**Abstract – Rheumatology Outpatient Clinic Backlog**

**Title:**

*Management of patients with chronic disease in a Rheumatology outpatient setting during the COVID-19 pandemic awaiting follow up appointments*

*~~How are we dealing with the outpatient “backlog” generated by disruption during the COVID-19 Pandemic in the Rheumatology department?~~*

**Background**

During the COVID-19 pandemic we were unable to provide regular outpatient services for patients with chronic rheumatic diseases. Resultantly a “backlog” of approximately 6800 patients on disease modifying therapies without an allocated follow up appointment had accrued by September 2021. We aim to quantify this cohort and analyse our attempts to deliver care remotely.

~~As a result of the COVID-19 pandemic we have accumulated a significant backlog of patients with inflammatory conditions, many of whom are established on immune therapies, and who need regular review to ensure their safety and determine the efficacy of their treatment. We have reserved our outpatient clinic appointments for patients needing urgent review but this has meant a substantial delay in regular review for patients who are not currently indicating any urgent problems. We want to understand the nature of the backlog in terms of the types of diagnosis and treatment, as well as documenting how we are attempting to deal with the backlog through a variety of types of consultation.~~

~~Because we are currently unable to book patients into a clinic appointment either for a face-to-face, telephone or video consultation, they remain on the backlog. However, once they have had an evaluation either by remote consultation or by direct consultation (face-to-face, telephone or video) the date on which they are recorded as being on the backlog (or “status date”) is updated to reflect that date within our electronic systems.~~

~~Therefore, to demonstrate our clinical impact on the backlog we cannot show a reduction in the total numbers of patients who are awaiting outpatient follow up, but we should be able to demonstrate change in the numbers of patients waiting on the backlog for longer than a certain period.~~

~~The backlog of patients in September 2021 was approximately 6800.~~

~~We have used three main methods to allow us to assess patients who are currently on the backlog. The first method is a face-to-face clinic appointment; the second method is a virtual consultation either by telephone or video; the third method is a remote consultation (the patients are sent a link to an electronic form which they complete giving us details of their current state, which we import into our database, with a summary and calculation of any patient reported outcome measures which are presented for review by the clinician who can decide on how best to manage the patient). The remote clinical management project is a separate audit project (ref 6500) but data from it are included in this project.~~

**~~Aims~~**

~~This project has two main aims~~

1. ~~To collect data from the hospitals ‘Revenue Cycle’ system on the number of patients per calendar month who are on the backlog, and measure how this number changes over time – with a view to assessing how well the department is clearing this backlog~~
2. ~~To understand the nature of the consultations that have contributed to dealing with patients on the backlog, using data from remote management databases and clinic appointment outcome forms – including types of consultations, diagnoses and follow up/management outcomes.~~

~~The beneficial outcomes of this project are:~~

* ~~To better understand the movement of patients through our department, which will help to identify any patients who have been waiting for substantial time without any interaction.~~
* ~~To better understand the demographic and diagnostic details of patients in our backlog and how that has changed over this period.~~
* ~~To observe any changes to underlying treatments especially of immunotherapy for patients on the backlog.~~

**Methods:**

We selected a 12-month timeframe May 2020-May 2021 and analysed the number of patients with no follow up since then. Of the ~6800 patients on the backlog, 3259 were within this 12-month window in September 2021.We revisited how many patients remained in that cohort on 4 separate assessments during the period September 2021 – March 2022. We assessed how these patients progressed through our service using face-to-face, telemedicine, and using electronic remote management forms (RMFs).

**~~Backlog~~**

~~In order to ascertain the monthly number of patients on the backlog, we used trust’s Electronic Patient Record (EPR), which has a built in system called the ‘Revenue Cycle’ on which an overview of patient encounters can be viewed: each encounter has a documented “status date” indicating the point of their last clinical encounter on the electronic system, which is used as a surrogate for their last clinic appointment (though there are some assumptions and caveats in this methodology).~~

~~Using this system, we could record the number of patients with a status date within each calendar month during our period of interest (the 12 month period May 2020 to May 2021). We repeated the data collection once a month over a three-month period (in September, October, and November 2021), as well as a later time point (6 months) in March 2022. This allowed us to prospectively review the changing numbers of patients who remained on the backlog.~~

**~~Remote Management~~**

~~To evaluate the use of remote management forms and their contribution to the backlog, data was used from the concurrent ‘Remote Management Forms’ project – which included the details of patients who had submitted electronic forms. Each for is a triage questionnaire, and included relevant questions to calculate disease severity scores, alongside information about medications, side effects and other disease factors. There were separate remote management forms created for each of the following diagnostic groups: Ankylosing Spondylitis, SLE and associated connective tissue disorders, Rheumatoid Arthritis, Vasculitis (including multiple specific diagnoses), and Psoriatic Arthritis.~~

**~~Consultation Data~~**

~~Data from our main rheumatology outcome form (RH077) which has replaced our clinical documentation of the patient encounter (face-to-face, telephone and video encounters), and data from this is stored within the Rheumatology department servers. We extracted this data without patient identifying information for analysis. The treatment forms for every encounter provide information on the diagnosis of the patients on the backlog and of any treatments or changes in treatment being made during this time.~~

**~~Data Analysis + Statistics~~**

~~Data was analysed in Microsoft Excel (Office 365) and R (v. 4.0.1) software.~~

**Results**

The number of patients on the backlog in the May20-May21 period had reduced from 3259 to 960 by March 2022 (a 71% reduction). There was no statistically significant change in the distribution of patients across the May20-May21 period between assessments – implying the “shape” of the backlog remained the same. Chi-square test for trend showed a statistically significant, linear change in the number of patients per month across all four assessments (p<0.0000004).

Of 1956 RMFs submitted by patients September 2021-March 2022, 261 were complete with a previous appointment date. 154/261 (59%) were from patients in our 12-month backlog period, indicating a preferential use of RMFs to target backlog patients. Between 2-8% of patients on the backlog were managed using RMFs.

**~~Characterising the Backlog~~**

~~The data represented in Figures 1A and B demonstrate how the number of patients on the backlog with a status date during our period of interest declined over time, with a fall in both the total number of patients and the patients waiting in each month.~~

* 1. ~~There was no statistically significant change in the median number and distribution of patients across the 12 month period between audit cycles (Wilcoxon Sign Rank test - results not included here), implying the “shape” of the backlog remains the same.~~
  2. ~~There was a statistically significant change in the total number of patients on the backlog (Chi-square test, p-value = 5.89e-274 ), with a statistically significant decrease between each of the four audit cycles (results not included here)~~
  3. ~~A Chi-square test for trend (with the assumption of the same proportion of patients in each month of the backlog at each time point – as supported by our analysis of backlog “shape” (see a., above)), supported a statistically significant, linear decrease in the number of patients in each month of the backlog period across all four cycles of the audit process (p-value = 3e-07).~~

**~~Analysis of the Remote Management Forms~~**

~~The total number of Remote Management Form responses collated in database was 1956. Fewer than half (745) of these forms were submitted during the time this audit was conducted (i.e. since 17~~~~th~~ ~~September 2021). Much of the data collected from the forms was incomplete, most relevant to our analysis is the absence of a known previous appointment date, which is required to identify patients completing these forms whose status date lay within the May 2020-21 backlog period. 261 forms were complete with a previous appointment, of which 154 forms were completed by patients on the backlog.~~

~~Table 1 and Figure 2 demonstrate the numerical and percentage contribution of remote management forms to shifting patients from the backlog during the period of our audit (Sep 21 – Mar 22).~~

**Conclusion + Discussion**

We are managing to reduce the backlog of outpatient follow up due to COVID-19, and remote management forms make a sizeable contribution of to this reduction; these results likely underestimate the effect of RMFs due to this dataset being incomplete.

~~The results presented here demonstrate that our centre is effectively clearing the outpatient backlog that has accumulated due to the COVID-19 pandemic. Not only is the overall number of patients waiting reducing, but this reduction is coming across every month of our 12-month period of interest. We have shown, however, that the “shape” of the backlog is not changing, and that there is no preferential effect of shifting those patients who have been waiting longest from the backlog.~~

~~The analysis of the remote management forms submitted by patients during the period of our study shows a small contribution of remote management forms (which avoid telephone/video or face-to-face consultations) to the removal of patients from the backlog (Table 1 and Fig. 2). The data presented here demonstrates an increase in the percentage of patients shifted from the backlog by remote management form over the 6 months of this audit cycle to approximately 8%. In fact, this data is very incomplete as analysis was limited by an absence of patient-submitted “previous appointment date”. Therefore, these results likely indicate an under-estimate of the effect forms played in managing the outpatient backlog.~~

~~It should be noted that the period covered in Audit Cycle 4 is 4 months (compared to 1 month for the previous cycles). It may be possible using the Rheumatology database and the Electronic Patient Record to ‘complete’ the remote management data with patient appointment dates and derive a more accurate estimation of the share of Backlog patients reviewed by electronic form compared to conventional consultations.~~

**[FIGURES OVERLEAF]**

**Figures**

**Chart

Description automatically generatedFigure 1**

**Figure 2**

**Chart, bar chart

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**Table 1**

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