

## ORIGINAL ARTICLE

## ESTABLISHMENT OF VIRTUAL FRACTURE CLINIC IN PRINCESS ROYAL HOSPITAL TELFORD: EXPERIENCE AND RECOMMENDATIONS DURING THE FIRST 9 MONTHS

Tahir Khaleeq, Patrick Lancaster, Keji Fakoya, Martin Black, Julie Littlehailes, Pedro Ferreira, Usman Ahmed

Physiotherapist trauma and Orthopaedic Department, Princess Royal Hospital-United Kingdom

**Background:** Virtual fracture clinics (VFC) have been shown to be a safe and cost-effective way of managing outpatient referrals to the orthopaedic department. During the coronavirus pandemic there has been a push to reduce unnecessary patient contact whilst maintaining patient safety.

**Methods:** A protocol was developed by the clinical team in collaboration with Advanced Physiotherapy Practitioners (APP) on how to manage common musculoskeletal presentations to A&E prior to COVID as part of routine service development. Patients broadly triaged into 4 categories; discharge with advice, referral to VFC, referral to face to face clinic or discussion with on call team. The first 9 months of data were analysed to assess types of injury seen and outcomes. **Results:** In total 2489 patients were referred to VFC from internal and external sources. Seven hundred and thirty-four patients were discharged without follow-up and 182 patients were discharged for physiotherapy review. Only 3 patients required admission. Regarding follow-ups, 431 patients had a virtual follow-up while 1036 of patients required further face to face follow up. Eighty-seven patients were triaged into subspecialty clinics. Thirty-seven patients were felt to have been referred inappropriately. **Discussion:** British Orthopaedic Association guidelines suggest all patients need to be reviewed within 72 hours of their orthopaedic injury. Implementation of a VFC allows this target to be achieved and at the same time reduce patient contact. Almost half the patients were discharged following VFC review; the remaining patients were appropriately followed up. This is especially relevant in the current pandemic where reducing unnecessary trips to hospital will benefit the patient as well as make the most of the resources available.

**Keywords:** Virtual Fracture Clinic; Trauma and Orthopaedics; Covid-19

**Citation:** Khaleeq T, Lancaster P, Fakoya K, Black M, Littlehailes J, Ferreira P, *et al.* Establishment of virtual fracture clinic in Princess Royal Hospital Telford: Experience and recommendations during the first 9 months. J Ayub Med Coll Abbottabad 2022;34(2):341–4.

### INTRODUCTION

Approximately 2 million people attend the emergency department every month, which has increased substantially since 2004.<sup>1</sup> Soft tissue injuries and musculoskeletal injuries account to almost 30% of these. The orthopaedic on call team are referred almost one in five of these patients, while the remainder are managed by A&E.<sup>2</sup> From the 2003 data almost 7.1 million appointments per year are followed by an orthopaedic surgeon which accounts to almost 75–92% of all musculoskeletal injuries in the NHS. 30% of these appointments are new while 70% are follow-ups.<sup>1</sup>

Guidance was published in August 2013 by The British Orthopaedic Association (BOA), in the form of the Standards for Trauma for Fracture Clinic services (BOAST 7 guidelines), which states that “Following acute traumatic orthopaedic injury, patients should be seen in a new fracture clinic within 72 hours of presentation with the injury”.<sup>1,3,4</sup> During the week there is at least one daily fracture clinic in majority of NHS hospitals while other hospitals even

schedule appointment on weekends so excess demand and BOAST guidelines can be managed.<sup>3</sup>

More than a quarter of the patients attending fracture clinic are delayed more than half an hour, according to the data from the Audit Commission. In 2012–2013, 7.3% of patients were not attending their appointments, making it almost 6.9 million appointments, and almost 4 million appointments were cancelled by the patient.<sup>5</sup> This indicates poor patient satisfaction with conventional fracture clinic, logistical difficulty in attending Fracture Clinics and the scope of patients with certain fractures to recover without needing further Specialist input.

Resources are limited across the NHS and due to the growing population, increasing disease burden and a drive to save £10 Billion pounds over the 5 years, these resources are being stretched.<sup>6</sup> To save almost £2bn per annum, improving operational productivity and workflow is required as identified by the Carter Report. This requires the optimisation of resources, including staff, policies and practises.

Therefore, the demands of the modern NHS cannot be fulfilled by the traditional fracture clinic model and is at tremendous risk of failing. The modern NHS requires a fracture management pathway which is redesigned and targets the aim of improving the individual experience of care; improving the health of populations; and reducing the per capita costs of care for populations".<sup>7</sup>

To help comply with the BOAST guidance many Hospitals have introduced trauma Triage clinics or Virtual Fracture Clinics (VFCs). These also have been significant in trying to keep with the demand of patients requiring fracture clinic services and also have been used as an alternative to the traditional face-to-face fracture clinics.

The objective of this project was to implement a rapid strategy that would allow management of trauma referrals in a socially distanced way by reducing clinic traffic without compromising patient safety.

## MATERIAL AND METHODS

The Virtual Fracture Clinic care model was pioneered by the Glasgow Royal Infirmary (GRI) in Scotland. They published evidence that clinical outcome is not affected as long as it is used in tandem with appropriate emergency department (ED) decision making. This also helped the Emergency Department as it was not placing any additional resource or administrative burden and it was also not associated with unnecessary re-attendance to the ED.<sup>8</sup> Virtual Fracture Clinic was started in 2011 in GRI and this was prior to development of BOAST 7. The Orthopaedic and Emergency Department worked together to redesign management pathways of non-operative fractures.<sup>9</sup> The pathways included that all patients presenting to the ED are either referred for orthopaedic urgent intervention, or allocated to one of two pathways.

After these pathways were implemented, 87–95% of patients were satisfied with their care, a reduction in treatment times was seen with an overall increase in patients who had definitive management plans.<sup>10</sup>

A major trauma centre, Brighton and Sussex University hospital, followed the implementation of VFC similar to the one started in Scotland. This intervention showed that many simple fractures can be safely and, in a cost, effective manner be reviewed and managed in a virtual fracture clinic.<sup>11</sup>

Keeping all these previous models in mind, a robust process was developed by key stakeholders including senior staff from Trauma and Orthopaedics, Physiotherapy & the ED, on how to manage common musculoskeletal presentations to A&E. The first part of this project has been to implement a safe referral

process that can be scaled up and was easy to understand. Further engagement was sought from colleagues in minor injury units in the region to ensure that this facility catered to their needs too.

Patient outcomes in ED (which refers the majority of patients) were broadly classified into four categories; discharge with advice from A&E; referral to VFC, referral to face to face clinic or discussion with the on-call team. Patients traditionally referred to face to face clinic were assessed against a criteria to ensure that VFC referral was appropriate. All patients were considered and the following were referred directly to a face-to-face clinic.

1. Open injuries
2. Vulnerable patients
3. Communication difficulties

Additionally, the ED team were given discretion as part of a safety net process to refer to face to face clinic if there were any doubts or concerns. The VFC started in August 2020 at the Princess Royal hospital, Telford. This was in line with the trauma restoration plan for our region following the first wave of COVID-19.

As with any new venture the key element is ensuring that the patient is at the centre of all decision making. An information leaflet was generated and ED staff was asked to give copy of this leaflet to all patients referred to VFC. This leaflet had the details of relevant individuals whom the patients could call in order to raise concerns and ensured that in the event of process failure that they could contact us. We encouraged all patients to call us if they had not heard from the team within 72hrs. The first 9 months of data were analysed to assess for gender, type of injury, referral source and outcome.

## RESULTS

Since commencing in August 2020, 3968 patients were referred to fracture Clinic. Out of these, 2489 patients were referred to VFC from various departments. 85% were referred from A&E, 10% were referred from multiple major injury units across the County while 5% were referred directly from GP. 59% of patients that were referred to VFC were male while the 41% were female. 55% of patients were diagnosed with an upper limb diagnosis while 45% had a lower limb diagnosis. Since the Establishment of VFC, every month an average of 59% of patients were referred to VFC out of the total of patients that were referred to Fracture clinic.

Seven hundred and thirty-four patients were discharged and 182 patients were discharged for physiotherapy review. 3 patients required admission with the remaining 87 patients booked for follow up with an appropriate specialist. Follow-ups were divided into VFC follow-up and face to face follow-

up, 431 patients had a VFC follow-up while 1036 patients had a face-to-face follow-up.

Thirty-seven patients were referred to VFC inappropriately as they had an open wound which was in the exclusion criteria for VFC referral. On a monthly basis an average of 59% of total fracture clinic referrals were seen in VFC

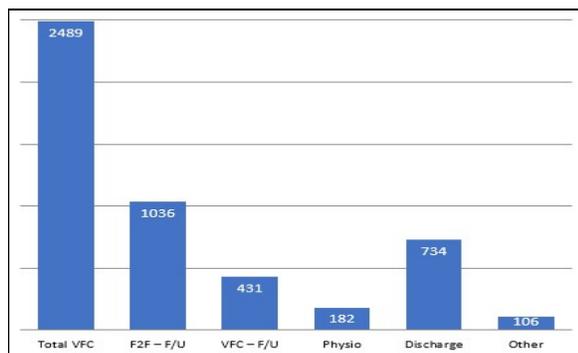


Figure-1: Total number of patients visiting VFC each month

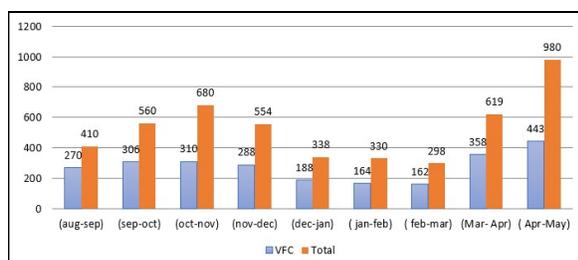


Figure-2: Total VFC outcomes

## DISCUSSION

A lot has changed in the workplace since the start of the current COVID-19 pandemic and therefore increasing the need for establishment of more virtual/remote engagement tools. Some of the advantages of establishment of VFC include; establishment of VFC have shown to have multiple advantages including; reduction of impact on the emergency department, reduction of non-attendance, increasing clinical efficiency while also being cost-effective.<sup>4</sup> Robust protocols and pathways allow Accident and Emergency clinicians to provide safe, appropriate and efficient care at the point of contact, reducing the burden on both the Accident and Emergency clinicians themselves and the Trauma and Orthopaedic on-call team. As this is a multi-disciplinary intervention, it is ideal that all pathways and protocols are agreed upon and followed by all members of the multi-disciplinary team, including ED, physiotherapy and T&O department and the success of the VFC model is dependent on the comradery and team work between these departments as this is the key to its success.<sup>12</sup>

One of the main advantages of the establishment of VFC is the reduction of face-to-face consultations. After the establishment of VFC some units have reported a reduction of almost 50% of outpatient appointments. Which in turn has become more cost saving to these units with thorough appointments, staffing and significant increase in patient satisfaction.<sup>13,14</sup>

Trainees also benefit from establishment of Virtual fracture clinics. Due to the extra time that the VFC provides to consultants, trainees receive a better learning environment which is a lot more fruitful than the face-to-face clinics.<sup>15,16</sup>

The key challenges in this project are engagement and culture. Pushing through a process change during the pandemic was advantageous but also required a lot of engagement which we were fortunate to receive. A key ambition in this project was to promote a positive culture of collegiality and cooperation within our hospital.

Additional learning from our experience has also highlighted the importance of education and training, especially in specialties where there is a high turnover of trainees. As we move this project forward, we aim to continue streamlining our processes and protocols but also enhancing the educational value of participation.

## CONCLUSION

We have successfully developed a virtual fracture clinic care model for our region, alongside conventional fracture clinics even though our service demand of trauma is increasing daily. As this project was approached as a quality improvement model, it can guide further research and development of the service, particularly at a district general hospital level. The establishment of VFC model is essential for meeting BOAST guidelines and regular staff feedback was essential for improvement of the project. Further work is underway to ensure patient and doctor awareness and to assess the quality of care provided along with patient satisfaction and cost-effectiveness.

## AUTHORS' CONTRIBUTION

TK: Helped with design of Quality improvement model, conducted, collected data, analysed data, paper written. PL: Helped with design of Quality improvement model, collection of data. KF: Collection of data. MB: Helped with design of Quality improvement model, collection of data. JL: Helped with design of Quality improvement model, collection of data. PF: Helped with analysis of paper. UA: Supervisor, Designed Quality improvement project, helped with analysis of paper, checked abstract once written

## REFERENCES

- Logishetty K. Adopting and sustaining a Virtual Fracture Clinic model in the District Hospital setting – a quality improvement approach. *BMJ Qual Improv Rep* 2017;6(1):u220211.
- Accident and Emergency Attendances in England - 2007-2008, Experimental statistics [Internet]. NHS Digital. [cited 2021 July]. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/hospital-accident--emergency-activity/2007-2008>
- BOAST Guidelines: fracture clinic services, August 2013. [Internet]. [cited 2021 July]. Available from: <https://www.boa.ac.uk/uploads/assets/7ded8f00-987e-42d5-a389e739b1e03b47/ec9d4564-4fa7-4d08-ae4efc3cede7d53/fracture%20clinic%20services.pdf>
- Rhind JH, Ramhamadany E, Collins R, Govilkar S, Dass D, Hay S. An analysis of virtual fracture clinics in orthopaedic trauma in the UK during the coronavirus crisis. *EFORT Open Rev* 2020;5(7):442–8.
- Harrop V. Virtual healthcare delivery: defined, modeled, and predictive barriers to implementation identified. *Proc AMIA Symp* 2001;244–8.
- NHS England. Five Year Forward View: NHS England; 2014 [cited 2016 Oct 24]. Available from: <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf>
- Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood)* 2008;27(3):759–69.
- Vardy J, Jenkins PJ, Clark K, Chekroud M, Begbie K, Anthony I, *et al.* Effect of a redesigned fracture management pathway and ‘virtual’ fracture clinic on ED performance. *BMJ Open* 2014;4(6):e005282.
- Glasgow Royal Infirmary Orthopaedic Department. Fracture Clinic Redesign 2015 [cited 2016 March 23]. Available from: <http://www.fractureclinicredesign.org/>
- Gamble D, Jenkins PJ, Edge MJ, Gilmour A, Anthony IC, Nugent M, *et al.* Satisfaction and functional outcome with “self-care” for the management of fifth metacarpal fractures. *Hand (N Y)* 2015;10(4):607–12.
- NHS England Brighton and Sussex NHS Trust Virtual Fracture Clinic 2016 [Internet]. [cited 2016 Oct 24]. Available from: <https://www.england.nhs.uk/challengeprizes/about/winners-1516/virtual-fracture-clinic/>
- Jenkins P, Gilmour A, Murray O, Anthony I, Nugent MP, Ireland A. The Glasgow Fracture Pathway: a virtual clinic. *BJJ News* 2014;2:22–4.
- Khan SA, Asokan A, Handford C, Logan P, Moores T. How useful are virtual fracture clinics?: a systematic review. *Bone Jt Open* 2020;1(11):683–90.
- O’Reilly M, Breathnach O, Conlon B, Kiernan C, Sheehan E. Trauma assessment clinic: Virtually a safe and smarter way of managing trauma care in Ireland. *Injury* 2019;50(4):898–902.
- McAuliffe O, Lami M, Lami T. The impact of virtual fracture clinics on medical education: a medical student perspective. *Med Educ Online* 2016;21:30950.
- Murray O, Christen K, Marsh A, Bayer J. Fracture clinic redesign: improving standards in patient care and interprofessional education. *Swiss Med Wkly* 2012;142:w13630.

Submitted: July 24, 2021

Revised: October 3, 2021

Accepted: October 9, 2021

**Address for Correspondence:****Tahir Khaleeq**, Physiotherapist trauma and Orthopaedic Department, Princess Royal Hospital-United Kingdom**Email:** [tahirkuze@live.com](mailto:tahirkuze@live.com)