

Editorial

Should we be using the Covid-19 outbreak to prompt us to transform our rheumatology service delivery in the technology age?

Despite the many successes of the National Health Service (NHS), the increased longevity of the ever-expanding UK population has added a significant burden on the healthcare service over the past few decades. Without significant transformational changes, there are concerns that NHS systems will face difficulties sustaining services.

The recent outbreak of Covid-19 has prompted several questions to be raised within the healthcare sector, including how routine outpatient services should run if the virus were to take hold of the UK for a significant period. This is especially pertinent for specialties such as rheumatology, where many of our patients are on immunosuppression and therefore fall into the ‘high-risk’ category. The British Society for Rheumatology (BSR) published risk-stratification guidance advising that patients on certain immunosuppressive agents should stay at home during this time, further highlighting the necessity for us to adapt our clinical services to ensure safe monitoring and contact with such patients [1]. Many centres around the UK have now temporarily converted the majority of their routine outpatient clinics to telephone clinics, though this has not, until now, been an established service within our current UK rheumatology healthcare models. Telephone clinics alone have many limitations, such as the inability to assess disease activity in patients who require physical examinations; furthermore, this service is only appropriate for patients with stable disease activity. Patients who require a formal consultation or those dependent on infusion therapies can still attend hospital appointments, though strict hygiene measures are implemented. Non-urgent reviews and infusions are being delayed, where appropriate.

Some rheumatology centres in the UK, such as London, Manchester and Leeds, have already developed virtual biologic clinics, with a view to reducing treatment delays and improving efficiency of care to patients on high-cost drugs. These clinics are often multi-disciplinary teams reviewing treatment, disease activity scores followed by repeat prescriptions, and, hence, negating the need for a further outpatient clinic review. This approach improves safe prescribing and standardizes the way biologics are prescribed and monitored and reduces inconvenience to patients. The development of such virtual clinics takes time and thoughtful planning and should be strongly considered when strategically planning for the future.

Development of several self-monitoring platforms, such as the National Rheumatoid Arthritis Society ‘Know

your DAS’ app, where patients calculate their own disease activity scores including joint examinations, will enable us to develop future services utilizing technologies to reduce the outpatient burden. If data from such standardized applications links directly to hospital-based software to allow remote patient monitoring, this could reduce the frequency of which patients need to attend hospital clinics for a review. This would be the easiest to trial for diseases where the key disease activity measures are predominantly subjective such as for spondyloarthritis or for conditions where blood test results can be monitored virtually. Such services would be most appropriate for those in remission or with stable low disease activity.

In Northern America, the concept of ‘telemedicine’ or ‘telehealth’ has expanded exponentially over the past decade. Statistics from the American Hospital Association reveal 76% of hospitals in the United States have the infrastructure to utilize technologies such as videoconferencing, electronic consults, wireless communications and remote monitoring, although this may be restricted by insurance coverage [2]. A further survey revealed that 74% of consumers would be keen to uptake telehealth services if given the opportunity [3]; although large-scale quantitative studies have yet to be performed, numerous international studies report favourable qualitative outcomes, such as consumer and provider satisfaction [4–7].

Since the outbreak of Covid-19 in Northern America, the Centers for Medicare and Medicaid Services (CMS) have expanded access to telehealth services in line with governmental attempts to minimize clinic-based reviews [8]. In keeping with this, the ACR has published guidance to rheumatologists advocating virtual medical care for non-urgent patients to minimize viral exposure [9]; reviews for non-urgent patients are either undertaken via telephone clinics or videoconferencing. Patients with complex needs requiring a formal, in-person consultation are still being reviewed; however, this may now take place at designated sites, away from inpatients, to reduce the risk of viral transmission.

In recent years, many European countries have also expanded laws and regulations to allow increased uptake of telemedicine systems [10]. This has been particularly helpful for such countries that have been hard-hit by the pandemic; guidance from such rheumatological societies (for example, in Italy and Spain) advises that

patients requiring imminent consultations (for example, those on biologic therapies) are reviewed by media that exclude a person-to-person relationship. As such, telephone clinics and videoconferencing (where available) are being utilized [11–12].

For future consideration is the use of artificial intelligence (AI); the European Institute of Innovation and Technology's (EIT's) definition of this is 'the capability of a computer programme to perform tasks or reasoning processes that we usually associate with intelligence in a human being' [13]. This can potentially be used for several domains within the healthcare sector; for example, chronic care management, triage and diagnostic purposes. An American company, Sensely, developed a virtual nurse assistant for several chronic diseases, allowing patients to access modules to aid with personalized monitoring; this can then automatically highlight whether clinical input is required; for example, if blood glucose readings are out of the normal range. At present, this technology provides content in 32 languages for 14 chronic conditions, including diabetes mellitus and congestive cardiac failure, although there is scope for this to be available for use by a much wider audience [13].

The McKinsey Global Institute studied how artificial intelligence may impact different workforces. Within the medical sector it has been predicted that such technologies may be able to automate up to 12% of tasks currently being carried out by physicians and surgeons [13]. AI is designed to enhance productivity by way of reducing administrative duties or tasks that can involve pattern recognition and thereby allow more time to be spent on more complex clinical management.

Although there are potential pitfalls in the implementation of nationwide technological services in the UK, such as the dependence on affordability by patients of relevant technologies or the possible limited ability to utilize such technologies, there are many obvious advantages. We acknowledge that this is predominantly relevant for only a subset of the chronic conditions that we see in our rheumatology clinics and the service would be dependent on hospital technologies being able to utilize the relevant software to enable such service delivery effectively. Patient education, training, review regarding ethics, personal data use and technology-related issues (such as data security) would be pertinent prior to the implementation of such changes.

Several barriers will need to be overcome, such as the need to review patient and provider attitudes towards technology, which is likely to differ between healthcare providers depending on the population it serves. The initial financial investment of advancing technology and patient-centric healthcare models is likely to be significant in the early stages.

Recent technological advances have transformed many aspects of the modern world. It may finally be time for us to implement rheumatological technological transformation and validation faced with the pandemic of Covid-19 in 2020.

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