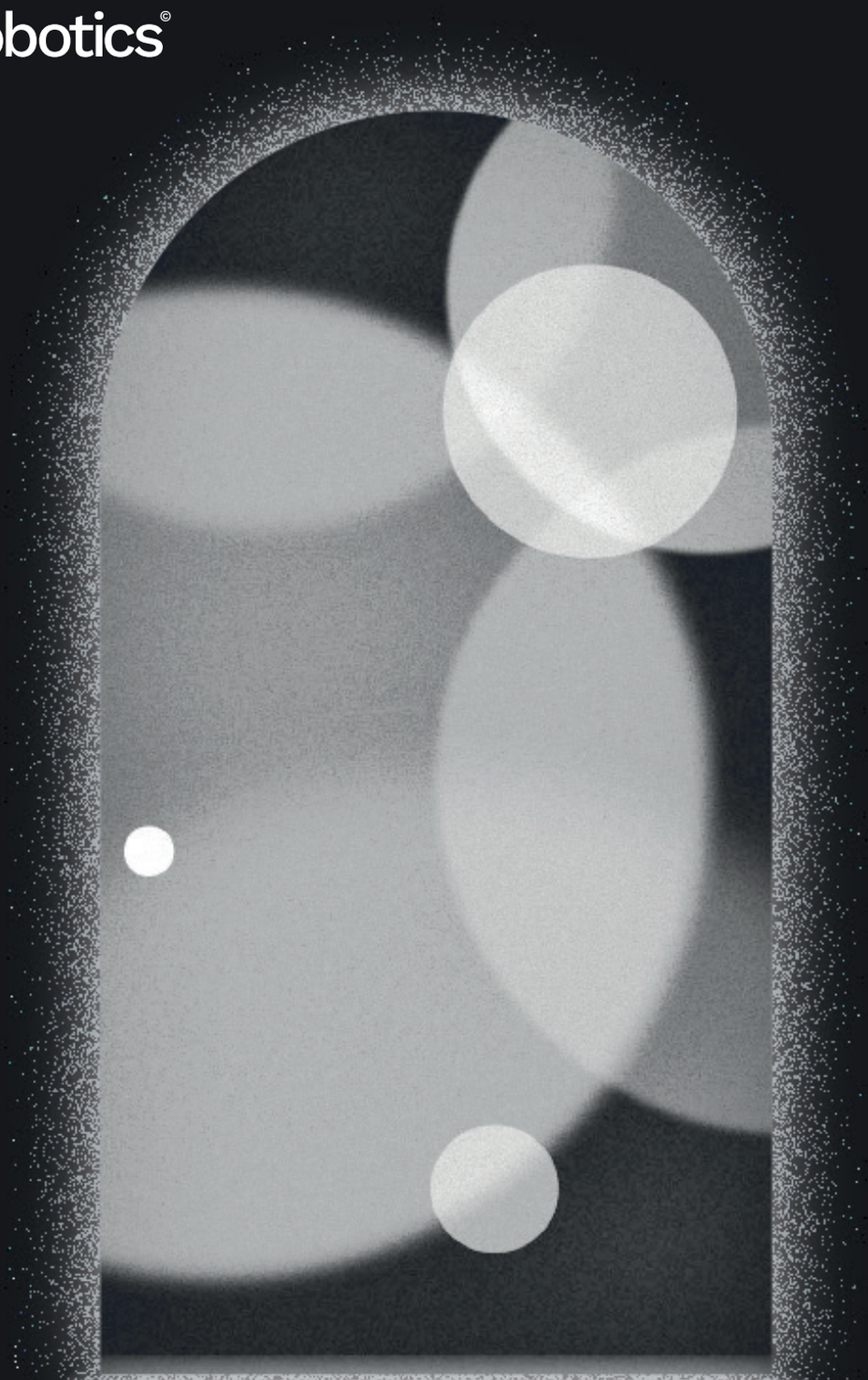
Radiobotics©



Understanding the real value AI can bring in Elective Care in the NHS

A publication by **Radiobotics**

13/4/2021

The strain in which our health systems are under has never been greater, elective care waiting lists are at an all time high. COVID has helped create a perfect storm where elective care procedures were postponed or cancelled across the globe.

How do we tackle this problem when the unprecedented manpower needed just isn't available. It's time to deploy human and AI healthcare superteams to unlock value to...

Enable Radiologists to tackle the growing backlog with increased efficiency

Equip Surgeons with tools to reduce surgical planning time and inappropriate attendance to their clinics due to more effective triage

Arm Primary Care Doctors with standardised diagnostic reports which enable speedy referrals

Reduce time to treatment for patients with quicker access to relevant healthcare staff

Introduction

In this paper, we will focus on how technology solutions, such as AI, can lessen the load that our clinicians are currently carrying. AI solutions which have been rigorously evaluated are available in the here and now, and ready to add value for staff to deliver high quality care. The need for these solutions has never been so pronounced and MSK is an area where AI can unlock significant value. Could AI solutions be the lifeline that the NHS needs right now to not only get out of the backlog we are facing but to thrive and flourish?

AI is an area of much hype and indeed if all of the claims made about AI were to materialise, we would be living in a utopia in the near future, or a dystopian future, depending on who you ask. That being said, there is clearly a place for technology, more advanced technology, in healthcare delivery models going forward. COVID-19 has shown us the power of technology in rapidly developing vaccines, as well as moves towards more digital healthcare with virtual consultations becoming increasingly accepted as the norm.

We must ride the waves of this success and enable new technology tools to help us deliver evidence based medicine, underpinned by technology, at an unprecedented pace and scale to deliver value to our healthcare system. In order to tackle these current challenges, humans and AI will need to come together as a more efficient and smarter pairing to deliver significant value for all.

AI as a tool for Primary Care Doctors

AI can be deployed at the beginning of most patients' clinical pathway when they see their primary care doctors. At this stage, AI systems can help GPs live up to national clinical guidelines.

For example, patients with knee pain can be directly referred to MRI and simultaneously referred to conservative treatment (physio, analgesics, weight-loss) as a first treatment option. This exemplifies that triage AI systems can be deployed to help primary care doctors to more effectively triage.

Coupled with this, access to standardised diagnostic reports (which can be provided by Radiology AI companies, such as **RBknee™** provided by Radiobotics) give clinicians access to easily understood reports which can give them sufficient reliable information in which to base treatment decisions on.

In this way, patients can be more easily triaged and as such less patients will be triaged to an inappropriate clinical pathway.

This will help reduce the number of overall appointments required by the system so as such should help release some pressure from waiting lists. These solutions can lessen the burden to staff throughout the system, reduce additional inappropriate referrals and unlock value for staff throughout the system to focus on getting through the backlog.

AI as a tool for Radiologists

It has long been discussed the effects that AI can have in Radiology. From doomsday predictions, where the profession would become obsolete, to more credible cases where AI can be used as a tool harnessed by Radiologists to enable them to diagnose with greater accuracy and speed. The job of a Radiologist is very complex and can in no way be replaced. Where AI can truly add value here is to automate certain portions of a Radiologist's work to give them more capacity to tackle an ever growing worklist. As Hugh Harvey points out, where radiology artificial intelligence is heading towards is digital augmentation of radiologists, to oversee clinical reporting and evaluation, rather than manually go through every possible mundane finding as they do now[1].

Looking at accuracy first, we can see that having access to more accurate diagnostic reports, which can be created using AI radiology companies such as Radiobotics, allows patients to get the most appropriate treatment which helps both the patient and the healthcare system. The patient gets treated earlier and this time saving both saves them suffering and potential disease progression. For the healthcare system, accurate diagnostic reports help with clinical triaging which in turn reduces the amount of patients in inappropriate clinical pathways, which causes the waiting lists to increase unduly. AI does not get tired, or underperform if they havn't slept properly the night before, so it is worth mentioning that consistency is another important

1: Hugh Harvey, 2018, Why AI will not replace radiologists

factor here for AI. AI is in effect always on and ready to perform. Given the workforce challenges this area is facing and the backlog that is ever growing, AI can be the perfect companion for Radiologists & Reporting Radiographers both during day and night shifts to help assist them.

For speed, AI can undoubtedly reduce the time it takes Radiologists and Reporting Radiographers to report on their cases which can unlock value to allow them to dedicate this time to other more time consuming aspects of their jobs which they may not have time to do at present[2].

For example, it was reported that only 1% of Radiologists managed to report their clinical workflow during normal working hours in 2019[3]. Whilst it is not reasonable to think that AI in Radiology can boost this number to 100%, an increase from 1% is expected.

Giving Radiologists the AI tools which they need to do this, such as **RBknee™** from Radiobotics, would likely reduce stress levels, particularly in a career where a 2015 survey revealed that 49% of Radiologists are experiencing burnout[4].

Allowing the throughput from Radiologists to rise, with time saving AI assistance, is one such way that is likely to unlock value and have an effect on RTT times for the NHS.

2: European Society of Radiology, 2019, Impact of artificial intelligence on radiology: a EuroAIM survey among members of the European Society of Radiology
3: Royal College of Radiologists, 2020, Clinical Radiology Workforce Census 2019 report
4: Harolds et al., 2016, Burnout of Radiologists: Frequency, Risk Factors, and Remedies: A Report of the ACR Commission on Human Resources.

AI as a tool for Surgeons

Orthopedic surgeons' waiting lists have grown substantially in the past 12 months. Many have been forced to cancel or reschedule routine orthopedic surgery due to COVID-related bed pressure. Facing a mountain of cases, can AI offer a solution to help reduce the amount of cases?

As mentioned earlier in the discussion, using reports from AI imaging companies, such as those built by Radiobotics, could enable more effective triaging of patients which in turn could reduce the burden of referrals which orthopedic surgeons are receiving. This would enable the orthopedic surgeons to use those precious outpatient appointment slots to consult patients who are in most need of their services.

Another case in which AI can help orthopedic surgeons is as a tool to enhance surgical planning. AI has the ability to calculate surgical techniques as well as estimate which prosthesis would best fit the patients. This reduces the time consuming task of surgical planning which enables surgeons to again turn their attention to reducing waiting lists, either by operating on more patients in surgery or seeing more patients in their outpatient clinics. These factors are of course, dependent on capacity of theatres and outpatient departments.

How AI benefits patients

The focus of AI should centre on how can we make the patient experience better and how can we generate better patient outcomes. It goes without saying that patients are the heart of healthcare and any adjustment to healthcare practises should always evaluate the impact this has / could have on patients.

In terms of patient experience, AI can unlock value to enhance patient experience in a number of ways. AI as a triage tool to allow patients to be diverted to the most appropriate clinical pathway and ultimately save time being diverted from one service to another. This is a source of significant pain for patients and results in feelings of dissatisfaction and potentially loss of trust in the services that we provide for our patients. AI can help to get it right the first time.

Better patient outcomes in MSK elective care can also be achieved using AI. For example, in the field of AI Radiology, products can be deployed, such as **RBknee™**, which can significantly reduce the turn-around time for reporting, which in turn gives clinicians the evidence they need to treat patients more rapidly. Faster treatment can lead to better patient outcomes.

AI can also benefit patients in terms of health inequalities. Deploying AI in patients clinical pathways ensures that patients are treated the same regardless of if a patient is being treated in a university hospital or a rural setting, if the patient is being reviewed early in the morning or late at night and enables patients to receive equitable care. This can not be overlooked, particularly as health inequalities across the UK have risen during the COVID crisis.

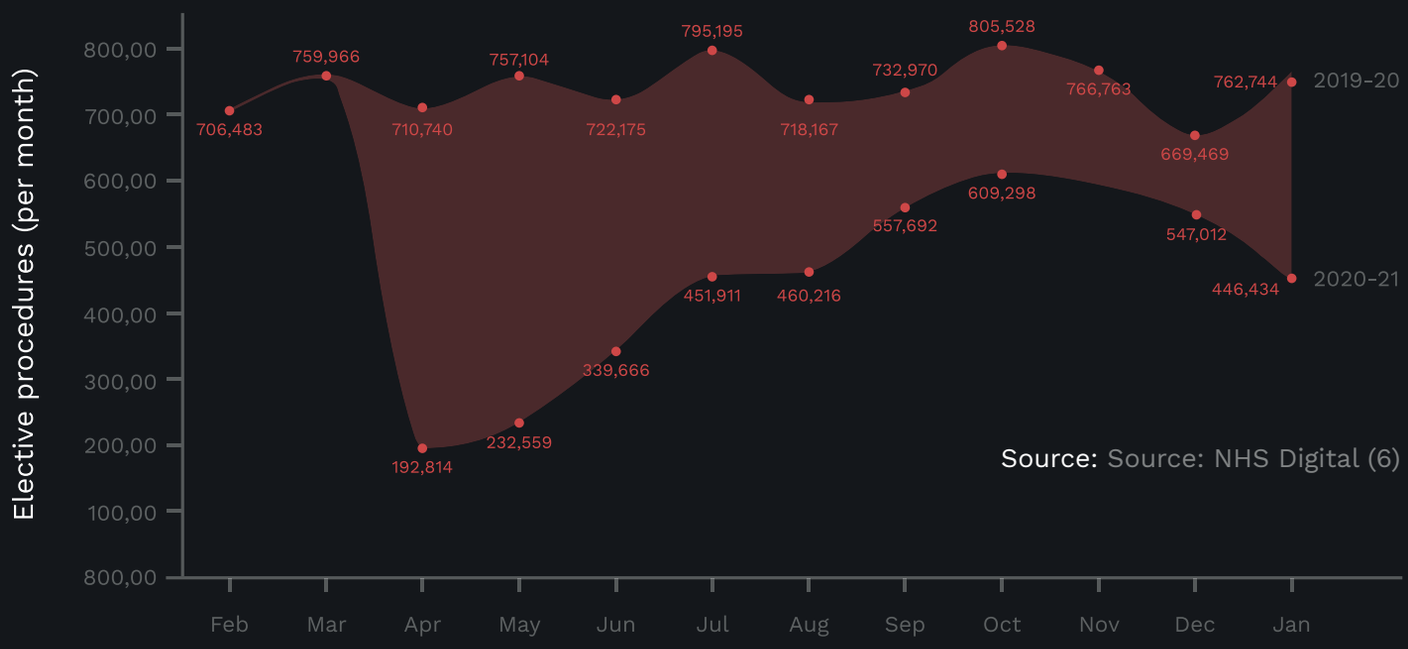
Conclusion

Growing elective care waiting lists in the NHS is a burning platform, as we enter the post-COVID era the true extent of this new crisis will be felt. We need to give clinicians and patients every chance to be able to succeed. In order to achieve this success, the NHS needs to transform and having technology & AI at the heart of this transformation is the only path forward. As discussed, AI can be utilised by primary care staff to arm them with information to enable the most effective triage, radiology staff to assist with the reporting backlog and surgeons to help plan surgical procedures at pace. This technology adopted at scale across the MSK pathway could drive significant value to help not only overcome the current elective care waiting list challenges but come out at the other end ready to flourish and thrive.

We are here to help

Radiobotics can deliver a range of solutions to support healthcare professionals on the road ahead, from automated & reporting tools which can enable health care professionals at every stage of the patient journey to make informed decisions to tools that can enable Orthopaedic Surgeons to more effectively plan patient's surgeries. Reach out to Cathal White (cathal@radiobotics.com) to hear more.

Elective procedures (all specialties) — 2019/20 versus 2020/21



Background

Even before the era of COVID, NHS waiting lists were a source of pain across the organisation. In January 2020, there were 730,267 patients waiting over 18 weeks to start treatment, this number has ballooned to 1,554,305 patients in January 20215.

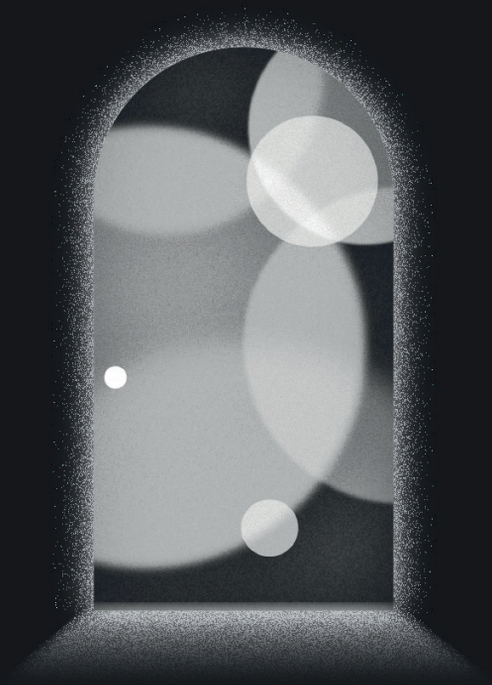
Looking closer at these figures, it reveals that patients waiting over 52 weeks have risen even more sharply, with 1,305 patients waiting over 52 weeks in September 2020 to 304,044 patients waiting over 52 weeks in January 20215.

Each of these numbers tells the story of patients who are patiently waiting for their procedures, all the while living with symptoms which are suboptimal for their health.

The graph above, shows the marked drop in elective care procedures across the NHS over a 1 year period and highlights the impact that COVID-19 has had on elective care. The British Medical Association[7] estimates that as of January this year, there were 3 million fewer elective care procedures and 20.7 million fewer outpatients appointments. The NHS is now faced with a growing backlog of non-COVID related care.

5: NHSE, 2021, Statistics » Consultant-led Referral to Treatment Waiting Times Data 2020-21
6: NHS Digital, 2021, Hospital Episode Statistics for Admitted Patient Care and Outpatient Data
7: BMA, 2021, Pressure points in the NHS

Radiobotics©



Radiobotics is an AI software company located in Copenhagen, Denmark, with a focus on developing algorithms for hospitals to automate reading of x-rays of bone and joints.

Lately **Radiobotics** has experienced strong traction, won multiple awards and grants, and established noticeable international collaborations. **Radiobotics** has 20 employees, comprising a diverse and highly skilled team, with expertise especially within machine learning and artificial intelligence (AI), software development, health-care IT system integration, clinical studies and evaluations, regulatory affairs and quality assurance.

All necessities for creating 'soft-ware-as-a-medical-device' under given regulations.

info@radiobotics.com

www.radiobotics.com