

## Inclusion of Plain-film Radiographs with GP Referrals to Lower-limb Orthopaedic Clinics: A Retrospective Study

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### Abstract

**Background:** It has been reported that 40% of new patients referred to orthopaedic clinics had radiographs in the previous 12 months. This means that radiographs very often have to be obtained during clinics, thus increasing out-patient clinic waiting time. This is especially so in District General Hospitals (DGHs) where long out-patient clinic waiting times cause dissatisfaction among patients.

**Purpose:** To determine whether new patients to orthopaedic clinics were being referred with plain film radiographs.

**Design and setting:** Retrospective study over a one month period in a DGH and a Tertiary referral centre.

**Method:** All new patient referrals to two consultant surgeons in a DGH and to four consultants in a Tertiary referral centre were reviewed over a one-month period to identify whether radiographs had been performed prior to referral. Information on previous radiographs was obtained from GP referral letters, orthopaedic clinic letters and this was verified through the imaging system at the hospitals.

**Results:** There were 414 patients seen in the two hospitals in the study period, of which 102 were new GP referrals. 37.3% of these new patients were referred with no plain-film radiographs.

**Conclusion:** More than a third of new patient GP referrals to orthopaedic clinics were not accompanied by plain-film radiographs. The efficiency of clinics and patient satisfaction is likely to be improved if this is addressed.

**Keywords:** General practice; Orthopaedics; Out-patients; Patient satisfaction; Radiographs

### Introduction

The Hospital Episode Statistics for out-patient activity 2014-2015 reported that 51.2% of first attendances to all specialty clinics were referred by General Practitioners [1]. Orthopaedics was second on the list of specialties with the most attendances at 8.8% [1]. A significant proportion of these patients will require at least one imaging study to aid diagnosis and treatment planning. Pathways have been created where primary care services can access clinical imaging services to enhance patient care [2]. The most widely available and frequently requested imaging is the plain-film radiograph. In the Accident and Emergency (A/E) department, when patients present with joint pathology, plain-film radiographs are likely to be requested prior to orthopaedic referral. It would similarly be expected to hold true across all specialties referring joint pathologies to orthopaedics, regardless of the acute or chronic nature.

Beggs reported in the British Journal of General Practice that 40% of new patients referred to orthopaedic clinics had radiographs in the previous twelve months [3]. This means that radiographs often have to be obtained during clinics, thus increasing outpatient clinic waiting time. This is especially so in District General Hospitals (DGHs) where long outpatient clinic waiting times cause dissatisfaction among

patients [4,5]. Waiting times are especially longer in DGHs as they cater for trauma as well as elective services.

The radiology department will have the additional and often unpredictable burden of imaging patients from the A/E department and fracture clinics. Subsequent delays may occur and there will inevitably be a knock-on effect on the overall time to completion of the elective clinic. This will in turn impact on the day schedule of individual patients and on the doctors in that clinic. For example, there could be delays in arriving at other clinics or theatre sessions scheduled after the elective clinic in question. The result is a degree of avoidable stress to patients, doctors, clinic nurses and radiographers.

The aim of our study was to identify whether new patients to orthopaedic clinics were being referred with plain film radiographs.

### Method

All new patient referrals to two consultant surgeons during a one month period in a DGH and to four consultants in a Tertiary referral centre were reviewed to identify whether radiographs had been performed prior to referral. The clinics covered were lower-limb arthroplasty, for which it is routine practice to require plain film radiographs.

Information on previous radiographs was obtained from GP referral letters, orthopaedic clinic letters and this was verified through the

imaging system at the hospitals. The imaging system at the tertiary centre covered all forms of investigative imaging studies performed not just at the hospital, but also in the two large neighboring hospitals where GPs can send patients to have imaging studies.

## Results

A combined total of 414 patients were reviewed between two hospitals, including 102 new patient referrals from GPs. Thirty-eight (37.3%) of these new patients were referred with no plain-film radiographs (Table 1).

Variables	District General Hospital	Tertiary Referral Centre	Combined
Total number of patients	156	258	414
Number of new patients	49	53	102
Number of patients with no radiographs	21 (42.9%)	17 (32.1%)	38(37.3%)

**Table 1:** Number of new referrals with no plain film radiographs.

Hundred fifty-six patients were seen across eight clinics by two consultants in a one month period at the DGH, including 49 new referrals. Of these new patients, 21 (43%) did not have radiographs prior to the consultation. In the tertiary centre, 258 patients were seen across fourteen clinics by four consultants, including 53 new referrals. Of these new patients, 17 (32%) had no previous radiographs.

All of these patients with no radiographs were imaged on attendance to the clinics. The GP letters of referral for these patients failed to mention that there were any previous radiographs.

## Discussion

Our study was aimed at determining whether new patient GP referrals to elective lower-limb orthopaedic clinics included plain-film radiographs of the joints with pathology. Ideally, all GP referrals to orthopaedic clinics would include plain radiographic films of the relevant joints. The benefit of having radiographs available prior to the out-patient clinic is that the patient does not have to make a trip to another department. They can be seen promptly and closer to the allocated clinic time. It is not surprising that longer out-patient clinic waiting time leads to increased dissatisfaction among patients [4,5].

Studies have consistently shown a relationship between longer waiting times and decreased patient satisfaction and this is common across specialties like primary care, emergency medicine and outpatient settings [6]. A study by Huang found that patient were 'reasonably satisfied' with waiting times up to 37 minutes in the out-patient setting [7]. Bar-Dayyan et al. conducted a study into improving patient satisfaction in the military primary care clinic setting. They found that decreasing clinic waiting times resulted in improved patient satisfaction. They stressed the importance of the 'time factor' and recommended this as a strategy worth consideration in orthopaedic practice [8]. More recent studies by Kreitz et al. have also added further evidence to the improvement of patient satisfaction by reducing clinic waiting times [9]. There is also evidence suggesting that older patients tend to report higher satisfaction scores than younger patients despite equally long waiting times [10].

## Strength and limitations

To the authors' knowledge, this is the first study to focus directly on radiograph inclusion with new GP referrals to lower-limb orthopaedic clinics, with a view to improving patient satisfaction and the efficiency of out-patient clinics. Radiograph inclusion has been reported on previously in terms of radiation exposure and financial implications,

but not from the perspective of patient satisfaction with their clinic journey. We hope to encourage further study based on our findings.

GP referrals for patients with no available radiographs on the imaging system and no mention of radiographic studies in the GP letters were included in the 'no radiographs' category. It is, however, possible that radiographs were obtained for some of these patients, but not available for viewing on the hospital imaging system due to problems accessing through image transfer to the imaging database. This further highlights the need for mentioning radiograph inclusion as part of the GP referral letter.

The authors have attempted to obtain more representative results by reviewing data from both a DGH and a tertiary centre. These two hospitals are also placed in different counties. Despite this, the findings from this study may not be applicable to all General Practice referrals across the United Kingdom. The sample size is just over 100 new patients and the study would have more power if performed on a much larger scale, with a larger number on new referrals across more counties.

Our study did not investigate the actual duration of delays in the clinics. It would have been interesting to record time spent in the radiology department, total time from arrival to consultation and total time from arrival to departure from clinic, for each patient. This coupled with patient satisfaction scores would further strengthen the argument the authors are making for GP referrals accompanying radiographs.

A study published in 1989 by Bransby-Zachary and Sutherland reviewed 420 new patients and found that 141 (33.6%) patients were referred with radiographs by GPs [11]. Subsequently, in 1997 Beggs recorded that 40.2% of new patients referred by GPs had radiographs obtained in the previous 12 months [3]. This study consisted of 500 new patients including 201 who had radiographs performed as part of the referral. The results from our study reveal that 63% patients were referred with radiographs so there has been some improvement over time but still room for improvement.

## Clinical Implications

It would be ideal if GP referrals to orthopaedic clinics included plain film radiographs of the joint concerned. It would help if the letters state that radiographs have been obtained or organised and the locations. In order to eliminate any ambiguity with regards to radiograph views, the authors suggest standard anteroposterior and lateral weight-bearing radiographs be requested by GPs. Any additional views deemed

essential will be obtained by the orthopaedic surgeon in the out-patient clinic after assessing the patient.

There are four benefits to encouraging GPs to obtain plain-film radiographs when referring new patients to orthopaedic clinics. First and foremost, we can improve patient satisfaction. We can also improve the efficiency of out-patient elective orthopaedic clinics which leads to more efficient use of precious hospital resources. Thirdly, as this change is applicable to all elective orthopaedic clinics (upper-limb, lower-limb including foot and ankle and spines), we would enhance efficiency across the National Health Service. Finally, carrying out early imaging of patients if found to be negative can exclude disease, reassure patients and prevent unnecessary referrals [2].

### Recommendations

We would recommend that new patient referral letters by the GP to the orthopaedic clinic should include a statement on whether x-rays have been performed or not on the joint concerned. Ideally guidelines would be set up where the hospital and the local Clinical Commissioning Group (CCG) would agree a policy where all new referrals to elective arthroplasty clinics would include x-rays of the joint in question. In certain circumstances, patients may not be able to get x-rays done prior to referral. This is acceptable as long as the referral letters indicate this to help orthopaedic clinicians make arrangements to prevent in-clinic delays. To improve this service a triage system could be made where patients referred without an x-ray and no valid reason for this would be delayed in being seen in the elective clinic until appropriate x-rays are available. The patients with x-rays available on referral would be given priority. This would encourage all GPs to adhere to the policy. Roland et al. [12] carried out a survey with GPs and consultant Orthopaedic surgeons with respect to improving care of patients in the orthopaedic outpatient referrals. They have concluded that developing agreed referral guidelines might help general practitioners to make more effective use of hospital services.

The King's fund research paper [13] looking at the quality of GP diagnosis and referral has suggested the referral process should have appropriate investigations performed prior to referral. Gran et al. [14] and Graydon et al. [15] have both highlighted the importance of investigations in improving the quality of the referral letter to the rheumatology outpatient clinic. The quality of GP referral similarly in elective orthopaedics could be improved further by auditing the process of including appropriate radiographs and providing feedback by consultants to GP practices.

### Additional information

#### Ethical approval

This study has been registered with the Robert Jones and Agnes Hunt Hospital's Audit and Research department.

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