awards

Award	Award winner(s)
Best Application of PDSAs	East Lancashire Hospitals NHS Trust
Bridging Cultural Boundaries	University Hospitals Birmingham NHS Foundation Trust
Quantity and Quality of Data	Sheffield Teaching Hospitals NHS Foundation Trust
Outstanding Patient Advocate: for Raising the Bar by Establishing National Standards for Children	Birmingham Women's and Children's NHS Foundation Trust
Determination in the Face of Adversity and Commitment to Patient Care	Guys and St Thomas' NHS Foundation Trust Oxford University Hospitals NHS Foundation Trust Betsi Cadwaladr University Health Board
Unstoppable Hero	Portsmouth Hospitals University NHS Trust University Hospitals Dorset NHS Foundation Trust (see image below)



Appendix D

List of contributors

Ashford and St Peters NHS Foundation Trust

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Hazel Watters

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Madeline Garner

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