

Original article

Base of thumb osteoarthritis in UK interface services – a cohort and survey-based study to assess current practice**Benjamin J. F. Dean¹, Stefan Kluzek², Andrew J. Carr¹, Sally Hopewell¹, Duncan Richards¹, Nicholas Riley³, Andrew Cuff⁴ and the Oxford Base of Thumb Collaborative****Abstract**

Objective. Base of thumb OA (BTOA) is a common age-related disease that has a significant negative impact on quality of life, while little is known about the structure and pathways of interface services. Our aim was to assess disease burden, referral pathways, service structure and management pathways in UK interface services.

Methods. A structured questionnaire was carried out with a participating clinician at each centre to detail the local guidelines and management of BTOA. Five patients referred with BTOA were prospectively identified in each of 32 UK interface centres.

Results. Most centres (72%) had a local guideline and a standardized treatment regime consisting of education (100%), joint protection (100%), range of motion exercises (84%), strengthening exercises (88%), splintage (100%) and use of assistive devices (78%). No centre routinely offered a steroid injection at the first appointment and no centre had a specific threshold for offering an injection. Injection delivery was variable. Most patients had not been referred previously (82%). Most patients used analgesia (72%), but a minority of patients had been treated with a splint (46%), therapy (43%) and steroid injection (27%) prior to their latest attendance.

Conclusion. Most BTOA patients newly referred to interface services have been treated with analgesics and have not received comprehensive multimodal intervention. The management of BTOA at interface services is standardized in terms of education, splintage and therapy. However, there is a lack of standardization in terms of both the threshold for, timing of and mode of delivery of injection therapy.

Key words: thumb base, osteoarthritis, UK, NHS, management, pathways

Rheumatology key messages

- Most new BTOA patients have been treated with analgesics and not multimodal interventions.
- There is a lack of standardization of injection therapy pathways.
- Most interface centres stopped providing steroid injections during the first peak of the pandemic.

Introduction

Base of thumb OA (BTOA) is a common condition that is frequently associated with substantial degrees of

pain, dysfunction and disability [1–3]. The existing evidence suggests that hand OA has a similar impact on health-related quality of life (QoL) as RA [4, 5]. BTOA is the most common form of hand OA and is present in half of patients with symptomatic hand OA [6]. Data from Versus Arthritis demonstrates that ~6% of people ≥45 years of age in the UK have sought treatment for OA of the hand or wrist [7], while the annual consulting incidence for hand OA is 1.3 per 1000 persons [8]. The majority of BT pain is managed in primary care or by referral to interface musculoskeletal services that are run by clinicians including physiotherapists, occupational therapists and doctors, including general practitioners (GPs).

¹Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Botnar Research Centre, University of Oxford, Oxford, ²University of Nottingham, Nottingham, ³Nuffield Orthopaedic Centre, Oxford and ⁴Connect Health Yorkshire, Wakefield, UK

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Correspondence to: Benjamin J. F. Dean, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, Botnar Research Centre, University of Oxford OX3 7LD. E-mail: Benjamin.dean@ndorms.ox.ac.uk

Non-surgical interventions include education, analgesia, joint protection, specific joint exercises, general exercise, acupuncture, heat therapy, weight loss and splint use. Current guidance relating to OA includes that from the National Institute of Health and Care Excellence (NICE) and the British Society of Surgery for the Hand (BSSH), which advises avoiding painful activities, while using analgesia, splintage and corticosteroid injections, with surgery considered to be a 'last resort' [9, 10]. Corticosteroid injections are widely used, however, there is a lack of clear guidance in terms of when and to whom they should be offered, while there is considerable uncertainty regarding their clinical effectiveness [11]. Notably, previous clinical trials relating to corticosteroid injection in BTOA have frequently failed to consider concomitant treatments and have been non-pragmatic in design [11]. Patterns for care for OA in general in UK primary care have been described, however, little is known relating to OA management in interface services, whether based in the community or hospitals [12].

The aim of this study was to assess the current management of BTOA in the UK's interface services.

In this context, the specific aims of this study were to assess the approximate number of new referrals for BTOA received by interface services in the UK,

describe the nature of local guidance and the local management of BTOA and

describe the demographics and previous non-surgical interventions undertaken in patients being treated under a new referral of BTOA.

Methods

We carried out a national multicentre observational cohort study in patients referred to 32 units in the UK. We collected only routine, anonymized data with no change to clinical care pathways. The study was registered at each site as a service evaluation project and, as such, no ethical approval was required, as stated by the Health Research Authority. A total of five patients being treated as part of a new referral for BTOA were prospectively identified from clinics at each of the participating interface units. Interface clinicians were invited to take part via the British Association of Hand Therapy, social media and regional contacts. Any unit that received patient self-referrals or referrals from primary care for patients with BTOA was eligible to take part and was deemed to be an 'interface' service. The patient data, local guidelines and clinician questionnaires were collected between September 2018 and September 2019.

Participants

A standardized data entry spreadsheet was completed for five consecutive patients at each unit who were attending for treatment as part of a new referral of BTOA, using paper and electronic patient records.

Patients with BT pain and other symptoms and/or signs and/or radiological features consistent with BTOA as determined by the participating clinician were included. Patients with post-traumatic arthritis, inflammatory arthritis or who were primarily presenting with another diagnosis, such as carpal tunnel syndrome, were excluded. Note that this clinic attendance may not have been the first clinic attendance of this new referral. The collected data included age, gender, hand dominance, date of appointment, duration of symptoms and non-surgical interventions undertaken prior to this clinic attendance. Participating centres sent copies of their local guidance relating to BTOA, including guidance relating to diagnosis, management and patient education. A structured questionnaire was also undertaken with the participating clinician at each interface unit. This questionnaire assessed specific aspects of the local BTOA pathway, including the specifics of the management of BTOA and specific details relating to the use of injection therapy. Note that for the questions regarding the specifics of injection therapy, if possible, the centres that did not inject gathered this information from their local injecting service; only one site was unable to provide any information about the specifics of their local injection service. Data from the guidance documents and structured questionnaires was extracted into a structured spreadsheet. A second short questionnaire was carried out at the end of July 2020 to assess any changes in practice during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic.

Statistics

The study was done according to Strengthening the Reporting of Observational Studies in Epidemiology guidelines for observational studies [5]. Statistical analysis was carried out using GraphPad Prism version 5.00 for Windows (GraphPad Software, San Diego, CA, USA) and with Stata/IC 16 (StataCorp, College Station, TX, USA). Unless stated otherwise in the characteristics description, numbers represent median [interquartile range (IQR)] for continuous variables and n (%) for categorical variables. Histograms for all data sets were analysed to assess for normality. The Fisher's exact test was used to compare variables between the two groups for categorical data, while unpaired non-parametric continuous data were analysed using the Mann-Whitney U test. Statistical significance was set at a level of $P < 0.05$.

Results

Centres, referral patterns and burden

The details relating to the 32 participating centres are represented in Table 1 and Supplementary Appendix 2, available at *Rheumatology* online. A total of 21 centres were run by a National Health Service (NHS) organization and 11 were run by non-NHS organizations. The mean catchment population per centre was 328 000 patients and the mean number of clinicians per centre

TABLE 1 Centre specifics including staff groups, therapy specifics and follow-up

Factor	Level	Overall, n (%)	Community based, n (%)	Hospital based, n (%)	P-value ^a
N		32	21	11	
Role of participant	Advanced PT	24 (75)	19 (90)	5 (45)	0.005
	Advanced OT	8 (25)	2 (10)	6 (55)	
Referral source	GP only	10 (31)	5 (24)	5 (45)	0.46
	Self and GP	15 (47)	12 (57)	3 (27)	
	Secondary care and GP	4 (13)	2 (10)	2 (18)	
	Secondary care and GP and self	2 (6)	1 (5)	1 (9)	
	GP and PT	1 (3)	1 (5)	0 (0)	
Guideline present for BTOA?		23 (72)	17 (81)	6 (55)	0.11
Clinicians	PTs	4 (13)	4 (19)	0 (0)	0.022
	OTs	2 (6)	0 (0)	2 (18)	
	PTs and OTs	10 (30)	4 (19)	6 (55)	
	PTs/OTs and doctors	6 (19)	4 (19)	2 (18)	
	PTs and doctors	10 (30)	9 (43)	1 (9)	
Diagnosis	Clinical only	31 (97)	20 (95)	11 (100)	0.46
	Clinical and X-ray	1 (3)	1 (5)	0 (0)	
PT performed by the service?		32 (100)	21 (100)	11 (100)	
Therapy is by	PTs	17 (53)	16 (76)	1 (9)	<0.001
	OTs	2 (6)	0 (0)	2 (18)	
	PTs and OTs	13 (41)	5 (24)	8 (73)	
Therapy includes	Education	32 (100)	21 (100)	11 (100)	
	Joint protection	32 (100)	21 (100)	11 (100)	
	ROM exercises	27 (84)	17 (81)	10 (91)	0.46
	Strengthening exercises	28 (88)	18 (86)	10 (91)	0.67
	Functional exercises	27 (84)	17 (81)	10 (91)	0.46
	3 levels as per Taylor	19 (59)	12 (57)	7 (64)	0.72
	General exercise	11 (34)	11 (52)	0 (0)	0.003
	Assistive devices	25 (78)	14 (67)	11 (100)	0.030
Splint used in therapy?		32 (100)	21 (100)	11 (100)	
Type of splint	Flexible non-custom	1 (3)	0 (0)	1 (9)	0.019
	Rigid non-custom	20 (63)	17 (81)	3 (27)	
	Non-custom and then custom	7 (22)	2 (10)	5 (45)	
	Both flexible and rigid non-custom	4 (13)	2 (10)	2 (18)	
No specific criteria for injection		32 (100)	21 (100)	11 (100)	
Outcome used	None	20 (63)	10 (48)	10 (91)	0.080
	EQ-5D	8 (25)	8 (38)	0 (0)	
	DASH	1 (3)	1 (5)	0 (0)	
	VAS pain and qDASH	1 (3)	1 (5)	0 (0)	
	VAS pain	1 (3)	0 (0)	1 (9)	
	MSK-HQ	1 (3)	1 (5)	0 (0)	
Follow-up time (months)	Median (IQR)	1.0 (1.0–2.0)	1.0 (1.0–2.0)	1.0 (1.0–1.0)	0.16*
	≤2 months	18 (62)	10 (53)	8 (80)	0.15
	≥3 months	11 (38)	9 (47)	2 (20)	

^aP-values refer to testing for differences between community-based and hospital-based centres. For categorical variables, the Fisher's exact test was used to compare two groups: community vs hospital based. For continuous variables, the Mann-Whitney *U* test was used to compare two groups: community vs hospital based (marked with an*). DASH: Disabilities of the Arm, Shoulder and Hand; EQ-5D: European Quality of Life 5-Dimensions questionnaire; MSK-HQ: Musculoskeletal Health Questionnaire; qDASH: quick DASH; ROM: range of motion; VAS: visual analogue scale.

was 12.8. A majority (20 centres) had a local guideline for the management of BTOA. The mean number of new BTOA referrals per week per participating centre was 7.5. Given that the approximate catchment population of these 32 units is 14.008 million and the UK's population is 66 million, by extrapolating this rate of referral, we

estimated that there are ~58 800 new patient referrals to interface services with BTOA per annum in the UK.

A total of 11 centres were purely hospital based and were 21 community based (18 were purely community based and 3 also had a hospital-based component). Of these, half ($n = 16$) were based in the community and a

separate organization to secondary care, seven centres were based in a hospital and the same organization to secondary care, while four were based in a hospital and a separate organization to secondary care. Of the 32 participating clinicians, 24 were physiotherapists (PTs) and 8 were occupational therapists (OTs). The most common form of referral was a mixture of GP and self-referrals [15 centres (47%)], followed by GP referrals only [10 centres (31%)]. Centres were staffed by a variety of different clinician groups with OTs being more frequently involved in hospital-based centres. The most common staffing mix in hospital-based centres was PTs and OTs in 6 centres (55%), while the most common in the community-based centres was PTs and doctors in 9 centres (43%).

Local guidelines

Most centres [23 centres (72%)] had a specific guideline relating to BTOA and the remaining 9 did not. The local guidelines referenced NICE guidance (57%), BSSH guidance (48%) and EULAR guidance (39%). Diagnosis (91%) and diagnostic red flags (87%) were mentioned in most of the guidelines. The following aspects of management were specifically mentioned by local guidelines: shared decision making (39%), education provision (96%), specific exercises (87%), strengthening exercises (87%), functional exercises (74%), activity modification/pacing (96%), general exercise (43%), weight loss (43%), thermotherapy (30%), assistive devices (70%), paracetamol (74%), topical NSAIDs (65%), oral NSAIDs (74%), opiates (9%), steroid injection (96%) and surgery (100%). Electrotherapy, glucosamine and acupuncture were not mentioned in any guidelines.

Management pathways

The details relating to management pathways are presented in Table 1. The diagnosis of BTOA was made based on clinical grounds in 31 centres (97%). All centres carried out therapy-based treatments. The therapy was most frequently delivered by solely PTs in centres with a community component [16 centres (76%)], while the therapy was most frequently delivered by a mixture of PTs and OTs in hospital-based centres [8 centres (73%)]. This difference in therapy delivery was statistically significant ($P < 0.001$). A variety of splints were used, with custom splints being used more frequently in hospital-based services ($P = 0.019$). Most centres had a standardized treatment regimen consisting of education provision (100%), joint protection (100%), range of motion exercises (84%), strengthening exercises (88%), functional exercises (84%), splintage (100%) and use of assistive devices (78%). Less frequently used treatments included a three-level exercise regimen (59%) and general exercise (34%). Most centres (63%) did not use a patient-reported outcome measure (PROM), while those that did used a wide variety of PROMs, as detailed in Table 1.

Injection pathways

The details relating to injection pathways are presented in Tables 1 and 2. No centre routinely offered a steroid injection at the first appointment and no centre had a specific threshold for offering an injection. Most centres carried out their own injections [19 centres (59%)], with 5 centres (16%) referring the patient for guided-only and the remainder referring back to the GP or to hospital services [8 centres (25%)]. The injections were carried out by a wide variety of staff in different centres, with a difference between hospital-based and community-based centres ($P = 0.016$). Therapists alone injected in 40% of both types of centre, while therapists and doctors performed injections in 9 community-based centres (45%) and only one hospital-based centre (10%).

The guidance type was highly variable, with half of injections carried out with landmark guidance [30 centres (50%)]. There was a split in terms of injection content, with around one-third using steroid alone, one-third using steroid and local anaesthetic separately and one-third using premixed steroid and local anaesthetic. A wide variety of drug doses and types were used overall. The most frequently used steroid dose and type was 10mg of triamcinolone [11 centres (37%)]. All centres advised a period of rest after injection, but the time period was variable. Most patients were followed up, with the most frequent type of follow-up being via telephone [16 centres (53%)] at a median time point of 1 month. The most frequently stated reason for referral to onward services was the failure of multimodal treatment and at least one injection [20 centres (65%)]. Onward referral was to surgical services in all cases.

Patient demographics, characteristics, investigations and previous interventions

Table 3 details the data relating to the 160 patients. Most patients were female (72%) and the dominant hand was most frequently affected (65%). Most patients were being treated as part of a new referral of BTOA treatment (82%) and the remainder (18%) had received treatment in at least one previous referral. The median duration of symptoms was 12 months, and this was significantly longer in those with a previous referral ($P < 0.001$). Most patients had had an X-ray (73%) and most patients were using at least one analgesic (73%). The most frequently used analgesics were paracetamol (46.9%), oral NSAIDs (26%), a topical agent (26%) and weak opiates (18%). Those patients who had presented with a previous referral were significantly more likely to be using a weak opiate ($P = 0.025$). Most patients had not had previous therapy (58%) and therapy had been used more frequently in those with previous referrals ($P = 0.032$). Almost half (46%) had used a splint prior to their review, with splint use being more common in those with a previous referral ($P < 0.001$). The most common type of splint used prior to review was a non-custom rigid splint. Only a minority of patients had had

TABLE 2 Injection pathway details{start}

Factor	Level	Overall, n (%)	Community based, n (%)	Hospital based, n (%)	P-value ^a
N		32	21	11	
Infections at unit?	No, refer back to GP	3 (9)	1 (5)	2 (18)	0.22
	No, refer to hospital services	5 (16)	2 (10)	3 (27)	
	Yes + no referrals	19 (59)	15 (71)	4 (36)	
	Yes for landmark + refer for guided	5 (16)	3 (14)	2 (18)	
Who injects?	Therapist	12 (40)	8 (40)	4 (40)	0.016
	Doctors sports/rheumatologist	1 (3)	0 (0)	1 (10)	
	Therapists and doctors	10 (33)	9 (45)	1 (10)	
	Therapy and doctors and radiology	3 (10)	3 (15)	0 (0)	
	Doctors and radiology	2 (7)	0 (0)	2 (20)	
	Surgeons	2 (7)	0 (0)	2 (20)	
Guidance type	Landmark	15 (50)	11 (55)	4 (40)	0.032
	Ultrasound	2 (7)	0 (0)	2 (20)	
	Fluoroscopic/X-ray	2 (7)	0 (0)	2 (20)	
	Mixture of US guided/landmark	9 (30)	8 (40)	1 (10)	
Injection content	Mixture of all	2 (7)	1 (5)	1 (10)	0.69
	Steroid alone	10 (33)	7 (35)	3 (30)	
	Premixed local and steroid	9 (30)	5 (25)	4 (40)	
	Local and steroid separately	11 (37)	8 (40)	3 (30)	
Local used?	No	10 (33)	7 (35)	3 (30)	0.84
	Premixed depo-lidocaine	12 (40)	7 (35)	5 (50)	
	Lignocaine 1%	6 (20)	4 (20)	2 (20)	
	Lignocaine 2%	1 (3)	1 (5)	0 (0)	
	0.25% bupivacaine	1 (3)	1 (5)	0 (0)	
Steroid type/dose	Methylprednisolone 10 mg	5 (17)	3 (15)	2 (20)	0.90
	Methylprednisolone 20 mg	2 (7)	1 (5)	1 (10)	
	Triamcinolone 10 mg	11 (37)	8 (40)	3 (30)	
	Triamcinolone 20 mg	7 (23)	5 (25)	2 (20)	
	Methylprednisolone 40 mg	4 (13)	2 (10)	2 (20)	
	Triamcinolone 40 mg	1 (3)	1 (5)	0 (0)	
Rest after injection?	Yes 24–48 h	14 (47)	6 (30)	8 (80)	0.031
	Up to 1 week	13 (43)	11 (55)	2 (20)	
	Up to 2 weeks	3 (10)	3 (15)	0 (0)	
Splint after injection?	No	28 (93)	19 (95)	9 (90)	0.60
	Yes 24–48 h	2 (7)	1 (5)	1 (10)	
Routine follow-up?	No	1 (3)	1 (5)	0 (0)	0.50
	Yes, telephone	16 (53)	10 (50)	6 (60)	
	Yes, clinic	5 (17)	2 (10)	3 (30)	
	Yes, clinic and telephone mix	6 (20)	5 (25)	1 (10)	
	Text message + clinic if needed	2 (7)	2 (10)	0 (0)	
Follow-up time, months, median (IQR)		1.0 (1.0–2.0)	1.0 (1.0–2.0)	1.0 (1.0–1.0)	0.16*
Referral indication	Multimodal + one injection	20 (65)	13 (65)	7 (64)	0.73
	Multimodal + at least one guided injection	4 (13)	3 (15)	1 (9)	
	Multimodal + one non-guided plus one guided	3 (10)	2 (10)	1 (9)	
	For injection	3 (10)	1 (5)	2 (18)	
	Generally referred after multimodal for a guided injection	1 (3)	1 (5)	0 (0)	
Refer to	Surgical services	31 (100)	21 (100)	11 (100)	

^aP-values refer to testing for differences between community-based and hospital-based centres. For categorical variables, the Fisher's exact test was used to compare two groups: community vs hospital based. For continuous variables, the Mann-Whitney *U* test was used to compare two groups: community vs hospital based (marked with an*).

a previous steroid injection (29%) and this was significantly more common in those with a previous referral ($P < 0.001$). The median number of previous injections in the previous referral group was 2, which

was significantly greater than that for those without a previous referral ($P < 0.001$). Most of these injections had been performed by a therapist (35%) or a GP (30%).

TABLE 3 Patient details including previous episode vs no previous episode

Factor	Level	Overall, n (%)	No previous episode, n (%)	Previous episode, n (%)	P-value ^a
N		160	132 (82)	28 (18)	
Sex	Male	45 (28)	37 (28)	8 (28)	0.95
	Female	115 (72)	95 (72)	20 (71)	
Age, years, median (IQR)			65.0 (57.5–72.0)	68.0 (61.0–73.5)	0.11*
Hand affected	Dominant	104 (65)	84 (63)	20 (71)	0.73
	Non-dominant	49 (31)	42 (32)	7 (25)	
	Both	4 (3)	6 (5)	1 (4)	
Duration, months, median (IQR)		12.0 (6.5–24.0)	9.0 (6.0–16.0)	24.0 (15.5–36.0)	<0.001*
X-ray	No	43 (27)	41 (31)	2 (7)	0.010
	Yes	137 (73)	91 (69)	26 (93)	
OA grade	1	8 (6)	7 (9)	1 (4)	0.29
	2	34 (25)	28 (30)	6 (23)	
	3	46 (34)	37 (40)	9 (35)	
	4	29 (21)	19 (21)	10 (38)	
Analgesia	No	43 (27)	38 (28)	5 (18)	0.26
	Yes	117 (73)	94 (72)	23 (82)	
	Topical	41 (26)	33 (25)	8 (29)	0.69
	Paracetamol	75 (47)	60 (46)	15 (54)	0.43
	Oral NSAID	42 (26)	33 (25)	9 (32)	0.44
	Weak opiate	28 (18)	19 (14)	9 (32)	0.025
	Strong opiate	7 (4)	6 (4)	1 (4)	0.82
Therapy	No	92 (58)	81 (61)	11 (39)	0.032
	Yes	68 (42)	51 (39)	17 (61)	
Duration of therapy, months, median (IQR)			2.0 (1.0–3.0)	4.0 (2.0–7.0)	0.018*
Location	GP	9	8 (6)	1 (4)	0.30
	Interface	126	106 (80)	20 (71)	
	Hospital/secondary	25	18 (14)	7 (25)	
Joint protection	No	116	102 (77)	14 (50)	0.003
	Yes	44	30 (23)	14 (50)	
Specific exercises	No	100	88 (67)	12 (43)	0.018
	Yes	60	44 (33)	16 (57)	
Splint use	No	87 (54)	79 (60)	8 (29)	<0.001
	Yes	73 (46)	53 (40)	20 (71)	
Splint duration, months, median (IQR)		12.0 (6.5–24.0)	9.0 (6.0–6.0)	24.0 (15.5–36.0)	<0.001*
Splint type	Flexible non-custom	11 (15)	9 (17)	2 (10)	0.40
	Rigid non-custom	46 (63)	34 (64)	12 (60)	
	Rigid doughnut type	3 (4)	2 (4)	1 (5)	
	Custom thermoplastic	7 (10)	3 (6)	4 (20)	
	Flexible and rigid	6 (8)	5 (9)	1 (5)	
Splint from	GP	18 (25)	16 (30)	2 (10)	0.085
	Interface	25 (34)	19 (36)	6 (30)	
	Hospital/secondary	30 (41)	18 (34)	12 (60)	
Previous steroid injection	No	114 (71)	110 (83)	4 (14)	<0.001
	Yes	46 (29)	22 (17)	24 (86)	
Number of injections, median (IQR)		0.0 (0.0–1.0)	0.0 (0.0–0.0)	2.0 (1.0–3.5)	<0.001*
Injection operator	GP	14 (30)	12 (55)	2 (8)	0.009
	Therapist	16 (35)	6 (27)	10 (42)	
	Sports doctor/ rheumatologist	4 (9)	2 (9)	2 (8)	
	Radiology	5 (11)	2 (9)	3 (13)	
	Surgeon	5 (11)	0 (0)	5 (21)	
Location of injection	Unknown	2 (4)	0 (0)	2 (8)	
	GP	19 (41)	17 (77)	2 (8)	<0.001
	Interface	12 (26)	1 (5)	11 (46)	
	Hospital/secondary	15 (33)	4 (18)	11 (46)	

^aP-values refer to testing for differences between patients with no previous episode vs those with a previous episode. The Fisher's exact test was used to compare variables between the two groups for categorical data (community vs hospital based) while unpaired non-parametric continuous data, marked with an *, was analysed using the Mann-Whitney U test as applicable.

SARS-CoV-2 pandemic changes to follow-up and injection pathways

[Supplementary Appendix 3](#), available at *Rheumatology* online, details practice as regards initial assessment of BTOA patients, the nature of follow-up and the changes to injection pathways in mid-July 2020. Before the pandemic, all centres generally assessed new referrals face to face in the first instance. However, there was a significant change in practice as a result of the pandemic, resulting in most centres using either phone [14 centres (44%)] or a mixture of video and phone [14 centres (44%)] for their first assessment. Most centres stopped performing steroid injections during the pandemic peak, with these being restarted in 14 centres at a reduced level (44%) or being scheduled to restart within 4 weeks in 7 centres (22%).

Discussion

This study has shown that most BTOA patients being treated as part of their first referral to interface services have been treated with simple analgesia and have not received multimodal interventions such as splintage, specific exercises and injection therapy. The interface service management of BTOA is standardized in terms of receiving splintage, therapy and some form of education. However, there is a lack of standardization in the threshold for, timing of and mode of delivery of injection therapy. Most interface centres stopped providing steroid injections during the first peak of the pandemic but have now restarted at reduced levels of activity. These results therefore provide useful insights into current practice in interface services that can be used as a platform on which to enable future research in this area.

The UK NHS has been subject to much upheaval in recent decades and the creation of interface musculoskeletal services has been a relatively recent phenomenon. The traditional model of care in which patients always presented to their GP and were then referred onwards directly to surgical services appears to have been largely superseded by a different model involving interface services, as described in this study. As this study demonstrates, the current pathways are heterogeneous, e.g. self-referral is used variably but is becoming increasingly common, while the locations and makeup of interface services are themselves inconsistent.

The fairly standardized treatment in terms of analgesia, splint use and specific exercises perhaps represents the fact that generally there is better evidence to support these interventions [13–15]. Specific exercises and joint protection are supported by evidence, although the effect sizes for exercise are small [15, 16]. There is a reasonable body of evidence supporting the use of splints, with this effect being demonstrated in the medium term, but not the short term [17]. There is high-quality evidence to support the use of analgesia, particularly oral and topical NSAIDs, with topical NSAIDs having a better side-effect profile [18]. There are

significant difficulties in interpreting much of this evidence, as has been noted by many of the systematic reviews [11, 15, 16, 19, 20]. Many trials are small and have been judged as at high risk of bias, while the adequacy of comparator interventional arm appears somewhat dubious in certain trials given the multimodal nature of the interventional arm.

Given that a significant proportion of patients undergoing surgery for BTOA have not exhausted non-surgical measures, the emergence of interface services may be a positive development for patient care [21]. Although it is likely uncommon that patients are referred directly to secondary care surgical services, a potential limitation of our study is that these centres would have been less likely to take part, even though they would not have been excluded, as detailed above. This may explain why some patients undergo surgery without completing a comprehensive multimodal non-surgical treatment plan. Our study has shown that hospital-based interface services are more likely to contain OTs than those based in the community, and this may explain the finding that assistive devices were more likely to be part of the treatment package in hospital-based interface services. This points towards the potential benefits of a multidisciplinary approach to staffing services for BTOA patients.

Several trials investigating the non-surgical management of BTOA have been recently completed or are under way, including the Osteoarthritis Thumb Therapy II (OTTER-2) trial and others involving splints [22, 23]. The OTTER-2 trial is a pragmatic trial that used a placebo splint in order to address the methodological concern regarding an adequate comparator arm. Unfortunately, a limitation of this study is that follow-up was not beyond 3 months. There is certainly a lack of high-quality evidence to support the use of injection therapy in BTOA, as previous trials have been underpowered and have frequently not paid adequate attention to concomitant interventions such as joint protection, exercise therapy and splint use [11]. This lack of evidence may explain the high degree of variability in current injection therapy pathways observed by this study within interface services. Currently there would appear to be a strong justification for a large pragmatic multicentre placebo-controlled trial to definitively assess the effectiveness of corticosteroid injection in BTOA [11]. Furthermore, there may be an argument for a large sham or placebo-controlled trial to investigate the role of specific exercise therapies in BTOA, as previously undertaken in the context of hip OA [24]. This study certainly provides a body of valuable information that may be useful, not only in providing context to forthcoming trial results, but also in informing future clinical trial design.

There are limitations to this study, including its size and bias relating to centre recruitment. The number of interface musculoskeletal centres in the UK is unknown, however, given the catchment populations we describe in [Supplementary Appendix 2](#), available at *Rheumatology*

online, it is reasonable to estimate that the included centres in this study represent around one-fifth of the UK total (total catchment population ~14 million of a total UK population of ~66 million). As outlined in the methods, any unit that received patient self-referrals or referrals from primary care for patients with BTOA was eligible to take part and was deemed to be an 'interface' service. Therefore, in theory, a surgical service based in secondary care could have been included, however, this situation did not arise, perhaps because the study was largely advertised via therapy organizations. It could be reasoned that active research centres are more likely to provide evidence-based treatment pathways, have their own guidelines and have higher overall standards of care and therefore an argument can be made that this sample of centres may overestimate the quality of treatment in interface services. Broadly though, very little has been published relating to the structure and pathways within interface musculoskeletal services for any common conditions. This means that the results of this study are of considerable novelty and clinical worth.

Conclusions

This study has shown that most BTOA patients presenting for the first time to interface services have been treated with analgesia and have not received comprehensive multimodal interventions. Education, splintage and therapy at interface services is standardized, however, there is a lack of standardization in terms of the threshold for, timing of and mode of delivery of injection therapy.

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The group members are listed in [Supplementary Appendix 1](#), available at *Rheumatology* online. The work should be published under the group name Oxford Base of Thumb Collaborative and all members qualify for authorship status. All members of the study group have been involved in the design of the work, data analysis, data interpretation, drafting of the work and final approval. All members of the writing group have contributed in terms of data interpretation, drafting of the work and final approval. All collaborators have contributed in terms of data acquisition, drafting of the work and final approval.

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Data availability statement

Data are available from the lead author upon reasonable request.

Collaborators: Catrin E. Hawthorn (Carmarthenshire CMAT service, Can Hywel Dda University Health Board), Helen Robson (Connect Health South Tyneside), Neil

Marshall (Connect Health Nottinghamshire), Katharine Netherton (Connect Health Hammersmith and Fulham), Chandrasekhar Dekka (Connect Health Herts Valley), Andrea Ravindra (Connect Health Merton), Hannah Davies (Connect Health Orsett), Subashini Bathini (Connect Health Camden), Elaine Willmore (Gloucestershire Hospitals NHS Foundation Trust), Corinne Birch (Somerset Partnership), Helen Thompson (East Lancashire Hospitals NHS Trust), Caroline Coulthard (St Peter's Hospital), Sarah Joyce (Surrey iMSK), Janet M. Buckle (Healthshare Oxfordshire), Brian Downey (UHLB MCAS service), Louise Thompson (Poole Hospital), Jan Beaumont (OT Hand Clinics, Dumfries and Galloway NHS Trust), Lisa-Marie Barrington-Ford (East Cheshire NHS Trust), Helen F. Patten (Sussex MSK partnership), Emma Bamford (University Hospitals of Derby and Burton), Caroline Clements (OASIS East, Abbey Manor Medical Practice), Falguni Hathi (Bexley MSK Integrated Service), Sarah Rodgers (Northern General Hospital Sheffield), Jennifer Maryan (Leeds Teaching Hospitals), Joseph S. Godwin (Thurrock Health Hub), Lorenzo Masci (Healthshare London), Harry Kardamilas (Care UK Bucks MuSIC), Emer Krievs (NHS Lothian), Renata Titurusova (MSK Interface Service, Sirona Care and Health, Cossham Hospital, Bristol), Fiona Cashin (Royal Liverpool and Broadgreen University Hospital Trust) and Miriam Parkinson (Hand Therapy Services, East Lancashire Hospitals NHS Trust).

Supplementary data

[Supplementary data](#) are available at *Rheumatology* online.

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