

SERVICE EVALUATION

Was the impact of COVID-19 on a spinal triage service as significant as expected? A retrospective service evaluation: Results and evaluation

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Abstract

Objectives: The aim of this evaluation was to review service outcomes for a spinal advanced practitioner physiotherapy (APP) triage service during COVID-19. The evaluation compares outcomes gathered against pre-pandemic data and evaluates the impact of the pandemic on service delivery.

Design: Service-level data were extracted between 2019 and 2021 including: total referrals, new and follow-up appointments, telehealth consultation rates, discharges at first appointment, magnetic resonance imaging and injection request rates. Multidisciplinary-team (MDT) meeting notes with Spinal Surgeons were reviewed and surgical conversion calculated. Patient satisfaction data were collated using: Friends and Family test, specific questionnaires, individual and formal complaints and compliments, and telephone surveys. Analysis was performed by the lead author and results were compared between years using analysis of variance, as well as with previously reported data.

Setting: 'Nottingham University Hospitals' National Health Services Trust is a secondary care spinal unit, using APPs to triage, assess and manage spinal conditions.

Results: In 2020, 407 (22%; $p = 0.02$) less patients were referred to the service, however, there was a significant increase in the number of telehealth attendances (mean = 50% in 2020 from 2019, $p = 0.005$). Only 13% ($n = 1342$) patients were discussed at MDT, of which 8% ($n = 808$) were discussed for surgical consideration, and 36% ($n = 268$) were directly listed. High levels of patient satisfaction were reported by 89% ($n = 1028$ of 1160) patients.

Conclusion: This service evaluation demonstrates a statistically significant change in numbers of patients referred and telehealth attendances in the year of the pandemic (2020). Surgical conversion declined during the pandemic, and did not recover post-pandemic.

KEYWORDS

multi-disciplinary meetings, service evaluation, spinal advanced triage practitioner, spinal services, spinal triage

1 | INTRODUCTION

Spinal advanced practitioner physiotherapists (APPs) have become embedded in routine care for low back pain, radicular pain and degenerative conditions in spinal services (Hutton, 2019). In the United Kingdom (UK) National Health Service, waiting times are longest for musculoskeletal conditions and outpatient appointments. Previous literature has suggested that 92% of those referred into a spinal secondary care unit may not require surgical review or consultation (Wood et al., 2016). These non-surgical patients create increased barriers to care for those requiring surgical intervention, as the time to diagnosis and treatment for all patients is increased. APPs have demonstrated benefit and increased use across orthopaedic and spinal services. However, few services in the UK have evaluated or audited their spinal APP services in recent years (Fennelly et al., 2018; Flynn, 2018; Kerridge-Weeks & Langridge, 2016; Roddy et al., 2013; Wood et al., 2016).

APP roles are 'advanced practice' roles or 'extended scope' as they extend beyond the remit of traditionally defined non-medical roles, and perform tasks traditionally associated with other medical professionals (Syme et al., 2013). APPs frequently have post-graduate qualifications or a high level of experience and training within their role, and work to the four pillars (clinical, education, research and leadership) of advanced practice in the UK (Health Education England NHS England and Skills for Health, 2018). APPs can assess patients, arrange diagnostic testing, independently decide on management recommendations, and have been described as 'key to the success of spinal pathways' in the UK (Hutton, 2019). APP roles were described in the UK as early as 1994 (Hourigan and Weatherley, 1994, 1995), and have grown in utilisation across both primary and secondary care orthopaedic in the UK. A recent meta-analysis demonstrated reduced waiting times for patients (Samsson et al., 2020), more holistic care packages (Bath et al., 2012; Samsson et al., 2020), high patient satisfaction rates (Trostrup et al., 2020), high rates of independent management (Fennelly et al., 2018; Kerridge-Weeks & Langridge, 2016; Wood et al., 2016) and lower costs (Samsson et al., 2020; Trostrup et al., 2020).

The COVID-19 pandemic had far-reaching impacts on National Health Services (NHS) across the UK and the world. All face-to-face routine elective activity was stopped with the nationally enforced lockdown, resulting in restriction to care provision at varying levels until the end of January 2022. The initial impact saw increased hospital admissions, NHS staff redeployment, and conversion of elective orthopaedic wards to medical COVID wards. Since the end of the pandemic, reported NHS analyses suggest that elective orthopaedic surgery has only reached 50% of pre-COVID levels (Gregory, 2022). For the patients surgically listed and awaiting spinal surgery, significant delay had occurred. For many, the wait time has led to gradual decline in both neurological function and general medical well-being. This was evident in a review of cervical myelopathy patients awaiting surgery seen at our NHS Trust (Dunstan et al., 2022).

As a spinal APP triage team, our service has continued to function throughout COVID-19. However, the effect of the pandemic has been far reaching and has influenced many aspects of the surgical triage pathway. This service evaluation aims to evaluate the impact of COVID-19 on service delivery and surgical decision-making. A secondary objective is to review the delivery and outcomes of the APP service in comparison to previously reported figures (Wood et al., 2016).

1.1 | Benchmarking data

A retrospective service evaluation was conducted over a 3-year period to assess the impact of COVID-19 on the APP spinal triage service, and evaluate the service as a whole. This was based at the Nottingham University Hospitals NHS trust. The APP spinal triage service has been in place for the past 13 years. There are no nationally approved standards to which an APP spinal triage service should conform, thus previously reported figures were used as a comparator (Table 1).

1.2 | APP service structure

1.2.1 | Paper triage

Since 2019, the APP team has triaged all referrals into the spinal outpatient department. Exclusions for the APP team are scoliosis, acute fractures, suspected metastatic disease and named referrals to certain consultants. Appointment letters are sent by post and include a booklet describing the APP service. This booklet was updated in 2021 with patient feedback.

1.2.2 | Surgical triage

APPs assessed patients in the spinal outpatient department. New patients received a 30-min appointment, and follow-ups were either 30-min in-person, or 15-min for telephone follow-ups. APPs would assess the patient, agree a management plan, organise any imaging or diagnostic requests and dictate a letter to the referrer (with the patient copied in) during this time.

1.2.3 | Consultant review

At the start of 2019, two dedicated multi-disciplinary team (MDT) meetings with Consultant Spinal surgeon occurred. Each MDT meeting was held with an APP and Consultant Spinal surgeon. At the end of 2019, one Consultant Spinal Surgeon in parallel with the Consultant Physiotherapist began monthly in-person 3-h MDT clinics to see more complex patients for surgical suitability. Spreadsheets including patient information for MDT meetings with Consultant

TABLE 1 Data previously reported in service evaluation between 2012 and 2014 (Wood et al., 2016)

	Total (n, % of total)
Total seen	2651
2012–2013	1248
2013–2014	1403
DNA total	314 (12%)
DNA new patient appointment	186 (7%)
DNA follow-up appointment	128 (5%)
Discharged at first appointment	383 (25%)
MRI	629 (24%)
Injections	477 (18%)
Surgical MDT discussion	171 (7%)
Management MDT (% of total)	36 (1%)
Surgical conversion (% of those discussed surgical MDT)	138 (81%)
Patient satisfaction	139 (5%)
Would recommend this service to family and friends	137 (99%)

Abbreviations: DNA, did not attend; MDT, multidisciplinary team meeting; MRI, magnetic resonance imaging.

Spinal Surgeons (two per month) and face-to-face MDTs (one per month) were retrospectively reviewed by two clinicians independently to count number discussed, reason for discussion, surgical listing and outcome.

2 | STUDY METHODS

2.1 | Data collection

Clinic utilisation data extracted from the hospital's online dashboard were compared across years with counts and percentages. Data extracted included number and percentage of new and follow-up appointments, telehealth appointments, number discharged at first contact, non-attendance rates, average weeks wait for new- and follow-up appointments. Further data were extracted using the business intelligence function inbuilt onto the local hospital system (Medway) to allow for injections requested and number of MRIs requested. Data regarding wait-list clinic initiatives were extracted retrospectively from submitted claim forms, with hours claimed per document per clinician counted and summed.

2.2 | Patient satisfaction data

Patient satisfaction data were collected through five main methods:

1) The Friends and Family test (NHS England, 2013) reports for the spinal outpatient department were extracted using business intelligence. This tests requests responders to rate their likelihood of referring the service to their friends and family (NHS, 2015).

This report was for the whole of spinal outpatients, not for the APP service only. The data analysts were only able to extract this for complete years and so the data represented was for April 2019 to March 2020, and April 2020 to December 2021.

- 2) Health care assistants contacted a convenience sample of patients in early May 2020 who had had a new telehealth consultation using the Doctor, Doctor Platform. Their experience was sought using predefined questions: mobility status, distance from hospital, whether video was more or less convenient, communication ease, and *their* choice for future appointments.
- 3) Patient satisfaction questionnaires were collected anonymously by health care assistants after appointments were completed in the spinal outpatient department. The patient satisfaction questionnaire has been used in previous APP evaluations. It seeks to understand whether patients were satisfied with the outcomes and recommendations of their consultation, whether they were involved as much as they would have liked to be, and whether they would recommend the service.
- 4) Patients reporting frustration or dissatisfaction with the service received were consented to be contacted by the lead author (LW), their stories heard, and mitigating changes suggested and addressed where possible to prevent repeat of the frustrations encountered. Each patient had a 1-h telephonic consultation and journey review, and was offered to attend a meeting where responses and proposed changes were fed back as a group. As a result of this group meeting, one further meeting was held with patient documentation for approval.
- 5) Concerns, compliments and complaints sent to the team via the Patient Advisory Liaison Service (PALS) were captured on a spreadsheet and counted. Themes were reviewed retrospectively.

2.3 | Data analysis

Data extracted were compared to previous service evaluation data. Each value was described as counts and percentages of the total. Direct comparisons were made between the years evaluated (2019, 2020, and 2021). Where monthly data was collected, 3-way analysis of variance (ANOVA) testing was applied to test for differences between the years. Where statistically significant differences were identified, univariate regression with Sheffe and Tukey post-hoc analysis was performed to test for year on year statistically significant findings, reported in reported as mean difference (MD) and *F* value.

3 | RESULTS

3.1 | Clinic utilisation

A total of 10,635 patients were seen by the APP service between 2019 and 2021 (see Table 2). Over the COVID-19 pandemic (2020) a decline of $n = 407$ (22%) was noted in referrals as well as in new patients seen ($n = 385$ less; $p = 0.02$). However, there was a significant increase in the number of telehealth new patient attendances (mean = 50% in 2020, $p < 0.01$). Waiting times for new patient (2019 to 2021–2.11 MD, $p = 0.02$) and follow-up (2019 to 2021–2.14 MD, $p = 0.02$) appointments with the APP team gradually increased over the 3-year period. When compared to Spinal Surgical Consultants within the service over the same time frame, the average wait for

new patient appointments was 10 weeks (range 7.3–14.0 weeks). Waiting times for follow-up appointments with the APP team averaged 6.5 weeks (5.3–7.7) compared to 12.9 weeks (range 8.7–17.0) for a follow-up appointment with a Spinal Consultant.

Numbers of patients seen in total remained similar between 2019 and 2020, but then increased into 2021 (18% increase in workload). The observed increase in workload in 2021 was absorbed through an increase in waiting list initiatives to mitigate the capacity limitations with an additional 305 h of wait-list initiative clinics delivered (see Table 3).

3.2 | Multi-disciplinary review

Only 13% (1305) patients required Consultant input into their care (see Table 4). A total of 808 patients (8%) were discussed in an MDT setting with a Consultant Spinal Surgeon for a surgical opinion. Most of these patients were either listed directly for surgery or reviewed in consultant clinic, however there was an increase in patients reviewed by consultants in 2020, and a slight reduction in directly

TABLE 3 Table to demonstrate service changes between 2019 and 2021

Team	2019	2020	2021
Clinical hours delivered (average per week)	96	94	127
Additional hours delivered over the year	103.5	56.5	305

TABLE 2 Counts and percentages of patients seen in the APP service between 2019 and 2021

	2019	2020	2021	Sig (using ANOVA)	<i>F</i> value
Total seen (<i>n</i>)	3360	3272	4003		
New referrals (% of total seen per year)	1884 (56%)	1477 (45%)	1633 (41%)	0.026 ^a	4.075
Total new patient appointments (% of total seen per year)	1709 (51%)	1324 (40%)	1349 (34%)	0.042 ^a	3.490
Telehealth new patient appointments (% of new patients)	13 (<1%)	660 (50%)	333 (25%)	0.005**	6.386
Average number weeks wait for new appointment	5.4	5.9	7.5	0.022 ^a	4.309
Total follow-up appointments (<i>n</i> , % of total seen per year)	1651 (49%)	1948 (60%)	2654 (66%)	0.000**	10.563
Telehealth follow-up appointments (<i>n</i> , % of follow-ups)	375 (11%)	991 (51%)	1063 (40%)	0.000**	33.051
Average number weeks wait for follow-up appointment	5.3	6.1	7.7	0.020 ^a	4.432
Total did not attend (DNA) (<i>n</i> , % of total seen)	261 (8%)	342 (10%)	577 (14%)		
DNA new (<i>n</i> , % of new patients)	133 (8%)	135 (10%)	144 (11%)	0.893	0.113
DNA FU (<i>n</i> , % of follow-ups)	128 (8%)	207 (11%)	433 (16%)	0.000**	17.846
Discharged at first attendance (<i>n</i> , % of new appointments)	423 (25%)	335 (25%)	376 (28%)	NA	
MRI's requested	631 (17%)	582 (18%)	1623 (41%)	NA	
Injections requested	289 (9%)	278 (8%)	454 (11%)	NA	

^aFor additional data regarding univariate regression between years, please see Supplementary Information S1 and S2. NA refers to values where ANOVA testing was unable to be performed due to the type of data extracted. Please see Appendix 1 for more detail regarding the statistical analyses undertaken. Statistical significance was set at $p = 0.05$, *is $p < 0.05$; **is $p < 0.005$

listed patients. Face-to-face MDTs demonstrated a similar surgical direct listing than virtual MDTs (36% vs. 33%). Only a small proportion of total patients were seen in face-to-face MDT (2% of total seen).

3.3 | Patient satisfaction

Over the 3-year period, satisfaction data were inconsistently collected. A total of 1160 (11% total patients seen) Friends and Family test responses were gathered via the different methods, with 89% ($n = 1028$) recommending the APP service. Please see Table 5 for more detail of the various methods and results of patient satisfaction.

Patients responding to the telephone survey reported that the video consultations more convenient ($n = 13$, 62%) but found communication more difficult ($n = 8$, 38%) most often because they found it difficult to explain their problem. Comments included that

'video was more convenient', but also that face-to-face was 'essential for a proper diagnosis'. These survey results led to face-to-face new patient appointments offered to all patients from September 2020, allowing them choice according to their preference.

Six patients expressed frustration and disappointment with the service received from the APP service. Themes from the individual discussions highlighted problems with communication, clinics running late, lack of information leaflets, unclear expectations for clinic appointments, difficulty in contacting the spinal outpatient team and delays in receiving treatment.

The formally submitted concerns raised related to loss to follow up ($n = 4$), inability to contact the team ($n = 2$), desiring a second opinion ($n = 2$), delays to MRI scans ($n = 2$) and communication difficulties ($n = 2$). The formal complaints involved delays to treatment wherein the patient had a complex presentation which led to multiple Virtual MDT discussions and MRI scans before finally being listed for surgery, and secondly due to assessment by an APP instead of a spinal surgeon.

TABLE 4 Counts and percentages of patients discussed at virtual Consultant multi-disciplinary meetings from 2019 to 2021

	2019	2020	2021
Total Seen in the Year	3360	3272	4003
Virtual MDT			
Patients discussed for surgical consideration (% of total seen in that year)	241 (7%)	210 (6%)	296 (7%)
Surgical listing (% of discussed)	94 (39%)	67 (32%)	107 (36%)
Consultant review (% of discussed)	73 (30%)	100 (48%)	109 (37%)
Surgically appropriate (% of discussed)	166 (69%)	167 (80%)	216 (73%)
Patients discussed for management plan (% of total seen in that year)	262 (8%)	166 (5%)	166 (<1%)
Face-to-Face MDT			
Patients reviewed (% of total seen)	9 (<1%)	84 (3%)	128 (3%)
Surgical listing (% of discussed)	3 (30%)	32 (38%)	37 (29%)
Consultant Review (% of discussed)	N/A	14 (17%)	32 (25%)

TABLE 5 Summary of patient satisfaction responses

	Sample derived from	Total responses	Recommend the service	Strongly recommend the service
Total friends and family tests	Spinal out-patient department	1068 (10% of total seen 2019–2021)	939 (88%)	610 (57%)
Telephone survey	Spinal practitioner virtual new patient appointments	21 (20% of 100 new patients seen in the month of Apr 2020)	18 (of 19 responses, 95%)	10 (53%)
Patient satisfaction questionnaires	Spinal practitioner patients	73 (2% of total seen in 2020)	71 (97%)	
Individual patient reported frustrations	Spinal practitioner patients	6 (<1% total seen in 2021)	N/A	N/A
Formal complaints and compliments	Spinal practitioner patients	13 (<1% total seen 2019–2021)	2 compliments raised, 9 concerns, 2 compliments	
Total	All	1162	1028 (88%)	620 (53%)

4 | DISCUSSION

This service evaluation demonstrates that although there was a statistically significant decrease in referrals received due to COVID-19 in 2020 compared to 2019, the APP service has exceeded previous activity in the year following COVID-19 through both telehealth appointments, and follow-up activity. However, there was a reduction in the number of patients listed for surgery and consultant clinics from MDT during the pandemic. In comparison to previously reported figures, the APP service delivered on average 3 times more activity than that delivered in our previous evaluation (2.85 times busier than 2012/3, 3.2 times busier than 2013/4). Despite this increase in activity, rates of independent management remained high: only 8% of patients seen were discussed for a surgical opinion, and 5% required management discussion.

The impact of COVID-19 on the service appeared to be most marked by increase in work-load post-pandemic, the reduction in referrals during the pandemic and subsequent impact on new patient appointments. Telehealth appointments increased in 2020 (50% new patient appointments $p < 0.01$, 51% follow up appointments $p < 0.0001$). However, patient and clinician feedback resulted in sustained virtual follow-up activity in 2021 (40%) and a reduction in telehealth new patient appointments (8%). The findings of our small patient-evaluation are confirmed by Craig et al. (2022) who reported a satisfaction rate of 36% with telehealth consultations. Qualitative feedback suggested that patients struggled to express themselves, and 78% preferred the option of an in-person appointment. These findings are in contrast to those of Greven et al. (2021) who reported 95% were satisfied or very satisfied with their telehealth consultation. Our service has continued to use telehealth consultations for follow-up appointments, but informal feedback from clinicians suggested the ability to validate a patient's symptoms by both the subjective and objective assessment in the first consultation allowed greater confidence when discharging after the first consultation.

The APP service continued to demonstrate high rates of independent management, similar to other sources of literature and our previous evaluation. Since the initial service review in 2016, the service has grown to see increasingly complex patients, most likely due to Consultants reducing or ceasing their degenerative new patient activity. Despite this, the MDT discussion rate has remained similar, with 7% discussed for surgical consideration in 2012–2014 and a similar proportion discussed in this evaluation, despite the increase in patients seen. There was an increase in the number of patients discussed for management opinions (1% in 2012–2014) however, this number has reduced steadily over the 3-year period (from 8% to <1% of total patients seen), suggesting staff factors and COVID-19 may have been partly responsible. This evaluation suggests that at least 85% of patients were managed independently by APPs, comparable to other spinal APP services: LaFrance et al. (LaFrance et al., 2021) demonstrated an 89.2%

independent management; Fennelly et al. (2018) reported 80% independent management, and Kerridge-Weeks & Langridge (2016) reported 69% independent management. Of those discussed in MDT there was a reduction in surgical listing from MDT meetings during 2020 from 2019 (18% from 20%), and an increase in consultant review (27% from 20%). In contrast to our previous evaluation (Wood et al., 2016), more patients were discussed at MDT (average 13%) than in the previous review (8%). A reason for this may be that more complex patients not previously triaged to APP clinics were now seen in APP clinics as the APPs have become more established, and many Consultants had reduced their new patient appointment capacity. To mitigate the high numbers of patients discussed in MDT for management reasons in 2019, the team developed pathways that were ratified and approved by Consultant Spinal surgeons to improve the management of frequently discussed patients such as asymptomatic myelopathies (Clarke et al., 2021).

COVID-19 may have made many surgeons more hesitant to consider interventional treatment during the pandemic, possibly due to restrictions in waiting lists and capacity, and local pathway restrictions on patient suitability due to perceived greater risk. In Nottingham, all patients over the 65 were restricted from receiving injection therapy in the initial stages of the pandemic. Gregory et al. (Gregory, 2022) reported that overall elective activity in the East Midlands reduced to 36% of pre-pandemic levels post-pandemic (2022).

4.1 | Strengths and weaknesses

This service evaluation builds on previously published data to demonstrate the growth of an APP service over a 10-year period. The evaluation compares the service over a 3-year period, allowing comparisons to be made pre- and post-pandemic, although the staffing team changed at each of these time points. This makes MDT data not directly comparable between years as new staff changes occurred in each year. The data demonstrated here are unique to this service, and may not be generalisable to other services or regions across the UK or world. A further limitation is the small proportion of patient feedback in comparison to the overall numbers of patients seen in the clinics, with limited ability to compare across years. This may be in part due to the increase in telemedicine use and reduced footfall in the hospital. Overall, the APP team grew significantly over the 3-year period, despite COVID-19. The addition of new staff to deliver the APP-led same-day emergency care unit (Wood & Dunstan, 2021), may have over-inflated the reported MRI requests as it was not possible to isolate the location of the staff member requesting imaging. Staff managing patients on the acute emergency care pathway are more likely to request imaging than in the chronic degenerative pathway where more patients are likely to present with existing imaging.

4.2 | Clinical implications

This service evaluation demonstrates the immediate impacts of COVID-19 were not as impactful as initially expected. As APP services become more entrenched in spinal triage delivery, the patient mix is likely to become increasingly complex. This is potentially represented in this review, as despite a highly experienced team, the surgical conversion rate reduced over time. The impact of listing to consultant clinics instead of to direct surgical lists may add an additional unnecessary delay to patients, and clinicians should be mindful of this trend to improve efficiency and the patient journey. Ensuring patient's voices are heard is an important part of improving service delivery. Regular, routine patient satisfaction data allows for improved data capture and more objective measure across time and staff delivery, and should be encouraged.

5 | CONCLUSIONS

The COVID-19 pandemic initially resulted in a reduction in referrals and interventional management, with a resultant increase in activity levels and demand. This service evaluation provides further retrospective evidence of high rates of independent management (87%) and surgical conversion rates (56%) that were sustained despite the pandemic. Reported patient satisfaction levels are high, with most patients likely to recommend the service to their friends and family.

AUTHOR CONTRIBUTIONS

Lianne Wood, Eleanor Dunstan, Matthew Dixon, Carla Eveleigh and Khalid Salem conceived the idea for the manuscript and contributed to data collection and analysis. All authors read, edited and contributed to the manuscript.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This retrospective service evaluation used service level data and was not deemed to require ethics using the HRA decision making tool.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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