those with multiple moderate than first time dislocations with moderate to large effect sizes seen for IL-2, TNFα, and IL-4 (Table 1).
Conclusions: Contrary to our hypothesis, patients with multiple dislocations demonstrated greater concentrations of inflammatory markers than those undergoing surgery after first time dislocation. The biomarkers that had the largest differences between groups (TNFα and IL-2) have been previously linked with rheumatoid arthritis (RA) more so than OA, suggesting that PTOA may share similar mechanisms to RA which may point towards potential treatment options to alter PTOA progression after shoulder dislocation. Clinically, physical therapy alone does not appear to quiet the joint for those with multiple dislocations, and future work will be needed to determine whether oral anti-inflammatories or intraarticular treatments may lessen the pro-inflammatory environment and promote improved long-term joint health.

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DIAGNOSTIC ACCURACY OF HISTORY TAKING, PHYSICAL EXAMINATION, AND AUXILIARY EXAMINATION FOR THUMB OSTEOARTHRITIS

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Purpose: The diagnosis for thumb osteoarthritis (OA) includes history taking, physical examinations, and auxiliary examinations. This study aimed to systematically examine the diagnostic accuracy of these diagnostic tests for thumb OA.
Methods: Medline, EMBASE, Cochrane Central Register of Controlled Trials, Web of Science Core Collection, and CINAHL were searched (from inception to January 13th 2022) for relevant studies. Key words included: thumb, interphalangeal joint, first metacarpophalangeal joint, first carpometacarpal (CMC) joint, and triscaphe joint, osteoarthritis, diagnostic tests, accuracy, assessment, history taking, physical examination, clinical examination, radiography, ultrasound, and Magnetic Resonance Imaging (MRI). Studies with any history taking, physical examination, auxiliary examinations or any other methods for diagnosing thumb osteoarthritis as index test and with any diagnostic assessment of the reference standard, such as radiological classification, clinical assessment, expert consensus, or combination of two or more of the above as reference standard were deemed eligible. No language restriction was applied. Study type as case report, review, letter, comment, conference proceeding, case-control study, cadaver or animal study were excluded. Selection procedures and data extraction were performed by two observers independently. Sensitivity (Se), specificity (Sp), positive predictive value (PPV), negative predictive value (NPV) and accuracy were extracted from the eligible studies.
Results: Six eligible studies were identified . Five studies considered radiographic changes only as reference standard and in one study radiographic changes were combined with the presence of thumb base (TB) pain. In studies where only radiographic changes were used as the reference standard, different stages of different classification systems were considered. Two studies evaluated the diagnostic accuracy of history taking (i.e. female sex, any TB pain, manual occupation), four of physical examinations (i.e. grind test, seesaw test, extension test, adduction test, basal joint tenderness, Eichoff test, Scaphotrapezio-trapezoid tenderness, Radioscaphoid tenderness, First dorsal compartment tenderness, Metacarpophalangeal tenderness, A1 pulley tenderness, metacarpal (MC) flexion test, and MC pressure-shear test), and one of auxiliary examinations (MRI signal changes). Diagnostic accuracy measures of history taking ranged from 47 to 100% for Se, 40 to 63% for Sp, and 40 to 80% for accuracy. Diagnostic accuracy measures of physical examination ranged from 2 to 100% for Se, 75 to 100% for Sp, and 47 to 98% for accuracy. Only one auxiliary examination, namely MRI signal changes, was studied. Diagnostic accuracy measures of it was 72%, 86%, and 76% for Se, Sp, and accuracy, respectively. Of all studied diagnostic tests, those with both Se and Sp $\geq$ 90% were adduction test, extension test, and MC pressure-shear test.
Conclusions: Within the limited available literature, we found that the diagnostic accuracy of history taking and physical examination methods for the diagnosis of thumb OA varied, while the knowledge about auxiliary examinations was lacking. Within the six eligible studies, there was little uniformity in the diagnostic reference standards for OA of the basal joint of the thumb. Given high sensitivity and specificity, but based on limited available literature, adduction test, extension test, and MC pressure-shear test can be recommended for the diagnosis of thumb OA.

	index test	reference standard	author, year	Sensitivity (Se)	Specificity (Sp)	Positive predictive value (PPV)	Negative predictive value (NPV)	Accuracy
history taking	Female sex	KL-grade 2 in at least one first CMCJ or STJ	Kwok et al., 2014	65%	45%	58%	51%	55%
	Female sex	KL-grade 2 in at least one first CMCJ or STJ combined with concordant pain	Kwok et al., 2014	69%	43%	35%	76%	51%
	Female sex	Verbrugge-Veys 1 E- or R-phase in the first CMCJs	Kwok et al., 2014	58%	40%	2%	98%	40%
	Female sex	Eaton and Littler stage>=2	Komatsu et al., 2017	94%	43%	81%	75%	80%
	Any TB pain	KL-grade 2 in at least one first CMCJ or STJ	Kwok et al., 2014	62%	51%	60%	53%	57%
	Any TB pain	KL-grade 2 in at least one first CMCJ or STJ combined with concordant pain	Kwok et al., 2014	100%	63%	55%	100%	74%
	Any TB pain	Verbrugge-Veys 1 E- or R-phase in the first CMCJs	Kwok et al., 2014	83%	44%	3%	99%	45%
	manual occupation	KL-grade 2 in at least one first CMCJ or STJ	Kwok et al., 2014	47%	46%	51%	42%	46%
	manual occupation	KL-grade 2 in at least one first CMCJ or STJ combined with concordant pain	Kwok et al., 2014	49%	49%	30%	69%	49%
	manual occupation	Verbrugge-Veys 1 E- or R-phase in the first CMCJs	Kwok et al., 2014	63%	50%	3%	98%	50%
physical examination	Grind test	Eaton and Littler stage>=2	Arnold et al., 2020	13%	91%	43%	66%	63%
	Grind test	Eaton and Littler stage>=2	Arnold et al., 2020	17%	98%	80%	68%	69%
	Grind test	Eaton stage>=2	Gelberman et al., 2015	44%	92%	75%	76%	76%
	Grind test	Eaton stage>=1	Merritt et al., 2010	42%	93%	96%	30%	53%
	Grind test	Eaton stage>=1	Merritt et al., 2010	53%	80%	91%	32%	59%
	Grind test	Eaton and Littler stage>=1	Sela et al., 2019	64%	100%	100%	32%	70%
	Seesaw test	Eaton and Littler stage>=2	Arnold et al., 2020	71%	82%	68%	84%	78%
	Seesaw test	Eaton and Littler stage>=2	Arnold et al., 2020	42%	86%	63%	73%	71%
	MC extension test	Eaton and Littler stage>=1	Sela et al., 2019	46%	100%	100%	28%	55%
	Extension	Eaton stage>=2	Gelberman et al., 2015	94%	95%	90%	97%	94%
	Adduction	Eaton stage>=2	Gelberman et al., 2015	94%	93%	88%	97%	94%
	Adduction and extension	Eaton stage>=2	Gelberman et al., 2015	88%	97%	93%	94%	94%
	Adduction or extension	Eaton stage>=2	Gelberman et al., 2015	100%	91%	86%	100%	94%
	Basal joint tenderness	Eaton stage>=2	Gelberman et al., 2015	94%	81%	73%	96%	86%
	Eichoff test	Eaton stage>=2	Gelberman et al., 2015	13%	75%	21%	62%	53%
	Scaphotrapeziotrapezoid tenderness	Eaton stage>=2	Gelberman et al., 2015	29%	75%	38%	67%	59%
	Radioscaphoid tenderness	Eaton stage>=2	Gelberman et al., 2015	17%	77%	28%	64%	56%
	First dorsal compartment tenderness	Eaton stage>=2	Gelberman et al., 2015	2%	81%	6%	61%	54%
	Metacarpophalangeal tenderness	Eaton stage>=2	Gelberman et al., 2015	13%	98%	75%	68%	68%
	A1 pulley tenderness	Eaton stage>=2	Gelberman et al., 2015	15%	89%	41%	66%	63%
	MC pressure-shear test	Eaton and Littler stage>=1	Sela et al., 2019	99%	95%	99%	95%	98%
	MC flexion test	Eaton and Littler stage>=1	Sela et al., 2019	36%	100%	100%	25%	47%
auxiliary examination	MRI: Signal change	Eaton and Littler stage>=2	Komatsu et al., 2017	72%	86%	93%	55%	76%

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INTRA-ARTICULAR LIPOPOLYSACCHARIDES ARE NOT DRIVING THE PROGRESSION OF OSTEOARTHRITIS

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Purpose: Osteoarthritis (OA) is a complex multi-tissue disease of the joint characterized by low grade chronic inflammation and mechanical erosion of cartilage. One of the main risk factors for OA is obesity that is linked to an imbalanced gut microbiota. Under these conditions, the gut epithelium may become permeable which leads to translocation of molecules such as lipopolysaccharides (LPS) from the gastrointestinal tract to the circulatory system. LPS is part of the outer membrane of Gram-negative bacteria that has been found in the synovial fluid of OA patients. Studies have previously correlated levels of LPS in serum, synovial tissue and synovial fluid with OA severity. LPS is a powerful mediator of systemic inflammation and a driver of septic shock syndrome. It induces multiple inflammatory pathways, as it stimulates toll-like receptors such as TLR4 and TLR2 through which it activates nuclear factor 'kappa-light-chain-enhancer' of activated B-cells (NFkB). However, it's role in progression of OA is currently unknown. The goal of the study was to elucidate the role of intra-articular LPS in OA.
Methods: We collected SF from 30 patients with knee OA and 30 trauma patients each from two separate clinics to minimize collecting bias. To analyze the precise LPS content in SF and compare the two groups, we performed the Limulus amebocyte lysate (LAL) assay. We performed functional assays on NFkB reporter cells treating them with patient SF and LPS to assess the biological significance of LPS at the reported concentrations. The cells used were NF-κB-SEAP IRF-Luc Reporter Monocytes called THP1-Dual™ cells (Invivogen). To assess NFkB activation we performed a QuantiBlue (Invivogen) colorimetric

assay measuring SEAP absorbance. Furthermore, we have spiked 6666 EU/mL LPS in SF and incubated it for 24 hours at 37°C to assess whether it remains functional under physiological conditions.

Results: LPS was present at high concentrations in both groups, interestingly there was no significant difference between LPS concentrations measured in OA SF compared to Trauma SF (Figure 1A). Functional assays didn't show any cell activation with our current set of SF samples independent of SF concentration (Figure 1D). Furthermore, as suggested by having on average the same LPS concentrations, no significantly different cell response was observed between OA and trauma SF (Figure 1D). Spiking LPS in SF for 24 hours at 37°C led to marked increase of LPS detection by the cells (Figure 1E), albeit 85% lower than LPS spike control alone. We performed the LAL assay on LPS spiked SF samples and measured an average of 90,7 ± 0,008% LPS recovery loss in OA SF and 91,9 ± 0,015 % LPS recovery loss in Trauma SF (Figure 1B, C). Upon treating the reporter cells with spiked SF, we observed a significant difference between OA SF and trauma SF, despite initially having similar cellular responses to SF treatment (Figure 1 D, E). Trauma SF overall showed a lower capacity to degrade LPS (Figure 1C, E) in comparison to OA SF (Figure B, E).

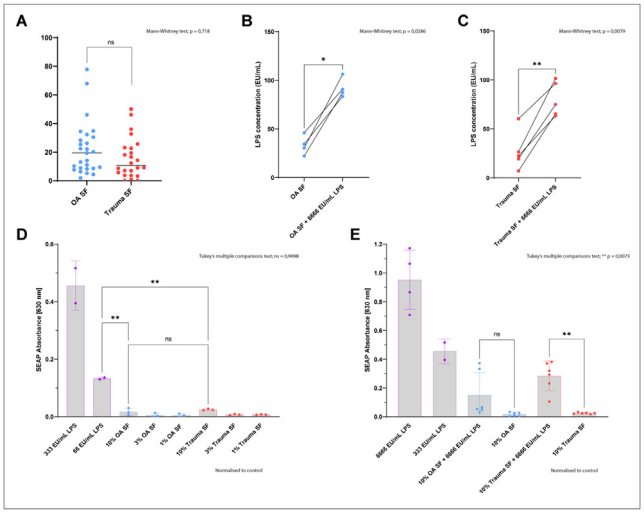

Figure 1 Figures comparing the amount of LPS measured in SF of 27 OA patients (blue) and 24 trauma patients (red) by LAL assay (A) before and after LPS spike in OA SF (B) and trauma SF (C) and showing the amount of SEAP absorbance indicating NFkB activation after treatment with LPS (purple), trauma SF (red), OA SF (blue) and LPS incubated in SF (D,E)

Conclusions: In this study we show that intra-articular LPS concentrations are present at high levels both in the arthritic and non-arthritic joints, however, at no significant difference between the two groups. We also observed that reported cells don't respond to LPS concurrent with the concentration measured. The observed lack of strong immune response to SF samples, indicates the limit of LPS biological activity, likely due to inhibition or degradation by proteases in the SF, which was confirmed experimentally. We observed a higher potential for LPS inhibition in OA SF in comparison to trauma suggesting that there is a prolonged exposure to LPS in OA which elicits a different immune response. All these data together suggest that intra-articular LPS alone isn't the main driver of cell-mediated inflammation in OA and showing that intra-articular LPS levels cannot be used as a simple diagnostic biomarker for OA.

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HOW IS ANKLE OSTEOARTHRITIS CURRENTLY MANAGED BY UK-BASED PHYSIOTHERAPISTS AND PODIATRISTS? AN ONLINE SURVEY

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Purpose: There have been no RCTs on the non-surgical treatment of painful ankle OA. This may be due to uncertainty of what constitutes usual care. Indeed, patients with painful ankle OA have a mixed experience of non-surgical management attributed to a lack of guidance for clinicians on treatment usual care and best practice. In order to develop a non-surgical usual care package specifically for ankle OA, more information is required about how it is managed currently by physiotherapists and podiatrists. The purpose of this study was to survey the current clinical practice of UK physiotherapists and podiatrists for the treatment of ankle OA.

Methods: Ankle OA was defined as talocrural (tibiotalar) joint OA and did not include the subtalar joint. This descriptive cross-sectional survey design used a self-administered electronic questionnaire (www.onlinesurvey.ac.uk). The survey consisted of 5 parts.

I: participant characteristics, II: clinical service and diagnostic criteria, III: treatment aims, IV: preferred treatment options and V: treatment outcome measures. Most questions were closed-ended multiple-choice questions with an option for open-ended answers from parts II to V. UK-based physiotherapists and podiatrists registered with HCPC treating people with painful ankle OA were invited to participate. The study was advertised to physiotherapists on Twitter and the iCSP interactive platform, and to podiatrists on the website of the College of Podiatrists (www.cop.org.uk), podiatryarena.com and its Facebook (https://www.facebook.com/podiatryarena/) and Twitter pages (PodArena; (https://twitter.com/PodArena). Screening questions ensured all participants were working in the UK and treating patients with ankle OA. Data were collected anonymously and stored on JISC online survey, later transferred on a passcode-secured Excel sheet, saved, and backed up (soft & hard copy on daily basis) on the university server. SPSS® V.26 was used for data analysis. Descriptive frequency and percentage measures were displayed and analysed using descriptive statistics of counts and proportions for categorical variables using histograms. We defined 'usual care' as responding 'Always' or 'Frequently', and 'not usual care' as 'Sometimes' 'Rarely,' 'Never', or 'not applicable'. Differences in responses between the physiotherapists and podiatrists were analysed using Chi-squared tests for each treatment modality. Statistical significance was set at $p<0.05$. A minimum agreement of 90% between participants was established as a threshold for general consensus, with 78% for consensus on individual items.

Results: The survey was open from 1st June 2021 until 31st August 2021. 506 people viewed the survey home page. 100 responses were received; 2 were invalid. 64 were physiotherapists, 34 were podiatrists. The most common treatment aims in both professions were to 'reduce pain' (89%) and 'improve quality of life' (84%). 50% of respondents used 3 or 4 treatment sessions and 57% or respondents saw patients for 30-40 minutes at each treatment. The five most common modalities used by physiotherapists were: patient education (100%), self-management (92%), lifestyle modification (89%), ankle strengthening (88%), and proprioception exercises (86%). For podiatrists, they were patient education (100%), ankle strengthening (88%), activity pacing (79%), lifestyle modification (76%), and gait training (76%). Less than 30% of respondents in both professions said they used ankle bracing or taping for usual care. Similarities were noted between physiotherapists' and podiatrists' practices in managing ankle OA not only in what treatment options they used for usual care, but also what they did not use as usual care treatment options. (Figures 1 & 2)

Conclusions: This first time survey on usual care for painful ankle OA revealed UK-based physiotherapists' and podiatrists' package of treatment that may now be considered usual care for patients with this chronic and painful condition. These results may pave the way for clinical trials to compare usual care with new treatment modalities