

Short Commentary

UK Surgery: Evolving through the Phases of the Covid-19 Pandemic

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Mini-Abstract

Consolidating the COVID-19 encountered surgical challenges into phases provides a framework for learning and development. 'The Acute Phase', includes the early response and peak infection period (February – May 2020). 'The Late Phase' (June 2020 – current), represents the period 'past the peak'. 'The Transition Phase' describes the future period of recovery.

Introduction

Since the first recorded case of the novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2) virus in December 2019, progressive world-wide transmission and sequential international lockdown has marked an astounding 2020. Current W.H.O. figures stand at 34 million infections worldwide and more than one million mortalities [1]. The subsequent effect on healthcare systems around the world has been dramatic. Abrupt changes to routine services, combined with the unique escalation of occupational risk has led to uncertainty and anxiety. The failure and subsequent restructuring of care pathways in the context of COVID-19, whilst attempting to maintaining safety, have resulted in remarkable systematic change. COVID-19 has changed the surgical landscape. The dynamic nature of maintaining safe surgery throughout a global pandemic has required service-wide and workforce adaptation. In the United Kingdom (UK), surgery

within both the National Health Service (NHS) and the independent sector continue to be severely affected by the COVID-19 pandemic.

The natural history of COVID-19 and its effect on surgical services can be consolidated into three distinct phases; 'The Acute Phase', 'The Late Phase' and 'The Transition Phase' [2]. The surgical impact of the COVID-19 pandemic has been staggering, and has evolved throughout the pandemic experience [3]. We aim to summarise the pertinent issues that have impacted UK surgery during the described phases of the pandemic, and how these challenges have been resolved or evolved during the late phase. By presenting the acute and late phase issues in tabular form (Table 1), we provide a structured overview of the evolving developments and national response. Finally, we propose challenges that will surface in the transition phase ahead, highlighting the merits of early surgeon involvement in these issues.

'THE ACUTE PHASE' ISSUES	RESOLUTION	'THE LATE PHASE' ISSUES
SURGICAL PROCESS		
Surgical case prioritisation		
Reduced theatre capacity	National halting of elective surgery April 2020	Non-urgent elective surgeries not resumed
Emergency and urgent surgery only	Local / national prioritisation systems adopted	Prioritisation systems continuing
Reduced theatre capacity		

Reallocation of operating suite areas for peak ventilation and critical care support	Return of surgical workspaces based on local prevalence	Patient segregation by COVID-19 status pathways continues to impact capacity
Aerosol Generating Procedures (AGP)		
Classification of routine anaesthetic and surgical procedures as high aerosol risk	Consensus review and reclassification of AGP	Difficulties declassifying procedures previously assigned as AGP
Ambiguity in initial AGP classification	Clarity on a broader range of procedures and techniques	Frequent iterations of AGP classifications; challenging to stay up to date
Dispute between speciality groups, NHS England and international classifications	Many procedures declassified from AGP	Adjustment of risk profile with reduce confidence
Theatre ventilation		
Negative pressure ventilation systems versus NHS positive pressure ventilation systems	Consensus review NHS ventilation systems safe	Continued efficiency problem: wait time for air changes
Theatre layout and environment		
Standardised utilisation of theatre layout unsafe in COVID-19	Green cases: Reallocation of theatre suite spaces to normal	Unable to perform simultaneous stages in adjacent areas
Equipment stored outside of theatre	No resolution	Issue unchanged
Increased staff requirement in theatre	No resolution	Issue unchanged
Surgical technique		
Minimising of AGP techniques including laparoscopy	Reclassification of risk with return to standard operating in most fields	Adjustment of risk profile with reduce confidence
Avoidance of complex, reconstructive surgeries	No resolution	Issue unchanged
SURGICAL PATIENTS		
Surgical pathways		
Routine surgical pathways not COVID-19 safe	Modification of pathways to minimise risk of viral transmission	True COVID-19-free pathway not possible
	Green, Amber, Red COVID-19 patient pathways	Potentially falsely reassuring for patients
Patient screening		
Limited testing	Testing capacity widely expanded, screening now compulsory for all elective surgical patients	Variable policies on paediatric screening. Screening within 48-72hrs of surgery is logistically challenging
Long processing time	Faster assays now in use	Overburdened service
SURGICAL PERSONNEL		
PPE		

Frequent changes and inconsistencies in PPE requirements.	Guidance now static	No further issue as guidance clear
Supply chain problems	Supply chain issues resolved	Risk of PPE stocks if second wave
Inadequately sized PPE for female staff	Generation of suitable PPE	Availability unknown
PPE wear related issues	No resolution	Issue unchanged
Personnel COVID-19 screening		
No routine personnel screening unless symptomatic	COVID-19 antibody test available to staff at most NHS trusts. Some independent hospitals screening all staff	No routine screening of staff
Shielding, isolation and sickness		
20% of workforce absent, highest NHS sickness rates ever recorded	Bring staff back scheme contributed to workforce	Some staff not returned, local-lockdowns have returned some staff to shielding
Redeployment		
Redeployment of surgical staff to support acute phase	Return to pre-pandemic roles	Adjusted rotas and pay in many cases not corrected
Risk factors		
Co-morbidities, BAME, Obesity, age, gender	Increased research and NHS wide staff risk assessments now performed	Issue unchanged
Training and development		
Reduction in standardised training	Training review process modified, additional measure brought in for trainee flexibility	Prolonged reduction in training opportunities with likely effect on competence
Psychological impact		
Stressful experience. High levels of anxiety	No resolution	Continued psychological impact, burnout

Table 1: COVID-19 pandemic surgical challenges. ‘The Acute Phase’ issues, details of resolution and ‘The Late Phase’ issues affecting UK surgery. Subdivided into surgical process, surgical patients and surgical personnel [3-5].

Pandemic phases

The Acute Phase: The first recorded UK case of COVID-19 was on 22nd January 2020 [6]. By mid-March widespread infection was established, and by late March progressive national restrictions were imposed on travel, work, households and public spaces. The infection rate escalated rapidly between March and April, resulting in a steep escalation of new recorded cases, hospitalisations and mortalities. The UK 'pandemic peak' occurred over the spring months (March – May 2020) [7]. We have denoted the early response and pandemic peak of COVID-19 as 'The Acute Phase', during which significant disruption to surgical services occurred.

The Late Phase: On 30th April 2020, Boris Johnson announced that the UK was 'past the peak' [8]. Whilst the daily COVID-19 infection rate had started falling (therefore passing the peak daily infection rate), the reproduction number remained high with a significant number of new daily infections as well as mortalities. Based on prevalence data from our institution and the national reported incidence, we consider that the late phase started in June 2020 and is the current phase [7]. 'The Late Phase' is characterised by lower daily infection rates and reduced morbidity and mortality, enabling a cautious return towards service resolution. Surgical practice has resumed in a step-wise fashion, requiring the restructuring of pathways and processes, alongside the constant threat of second or subsequent peaks. Local disease prevalence, nationally assigned surgical case prioritisation and local factors (patient, personnel and process) have determined the departmental operating scope.

The Transition Phase: Following a pandemic, the transition phase represents a period of systematic change and wider recovery [2]. During this phase, lessons learnt from the pandemic are incorporated into future practice. Strategies should be developed for future waves or alternative infectious risks, as well as managing the resultant secondary health burden.

Evolution of COVID-19 UK surgical challenges

Table 1 summarises the challenges affecting UK surgery in the COVID-19 pandemic up to present day. The challenges have been subdivided into three main areas: surgical process, surgical patients and surgical personnel [3-5]. As the pandemic has unfolded, the issues affecting surgery have evolved. We have therefore included the measures taken to resolve the acute phase issues. Many of these late phase issues have yet to be resolved and will undoubtedly contribute to the burden of the transition phase.

'The Transition Phase' represents future issues that will continue to test the surgical specialities as we move out of the late pandemic phase. Areas of major concern include the impact on the economy and NHS debt on surgery, the elective surgery backlog, the use of private services to combat waiting lists in a financially

deplete system and the sustainability of current inclusions in the NHS surgery scope of practice [9].

National re-classification of surgeries to reduce the range of NHS-available, non-essential surgeries, when combined with stricter commissioning, would certainly reduce the operative burden and associated cost. However, narrowing the scope of NHS surgical practice is a reaction of healthcare restriction, which will not only negatively impact a sector of patients, but is not a sustainable response if we are to continue a free-for-all users' public health service. Alternatively, we must be creative in our solutions. By utilising the pandemic experience as a platform for change, we as surgeons can address ineffectiveness in our local hospitals from the core.

Progressive institutions could utilise the inevitable post-pandemic review of local practice as an opportunity to develop departments more sustainably. Surgeons as clinical leaders, are vital in departmental planning, service effectiveness and restructuring. Surgical training develops an individuals' resilience, alongside crisis management skills. These assets, coupled with specialised insight to clinical practice, patient experience and process logistics are extremely valuable in the process of service development. Initiating complex discussions regarding service rationing strategies at a local level will be best placed to meet the needs of each NHS trusts' patient catchment [10].

Reinstating surgical practice in some sub-specialities, such as bariatric surgery, microvascular autologous reconstruction and dental surgeries, has been problematic due to risk of post-operative complications, vulnerable patient groups, high staff requirement (both during and after surgery) and increased risk of transmission of COVID-19. Surgical departments should focus on safer surgery in these realms of practice, using COVID-19 as a driver for surgical improvement. Focus should be on factors that reduce the risk of surgery and if possible, inpatient stay. Development of optimisation pathways, pre-operative assessment, streamlining of trauma, as well as enhanced recovery pathways could have dramatic impact on surgical wastage.

Finally, 'The Transition Phase' should be coupled to data. The importance of appropriate personnel protection, disease surveillance and reporting will be paramount and should be integrated into practice [2]. Data collection, evaluation and reporting will be crucial, and surgical services could harness any periods of reduced workflow to develop and initiate novel systems, inclusive of real time data collection. Resultant benefits would target the ongoing need for disease surveillance by providing accurate reporting of COVID-19 cases and increasing the evidence basis of the effects of COVID-19 within surgery, whilst at the same time providing important departmental data on surgical process

and patient outcomes which would drive service improvement.

Conclusion

The COVID-19 pandemic has had the most profound effect on the NHS since its foundation in 1948. The scale of disruption to surgical services has been monumental and the after effects will continue to shape the availability of services for years to come. As we emerge from the pandemic, surgical personnel will need to work in partnership with hospital managers and policy makers in order to navigate these complex issues. Leadership, collaboration and innovation will be of paramount importance as we move from the late phase into the transition phase. Considering the COVID-19 experience in the context of pandemic phases facilitates the coherent subdivision of the issues facing surgery and provides a framework for future planning.

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