The virtual knee clinic – A tool to streamline new outpatient referrals☆

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ABSTRACT

Introduction: Traditionally it has been the case for orthopaedic consultants to review GP referrals for the orthopaedic outpatient clinic where possible in amongst other clinical commitments. This could sometimes lead to unsuitable patients being reviewed and both patients and clinicians becoming frustrated. Building on the virtual fracture clinic, a new screening tool was implemented to streamline new referrals. The aim of this study is to investigate the change in patients given outpatient appointments following the introduction of a new streamlining protocol.

Methods: Referrals had to meet the criteria of BMI under 40 or evidence of weight loss effort, recent radiographs and appropriate clinical details in keeping with Getting It Right First Time (GIRFT). Consultant were given dedicated clinical time to review and either triage the patient to the most appropriate clinic type, or return the referral with advice to the GP. 10 months of data was collected prior to the protocol and 10 months after implementation.

Results: 1781 patients were referred pre-protocol with an average of 14.2% of these being returned. Post protocol there were 2110 patients referred with 31.2% returned. There was an increase in 195% of referrals returned to the GP ($p < 0.0001$). The highest proportion of these was for mild to moderate osteoarthritis on the radiograph which has been proven to be unsuitable for intervention. At 12 month analysis there was no significant increase in patients re-referred to the service ($p = 0.53$)

Discussion: The new screening tool allows more appropriate referrals to be seen in clinic allowing less frustration to clinicians and patients by reducing therapeutic inertia. Furthermore it allows new referrals to be seen by the most appropriate sub-specialist. It allows advice to be given to GPs on further management for the patient. 619 appointments were saved. At a cost of £120 per appointment, this leads to a real terms cost saving of £74,280, with further savings in time and travel.

Introduction

Orthopaedic practices have been forced to evolve considerably over the course of the COVID-19 pandemic. Restrictions on elective services seem to be in a constant state of flux, with reduced capacity due to shortages of all resources, combined with needs for social distancing and patient isolation. The British Orthopaedic Association has recently released a statement showing as of 31st January 2021 the total waiting list was 588,658 – the largest waiting list for over a decade.[1] There are no national figures available on the number of patients waiting for an outpatient first appointment, although some trusts are reporting their average waiting time for

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routine referrals as reaching 300 weeks.[2] This makes it paramount to utilize the resources we have in the most efficient manner, and look to optimize where possible.

Traditionally it has been the practice for patients with knee pathology to be referred by their general practitioner (GP) to the elective orthopaedic outpatient clinic for consideration of surgical management. This involves administrative staff receiving the referral and consultants reviewing and accepting or returning the referral. This was commonly done when possible alongside other clinical commitments. This would sometimes lead to patients who did not require specialist treatment, either operative or non-operative, being given appointments unnecessarily resulting in ineffective use of a valuable resource. Patients could also be informed at their appointment that further investigation or imaging would be needed before any treatment could be considered, or indeed due to their existing medical conditions they would not be a suitable candidate. This frequently leads to frustration to both patients and clinicians, as they can feel it was a wasted visit. Further delays in the patient pathway can come when a patient must be referred to another consultant within the same service for a specific operation such as high tibial osteotomy or patello-femoral joint replacement.

A similar issue had been addressed in the orthopaedic fracture clinic. Patients were historically referred by the emergency department for a next day appointment, where often after a review of the radiograph the patient was informed no further intervention was needed and the patient asked to return for review at a later date. A virtual fracture clinic has increasingly been adopted by orthopaedic departments, the radiographs are reviewed along with the clinical details from the emergency department assessment and the patients are asked to be reviewed at a more appropriate time, and often triaged to the most appropriate consultant.[3] For certain conditions which did not require orthopaedic review these were discharged with advice or referral to physiotherapy with no adverse effect to outcome or patient satisfaction. For these minor fractures this lead to an 88% decrease in outpatient workload.[4]

After incorporating a virtual fracture clinic into practice in our institution, it was postulated whether a similar screening tool could be applied to elective knee clinics leading for further optimisation of the outpatient service. The principle of using a screening tool for referrals may achieve more appropriate referrals with essential baseline investigations, more appropriate consultant assignment, and increased feedback for the referring general practitioners. The aim of this study is to demonstrate our institutions experience of implementing a virtual knee clinic and show the potential reduction in unnecessary outpatient appointments.

Methods

The study took place in 2016 at an acute district general hospital serving a population of 370,000. Prior to this study GPs would make daily referrals electronically, which were received by the orthopaedic consultants, this was done coinciding with their other clinical duties rather than during dedicated clinical time. Once vetted, administrative staff would then assign to the shortest consultant waiting list.

At the start of this study one consultant was given a dedicated clinical session for the virtual knee clinic in their job plan. This allowed the consultant to have time to access the digital radiographs and previous medical records, allowing them to triage the referral appropriately.

A protocol was then communicated to GPs with essential criteria to be met before the patient would be given an appointment:

- Up to date radiographs of the affected joint
- Patient BMI < 40 or evidence or significant attempt at weight loss
- Appropriate clinical details including any significant past medical history

The patient was vetted based on the GP's assessment. When the decision was made that the referral was not suitable, the GP was given advice as to why this was. A letter was also sent to the patient explaining the reason, including a contact telephone number for the department. Reasons could be:

- Baseline investigations not completed to allow suitable assessment.
- Radiograph does not demonstrate significant osteoarthritis therefore patient would not benefit from a surgical procedure
- Patient needs referral for MRI scan and communication will be made after this has been performed (this was made by the reviewing consultant)
- Patient must go to weight management or show significant effort in weight loss attempt
- Patient would benefit from trial of joint injection, this can be done in primary care (there has been prior significant GP training for steroid injection and an agreement they will attempt this in the first instance)

Once accepted the referral could be directed to the most appropriate knee specialist consultant or to the pooled waiting list depending on:

- Osteoarthritis or soft tissue clinic
- New patient or return patient. If the patient was seen within the last 2 years with the same condition a review appointment was made with the same consultant
- Simple OA sent to the consultant with the shortest waiting list
- Complex OA sent to one of 2 surgeons doing complex and revision replacements
- Uni-compartmental knee replacement and high tibial osteotomy done predominantly by 2 consultants
- Suitable patient for GP with special interest in musculoskeletal review or consultant physiotherapist

Data collection

All outpatient referrals were recorded prospectively in a database for 10 months prior to implementation and for 10 months following successful implementation. Proportion of referrals returned to GP and reasons for this were recorded. Of the referrals returned, these were searched electronically at 12 months to assess re-referral rate.

Data was analysed using SPSS and non-parametric (chi squared test) was employed as most of the data was categorical in nature. Level of significance was set at $P < 0.05$.

Results

Patient demographics:

	Pre-virtual clinic	Post implementation	P value
Number of referrals	1781	2110	
Mean age	55.6 (11–90)	55.3 (14–98)	0.6
M:F	1.2:1	1.1:1	0.17

Proportion of referrals returned:

	Pre-Virtual Clinic	Post Implementation	P value
Total Referrals	1781	2110	
Number appointed (%)	1528 (85.8%)	1452 (68.8%)	<0.00001
Returned to GP (% of total)	253 (14.2%)	658 (31.2%)	<0.00001
Re-referred in 12 months (% of those returned)	12 (4.7%)	39 (5.9%)	0.53

The reason for the return of referrals were also recorded and showed as a proportion of the total referrals returned post implementation:

Reason for return	Number of referrals returned (%)
Early mild osteoarthritis	248 (37.7%)
BMI > 40	124 (18.8%)
MRI scan requested	78 (11.9%)
Insufficient clinical information	62 (9.4%)
Bakers Cyst	31 (4.7%)
Significant Medical Co-morbidities	33 (5%)
Injection by GP	39 (6%)
Other	43 (6.5%)

The patients who were re-referred to the service were recorded post implementation:

Reason for re-referral	Number of patients (%)
Early mild osteoarthritis	4 (10.2%)
BMI > 40	8 (20.5%)
MRI scan requested	1 (2.6%)
Insufficient clinical information	21 (53.8%)
Bakers Cyst	0
Significant Medical Co-morbidities	1 (2.6%)
Injection by GP	2 (5.1%)
Other	2 (5.1%)

Analysis

Patient demographics showed no significant difference in the 2 study periods. There was a significant increase in the number of patients whose referral was sent back to the GP, however this did not result in a significant increase of number of patients re-referred within 12 months.

Discussion

The current study has described a screening and triage tool for new GP referrals to the orthopaedic outpatient clinic. Proportion of referrals returned to GP with explanation and advice has significantly increased as a result of the protocol. This has allowed more effective use of available clinic appointments, which is invaluable in the current climate.

The advantages of this system are that patients who are not suitable for operative management or do not require specialist treatment do not attend the clinic, avoiding disappointment and frustration to the patient who may have built up expectations whilst awaiting their specialist review. Both patient and GP will be provided with a full explanation of the condition, and rationale for conservative treatment in the first instance. A similar model has been introduced in our institution for hand surgery. Stirling et al. report on the virtual hand surgery clinic, they describe the number of patients returning to clinic has reduced by 60% in the 8 years the service has been running in the current format. They advise as orthopaedic services emerge from the COVID-19 pandemic, It is a prime opportunity for modernization of practices.[5]

When a referral is accepted there is also more efficient triage of the case. They can be booked as a new patient appointment, or if they are known to one of the consultants in the unit they can be booked as a return patient. The benefit of this is a time saving as the consultant will be able to familiarise themselves with the previous history more effectively, allowing better continuation of care to the patient. Further to

this the patient can be listed to the pooled knee waiting list, or to a specialist list if the case is deemed complex due to the radiographs or clinical context. Being seen by the most appropriate consultant in the first instance reduces therapeutic inertia and consultant to consultant referral within the same department.

The requirement for appropriate clinical details in the referral is in keeping with standards set by the Getting It Right First Time (GIRFT) Post-COVID Elective surgery Recovery & Transformation plan 2020.[6] The intension is not to shift more responsibility to the GP, but to allow enough clinical details for the receiving consultant to make an informed decision. Furthermore it allows feedback or advice to the GPs with regards to some of the criteria which they may be able incorporate into their own practice. Standard advice responses can be given quoting evidence based best medical practice. For example, if a patient is not suitable due to having only early osteoarthritic changes seen on radiographs the feedback would be: "Arthroscopy has been shown to be of limited use in early osteoarthritis. This patient would benefit from conservative management at this current disease severity level."

The role of BMI has become an increasingly significant issue in joint replacement, and attitudes towards patients with morbid obesity (defined as BMI > 40kg/m^2) have evolved in recent years. The current national guidance on this issue is describes whilst the risks of operation are significantly increased, joint replacement may still be an effective option of treatment and a holistic approach to the issue must be maintained.[7] It further advises use of weight management services and patient-initiated return. Trusts should decide their own stance on the issue and can incorporate this into their own referral pathways.

The virtual fracture clinic was first reported by Jayaram et al. as an effective tool in reducing unnecessary clinic appointments and improving the patient experience.[8] The service redesign was also analysed for cost savings and found that over a period of 2009–2014 the departmental staffing cost rose 4% compared to a national increase of 16%. There was also a fall in outpatient appointments of 15% compared to national fall of 5%. They conclude an overall reduction in use of staff resources and identify a potential to achieve significant cost savings.[9] The success of this has led to national uptake of virtual fracture clinics, and reports of substantial cost savings to trusts upon adopting them.[10]

Whilst the nature of trauma patients is significantly different to that of elective knee pathology, the optimisation of the service brought by the clinic can be sought for. The appointments department managerial staff were approached and the cost of an outpatient clinic appointment was given as £120. The patients are indeed given a text reminder for their appointment quoting this figure to encourage them to attend or cancel their appointment. Of the 658 patients whose referral were returned, subtracting the number re-referred and those given return appointments, 619 appointments were saved. At a cost of £120 per appointment, this leads to a real terms cost saving of £74,280. This is the cost purely for the clinic appointments and does not consider the sizable cost to the patient in terms of time and money spent to attend, and in some cases to the trust to arrange hospital transport.

There has been some criticism of the new protocol from GPs who have had their referrals returned, however where possible their reasons and feedback has been reviewed and incorporated in our practice. In all communications it is made clear the intension is not to try to add to the GPs workload or restrict access to advice and services in anyway, rather we aim to improve the efficiency of the patients healthcare journey. A GP can be placed in a difficult situation if a patient is not satisfied with the outcome of their referral. We ensure the GPs feel comfortable in re-referring patients who they feel still would benefit from specialist consultation. GPs are able to send their feedback or concerns in written format directly to the reviewing consultant via email or SCI-gateway. Small matters could be directly addressed and responded to, bigger issues which may warrant a change in policy or procedure are discussed at the monthly departmental meeting where clinical duties are cut and all staff are expected to attend. The results of our study show no significant increase in the re-referral rate which is reassuring. In our geographical region many GPs are able to perform steroid injections which can be an effective treatment for early osteoarthritis, any practices however which are unable to offer this service are still able to refer to orthopaedics for this. All GPs are also able to make direct referrals to physiotherapy and orthotics, the reviewing orthopaedic consultant can also directly refer to these services if more specialised services are needed, this further streamlines the patients journey.

The impact on patient satisfaction should also be considered. Reducing unnecessary appointments will provide a time and cost saving to patient and can be in their best interest. However, the patients' expectations may not be fulfilled if they are wishing to be seen by a specialist. Ensuring sound education for the patients into their condition and the best evidenced based practice will allow increased satisfaction. Reassuring rates of patient satisfaction have been documented by Little et al. who report ton their experience of a virtual hand clinic. They show 99.3% of patients were satisfied after being discharged directly with advice for self care.[11]

Virtual follow-up clinics for arthroplasty have gained popularity since services have been re-instated after the first COVID-19 wave. El-Ashmaway et al. adopted this approach prior to the pandemic and have reported on 1749 patients who had virtual post-operative follow-up. They report after an initial consultation 6 weeks post-operatively patients were followed up via telephone call, postal survey and attendance at local clinic with Xray facilities at their convenience. They report only 3% of patients subsequently needed consultant face to face review and patient satisfaction was 89.29%.[12] Hart et al. have investigated the routine follow-up of 938 patients, showing no abnormalities were seen on radiographs taken 1 year post-operatively. They advise substantial advances in surgical technique and biomaterials now call into question the clinical value of routine radiographs in asymptomatic patients.[13] This gives further scope for optimisation of virtual follow-up pathways and more targeted use of both face to face clinics and radiography facilities.

Hampton et al. have shown a 73.2% increase in their inpatient waiting list over a 12 month period after the first wave of COVID-19, however they also note a 49.7% reduction in new outpatient referrals waiting to be seen.[14] They propose

this is due to public health messages warning to only access medical services if absolutely necessary during this challenging time. Demand for hip and knee arthroplasty is increasing year on year, and there is likely to be an influx of new referrals to outpatient orthopaedic services now that access to routine healthcare is less restricted.[15] The current study is not intended to be a tool for rationing the available resources, however can be implemented to ensure services run in the most efficient manner, and valuable appointments are utilized by the most appropriate patients.

In conclusion, the virtual knee clinic is new protocol whereby a consultant was given designated clinical time to review all referrals for elective knee clinic appointments. This allowed more appropriate triage of services, and reduction in unnecessary appointments. This provided more effective use of clinical time and reduced therapeutic inertia. The recommendation of this study is a virtual knee clinic is an effective tool for streamlining elective orthopaedic services and ensuring the most appropriate patients are reviewed in clinic.

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Declaration of competing interest

All authors have no conflicts of interest to declare.

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