



# Reflections from London's Level-1 Major Trauma Centres during the COVID crisis

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## Abstract

Emergence of the Covid-19 pandemic resulted in dramatic changes in global healthcare provision. Resources were redirected across all healthcare sectors to support the treatment of viral pneumonia with resultant effects on other essential services. We describe the impact of this on the provision of major trauma care in a major capital city.

**Keywords** Major Trauma Centre · Covid-19 · London

## Introduction

London's population of approximately 9 M is served by 4 Level-1 Major Trauma Centres (MTCs) with surrounding trauma networks of Level-2 community centres [1]. These 4 hospitals were the first in the UK to admit large numbers of seriously ill patients affected by COVID-19 infections. Although major incident protocols are well-rehearsed at Level-1 MTCs, the challenges posed by COVID-19 have been very different. London is unfortunately accustomed to terrorist attacks, triggering short-lived mass-casualty major incidents where all resources are directed towards the provision of trauma care [2]. Recently, this traditional model of the 'major incident' has been redefined, with trauma services becoming marginalised to prioritise treatment for patients with viral pneumonia. Major operational changes increased capacity for medical and intensive care while downscaling capacity for major trauma—the polar opposite response to the mass casualty scenario that we prepare for.

The resulting reconfiguration has had dramatic effects on normal healthcare provision. Very few aspects of the patient journey or health workers' roles have remained unaffected but many of the adaptations have already become established practice, with transformative service change emerging.

In this article we reflect on the changes introduced and the lessons learned at London's four Level-1 Major Trauma Centres, in maintaining a reduced but functional service for trauma and urgent musculoskeletal pathology, in the midst of the COVID-19 pandemic.

## Workforce planning

Reconfiguration of the trauma service was the first critical element. Each centre adapted individually but the problems faced were identical; continuing to provide high quality sub-specialist orthopaedic and trauma care on the unstable platform of inevitable staff illness, redeployment and concerns around safety. We anticipated that up to 30% of our workforce may be infected and confined to self-isolation at any given time [3].

There were many common themes between centres and, as ever, high-level leadership and clear communication were often the hardest elements to get right [4]. The workforce was reorganised into smaller teams each with designated leaders and with a full spectrum of sub-specialties represented (pelvis, upper/lower-limb etc.). Daily managerial and clinical decision-making could be shared among highly visible and readily available leaders at ground level. Senior leaders were then allowed to focus

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on strategic responsibilities. Smaller teams allowed agile, senior led responses, particularly in the polytrauma situation. It also allowed movement between teams in the event of staff absence, along with recovery time after periods of deployment.

High infection rates within healthcare highlighted the vulnerability of the workforce [5]. Colleagues considered ‘high risk’ due to medical co-morbidities who had been advised to stay away from patient-facing duties were well-utilised. They provided off-site support in terms of rota co-ordination, communication with satellite hospitals and virtual out-patient consultations, a critical part of shutting down elective services.

The actual staff sickness rate was much lower than expected and was, on average, closer to 10% at any given time. Despite delayed introduction, the availability of COVID-19 testing for staff and family members made a positive impact on staff retention, although the lack of test reliability has subsequently eroded this confidence [6]. Overall, social lockdown measures dramatically reduced trauma numbers allowing safe, effective major (and minor) trauma services to be maintained despite resource limitations.

## Communication

The traditional morning trauma meeting remained pivotal to the efficient and coordinated delivery of reconfigured services. However, the emerging situation enabled instigation of new modes of communication that would previously have seemed too disruptive to apply and embed.

### Top–down communication

During the first weeks of the pandemic there was a deluge of information from a variety of governing bodies, which was often inconsistent and prompted confusion. Guidance was provided/updated on a daily and sometimes hourly basis, giving steer on everything from clinical decision-making, risk stratification and use of personal protective equipment (PPE). These constantly shifting sands made it difficult for clinicians to remain up-to-date and well informed. This was amplified by local variations of how guidelines were interpreted, something that often did not resonate with front-line clinicians [7]. The importance of clear, well considered, centrally driven directives cannot be overstated in any crisis and hospital leadership consistently struggled to support guidance from governing bodies with the real-time feedback from clinicians at ground level. In the initial phase of rapid change, this juxtaposition of conflicting advice (central vs on-the-ground) was difficult to manage and presented a major source of anxiety.

### Side-to-side communication

Clinical teams often became dispersed to meet the demands of operating theatres, wards, out-patient clinics and the ED. Staff members working at home also needed to be kept abreast of developments in the hospital, both for their general awareness and their input towards clinical MDT decision-making. Moreover, it felt crucial for everyone to remain feeling engaged, included and appreciated within the team. Side-to-side communications also included contact and co-ordination with partners in other specialties internally, as well as networked hospitals outside.

Concerns around patient confidentiality with instant messaging apps were addressed at national level, where their use was sanctioned [8]. Around the hospital, their use became ubiquitous, allowing rapid dissemination of information within groups. However, negative elements of these social platforms also blossomed, as useful constructive information circulated alongside rumours, ‘fake news’ and conspiracies, with minimal discrimination between them [9]. Clinicians were presented with swathes of documents with no peer review or sense of authenticity, which had a destabilising effect when trying to instigate plans. Humorous posts and angry outbursts were aired over the same channels as important updates, which clouded the sharing of genuinely important information. Only once a sense of responsibility and a level of self-discipline around social media behaviour was established, could the value of real-time electronic communication be maximised.

All centres rapidly introduced virtual meeting software and staff adapted well to its use. Platforms such as Zoom, Gotomeeting and Microsoft Teams were widely adopted [10]. This enforced transition has opened our eyes to embracing remote communication and incorporating it into ongoing daily practice; a classic example of beneficial service transformation arising from a disruptive and unsettling event [11].

### Patient-facing communications

The 4 hospitals quickly became COVID-19 hotspots, forcing us to critically appraise out-patient practices. To minimise risks, it was essential to distance patients from hospital unless physical attendance was absolutely necessary. Telephone clinics replaced face-to-face interactions, except those where remote consultations would fall short. Predictably, many patients could be willingly postponed or even discharged by telephone, seemingly confirming that traditional practice around out-patient follow-up is outdated and open to modernisation [12]. Our anecdotal experience reflects previous reports that telephone or videoconference consultations are not quicker, but the patient-experience seems preferable in some cases, compared to attending hospital [13, 14].

## Clinical decision-making

Anaesthetic staff redeployments and reconfiguration of operating theatres placed heavy constraints on surgical capacity. Consequently, there was an almost immediate postponement of all non-urgent elective surgery with no indication of when this work might resume [15].

The concern was that capacity would be downgraded so severely we would be forced to completely reconsider thresholds for trauma surgery. The British Orthopaedic Association encouraged us to consider amending our usual practices and apply non-operative treatments where feasible [16]. The downside of this conservative approach would be potential late displacement of fractures leading to malunions/non-unions, requiring months of post-COVID reconstructions. Fortunately, this did not materialise as societal *lockdown* led to a dramatic reduction in trauma volumes. This allowed risk-stratified surgical care to those who needed it, despite the heavily constrained access to surgery. In the event, poor reductions were rarely accepted unless the patient was high-risk for an adverse outcome with COVID-19 infection. Our reluctance to recommend surgery was easily matched by reluctance of the public to undergo surgery.

Restricted operating room access reinforced the need for definitive single-stage surgery wherever possible and plastic surgery for soft tissue defects moved from free-flap reconstruction (requiring long operative times) to local flaps. Early amputation for severe mangled limb trauma was more favourably weighted against limb salvage, potentially requiring multiple operations and prolonged inpatient stays [17]. Early weight bearing was encouraged to facilitate rapid discharge and minimise viral exposure [18, 19].

## Operating theatres

Operating rooms were refashioned as extensions to critical care, with ventilators redistributed accordingly resulting in 50–75% reduction in operating capacity across all MTCs. Anaesthetic colleagues were redeployed to ICU for their airway skills and established surgical teams were broken up [20].

In addition, infection control measures have strongly diminished efficiency and turnover. Despite efforts to streamline processes, there are no shortcuts when it comes to safety of staff and patients. Adjustments to anaesthetic protocols and donning/doffing of Personal Protective Equipment (PPE) have led to a downturn in productivity [20]. Unfortunately, COVID-19 will continue to be a major influence in all our activity for the foreseeable future and while the threat still exists, this reduced theatre efficiency may become the new norm, negatively impacting each hospital's ability to revamp elective surgery services. We will undoubtedly need

to consider innovative ways of addressing the huge backlog of elective work that has accrued [21].

## Surgical training

The impact of COVID-19 on training has been profound in all specialties but particularly in surgery. All 4 institutions have large resident programmes but training opportunities have become scant. The need to keeping surgical times to a minimum, along with the cessation of elective surgery has slowed progress for all trainees and fellows, and for many, prolonged their period of residency by 6-months or more [22].

## Trauma networks

Aside from managing all polytrauma, the UK's MTCs provide support to their network hospitals in treating high-energy complex fractures [23]. These referral pathways became strained as inter-hospital transfers were minimised, which forced regional hospitals to take-on higher-energy injuries, having lost the referral option to the hub [24]. Again, electronic meeting platforms allowed for case discussions, advice and support. Often, pragmatic temporising measures were encouraged, rather than complex fracture reconstructions, to minimise difficult late reconstructions.

## Wellbeing

Much attention has been paid to the physical wellbeing of health workers and their vulnerability to infection. Outside of those physicians working on the genuine *front-line* of caring for COVID patients (ED, ICU, Medicine, Anaesthetics, etc.), there has traditionally been less focus on the psychological health of the workforce; particularly in surgery. However, secondary psychosocial effects have permeated the hospital workforce at large and it is impossible to estimate how this may have affected judgement and performance as clinicians [25]. Trainees have seen logbook entries, job prospects and fellowships evaporate. Career uncertainty prevails for many and the threat of redeployment to unfamiliar environments has remained a destabilising influence. Arguably the biggest generator of anxiety has been the use and availability of PPE. As guidelines evolved, an unfortunate sense of mistrust emerged, fuelled by social media, as many perceived the updates were a reflection of poor planning and limited availability rather than a gold standard of protection [26]. Personal concerns around family members, social isolation, home schooling and financial worries have compounded this.

Reassuringly, our hospitals have shown unprecedented willingness to engage in wellbeing initiatives to support staff. Examples include free staff yoga/Pilates classes;

morning meditation and wellbeing sessions for staff; free food donations welcomed from outside charities; volunteer *wellbeing officers* (clinicians with a personal interest) being identified and offering advice and useful contacts to colleagues; assignment of designated rest areas and staff *chill-out zones*; handouts and posters encouraging staff debriefs and offering opportunities to talk and share. Staff wellbeing now feels like a priority in many hospitals with psychological problems no longer seen as a sign of weakness but as a treatable (and sometimes preventable) condition.

## Conclusion

The COVID-19 pandemic has forced trauma services to adapt and evolve in ways that we had not previously envisaged. Emerging from the first wave, there is a sense of relief, but cautious optimism is diluted by the threat of future outbreaks. The full extent of COVID-19 will not be apparent for some time but the experiences of the past 3 months have transformed our understanding of how to cope with what lies ahead. We have already embedded many new ways of working into our normal practice, which will persist long beyond this pandemic.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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