Tuesday 1 May 2012, 10.30 – 11.30

POSTER VIEWING I

BHPR RESEARCH: QUALITATIVE

1. COMPLEX REASONING DETERMINES PATIENTS' PERCEPTION OF OUTCOME FOLLOWING FOOT SURGERY IN RHEUMATOID ARHTRITIS

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Background: Foot surgery is common in patients with RA but research into surgical outcomes is limited and conceptually flawed as current outcome measures lack face validity: to date no one has asked patients what is important to them. This study aimed to determine which factors are important to patients when evaluating the success of foot surgery in RA
Methods: Semi structured interviews of RA patients who had undergone foot surgery were conducted and transcribed verbatim. Thematic analysis of interviews was conducted to explore issues that were important to patients.
Results: 11 RA patients (9 ♀, mean age 59, dis dur = 22yrs, mean of 3 yrs post op) with mixed experiences of foot surgery were interviewed. Patients interpreted outcome in respect to a multitude of factors, frequently positive change in one aspect contrasted with negative opinions about another. Overall, four major themes emerged.

Function: Functional ability & participation in valued activities were very important to patients. Walking ability was a key concern but patients interpreted levels of activity in light of other aspects of their disease, reflecting on change in functional ability more than overall level. Positive feelings of improved mobility were often moderated by negative self perception (''I mean, I still walk like a waddling duck'').

Appearance: Appearance was important to almost all patients but perhaps the most complex theme of all. Physical appearance, foot shape, and footwear were closely interlinked, yet patients saw these as distinct separate concepts. Patients need to legitimize these feelings was clear and they frequently entered into a defensive repertoire (''it's not cosmetic surgery; it's something that's more important than that, you know?'').

Clinician opinion: Surgeons' post operative evaluation of the procedure was very influential. The impact of this appraisal continued to affect patients' lasting impression irrespective of how the outcome compared to their initial goals (''when he'd done it . . . he said that hasn't worked as good as he'd wanted to . . . but the pain has gone'').

Pain: Whilst pain was important to almost all patients, it appeared to be less important than the other themes. Pain was predominately raised when it influenced other themes, such as function; many still felt the need to legitimize their foot pain in order for health professionals to take it seriously (''in the end I went to my GP because it had happened a few times and I went to an orthopaedic surgeon who was quite dismissive of it, it was like what are you complaining about'').
Conclusions: Patients interpret the outcome of foot surgery using a multitude of interrelated factors, particularly functional ability, appearance and surgeons' appraisal of the procedure. While pain was often noted, this appeared less important than other factors in the overall outcome of the surgery. Future research into foot surgery should incorporate the complexity of how patients determine their outcome
Disclosure statement: All authors have declared no conflicts of interest.

2. AN EVALUATION OF PATIENTS' PERSPECTIVES OF PARTICIPATING IN A TWO WEEK INPATIENT ANKYLOSING SPONDYLITIS REHABILITATION PROGRAMME

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Background: The Royal National Hospital for Rheumatic Diseases in Bath provides a specialist 2 week inpatient course promoting self-management of AS, with a combination of education, exercise, hydrotherapy, pain management strategies and the opportunity to meet others with the condition.

The AS course at the RNHRD has not previously been investigated in terms of how patients perceive the course and their condition after taking part; this study explored the experience of being on the course using qualitative research techniques.
Methods: 12 participants were interviewed at the end of, or shortly after, the AS programme. Interviews lasted between 30 and 90 minutes and were audio recorded and transcribed verbatim to allow in-depth analysis of the data. Data was analysed manually using an Interpretative Phenomenological Analysis method, following the four-stage process described by Smith and Osborn (2003). An idiographic approach was used, taking a single case and moving on to examine the others (Chapman, Parameshwar, Jenkins, Large, & Tsui, 2007). Quotes were selected for inclusion if they provided a powerful expression of a recurring theme.
Results: 12 participants were recruited into the study over a 6-week period in June-July 2011. 8 participants were male, 4 female, ranging in age from 29 to 66 years (M = 44 years 9 months, SD = 10.3). Onset of symptoms varied from 2 to 50 years (M = 22 years). Length of time since diagnosis varied from 6 months to 31 years (M = 13 years). 5 participants had previously attended, 7 were attending for the first time. The data clustered around four main themes with related sub-themes:

1. Knowledge: with awareness comes power. Learning in the long-term, sense of enlightenment, deeper level of understanding and awareness of condition.
2. Coping: acceptance and motivation. Self-motivation, acceptance and benefit finding
3. Improvement: physically and emotionally. Physical improvement and attitude shift.
4. Relating to others: comparisons and social support. Experiences of others, identification with others, learning from other patients and relating to health professionals.

Conclusions: 'I refer to my AS as carrying a rucksack. I come before my AS, unfortunately I have to bring it with me, wherever I go . . . I prefer not to make it a front pack instead of a back pack . . . some days that rucksack might be a bit fuller than other days'.

Patients were unequivocally positive about their experience of coming on the programme. The increase in knowledge and awareness meant that patients felt more able to take responsibility for the self-management of their condition. Patients felt that the programme equipped them with the coping skills they needed, whether these were learnt from the experiences of others or the information provided by the healthcare professionals. The programme facilitated an improvement on a physical and a psychological level.
Disclosure statement: All authors have declared no conflicts of interest.

3. 'YOU MAKE YOUR OWN LUCK': THREE DIFFERENT PERCEPTIONS OF LIVING WITH RHEUMATOID ARTHRITIS: A Q-METHODOLOGICAL STUDY

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Background: Most research about daily life with RA was conducted before current more aggressive medication. The aim of this research is to explore daily life on current therapies.
Methods: Q-Methodology: 30 RA patients sorted 39 statements (generated in previous qualitative interviews) about daily life with RA across a forced distribution, in ranked order of agreement. Data were analysed using centroid factor analysis with varimax rotation (i.e. in Q the participants are the variables). Demographic and clinical data were collected and patients completed comments booklets about their rationale for sorting the statements.
Results: Three factors were generated, which explained 33% of the study variance and accounted for 23 of the 30 participants. None of

the Q-sorts were confounded (loading on more than one factor). A participant loading of 0.41 reached significance at $p < .01$.

Factor A: Taking Control: ''Just a fact of life'': Seven participants: mean disease duration 22.7yrs (SD 10.8), age 61.7yrs (SD 10.3), HAQ score 2.0 (SD 0.6), patient global 3.1 (SD 1.7), 86% female, 71% on biologic therapies.

These patients constantly micromanage their RA, find different ways of doing the things they want to and will not let RA interfere with their responsibilities. They take their medication exactly as prescribed and will not over-do it. They also use tools as aids and plan rest time into their week. They do not believe in alternative medicines or special diets.

Factor B: Struggling Through: ''It gets me down every single day'': Eight participants: mean disease duration 15.3yrs (SD 14.3), age 55.5yrs (SD 7.1), HAQ score 1.3 (SD 0.9), patient global 4.8 (SD 2.5), 63% Male, 50% on biologic therapies.

These patients are never symptom free, experiencing pain and fatigue daily. They worry and get angry and frustrated about their RA. It gets them down daily. They report being unable to be spontaneous or to exercise and they struggle to explain their experience to their family. They feel their body has let them down and consider themselves unlucky.

Seven participants: mean disease duration 9.9yrs (SD 10.1), age 42.4yrs (SD 11.2), Factor C: Keeping RA in its place: ''It's a very small part of you'': HAQ score 0.5 (SD 0.5), patient global 1.7 (SD 1.0), 100% female, 71% employed, 86% mothers, 43% on biologic therapies.

These patients do not allow RA to interfere with their responsibilities, nor hold others back. Fatigue is their highest ranked symptom, but they do not plan rest time into their week as they are too busy. They are often able to forget about their RA as they do not need to use tools or ask for help and they will not consider their RA when choosing their clothes. They do not allow RA to get them down and consider themselves lucky in comparison to others.

Conclusions: Many patients report coping well with their RA. Others, mainly men, struggle to accept and adapt to RA, indicating a need for an increased awareness of the support needs of male RA patients.

Disclosure statement: All authors have declared no conflicts of interest.

4. 'WHAT I WANT THE HEALTH PROFESSIONAL TO KNOW': THE EXPERIENCES OF PEOPLE WITH OSTEOARTHRITIS AND RHEUMATOID ARTHRITIS

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Background: In 2010 Arthritis Research UK commissioned a study to identify education needs of nurses, allied health professionals (AHPs) and associate practitioners (APs) working with people with osteoarthritis (OA) and rheumatoid arthritis (RA).

Methods: Four focus groups were conducted with people with OA and RA in England and with nurses, AHPs and APs in England and Scotland. The focus groups used a semi-structured topic guide to identify the educational needs of nurses and AHPs and APs. The duration of the focus groups was 1 to 1.5 hours. The focus group discussion was audiotaped and transcribed verbatim. The transcripts were analysed by two researchers using content analysis and the results used to design an electronic questionnaire which was distributed to members of professional organizations including BHPR and the RCN Rheumatology Forum.

Results: 23 people participated in the focus groups including 5 people with OA, 8 people with RA, and 10 health professionals including 2 APs. 162 health professionals responded to the electronic survey. The main themes identified from the transcripts and the survey included:

(1) Living with pain. Pain was the dominant symptom for all participants and was described as ''having radios on at different volumes''. Participants wanted to learn how to manage their pain but this service was not available to them. Survey participants responded that they did not have the knowledge or were unsure about providing advice on pain medication for people with OA (45%) or RA (30%).

(2) Participants with OA had no access to any services and referred to ''the absent health care professionals'' yet wanted advice on exercise, pain and fatigue to optimize their independence. Survey participants responded that they did not have the knowledge or were unsure about providing advice on exercise to people with OA (61%) or RA (37%), despite exercise being a core treatment in the NICE OA guidelines.

(3) To be treated as an individual. All participants wanted health professionals to listen, empathize, understand the impact of the condition on physical, psychological and social function, have condition-specific knowledge, provide support and be accessible. Survey participants felt they had the skills to conduct a biopsychosocial consultation with people with OA (72%) and RA (80%).

Conclusions: We need to provide training in the 3 ''e's'' easing pain, education and exercise to enable nurses, AHPs and APs to respond to the needs of people with RA and OA. We also need to ensure that people with RA and OA can access the expertise that is available to them.

Disclosure statement: All authors have declared no conflicts of interest.

5. EXPLORING OCCUPATIONAL GAIN IN PEOPLE WITH INFLAMMATORY ARTHRITIS RECEIVING ANTI-TNFα

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Background: AntiTNFα therapies have had a significant impact on the management of RA and AS, significantly reducing disease activity, improving function and quality of life. The evidence base for these therapies is informed predominantly by RCTs that do not reflect the nuanced ways in which individuals' accommodate changed life trajectories. The increasing use of antiTNFα poses new questions for patients and occupational therapists (OT) in a disease profile previously associated with long-term functional occupational decline. This study aims to develop an in-depth understanding of the experience of occupational gain in people receiving antiTNFα therapy, exploring the implications for OT interventions.

Methods: People with a good clinical response to treatment were recruited through clinics in East Anglia and the North West. Purposive sampling enhanced transferability of findings with recruitment of 26 people aged 21-77. Their antiTNFα therapy ranged from 6 months to 7 years. Single semi-structured interviews provided detailed narratives focusing on their journey to accessing antiTNFα and subsequent occupational gain. Interviews were transcribed verbatim and analysed using interpretative phenomenological analysis. Trustworthiness was enhanced by triangulating patient and OT experiences, participant validation, and sharing findings with lay and professional peers.

Results: Whilst antiTNFα led to an improvement in quality of life with reduced pain, fewer flare ups and increased function, participants still experienced physical and psychological challenges. If symptoms did not improve soon after starting therapy there was fear that drugs would be withdrawn; improving clinical markers provided reassurance. They experienced a time of transition as symptoms receded and they tested how far they could extend participation in daily living activities, leisure and employment. However, where there had been significant pathological damage, participants were still restricted in activities. Many reported continuing fatigue. There appeared to be limited information on the benefits of planning and pacing activities. They were fearful of changing employment, citing uncertainty about the long-term efficacy of the therapy. If ill health had led to them temporarily stopping antiTNFα, the decline in their well-being left participants fearful of having to stop treatment again. Very few participants reported having any meaningful contact with OTs after receiving antiTNFα

Conclusions: Personal experiences of patients and OTs and robust interpretative analysis led to propositional knowledge indicating that there should be an increased focus on supporting patients during the early stages of receiving antiTNFα. We argue that contact with OTs could enhance patients' experiences and optimized the benefits of treatment. Reassessing pathways of care could ensure patients are readily able to access support on symptom management, planning and pacing and engagement with employment.

Disclosure statement: All authors have declared no conflicts of interest.

6. 'JUST DO SOMETHING ABOUT MY FEET': FOOT PROBLEMS AND ACCESS TO FOOT CARE IN PEOPLE WITH RHEUMATOID ARTHRITIS

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Background: The foot is often involved in RA but the impact of foot involvement in patients with RA and patients' beliefs regarding access to and efficacy of foot care services are unknown.

Objective: To explore patients with RA experiences of foot problems and their access to foot care provision.
Methods: Inductive thematic analysis of the transcripts from semi structured face-to-face interviews with patients purposively sampled for self-reported foot problems and a range of personal/disease characteristics. Themes were identified within and across data sets. Analysis was by OW with a subset independently analysed (SH, ED and patient partner EQ). Emerging themes were discussed and agreed by all authors.
Results: 12 patients (7F); aged 29-72 yrs (mean 56.8); 42% accessed foot care services; disease duration 2-27 yrs (mean 12); with 92% on DMARDs; 42% on biologics; HAQ 0-2.875 (mean 1.58); and global opinion numerical scale 0-9 (mean 5.9). An overarching theme of *Access to Foot Care* was identified, comprising three themes.

Access supported. ''I'd put them [feet] top priority'': This included proactive discussions of foot problems generated by patients and health care professionals (''He generally asks''); having feet examined (''Took my shoes and socks off and showed the woman''); previous positive experiences of foot care (''The podiatrist is keeping an eye on them''); and continuing access to foot care (''It helps'').

Access perceived unnecessary. ''It's not where I want to go [prescribed footwear], another nail in the coffin'': This included: fluctuating foot symptoms (''Some days I can't walk, then it goes''); general RA disease activity (''Just took it as part of the RA''); ability to self-manage foot problems (''I know how to look after my feet''); feet not being considered a major concern (''Not a big problem'').

Access hindered. ''It seems to be an area where medical staff don't know an awful lot do they?'': This included patients' perceptions of feet being ignored in clinical practice (''Not on any RA form''); limited knowledge of how or when to access care foot care (''Didn't know you could access it on the NHS''); expectations that the rheumatology team would initiate access to foot care (''He will refer me''); assumptions that no treatment options were available (''I've just plodded on''); and previous negative experiences of foot care (''All they did was cut my nails'').
Conclusions: Patients who had accessed foot care services prioritized their foot problems as an important health care need. However, for others who would like foot care services, personal knowledge and values, and perceived barriers in clinical practice, appear to interact to inhibit foot care access. The extent which these interactions affect overall access to foot care in RA patients in general now needs to be quantified to help to inform and improve the effectiveness of the organization and delivery of foot care.
Disclosure statement: All authors have declared no conflicts of interest.

7. OBSERVATIONAL STUDY OF EXERCISE AND RHEUMATOID ARTHRITIS: PATIENTS' PERCEPTIONS AND EFFECT ON DISEASE ACTIVITY MEASURES

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Background: The link between rheumatoid arthritis (RA) activity and decline in physical ability is well established. Historically, RA patients were discouraged from weight-bearing exercise but contemporaneous studies have determined that exercise (EXC) is safe in stable RA and can inhibit disease progression. Only 19% of RA patients achieve the recommended levels of physical activity compared to 35% of the normal population.

We performed an observational study to assess patient's perceptions on EXC in relation to RA. Also, we assessed for correlations between level of EXC with RA disease activity & CVD risk.
Methods: Data was collected prospectively using a patient questionnaire covering the following: EXC type undertaken; intensity, duration & effort of EXC; change in level of EXC since diagnosis of RA; knowledge & education regarding appropriate EXCs in RA. RA patients >18 years old were recruited from Princess of Wales Hospital, Rheumatology Dept. DAS28-CRP, CRP & 10-year CVD risk scores (using QRISK2) were obtained.
Results: 50 patients were assessed (M = 13, F = 37; mean age 62yrs) who participated in a diverse range of activities including vigorous EXC (24%) - zumba,cycling & swimming - to mild/moderate EXCs (42%) - walking or seated exercises - & no EXC at all (34%). 64% patients felt less able to participate in EXC after diagnosis of RA; pain after EXC was the main barrier to participation. Few patients felt they received EXC education by their healthcarers & <50% felt they knew what EXCs to do. Overall, participation in EXC (vigorous EXC type, longer duration, more effort & intensity in EXC) correlated with a reduction in meanDAS28-CRP, meanCRP and mean relative risk QRISK-2 scores($p > 0.05$). One confounding result was that those who did no EXC had a lower meanDAS28; this was mainly due to lower pain scores.
Conclusions: In this observational study, there appears a correlation between EXC participation & lower RA disease activity, though of course it is difficult to determine if EXC is a cause or effect of better arthritis control. The lower DAS28 found in patients who do no EXC could be due to their VAS scores: meanVAS was lower in those who did no EXC but other composite scores improved with EXC. CRP & QRISK2 were lower in patients who undertook EXC.

Majority of patients reported a decrease in the amount of EXC since diagnosis but with 19% of subjects having had disease for >20years, some of the decline is attributable to aging. Perceptions on EXC were similar to previous studies, with patients not reporting having discussed EXC with their healthcare professionals. Most patients believed that EXC had a beneficial effect but were reluctant to participate due to uncertainty regarding appropriate EXCs.

With better understanding of the beneficial effects of EXC on RA disease activity, CVD risk and patient well-being, it is imperative that a more committed approach to promoting fitness and EXC be established.
Disclosure statement: All authors have declared no conflicts of interest.

8. EXPLORING THE EXPERIENCES AND NEEDS OF YOUNG ADULTS (16–25 YEARS) WITH A CHRONIC INFLAMMATORY MUSCULOSKELETAL DISEASE WITHIN AN ADULT RHEUMATOLOGY SERVICE: A QUALITATIVE STUDY

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Background: The experiences of transition for sixteen to twenty five years olds are now becoming the focus of research within adult care. This is a complex process which includes the relationships that young people enter with health care professionals, attitudes towards their condition and support networks from family and friends. One aspect is the transition from paediatric service, although some young adults enter into adult care immediately. The literature supports developmentally appropriate information delivered in methods which will engage the future users of the health care system.
Methods: The aim of the study was to explore the experiences of young adults who had transitioned or entered directly into an adult rheumatology secondary care service. This is an exploratory qualitative study utilizing Interpretative Phenomenological Analysis (IPA). Six participants, with an equal split of gender, varying in age between 16-25 years old were recruited from the West Midlands, UK. Semi-structured interviews were carried out and transcribed verbatim.
Results: Two main themes emerged from the data which included 'facets of transition' and young people's 'expectations of an adult service'. Trusting and concordant relationships with healthcare professionals were viewed as essential in easing the transition process. Whilst young adults want to be viewed as 'special' within their support networks (including the hospital setting) they also want a sense of normality as well.
Conclusions: Improving services will help to engage young people with a chronic illness and should cover the spectrum of medication, vocational issues, education and independent living. The dynamics for adolescent care are different to adult care with longer consultation time requirements, and particular skills required that are appropriate for younger adults. Further training for those working with this age group may be appropriate to maximize concordant relationships.
Disclosure statement: S.P. has received an educational grant from Wyeth (Pfizer) and an education bursary from Arthritis Research UK. All other authors have declared no conflicts of interest.

9. INVOLVING SERVICE USERS IN TRIAL DESIGN: OUTCOMES, SPLINT SELECTION AND PLACEBO DESIGN IN A TRIAL OF TREATMENT FOR THUMB BASE OSTEOARTHRITIS

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Background: Thumb base osteoarthritis (OA) affects 20% of people aged ≥55. It is associated with long-term pain, work disability, reduced quality of life and overall function. Optimal management for thumb base OA has the potential to deliver benefits for patients, health services and society. A common approach is splinting. However, previous trials of splints for thumb base OA have not included placebo groups and it is not clear if they assess outcomes or splints that are important or acceptable to patients. To address these gaps, and in light of recent evidence about the value of patient involvement in research, we conducted a patient involvement project to inform the design of a new trial of splints.
Methods: Two involvement sessions comprised a total of eight people who all wore hand splints for thumb base OA. Sessions aimed to identify outcomes to include in a future trial; to identify splints to assess in a subsequent Delphi study prior to the trial; and to design placebo splints. Sessions were facilitated by a researcher experienced in patient involvement, and a research-lead in occupational therapy. Another staff member took notes, and a user support worker attended one session. Group members were encouraged to discuss their experience of OA, their use of splints and outcomes of importance to them. They were shown 45 splints, which they discussed and tried. Finally, the idea of a placebo splint and possible design options were introduced. Group members worked alongside facilitators to identify key elements of a placebo that would make it convincing and acceptable. At the end of each session, group members completed brief satisfaction questionnaires.
Results: Group members identified outcomes centring on everyday activities such as housework, driving, gardening and other tasks requiring dexterity and grip. Through trying on a variety of splints, they defined acceptable and unacceptable design features. These focused on two areas: wearability and support/immobilization. Factors that affected wearability included warmth, colour, material, method of fastening and washability. Factors relating to support and immobilization included rigidity, fit and pressure. Groups discussed placebo design and arrived at a consensus about a potential placebo splint. Questionnaire responses showed that all group members were very satisfied that their views had been taken into account; were satisfied or very satisfied that the group had made decisions about splint types; and all were very satisfied that the group had made decisions about how to design a placebo splint.
Conclusions: This project provides a case study of patient involvement as an efficient and satisfactory way to include service users in early stages of trial design. The impact of the activity on the pilot trial is still to be evaluated and it will be important to assess the acceptability of the placebo in practice to patients and health professionals.
Disclosure statement: All authors have declared no conflicts of interest.

10. '...WELL, I PUT IT DOWN TO HAVING A CLEAR CONSCIENCE, BEING POLITE TO ALL PEOPLE AND BEING A MEMBER OF THE LABOUR PARTY': PREVENTION OF KNEE PAIN: A QUALITATIVE STUDY IN SYMPTOMLESS OLDER ADULTS

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Background: English health policy on prevention focuses predominantly on major diseases. Various documents detailing self-management and prevention of osteoarthritis (OA) exist, including NICE guidelines and the Arthritis Foundation's National Public Health Agenda for Osteoarthritis. Yet, few studies explore preventative knowledge of knee OA amongst the population. In particular, asymptomatic members of the population may provide further information in considering how to prevent knee pain. This study aims to explore perceptions around the prevention of knee pain amongst an asymptomatic population, which may provide further insights for stimulating preventative behaviours.
Methods: A semi-structured interview study of 28 people detailed their views on prevention of knee pain, and a sub-sample of thirteen patients without current knee pain were selected from this larger sample. Interviews were tape recorded and fully transcribed. Qualitative computer software package NVivo2 was used to manage the data. Thematic analysis was conducted using the constant comparative method.
Results: Participants interpreted the definition and causes of knee pain in a variety of ways. The importance of prevention was recognized by a sub-set, while a small proportion of individuals denied the role of prevention. Early adoption and a range of social factors influenced the implementation and continuation of preventative behaviours. Individual responsibility for prevention was a principal theme. Exercise was recognized as a key preventative strategy, but not all participants viewed exercise in a beneficial way. Some participants deemed pharmacotherapy to be harmful, and preferred to adopt preventative behaviour.
Conclusions: Our asymptomatic population demonstrated considerable breadth of knowledge around preventative strategies for knee pain, and similarities in perceptions of prevention exist within the symptomatic population. These include emphasis on individual responsibility, and considerations on the role of exercise and pharmacotherapy in knee pain. When individuals consult they are willing to act upon recommended treatments as per NICE guidance, and this suggests the potential of widening preventative strategies in order to improve the musculoskeletal health in the general population.
Disclosure statement: All authors have declared no conflicts of interest.

BHPR RESEARCH: QUANTITATIVE

11. CONCURRENT VALIDATION OF THREE NOVEL ACTIVITY MONITORS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Physical activity is a frequently reported outcome in rheumatology and a key concern to patients yet it is difficult to objectively measure outside the gait lab. A new generation of activity monitors offers the potential to objectively measure activity as well as temporal & spatial gait parameters but these have only been validated in healthy populations. This study aimed to evaluate a new generation of activity monitors in patients with RA.
Methods: Three activity monitors: Activ4Life Pro V3.8 (A4L), Step-N-Tune, and the Intelligent Device for Energy Expenditure and Activity (IDEEA) were concurrently tested in patients with RA and in a healthy control group. Participants walked at a self selected speed for a two minute period and were filmed for later review. Temporal and spatial gait parameters were validated using the GAITRite instrumented walkway and total step counts compared to a gold standard derived from a mean of three manual step counts from half speed video replays.
Results: Data were collected on 12 RA pts [2 Male, 10 Female; mean (SD) age 51.6 (18); BMI 31.1 (7.1); disease duration 18 (13.4); median (IQR) DAS28 5.02 (3.76 to 5.75); HAQ 1.5 (1.0 to 2.13)] and 12 healthy controls [6 Male, 6 Female; mean (SD) age 41.6 (9.8); BMI 23.4 (2.8)]. RA patients took fewer steps than the control group during the study period according to the gold standard [mean (SD) RA: 159.50 (19.2); Controls: 221.75 (19.21)]. Activity monitor performance varied between devices but all showed decreased performance in the RA group (see Table 1). Bland-Altman plots demonstrated wider 95% limits of agreement in the RA group and a systematic increase in agreement between activity monitors and the gold standard with increasing functional ability. Agreement between the GAITRite walkway and activity monitors was less uniform for temporal & spatial gait parameters but again showed marked differences between disease groups.
Conclusions: Despite some variation between devices, the activity monitors tested performed reasonably well in healthy young volunteers. All except the A4L showed a marked decrease in performance in patients with RA suggesting A4L could be the most suitable for use in this patient group, although further work is needed to assess its use in real world situations. The marked between group variation, and systematic increase in device performance with improving gait, indicate that activity monitors must be validated in target clinical populations before they can be used in clinical studies.

TABLE 1 Regression based Bland-Altman 95% limits of agreement between activity monitors and the video gold standard

	RA	Control
Step-N-Tune	$y = -221.59 + 1.11x \pm 89.46$	$y = 8.71 - 0.011x \pm 11.94$
A4L	$y = -44.14 + 0.38x \pm 27.88$	$y = -5.25 + 0.13x \pm 23.16$
IDEEA	$y = -280.84 + 1.53x \pm 119.32$	$y = -31.47 + 0.05x \pm 32.42$

y = intercept + (slope*x) ± 95% limits of agreement x = mean of gold standard and test measurements intercept <0 and slope >0 = agreement increases with mean step count

Disclosure statement: A.R., D.W.: The A4L data was derived under the terms of a non-disclosure agreement between the company and university which protects the proprietary intellectual property associated with the computer algorithms used to derive step count data. A4L provided devices for the study but no commercial benefits arose from the agreement. All other authors have declared no conflicts of interest.

12. FACTORS ASSOCIATED WITH ADHERENCE IN RHEUMATOID ARTHRITIS

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Background: Adherence to medication is a key challenge for patients with rheumatoid arthritis (RA) and those clinicians working with the patient population. Current research suggests that less than 50% of patients adhere to their medication. We have prospectively evaluated those factors which are associated with adherence. Our overall goal is to identify patients most likely to benefit from interventions to improve adherence.
Methods: We studied 125 patients from a cross-sectional study evaluating patients attending an outpatient rheumatology clinic. Questionnaires assessed their beliefs about illness and medication, disability and quality of life. Medication adherence was assessed using the 5-item self-report Medication Adherence Rating Scale (MARS). Patients with MARS scores of 23 and under were classified as poorly adhering to their medications. Factors associated with poor adherence to medication were investigated using a multivariate logistic regression model. To determine the strength of associations between predictors and poor adherence to medications, stepwise logistic regression analysis was employed.
Results: Fifty-two percent of patients had sub-optimal adherence (MARS 24 or less); the prevalence of poor adherence was 34%. A dominant factor associated with better adherence was older age (odd ratio (OR):0.92, 95% CI [0.88-0.95]). Other significant associations with good adherence included patients viewing their medication as 'necessary' (OR: 0.88, 95% CI [0.79-.0.98]) and high levels on the subdomain of energy and vitality on the SF-36 (OR: 0.96, 95% CI [0.94-.0.99]). Poor adherence in contrast was associated with stronger illness identity (OR: 1.3, 95% CI [1.03-1.64]) and worse general health status scores on the SF-36 (OR: 1.03, 95% CI [1.004-1.063]).
Conclusions: Poor adherence was associated with patients who were younger, those who did not see their medications as necessary, patients who rated their general health as lower and reported higher levels of fatigue. This research can help clinicians to identify patients at risk of lower adherence to their RA medications as well as patients who would benefit from appropriate interventions.
Disclosure statement: All authors have declared no conflicts of interest.

13. HEALTH PROFESSIONALS' PERCEPTIONS OF THE EFFECTS OF EXERCISE ON JOINT HEALTH IN RHEUMATOID ARTHRITIS PATIENTS I: A QUESTIONNAIRE STUDY

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Background: Exercise is an important factor in the treatment and management of RA. Our previous research has indicated that RA patients perceive that health professionals lack certainty and clarity regarding exercise in RA management and its relationship to joint damage (Law et al., 2010). Therefore we set out to investigate perceptions of health professionals regarding the effects of exercise on joint health in RA patients using a questionnaire.
Methods: The online questionnaire included a brief introduction followed by 3 questionnaire sections. Section 1 incorporated demographics questions. Section 2 included a measure of participants' current physical activity levels (IPAQ). Section 3 included 40 items concerning participants' thoughts about exercise and RA patient joint health. Questionnaires were distributed via professional networks and websites, and sent to rheumatology HPs identified from the BSR handbook. Confirmatory factor analysis (CFA) was conducted and total percentage responses for each theme were calculated. One-way ANOVAs were conducted on each of the variables of practitioner category, IPAQ classification, age, gender and location of practice.
Results: 137 rheumatology HPs (95 females, 42 males; 76 rheumatologists, 24 nurses, 18 physiotherapists, 10 occupational therapists, 9 other HPs; age: 27-65 years) completed the questionnaires. Following removal of four items with low factor loadings CFA showed that a four factor solution provided an acceptable fit to the data (SB $\chi 2 = 863.04$, $df = 588$, $p < 0.000$, RMSEA = 0.06, CFI = 0.93, SRMR = 0.094). The factors were: 1. HPs lack of exercise knowledge; 2. Worry about causing harm to joints; 3. Not wanting to recommend exercise as patients are in pain; 4. Having to recommend exercise because it is helpful. Large percentages of respondents strongly disagreed or disagreed with factors 1, 2 and 3 with responses of 78%, 86% and 90%, respectively. Only 63% of respondents strongly agreed or agreed with factor 4. These responses varied depending on practitioner category only.
Conclusions: HPs believed they did not lack exercise knowledge, they mostly did not worry about exercise causing harm to joints and did not avoid recommending exercises to patients due to concerns about pain. This is in direct contrast to our findings about the perceptions of RA patients (Law et al., 2010). However, only two-thirds of HPs felt that exercise was helpful for RA patients. Further qualitative research is required to investigate the differences between RA HPs and patients and the underlying reasons for this in greater detail. Variation in the responses from the different practitioner categories also need to be investigated further so that education and resources can be provided where appropriate.
Disclosure statement: All authors have declared no conflicts of interest.

14. CARTILAGE TURNOVER, SYSTEMIC AND SYNOVIAL INFLAMMATION: THE ACUTE RESPONSE TO HIGH-INTENSITY AEROBIC AND RESISTANCE EXERCISE

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Background: Continued, high-intensity exercise has been shown to be safe and effective for patients with rheumatoid arthritis (RA). However, the potential detrimental effects for large weight-bearing joints have previously been highlighted and the effects of exercise per se are unknown. Furthermore, research suggests that patients are concerned about the effects of exercise on joint health. Therefore, to enhance the information available for this population, our aim was to investigate the acute effect of high-intensity aerobic and resistance exercise on cartilage turnover, synovial and systemic inflammation.
Methods: 8 stable RA patients (age: 60 ± 12 years; disease duration: 19 ± 12 years; mean $\pm$ SD) with a history of knee symptoms and 8 age and gender-matched, healthy control participants performed two types of exercise (aerobic and resistance), one week apart. The aerobic exercise session involved ~30 minutes walking including 4 intervals of 3 minutes at 70-90% of maximum heart rate (MHR) and 2 minutes at 50-70% MHR. The resistance exercise session involved 3 sets of 8 repetitions at 80% of 1 repetition-maximum of three lower body exercises; leg press, leg extension, leg curl. The main outcome variable was serum cartilage oligomeric matrix protein (COMP), a biomarker of cartilage turnover. Both knees were assessed for synovial inflammation using colour Doppler ultrasound and colour fraction (CF) was determined for quantitative analysis. Serum CRP provided a measure of systemic inflammation. Blood samples and US assessments were taken prior to, immediately following and 30 minutes, 1 hour, 2 hours, 6 hours and 24 hours post-exercise. Mixed model ANOVA with repeated measures was used for statistical analysis.
Results: Baseline COMP and CRP were significantly higher in the RA group (CRP: 16.2 ± 17.3 mg/L; COMP: 1359 ± 381.9 ng/ml) when compared to the healthy control group (CRP: 1.3 ± 1.2 mg/L; COMP: 1179 ± 446.3 ng/ml; $p = .046$ and $p > 0.00$, respectively). However, there were no significant differences in serum COMP or CRP between the time points after either the resistance or aerobic exercise session. There were no clinically significant levels of synovial inflammation prior to exercise and no change in CF for either group following both exercise conditions. Furthermore, patients were able to tolerate high-intensity exercise of both types.
Conclusions: Cartilage turnover, synovial and systemic inflammation showed no statistically or clinically significant changes in the 24 hours following 30 minutes of high-intensity aerobic or resistance exercise. This preliminary research offers further confirmation that high-intensity exercise is not detrimental to joint health in patients with inactive RA. These findings will help facilitate the transfer of positive information relating to exercise and joint health. Further research will determine if continued high-intensity training affects the acute response to exercise.

Disclosure statement: All authors have declared no conflicts of interest.

15. THE CONTINUING NEED OF BME COMMUNITIES FOR ARTHRITIS EDUCATION

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Background: Public ignorance about arthritis is widespread, despite its frequency. Our needs assessment a decade ago revealed a huge local desire for more information in plain English and in languages relevant to our large BME communities (1/3rd of population). Birmingham Arthritis Resource Centre was set up to meet this need and together with City Hospital provides multi-lingual educational material (including audio CD's and a web site) plus personal support to local and phone callers. The extent to which this meets current community needs or the drive for early arthritis diagnosis was assessed in 2 new surveys.
Methods: 500 people entering the Birmingham Central Library foyer completed a survey to explore their interest in arthritis and need for further information. A second survey assessed the extent of public health education available to BME groups. A team of BARC volunteers screened 4309 articles over a 3/12 period in the 5 available Asian language newspapers (ALP) versus 10 English dailies (EN) for arthritis-related articles. 4/10 EN and 4/5 ALP ran health articles, often weekly.
Results: 1.Library Survey respondents ranged from age 16 to 76, majority <50 years. Half were Caucasian and half came from 11 BME groups (including 35% S. Asians). 87% had some direct interest in arthritis; 33% recorded a personal arthritis problem while 54% were carers for a sufferer. 86% wanted a service providing arthritis education and support available in the emerging new city library. 2.The newspaper survey included 1638 ALP versus 1496 EN articles. The percentage of health to total articles was fairly similar (3.5% in ALP v 5.7%) but with several important differences. 1. Choice: EN offer >4 dailies for readers but ALP only one per language - leaving several local ethnic groups with no newspaper they could read. 2. Length: most ALP have very brief health articles (100–200 words), compared to substantial ones (>1000w) in EN. 3. Content: 60% of health features in ALP are on herbal remedies, unlike EN. In addition >10 health magazines in English exist at Central library but none for ethnic communities. Here only 0.9% of 1172 features scanned related to arthritis, which was even more uncommon across newspapers - 0.33% of total EN but only 0.12% of ALP articles. Prominent press reports on the RA session at the 2010 British Science Festival featured in 7 national plus 4 regional EN - but no ALP. Similiarly, 6 locally-active arthritis support groups operate only in English.
Conclusions: Ignorance about arthritis persists even among people complaining of arthritis and their carers. This is particularly marked among BME groups who often hold concepts of arthritis very different to the western medical model. Both journal information in their own language and community support are lacking for these groups. There is a continuing need for community education provided by voluntary groups collaborating with health professionals in this area, in line with the new WHO focus on non-transmissible diseases.
Disclosure statement: All authors have declared no conflicts of interest.

16. MEASURING THE RESPONSE OF EXTRA-HEPATIC SYMPTOMS AND QUALITY OF LIFE TO ANTIVIRAL TREATMENT IN PATIENTS WITH HEPATITIS C

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Background: Hepatitis C (HCV) infection is associated with musculoskeletal manifestations such as chronic widespread pain, sicca syndrome, polyarthritis and a reduced health-related quality of life (HRQOL). Little data is available on the effect of treatment on these manifestations. This study measured changes in extra hepatic symptoms before and after antiviral treatment in a large UK patient cohort.
Methods: 93 patients with HCV treated at the Royal Sussex County Hospital completed standard antiviral treatment with pegylated interferon and ribavirin and had also answered the hepatitis quality of life questionnaire (HQLQ) and a survey of symptoms affecting the spine, muscles, bones and joints before treatment and six months after finishing treatment. Outcome measures included presence/absence of chronic widespread pain (CWP) according to the Manchester criteria, pain intensity and impact as scored on a visual analogue scale (VAS), and a subjective reporting of sicca symptoms using questions from the Vitali questionnaire. Pre and Post treatment results were compared and tested against patient demographic data and serological markers such as presence/absence of sustained viral response (SVR) to treatment and rheumatoid factor.
Results: There was a statistically significant improvement in scores in the following 6 out of the 12 domains of the HQLQ: Physical functioning, Physical disability, Social functioning, Limitations due to hepatitis, Health distress due to hepatitis, and General health. There was a statistically significant decline in 3 of the domains (Positive well being, Health distress, and Mental health), and no significant change in the rest of the domains (Body pain, Motivation, and Vitality). There was a statistically significant decline in the level of pain reported by patients on the VAS before and after treatment (mean start score 3.4/10 versus mean end score 2.8/10, $p=0.029$). Scores of CWP and sicca symptoms showed improvement without statistical significance. There were positive associations between SVR and changes in all HQLQ scores excluding General health, Vitality and Mental health, as well as positive associations between SVR and changes in CWP and the number of painful joints, but these were not statistically significant. A high rheumatoid factor was slightly more prevalent in people with pre-treatment CWP (31.2%) than in those without CWP (24.5%), this was not significant.
Conclusions: Antiviral therapy with interferon and ribavirin significantly improves both HRQOL and pain symptoms in HCV patients. This suggests a role of the virus in contributing to musculoskeletal symptoms. Further work with larger numbers of patients and longer follow-up is needed.
Disclosure statement: All authors have declared no conflicts of interest.

17. DEVELOPMENT OF THE EVALUATION OF DAILY ACTIVITY QUESTIONNAIRE IN MUSCULOSKELETAL CONDITIONS: PHASE ONE

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Background: The Evaluation of Daily Activity Questionnaire (EDAQ) is a comprehensive patient reported outcome measure of activity/activity limitations [1]. It was developed in Sweden and is used in Occupational Therapy for clinical, audit and research purposes. We have already revised this for the UK and tested its reliability and validity in rheumatoid arthritis (RA). It now includes 14 sub-scales of personal and instrumental activities of daily living (with 6-14 activities in each; 138 in total). We now aim to test its psychometric properties in six other musculoskeletal conditions. In Phase 1 we are identifying whether or not people with these conditions consider these 138 activities are also important to include.
Methods: Cognitive debriefing interviews were conducted with people with either of these six musculoskeletal conditions. Participants completed the UK-EDAQ and rated items for inclusion on a $1=$not to $5=$very important scale. Items were considered for exclusion if rated <3. Participants were also asked to identify if there were any other activities causing difficulty which should be included. If two or more participants suggested the same activity, these were considered for inclusion.
Results: Forty participants (28 women: 12 men) were recruited from five rheumatology departments. Their mean age was 55.22 years (range 19-85); mean condition duration 11.98 years (SD 9.29); modified HAQ score $=0.75$ (SD 0.66). Participants were diagnosed with: osteoarthritis ($n=11$), ankylosing spondylitis ($n=6$); systemic lupus erythematosus ($n=10$), systemic sclerosis ($n=4$); chronic pain ($n=5$) or a chronic hand condition (e.g. carpal tunnel, de Quervains, $n=4$). No items were rated <3; 34/138 were rated as 3; 97/138 as 4; and 7/138 as 5. Some activities were rated as <3 by people in specific condition groups. A further 32 activities were suggested by 13 participants. Only four activities were suggested by two or more participants. These could be integrated into existing items: using a mobile (added to ''using a phone''); managing wood burners/fires (added to ''manage heating''); handling cards/using ATM (added to ''handle money''); and bicycling (added to ''doing physical activities, eg dancing, active sports, swimming'').

Conclusions: The UK-EDAQ content was appropriate for people with these musculoskeletal conditions. The next stage will be to test the reliability and validity of the assessment in these six conditions.
Disclosure statement: All authors have declared no conflicts of interest.

Reference

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BHPR: CLINICAL EVALUATION AND AUDIT DELIVERY

18. AUDIT: ARE POTENTIAL REACTIVE ARTHRITIS PATIENTS SCREENED FOR A SEXUAL AETIOLOGY?

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Background: The most common cause of a sexually acquired reactive arthritis (SARA) is chlamydia, affecting 5-10% of sexually active people <24 years in the UK. There are no internationally validated diagnostic criteria or guidelines to aid in the investigation of reactive arthritis (ReA), potentially leading to inconsistencies in patient management. In 2008, the British Association of Sexual Health and HIV (BASHH) published guidelines on SARA, recommending all patients suspected of ReA are screened for sexually transmitted infections (STIs). BASHH recommends asymptomatic screening should involve a first pass urine test in males and either a cervical or vulvo-vaginal swab in females, for whom urine specimens are inadequate. Vulvo-vaginal swab can be self-taken. Symptomatic patients should be referred to genitourinary medicine. This audit aimed to establish whether patients <30 years referred to a Teaching Hospital Rheumatology Department were screened for STIs if they potentially had a ReA, which screening tests were used and which other investigations were routinely carried out.
Methods: The 2008 BASHH guideline on the management of SARA, as well as the revised 2010 chlamydia guidelines were referred to as audit standards. Data collection was retrospective using the first clinic letter and hospital results server. All new patient referrals <30 years old to any general or early arthritis clinic in the preceding 6 months were audited.
Results: 244 patients were referred of which 202 had a clear alternative diagnosis and 42 had a potential ReA and audited further. The most common presenting complaints of these included: back pain/stiffness, n = 22; oligoarthritis (any joint) n = 14; monoarthritis (any joint) n = 11. Some patients had multiple presenting complaints. In total, 10/42 (24%) were screened for an STI, all were negative. Of these, 6 were female, 83% (n = 5) of which were tested with urine samples. Therefore, only 5/42 patients (12%) were screened using the correct test. In patients with high risk ReA (lower limb only mono/oligio arthritis, n = 19), 5/19 (26%) were tested for an STI. Other investigations carried out included: HLA B27, 16 tested, 6 positive (38%); Rheumatoid Factor, 30 tested (all normal); Anti CCP, 29 tested (all normal).
Conclusions: SARA may be an under-recognized diagnosis, due to reluctance from both the patient and the rheumatologist to discuss and investigate such matters, but also due to high rates of asymptomatic chlamydia. Less than a quarter of patients had an STI screen and a 'high risk' presentation commonly failed to prompt screening. There was a reliance on urine samples for testing chlamydia which does not offer acceptable specificity or sensitivity in females. The audit also revealed a large variation between clinicians as to the baseline investigations performed and coupled with inadequate STI screening this demonstrates the need for national guidelines for this disease.
Disclosure statement: All authors have declared no conflicts of interest.

19. CONNECTIVE TISSUE DISEASE SERVICE IN A DISTRICT HOSPITAL: ARE WE ACHIEVING QUALITY OF CARE?

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Background: Connective Tissue Diseases (CTD) are a group of rheumatological conditions characterized by multi-organ inflammation and autoimmunity, though uncommon they have a significant impact on a persons quality of life and can be life threatening. The Department of Health has suggested people with long term conditions should be treated within their locality, with access to more tertiary services if needed. A District General Hospital (DGH) can meet these criteria by ensuring patients with these chronic debilitating conditions can have specialist care provided locally with access to a multi speciality team (dermatology, respiratory, gastroenterology etc). Arthritis and Musculoskeletal Alliance (ARMA) developed a set of standards of care for people with CTD's in response to evidence that showed peoples experiences and quality of care varied widely across the UK depending on their local services (1). We decided to audit our service against the ARMA standards of care for Connective Tissue Disorders to evaluate our service.
Methods: A Trust approved questionnaire based on nine of the relevant standards set out by ARMA was given to all adult patients attending the connective tissue clinic during a 3 month period. The questionnaires were anonymous and collected in a box. The questionnaires were analysed using excel.
Results: 37 completed questionnaires were received during the 3 month period. Demographics were M:F 1:5, mean age was 56 yrs. The CTD's included SLE, olymyositis, CREST, scleroderma, Sjögren's, temporal arteritis, Raynaud's and PMR. 95% of patients strongly agreed or agreed that their diagnosis was given with care and sensitivity, 92% of patients either agreed or strongly agreed that their needs were supported by the specialist connective tissue disease clinic.
Conclusions: The audit demonstrates the ARMA standards of care are met in the connective tissue service at this DGH. The results have highlighted a need to raise awareness of support organizations and cardiovascular risks to the patients with CTD although it was apparent that patients didn't realize that monitoring blood pressure, checking weight and lipids addressed the issue of cardiovascular disease. Lifestyle changes including smoking, exercise and weight control needs to be reinforced at every clinic appointment.

TABLE 1 Results from audit of ARMA standards of care for CTD, *n* (%)

n = 37	Yes	No	N/A
Explanation of disease and prescribed medication	37 (100)	0	0
Access to specialist doctor	37 (100)	0	0
Access to specialist nurse/practitioner	35 (95)	1 (2.5)	1 (2.5)
Appointment time long enough	37 (100)	0	0
Information given about support organizations	29 (78)	8 (22)	0
Aware of increased risk of cardiovascular disease	24 (65)	12 (32.5)	1 (2.5)
Information on telephone advice line	35 (95)	2 (5)	0
Lifestyle advice	31 (84)	6 (16)	0
Advice on work/daily activities	35 (95)	2 (5)	0
Risk/benefits of non-prescribed medication	31 (84)	6 (16)	0

Disclosure statement: All authors have declared no conflicts of interest.

Reference:

1. ARMA 2007.

20. MONITORING IgG FOLLOWING RITUXIMAB THERAPY FOR RHEUMATOID ARTHRITIS

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Background: To investigate whether IgG levels are being monitored in patients receiving Rituximab (RTX) therapy for Rheumatoid Arthritis (RA) according to the recently published BSR guidelines and if there is a relationship between IgG levels and the incidence of severe infections.
Methods: An audit was carried out of 35 RA patients who had been given RTX therapy since 2005. The dates of first infusion, numbers of infusions and frequency of IgG monitoring were collated. In addition, the incidence of severe infections leading to hospital admission and/or death was examined.
Results: Of the 35 patients 27 (77%) were female and 8 (23%) male, the mean age was 55.7 years and 28 (80%) were white. Thirty-two (91%) patients had received previous anti-TNF therapy. The mean duration of follow up was 18.5 months. Twenty-nine patients (83%) had an IgG level measured at any point since 2005. Ten (29%) had an

IgG level measured 3 months prior to infusion. Although 17 (49%) had IgG levels measured after initiation of RTX therapy only 6 (17%) were measured within 4-6months after RTX therapy, and only 1 (3.5%) had IgG levels measured both before and 4-6 months after RTX therapy as per BSR guidelines. There were 4 incidences of severe infection; an infection rate of 7.3/100 patient years. None of the patients who suffered a severe infection had low IgG levels (defined as <6 g/L). However, 3 of the 4 patients had IgG levels <8 g/L and all 4 had IgG levels <12 g/L. Of these four patients, 3 also had a history of cardiac and/or respiratory disease.

Conclusions: The audit shows that there was insufficient awareness of the need to monitor IgG levels following RTX therapy, with only one patient having their IgG levels monitored as per the BSR guidelines. However, the data in the audit were generated prior to the publication of the guidelines. The patients who developed severe infections were not found to have an IgG level below the minimum threshold recommended by the BSR guidelines (<6 g/L) but did have other risk factors for infection associated with RTX therapy. Our study therefore suggests that, in addition to low IgG levels, attention must also be paid to these risk factors, in particular cardiac and respiratory disease. More research is needed to determine the appropriate minimum IgG threshold for RTX therapy in patients with such co-morbidities. RTX therapy has similar short-term infection rates as other biologic therapies but due to the potential for irreversible hypogammaglobulinaemia that has been reported following RTX therapy more care may be necessary in high risk patients. Consideration should be given to all of the potential risk factors for infection and complications that are associated with RTX therapy before recommending its use in patients with RA who do not respond to anti-TNF therapy. There should also be greater awareness of the need to monitor IgG levels after commencing RTX therapy.

Disclosure statement: All authors have declared no conflicts of interest.

21. A SERVICE EVALUATION OF A PHYSIOTHERAPY EXTENDED SCOPE PRACTITIONER COMMUNITY-LED INJECTION SERVICE

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Background: Musculoskeletal pain is a common problem seen in the community, which injections can be effective in treating. The NHS drive to maintain quality of care, whilst reducing costs, has encouraged traditional medical procedures to be undertaken by ESP physiotherapists. In the current NHS climate, it is vital that this service proves that it is meeting the needs of patients and its commissioners ensuring that the service continues to be funded.

Methods: The two main aims were i) to determine if the physiotherapy ESP community-led injection service meets the needs of patients and achieves a good clinical outcome (by decreasing pain and increasing function) and ii) to assess overall patient satisfaction. All patients attending the service, across seven community clinic sites in the Solihull Borough between July and September 2011, were invited to participate. The evaluation involved a two stage questionnaire: stage one administered at the injection clinic and stage two, a postal questionnaire completed two weeks after the injection. In an attempt to increase the response rate to stage two, a stamped addressed envelope was enclosed with the questionnaire and a reminder letter was sent to patients two weeks after the stage two questionnaire was sent. The results were analysed using Microsoft Excel 2007, with statistical significance set at $p \leq 0.05$.

Results: In stage one of the service evaluation 75 patients were recruited, with 50 patients (66.67%) responding to stage two. The most commonly injected site was the knee (51%). Interferential statistic calculations were based on only patients who completed both stages of the quesetionnaire ($n = 50$).There was a statistically significant decrease in pain post injection ($p = 0.00000003$), with the mean change of VAS score being 2.29. There was no statistically significant change between pre- and post- injection function with all functional activities ($p = 0.423$). A possible reason for the lack of functional change may be due to the chronicity of some of the conditions injected and also due to existing co-morbidities. Patients were happy with both the waiting time for (83%) and the location of (96%) their appointment and 86% of patients would like to self refer to the service. Patients were happy with the ESP consultation and felt they received sufficient explanation (88%), had sufficient involvement in decision making (96%), had enough time with the ESP (100%), and had opportunity to ask questions (100%). Overall, 94% of patients said they would use the service again if required and 92% of patients were either very satisfied (64%) or satisfied (28%) with the service.

Conclusions: This service evaluation demonstrates that this service is meeting its aims. This study provides new information on what a physiotherapy ESP community- led injection service can provide. This type of service is clearly considered valuable by patients. The results of this service evaluation will be used to improve patient care.

Disclosure statement: All authors have declared no conflicts of interest.

22. POST-OPERATIVE REHABILITATION PROVIDES AN UNMET NEED FOR BETTER PATIENT SUPPORT AND ADVICE FOLLOWING LUMBAR SPINAL FUSION

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Background: In the absence of evidence-based post-operative rehabilitation, following fusion surgery for severe persistent low back pain, people receive advice to rest for 3 months then progressively resume normal function. Such unclear, generic advice is unhelpful, and post-operative recovery may be delayed or suboptimal. We introduced a structured post-operative rehabilitation programme of individualized progressive exercise and self-management advice for people who had undergone lumbar fusion. We wanted to evaluate how helpful participants found the program.

Methods: 15 patients attending follow-up appointments were asked about their concerns, experiences, perceptions and needs. Four patients on the programme (small group, once a week for 10 weeks) were asked if and how the programme helped them. The main themes that emerged were documented.

Results: Patients primarily reported concerns about musculoskeletal or psychosocial issues rather than technical surgical problems, e.g. residual pain and disability, how to reduce analgesia, when to resume certain activities, etc, but complained of a lack of advice and support. The programme enabled access to a healthcare professional who could fully address people's concerns ''...my GP said to ask my consultant but I never get to see him, so it is great that I can ask you...''

Four areas raised most concerns:

- Residual symptoms: People didn't know what to expect and presence of residual symptoms concerned them ''...if the operation was a success why do I still have pain...''.
- Prognosis: They wanted to know what would happen ''...will this metalwork wear out...will it have to come out...''. The programme allowed them to ask questions and learn from others ''...I am glad to hear that exercise will not cause my spine to wear out. The others in the class have helped me see that I can get better...''.
- Physical function: People were keen to return to more normal physical function but were unsure what to do, how and when ''...they told me to gradually increase my activity, but which activity and when...''.
- Comorbidity: People were unclear how comorbidity might affect outcome ''...how does my diabetes affect exercise...'' ''...my neck hurts as well...'' but advice was lacking, unhelpful or impractical. The program gave individuals specific advice and they experienced benefits first-hand ''...the consultant just kept telling me to walk, but my knee hurt and I was scared. It is so helpful that you can help me manage all of these problems...''.

Conclusions: There is a need for better support to answer concerns that cause distress, anxiety and may impede post-operative recovery. Surgeons are primarily concerned about infection, implant failure, etc. Our post-operative rehabilitation program improved access to healthcare professionals who gave advice and support that might improve outcome. The programme warrants more thorough evaluation.

Disclosure statement: All authors have declared no conflicts of interest.

23. SELF-REFERRAL TO RHEUMATOLOGY PHYSIOTHERAPY: A VITAL COMPONENT OF SELF-MANAGEMENT

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Background: Nurse Advice Lines have been a long accepted practice in Rheumatology. At St. Helens Hospital we expanded this to a Therapy Advice Line, and noticed an increasing tendency for self referral by our patients. From working parties on management of Early RA and Stable RA we emphasized our self referral facility to patients.NICE Guidelines (section 1:3) recommends ongoing access to SPECIALIST Physiotherapy and Occupational Therapy. ARMA (Arthritis and Musculoskeletal Alliance) Standard 2 encourages self management, and Standard 6 recommends access to safe evidence-based care and management. Our concern was whether the self referrals were appropriate and relevant so this was the basis of our investigation. The recent National Rheumatoid Arthritis Society (NRAS) survey reported in October 2011 in a national newspaper, as well as in professional publications, raised concerns around access to SPECIALIST Rheumatology physiotherapy.
Methods: We audited physiotherapy self referrals between September 2010 and August 2011. We randomly selected 3 of these from each month. They were then scored on relevance on a scale of: 0 (inappropriate) to 5 (wholly appropriate), from information provided in discharge letters. The conditions covered and attendance rates were noted.
Results: Self referrals per month varied between 7 and 22 out of total monthly referrals between 39 and 89, which worked out as between 16% and 26% of the total referrals.

67% of referrals selected for investigation (36) were wholly appropriate, each scoring 5. Only 2 scored 0; one patient cancelled and one did not attend. Conditions reported as requiring treatment included neck and back, shoulders, elbows, wrists, hips, knees, ankles and feet. Attendance rates were excellent at 94%. It was encouraging to discover that the details were available in all discharge letters, and that the Physiotherapy correspondence reviewed was of a high quality.
Conclusions: Patients have become more aware of our self referral facility. A variety of problems presented, which were felt to be largely appropriate, with excellent outcomes and attendance. This suggests that if patients know how physiotherapy can help them and are well informed in this respect they can utilize this service to help manage their long term condition. As outcomes were decided from information in discharge letters, it highlighted the importance of recording appropriate and relevant details in these communications.

In a speciality where we strongly encourage appropriate self management, self referral is a vital component of this approach. This method of accessing Physiotherapy is consistent with NICE guidelines, ARMA standars and NRAS recommendations.
Disclosure statement: All authors have declared no conflicts of interest.

24. DOES OUR TELEPHONE ADVICE LINE SERVICE MEET CURRENT NATIONAL GUIDANCE?

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Background: Current NICE guidance and recent reports advocate the availability and value of a telephone advice line within rheumatology services. A rheumatology advice line service has been available at Trafford General Hospital for the last 20 years. It is manned by 4 Rheumatology Nurse Specialists (RNS) and has recently been enhanced by the services of a clerk. This audit was undertaken to identify:

- How many calls were answered directly.
- Who answered the call.
- Reason for the call.
- Resolution of the call.
- Level of patient satisfaction with the advice line service.

Methods: All patients who telephoned the advice line one or more times during December 2010 were sent a questionnaire by post with a covering letter explaining the aims of this survey and asking them to answer it retrospectively. Verbal consent was obtained at the resolution of each call. All responses were anonymous and only one form was sent per patient.
Results: 104 questionnaires were posted to patients: 76 (73%) were returned; 48 (63%) calls were answered directly, of which 37 (77%) were answered by a RNS and 11 (23%) by the clerk. 18 (24%) responders left a message on the answerphone, 8 did not answer this question. Of the 18 callers who left a message on the answerphone, 13 calls were returned on the same day, 1 call within two working days and 4 people stated that their call had not been returned. However these 4 patients did state that their call had been resolved at least to some extent. Reasons for calling the helpline were broken down as follows:

- 26% general questions or advice about their condition/medication;
- 20% requesting repeat prescriptions;
- 18% patients experiencing a flare of their arthritis;
- 8% requesting blood forms;
- 4% with an appointment query;
- 24% other reasons, usually 2 or more of the reasons listed above.

The majority of these patients felt that their query had been resolved in a timely fashion, 56% felt it had been answered immediately and 19% of queries were answered once more information was available. Only 1% felt that their query was not resolved. The remainder felt a verbal response was not required as they were asking for prescription and/or blood forms. Overall, 73 patients (99%) were satisfied with the service they had received. Only one patient felt that they would have liked more information. 44% of the total calls received were for clinical reasons- either a flare or general advice on their condition/medication. 12% of all calls received could be dealt with directly by the clerk.
Conclusions: This audit demonstrates that calls are dealt with promptly and with a high degree of patient satisfaction. Having a clerk involved increases efficiency by releasing RNS time for clinical duties. The telephone advice line meets current guidance by offering an easily accessible point of contact for patients and their carers. It also gives patients ongoing access to information and support both in general and when experiencing a flare of their condition.
Disclosure statement: All authors have declared no conflicts of interest.

25. EVALUATION OF PRE-EXISTING PULMONARY DISEASE IN RA PATIENTS INITIATING ANTI-TNF

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Background: Interstitial pulmonary fibrosis (IPF) can be a manifestation of rheumatoid arthritis(RA), side-effect of immunosuppressive drugs eg methotrexate and, as is increasingly recognized, a consequence of biologics especially anti-tumour necrosis factor (aTNF). In our department, 2 RA patients treated with humira developed aTNF induced IPF, one of whom had preexisting IPF prior to starting therapy. We audited our practice of pretreatment lung evaluation for the presence of existing lung disease in all our RA patients who had commenced aTNF.
Methods: A retrospective audit was conducted on all RA patients who started their first aTNF through the rheumatology dept of Royal Glamorgan Hospital,Wales. 109 patients were identified. Data was gathered relating to respiratory symptoms, smoking status, CXR findings & any subsequent assessments requested.
Results: Data on 100 subjects was obtained. Subjects were predominantly female (81%); mean age 55 yrs. Most patients(93%) reported no respiratory symptoms prior to starting treatment. Of the 7 with symptoms, diagnoses were established in 5 cases (via chest HRCT/lung function testing): 1 mild and 1 moderate IPF, 2 obstructive pulmonary disease and 1 bronchiectasis. Most patients were non-smokers (58%). Only 42% of patients had a CXR within 6 months before commencing aTNF as per NICE guidance. 87% of subjects had normal CXRs; of the remaining 13%, 7 correlated with abnormalities on HRCT - 5 were the symptomatic patients, the other 2 were found to have mild asymptomatic IPF and COPD. In total 3 cases had preexisting IPF, 2 of whom were symptomatic, however all had abnormal CXRs which compared with HRCT scanning.
Conclusions: The findings from the BSRBR show a poor prognosis of aTNF induced IPF with an overall mortality of 1/3 which rises to 2/3 in patients with preexisting IPF, however identifying those patients at risk remains difficult. This audit shows that preexisting pulmonary disease is uncommon. Screening prior to initiating aTNF revealed few patients with symptoms or radiological abnormalities. Smoking exposure correlated with those who had COPD but no other lung disease. Clinically significant symptoms, that is symptoms that correlated with a diagnosis, were only found in 5% of patients, and clinically significant radiological findings, where CXR and HRCT abnormalities correlated with a clear diagnosis, were only found in 6%. Of the 2 patients who developed aTNF induced IPF, one subsequently died and the other survived upon cessation of treatment but left with significant lung morbidity. The patient who died had mild asymptomatic IPF but no other obvious risk factors which could have helped to predict her risk of developing aTNF induced IPF. The second patient who survived had no symptoms, CXR abnormalities or any other risk factors to predict

her risk. More parameters, whether clinical or biological, are needed to help stratify patients who are at risk of developing fatal/disabling pulmonary complications from aTNF.
Disclosure statement: All authors have declared no conflicts of interest.

26. ALL WALES RE-AUDIT OF THE INITIAL MANAGEMENT OF GIANT CELL ARTERITIS (GCA)

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Background: In 2007, a national audit on the initial management of GCA was undertaken across all the Welsh rheumatology centres, the results of which were published as an abstract in the 2008 BSR conference. That audit highlighted many areas that needed improvement in GCA management and with the publishing of BSR/BPHR guidance on GCA, we re-audited our practice to reassess whether our collective performance had improved.
Methods: Patients diagnosed with GCA between Jan 2008 and Oct 2011 were assessed using a tick-box proforma covering the following categories(as per BSR guidelines): presenting features, examination findings, investigations, initial steroid dosing, temporal artery biopsy (TABx) details, concomitant medication prescribing & patient education. All rheumatology centres across Wales participated.
Results: 73 subjects were audited from across all the welsh health boards. There was a 2:1 female:male ratio with a mean age of 70 years (median 74yrs). 63% cases were initially assessed in secondary care by a rheumatologist, 30% by non-rheumatologists and 7% unknown. Akin to the 2007 audit, review for limb claudication and cerebrovascular events were poorly reported and there was deficient documentation in examination of cranial nerve status, large vessel signs and visual assessment (fundoscopy/visual fields/acquity). Baseline assessment of immunoglobulins/electrophoresis, CXR and urinanalysis was worse in this audit than in 2007 (42 v 50%, 33 v 36% and 27 v 44%, respectively). Appropriate steroid dosing occurred in 53% of patients compared with 52% in 2007. TABx was requested in 56% (v 66% in 2007), 78% of which were performed within 2 weeks of symptom onset. Prescribing of concomitant medications had all significantly improved - bisphosphonates 66 to 79%; calcium & vitamin D supplements 60 to 83%; aspirin 14 to 52%; gastric protection 50 to 64%. Documentation of patient education provision had improved from 7% in 2007 to 24%.
Conclusions: While this national re-audit shows a significant improvement in some areas of the initial management of GCA, there are some important areas where the guidelines are not being followed. There has been a decline in the rates of TABx requests and other secondary investigations. Also there has not been an improvement in the appropriate initial starting dose of steroids. The chief reasons for the drop in biopsy rates was due to difficulty in obtaining TABx from local surgical services and that the interval between starting steroids and time of assessment was too delayed to obatin a viable result. To remedy this, better lines of coordination and communication are needed between surgical/primary care systems with the rheumatology departments.

GCA remains one of the commonest vasculitides and indications for steroids in the elderly population and the importance of improving our performance using available guidance was reinforced in our recent bi-annual All Wales Audit meeting in Oct'11.
Disclosure statement: All authors have declared no conflicts of interest.

27. CHRONIC KIDNEY DISEASE MAY BE UNDERRECOGNIZED IN RHEUMATOLOGY PATIENTS ON DMARDS

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Background: Chronic kidney disease (CKD) is increasing in prevalence. Royal College of Physicians and NICE guidelines were issued in 2008 defining 5 stages of CKD based on eGFR measurements (Table 1). The guidelines cover management of blood pressure, proteinuria, cardiovascular risk and NSAID use in CKD patients, and indications for referral. Rheumatology patients may be at increased risk of CKD, and DMARD blood monitoring provides an opportunity to identify those requiring further assessment.
Methods: We studied CKD in 1006 rheumatology patients from our DMARD monitoring database whose eGFR had been measured within the preceding 12 months. The age range was 19-92 (median 59 years), 66% were female. 50/1006 (5%) of patients had an eGFR indicating stage 3-5 CKD confirmed on $\geq$2 consecutive occasions, and were studied in more detail from their records and by contacting GPs.
Results: Patients with CKD stage 3-5 had the following diagnoses: RA 31/50 (62%), other inflammatory arthritis 10/50 (20%), vasculitis 3/50 (6%), SLE 1/50 (2%), other 5/50 (10%). The breakdown by CKD stage was: stage 3a - 29 patients (58%), stage 3b - 18 patients (36%) and stage 4 - 3 patients (6%). 3/50 had a documented cause of CKD in their notes and 8/50 (16%) had diabetes. The most common DMARD used was methotrexate (22 patients, 44%); others included leflunomide, sulphasalazine, hydroxychloroquine and azathioprine. 11 patients (22%) were on an NSAID. 6/50 (12%) patients with CKD had been referred to a renal physician. 37 had not been referred; in 7 patients this information could not be obtained. Of 37 patients not referred, 28 (76%) were being monitored elsewhere (GP 27, diabetic clinic 1); 7 were not actively monitored (in 2 eGFR has since improved) and in 2 data was incomplete. 10/50 patients (20%) had had their blood pressure measured in rheumatology clinic in the past year. Measurement of proteinuria using protein:creatinine (PCR) or albumin:creatinine ratio (ACR) had been performed in 37/50 (74%) patients.
Conclusions: Our data show that not all CKD patients in our database had been identified for increased monitoring, and simple assessments such as blood pressure measurement were often not recorded in this high-risk group. We highlight the significance of eGFR for the identification of CKD in rheumatology patients and the relevant guidelines. Rheumatologists have a role in recognizing CKD in patients undergoing monitoring, and ensuring appropriate investigation and management in cooperation with primary care colleagues and renal physicians.

TABLE 1 Chronic kidney disease classification by stage (RCP 2008)

CKD stage	eGFR
1	$\geq$90 ml/min/1.73 m^2 with other evidence kidney damage
2	60-89 ml/min/1.73 m^2 with other evidence kidney damage
3(a)	45-59 ml/min/1.73 m^2
3(b)	30-44 ml/min/1.73 m^2
4	15-29 ml/min/1.73 m^2
5	$<$15 ml/min/1.73 m^2

Disclosure statement: All authors have declared no conflicts of interest.

28. AUDIT: IN A ROUTINE RHEUMATOLOGY OPD WHAT IS THE UTILITY OF WHOLE SPINE MRI IN PATIENTS WITH SUSPECTED INFLAMMATORY BACK PAIN?

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Background: Following the publication of new research (Rudwaleit M, Schwarzlose S et al Ann Rheum Dis 2008, Bennett AN et al Arthritis Rheum 2009 and Rudwaleit M, Jurik AG et al Ann Rheum Dis 2009) and national guidelines (NASS 2010; NICE TA143), a revised local pathway for the management of patients with Ankylosing Spondylitis [AS] was developed. Magnetic Resonance Imaging [MRI] of the whole spine and sacroiliac joints [SIJs] was a key diagnostic tool in this new pathway. Locally this lead to questions about the utility of MRI and how it would affect the subsequent pathway of patients. We hoped to demonstrate that by using early MRI in patients with possible IBP, we could efficiently discharge those with negative MRI scans (if clinically appropriate), and could swiftly offer treatment to those with proven spinal inflammation.
Methods: A list of all rheumatology patients that underwent spinal MRI over a six month period was obtained. The clinical records were then manually searched to identify those patients being investigated for IBP and a retrospective analysis of MRI, plain film results and subsequent clinical management was then carried out. The group of patients not investigated for IBP was excluded from further data collection.
Results: Of the 146 patients, it was found that 79 were being investigated for IBP. 20 patients (25%) had definite MRI signs of inflammatory disease, 58 (74%) had no signs of inflammatory disease and 1 patient had an equivocal scan. 50/79 patients (63%) had also undergone plain film investigation of the lumbar spine and bilateral SIJs. Within this group 18 (36%) had positive signs of inflammatory disease on plain film, but 5 patients with negative plain films were subsequently found to have a positive MRI scan (10% of total). Following investigation, 26 (33%) patients were discharged, 14 (18%) underwent treatment with NSAIDs and 12 (15%) started Anti-TNF therapy. For the remaining patients, management fell into 3 broad groups: ongoing/new DMARD therapy for peripheral arthritis, pain management, or further clinical review. New vs. Existing Patients: 56 (71%) were newly presenting patients; 23 (29%)

pre-existing rheumatology patients. 29% of new patients and 17% of existing patients had positive MRI findings. Of the new patients 25/56 (45%) were discharged following investigation.
Conclusions: Early utilization of MRI in patients with possible IBP, allows more rapid direction of patients to appropriate management streams. It facilitates discharge or alternative treatment of patients with non-inflammatory disease, and early initiation of appropriate medical therapy in those with inflammatory disease. A discharge rate of 45% from new, in a group of patients with initial clinical suspicion of inflammation, offsets the cost of MRI scanning and more importantly prevents diagnostic uncertainty for patients and unnecessary repeat visits to the rheumatology clinic.
Disclosure statement: All authors have declared no conflicts of interest.

29. A RE-AUDIT OF SERUM 25-HYDROXY VITAMIN D IN A RHEUMATOLOGY OUTPATIENT CLINIC

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Background: The prevalence of vitamin D deficiency in rheumatology outpatients has received much attention over the last few years although no screening guidelines exist specifically for these patients. We previously suggested that clinical suspicion could identify more vitamin D deficiency than Australian Working Party guidelines (AWP). Recently, the American Endocrine Society (ES) published its guidelines for the identification of hypovitaminosis D in the general population. We aimed to determine whether our previous audit led to increased testing for hypovitaminosis D and the cost implications of this. We also determined rates of vitamin D deficiency predicted by AWP and ES guidelines in patients suspected of being vitamin D deficient by their treating rheumatologist.
Methods: Requests for serum vitamin D levels were identified from laboratory records from April 2007 to March 2010 were linked to patient details. Vitamin D deficiency was defined as 25-hydroxy vitamin D (25(OH)D) <10 ng/ml and insufficiency as $11 \leq 20$ ng/ml. Analysis was performed using STATA v10 and non-parametric tests.
Results: 345 requests were identified in the initial audit period (April 2007-March 2009) and 651 in the reaudit period (April 2009-March 2010). The 2 groups were not significantly different; both were predominantly female (80% and 76%) with median (IQR) age of 48 (37-59) and 50 (38-61) years. Hypovitaminosis D (<20 ng/ml) was identified in 222/345 (64.3%) and 418/651 (64.2%). Median serum 25(OH)D was not different between the 2 groups (13.0[7.7-20.9], 16.5[9.9-26.0]ng/ml, $p = 0.87$). Serum 25(OH)D varied significantly with season, being highest in summer (20.5[13.3-30.7], 20.2[12.8-29.1]ng/ml and lowest in spring (13.0[8.2-23.6] and 12.6[7.9-23.7]ng/ml, $p < 0.01$). Serum 25(OH)D also varied significantly with ethnicity, being greatest in Caucasian patients (18.3[10.6-29.6], 18.5[11.8-28.1]ng/ml). In the first audit, median serum 25(OH)D was significantly lower in patients with undiagnosed muscle or joint pain, but this was not confirmed in the second audit. The cost of performing serum 25(OH)D assays on the patients screened and treating all of those with vitamin D deficiency (<10 ng/ml) was £16,163. The cost of empirically treating all of those patients suspected to have hypovitaminosis D without screening would have been £15,936.
Conclusions: Hypovitaminosis D appears to be common in rheumatology patients. In our audits serum 25(OH)D varied significantly with season and between ethnic groups. In a rheumatology outpatient population, clinical suspicion seems to better identify vitamin D deficiency than both AWP and ES guidelines. It also appears more cost effective to empirically treat all patients suspected of being vitamin D deficient. Although this audit points towards at-risk groups, the true prevalence of vitamin D deficiency in our inner city population remains to be determined. Further study is needed to develop guidelines directly relevant to rheumatology patients.
Disclosure statement: All authors have declared no conflicts of interest.

30. DOES INFORMING PATIENTS ABOUT THE LINK BETWEEN GUM DISEASE AND RHEUMATOID ARTHRITIS ENCOURAGE BETTER DENTAL CARE?

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Background: Evidence has shown that people with RA have a higher incidence of periodontal disease (PD) and the extent and severity of both the PD and RA are linked. Periodontal therapy has been shown to have a beneficial effect on the severity of the RA. Smoking and PD are also linked and are a risk factor for developing RA. An important factor in oral care is access to dental care. We decided to audit the access to dental care in a sample of our patient cohort with RA. Following the audit we produced a patient dental care leaflet highlighting the importance of dental care which was distributed to all our inflammatory arthritis patients. We then re-audited a sample of patients to determine if there had been any change in behaviour or access to dental care.
Methods: Two audits took place, the first in 2009. All adult patients attending the rheumatology clinic were asked to complete an approved questionnaire. These were anonymous and included questions on access to both NHS and Private dental care. During 2010 an approved patient leaflet about the importance of dental care was given to all patients with RA who attended the rheumatology department. Six months later all adult patients attending the rheumatology clinic were asked to complete a second questionnaire. This included questions on the dental care leaflet and access to dental care.
Results: Demographics for both audits were similar: audit 1 M:F 1:1.63, age range 25-90 years (median 64), diagnosis: RA 129, AS 2, PsA 27. Audit 2 M: F 1:1.65, age range 21-98 (median 62), diagnosis: RA 126, AS5, PsA 15. In the second audit 139 (95%) patients admitted to receiving the leaflet on dental care. All patients agreed or strongly agreed that the leaflet was easy to understand. Only 10 patients thought the leaflet contained no new information. 74 patients thought the leaflet applied to them and 125 patients thought the leaflet was helpful. Despite this very little change in behaviour was seen although 8 patients admitted that hey could not afford the dentist.
Conclusions: Dental care has become increasingly important in the light of new evidence linking severity of RA disease with both smoking and poor periodontal health,however a patient education leaflet led to minimal change in behaviour. Increasing the awareness of the potential link between poor oral hygiene and RA may have a useful impact on disease severity, but future studies may need to concentrate on barriers to changing behaviour which may be due to cost or fear of dentists.

TABLE 1 Results from audits of dental health questionnaire

	2009, *n* (%) ($n = 158$)			2010, *n* (%) ($n = 146$)		
Yes	No	No answer	Yes	No	No answer	
Annual review with dentist	126 (80)	19 (12)	13	123 (84)	18 (12)	5
Annual review with hygienist	55 (35)	103 (65)	0	59 (40)	87 (60)	0
Registered with NHS dentist	81 (51)	52 (32)	25	95 (65)	34 (23)	17
Admitted to smoking	19 (12)	139 (88)	0	19 (13)	127 (87)	0
Offered help to stop smoking	19	NA	NA	19	NA	NA
Use an electric toothbrush	64 (40)	89 (56)	5	63 (43)	83 (57)	0

Disclosure statement: All authors have declared no conflicts of interest.

31. IMPACT OF ANTI-TNF THERAPY ON BASDAI AND EMPLOYMENT IN ANKYLOSING SPONDYLITIS

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Background: Patients with Ankylosing spondylitis (AS) are usually symptomatic in their early adult life. As the condition affects working age population, it is imperative that AS is diagnosed and treated early and optimally in order to improve their employment prospects. NICE guidelines of 2008 approving anti-TNF(aTNF) therapy for patients with AS who have failed two NSAIDS was a landmark step in this direction. The National Ankylosing Spondylitis Society (NASS) survey of 2009 highlighted the importance of these guidelines and made further recommendations emphasizing the role of the MDT in enabling patients to remain in work. This audit examines the impact of biologic therapy on BATH indices and employment status in patients with AS.
Methods: Patients with AS who had been commenced on aTNF in our unit in the time period between 2003-10 were identified from our biologics database. Their case notes were examined for work status and BATH indices prior to and up to one year post aTNF. Compliance with NICE guidelines and NASS recommendations where applicable were assessed.
Results: 40 patients (32 M, 80%) were identified in the time period; mean age was 53 yrs, range 20-84yrs and median 52 yrs. All 40 patients had met the NICE criteria for commencing aTNF therapy and had been seen by our specialized physiotherapists and nurse specialist since presentation. Following the introduction of

multidisciplinary AS review clinics in 2008 designed to review all AS patients on an annual basis, 29 (72%) had been assessed by our occupational therapists with emphasis on employment and ADLs. 19 (47%) were working pre aTNF with 16 (40%) continuing to work 1 year on. Of those that no longer worked 1 had retired. Of the remaining 21 (52%) patients, 14 (35%) were not available for employment but 7(17%) were considered unemployed. 30 (75%) patients showed a reduction in BASDAI scores to below 4.0. 32 (80%) had achieved a 50% reduction or fall of more than 2 units. Reasons for no improvement in the BASDAI in the remainder include lack of efficacy (6%), other medical problems arising during study period (6%) and withdrawal of aTNF due to multiple DNAs in clinic (3%). In the 7 (17%) who remained unemployed, BASDAI improved by mean of 2.58 while in the 16 (40%) employed patients, BASDAI impovement (4.13) was significantly greater.

Conclusions: All our patients were found to comply with NICE guidelines and as per NASS recommendations, our MDT was closely involved in their management. In unemployed patients, improvement in BASDAI at one year did not correlate with employment gains. Although this may reflect the short review period, and the subjective elements of BASDAI, we postulate that BASFI/BASMI may better reflect patient fitness to work. Our audit highlights the need to accurately document work status at every consultation. A larger cohort and longer term analysis is required to fully assess the impact of biologic therapy on quality of life and employment prospects

Disclosure statement: All authors have declared no conflicts of interest.

32. A REVIEW OF THE IMPLEMENTATION OF CURRENT GUIDELINES REGARDING TRIPLE DMARD THERAPY FOR EARLY RHEUMATOID ARTHRITIS: IS IT HAPPENING IN PRACTICE?

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Background: Current guidelines for the management of Rheumatoid Arthritis (RA) recommend early commencement of triple DMARD therapy as part of a more aggressive approach to managing active disease. Locally the early RA pathway was reviewed to incorporate a multidisciplinary package of care as well as a designated nurse-led clinic. Initiation of triple therapy has been adopted although in some patients this may be a staggered process.Once prescribed triple DMARD therapy, patients are seen by a rheumatology nurse specialist (RNS) for counselling and initiation of treatment, then monthly for three months to assess the effectiveness of triple therapy as well as optimizing physical and psychological function. A review of practice was conducted to ascertain the number of patients starting and remaining on all three drugs.

Methods: A review of the nurse-led early RA clinic (x 1 per week) between February and July 2011, was undertaken to identify; 1) the numbers of early RA patients who commenced and continued with triple therapy 2) the reasons why triple therapy was discontinued.

Results: The number of newly diagnosed RA patients who were reviewed in the nurse-led early RA clinic was identified (n = 69). The percentage of patients who commenced triple therapy of Methotrexate, Sulfasalazine and Hydroxychloroquine was 46% (32/69). A large percentage remained on all three DMARDS (36%; n = 25), whereas 6/32 had discontinued triple therapy but remained on combination therapy with two DMARDS. Only one patient stopped all three DMARDs. Reasons for stopping drugs included nausea and vomiting (n = 5), diarrhoea (n = 1), patient choice (n = 1). Further analysis revealed that 16% (11/69) had commenced combination therapy with two DMARDS and 38% (26/69) were prescribed monotherapy. Corticosteroid use was not included in the analysis.

Conclusions: Combination therapy is recommended in the management of early RA, however monotherapy or combination therapy with two DMARDs may be more appropriate than triple therapy, depending on the assessment of the individual and consideration of other comorbidities and patient choice. The results reveal that the total number of patients on triple therapy is lower than expected, which may suggest that changes in prescribing practice are slower to become established,reflecting prescriber confidence,patient choice or tolerability of combination therapy.Further work to explore patients' opinions of taking multiple medications needs to be explored as well as ascertaining the number of patients who reach early remission or progress to biologic therapy.

Disclosure statement: All authors have declared no conflicts of interest.

33. NEGOTIATING TARGETS FOR THERAPY ACROSS THE RANGE OF FOLLOW-UP RHEUMATOLOGICAL CONDITIONS

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Background: NICE guidelines for Rheumatoid Arthritis (RA) suggest negotiating targets for treatment with patients. We have previously shown that these negotiations usually result in a target to maintain or regain a physical activity (1). The benefit should be that a longer term view is taken of a person's condition, minimizing the effect in a busy clinic of a patient not wanting to cause problems and saying ''I'm fine''. The same benefit should also apply to other conditions that we see. We were interested to explore whether it was possible to negotiate targets for treatment with other groups of Rheumatology patients under routine follow-up.

Methods: Consecutive patients under regular ongoing review by one consultant, seen in outpatient clinics, were included. An attempt was made to negotiate a target for treatment of their condition regardless of diagnosis. In addition, any patients with fibromyalgia (FMS) were negotiated with, even though they were likely to be discharged.

Results: Twelve consecutive clinics were used. These contained 108 patients who were on treatment, under regular review and with plans to continue indefinitely. Diagnoses were

RA n = 66; Sero-negative arthritis n = 29; Soft tissue and degenerative problems for steroid injections n = 7 and others (OA, PMR, Myositis) n = 5. In addition there were 7 patients with FMS. For the 66 RA patients, it was not possible to negotiate a target with 7. Two because of intellectual comprehension and 5 because a condition other than RA predominated. Of the remaining 59, 36 chose to maintain and 23 to regain an activity. The targets chosen are shown in Table 1 and are similar to the previous study. For the 29 sero-negative patients, one could not negotiate as Psoriasis predominated. Seventeen wished to maintain and 11 to regain an activity. The targets are shown in the table and are similar to the RA group. The Injection group all wished to regain. Four could only express this as improved pain. For most this was for a 3 month period. The FMS patients could only express their targets as improved pain (4) or fatigue (3).

Conclusions: It is possible to negotiate targets with patients in busy clinics. Targets are predominantly based on walking. Sero-negative arthritis was similar to RA. Temporary treatments such as injections require a time as well as an efficacy scale. FMS patients can only see feeling better as a target for treatment.

TABLE 1 Chosen targets

Diagnosis	RA	Sero-negative	Injection	Other	FMS
Walk	42	16	2	4	0
Work	4	3	0	0	0
Domestic	5	3	0	0	0
Leisure	6	3	0	1	0
Personal care	2	0	0	0	0
Sleep	0	2	1	0	0
Symptoms	0	1	4	1	7
Total	59	28	7	6	7

Disclosure statement: All authors have declared no conflicts of interest.

34. AN AUDIT ON VACCINATIONS IN PATIENTS WITH AUTOIMMUNE RHEUMATIC DISEASES

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Background: Locally there had been an awareness that many patients with rheumatic diseases were presenting with pneumonia with significant morbidity and mortality, which was mainly related to the infection. In April 2011 the European League Against Rheumatism (EULAR) released guidelines on vaccinations in patients with autoimmune rheumatic diseases. The guidelines discussed the increased risk of this cohort of patients contracting infections due to the diseases themselves and due to the immunosuppressive treatment. Two of their recommendations were that these patients should receive the annual flu vaccine and the pneumococcal vaccine. We audited the compliance with this advice.

Methods: During September 2011 a questionnaire was given to patients attending the rheumatology outpatient department. Data was collected on whether the patients had had the annual flu and pneumococcal vaccine, whether they had had a cold, flu or pneumonia and if they had pneumonia were they admitted to hospital. Information was collected on the medications they were prescribed and whether

they stopped their disease-modifying medication (DMARDs) if they had an infection. The aim was to have a 100% uptake of annual flu vaccine and the pneumococcal vaccine.
Results: 272 questionnaires were completed, 66 were excluded because they were either incomplete or they had a non immune related condition. 213 patients were reviewed. Of this population 63% were immunized with the annual flu vaccine, 36% had the pneumococcal vaccine and 31% had both vaccines. Patients over the age of 65 years were more likely to be vaccinated. However, we found that the vaccinations did not provide any statistical significant protection from pneumonia or flu ($p > 0.25$) in our cohort. It was also illustrated that 42% cohort did not stop their DMARD medications during their acute illness.
Conclusions: There was inadequate uptake of both the flu and pneumococcal vaccines. Only a third of the patients reached our target, with more uptake of the vaccination in elderly patient. However, we found that the vaccine did not seem to have statistically significant protection in preventing infections. Awareness needs to improve about stopping DMARDs during acute illness as only 42% stopped their DMARDs. These findings have highlighted areas to improve the local practice. Specialist nurses are going to actively promote vaccinations and educating patients about stopping DMARDs during acute illness.
Disclosure statement: All authors have declared no conflicts of interest.

35. PERSISTENCE WITH HYDROXYCHLOROQUINE IN A RHEUMATOLOGY COHORT

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Background: Hydroxychloroquine (HCQ) is a commonly prescribed DMARD. Its use is likely to increase as part of combination therapy in early RA and SLE; in addition there is an emerging role in osteoarthritis, CPPD and general cardiovascular protection. It is generally considered safe and better tolerated than other DMARDs. We studied indications for HCQ use, and persistence with the drug by diagnosis after first prescription.
Methods: All new HCQ prescriptions issued by a rheumatologist during the period May - November 2010 were included. At the endpoint (May 2011) we determined which patients were still taking the drug; persistence was defined as continuing treatment for at least 6 months. Information was obtained from electronic script issues / renewals and casenotes; where incomplete, patients were telephoned.
Results: 150 new HCQ prescriptions were issued during the study period. Indications for treatment were: RA (45%), unspecified inflammatory arthritis (UIA) (24%), connective tissue diseases (CTD) (13%), OA (14%), other (4%) (including CPPD, $n = 3$). At the endpoint 5 patients (3%) could not be contacted and 5 patients (3%) had died; these were excluded from later analyses. Of the remaining 140 patients, 97 (69%) were still taking HCQ and 43 (31%) had discontinued. Persistence with HCQ by diagnosis was as follows: RA 47/64 (73%), CTD 17/19 (89%), other inflammatory arthritis 21/32 (66%) and OA 8/19 (42%). Patients with OA were significantly less likely to continue treatment compared with RA patients ($p < 0.025$), and the rest of the sample combined ($p < 0.01$). The mean age was lower in the RA group compared with the OA group (59.1 years v 68.2 years). Reasons given for discontinuing HCQ were: side effects (51%), lack of effect (23%), other reasons (21%), unknown (5%). None of the RA group stopped treatment due to lack of effect, compared with 4 patients with OA and 5 with unspecified inflammatory arthritis. Side effects were commonly gastrointestinal ($n = 10$) but also headaches ($n = 3$), rash / pruritis ($n = 2$), dizziness ($n = 2$) and others. Other reasons for stopping included forgetting to take the drug ($n = 1$), not renewing the script ($n = 2$), advice from a doctor ($n = 1$) and cost ($n = 1$). 4 patients elected not to start HCQ as prescribed.
Conclusions: The use of HCQ in rheumatology patients in a DGH rheumatology practice was associated with a 31% early withdrawal rate, most often due to side effects. The majority of new HCQ prescriptions were for RA, undifferentiated inflammatory arthritis and CTD. 14% were for OA. Persistence in this cohort was highest in the CTD and RA groups and lowest in the OA group. Lack of effect was uncommonly reported in the RA and CTD groups but relatively common in the OA and UIA group. The observed poor persistence with HCQ in OA patients, despite a relatively higher age in this group, warrants further study.
Disclosure statement: All authors have declared no conflicts of interest.

36. AN AUDIT OF THE EFFECTIVENESS OF SILDENAFIL IN THE MANAGEMENT OF PATIENTS WITH MULTI-TREATMENT RESISTANT RAYNAUD'S PHENOMENON

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Background: Secondary Raynaud's phenomenon associated with connective tissue disease can cause significant morbidity e.g. digital ulceration and soft tissue infection. Effective vasodilatory therapy in Raynaud's is limited by treatment failure and side effects. Where usual oral options e.g. calcium channel blockers have failed, infusion of an IV prostaglandin analogue is tried over several days. These infusions are time consuming and expensive to administer, and associated with a range of side effects. Increasing evidence suggests a role for sildenafil in controlling vasospastic symptoms in resistant Raynaud's. Sildenafil is already used with success in non-erectile indications such as pulmonary hypertension. We aimed to assess whether sildenafil is beneficial in controlling symptoms and incidence of digital ulceration, in patients with secondary Raynaud's phenomenon who have failed IV prostaglandin therapy due to lack of efficacy or lack of tolerance.
Methods: 12 patients attending our rheumatology department were identified as taking sildenafil. They met local criteria for treatment i.e. had an inadequate response to IV epoprostenol (epo) (needing 3 or more infusions/year) or suffered intolerable side effects. Patients completed a questionnaire assessing the impact of sildenafil on frequency and duration of Raynaud's attacks, the presence of drug side effects, incidence of digital ulceration and ulcer healing time.
Results: 9/12 patients completed the questionnaire. All had scleroderma and took up to 20 mg TDS of sildenafil. Number of attacks experienced/week fell from a median of 70 (IQR 35-70) on epo to 4 (IQR 2-7) on sildenafil. Median attack duration (minutes) fell from 30 (IQR 12-80) on epo to 7.5 (IQR 1-12) on sildenafil. All patients had had multiple digital ulcers on IV epo; since starting sildenafil only 3 developed ulcers. Ulcer healing time ranged from 6 weeks to 6 months on epo and 1 to 6 weeks on sildenafil. Patients had been using sildenafil for 7-18 months: 6 experienced no side effects, 2 suffered mild headaches and 1 reported improved erectile function. 5 patients reported independently reducing the dose of sildenafil to 20 mg OD or 20 mg BD. Reasons reported for reduction were attaining adequate symptom control at lower doses, and awareness of drug cost. No side effects led to disontinuation of treatment or dose reduction.
Conclusions: Sildenafil has led to marked improvements in symptoms in this small group, beyond that seen with previously tried epo. Further evaluation in a RCT e.g. IV epo vs sildenadil may be appropriate.
Disclosure statement: All authors have declared no conflicts of interest.

37. THE APPROPRIATENESS OF ANA REQUESTING BY GENERAL PRACTITIONERS AND THE RELEVANCE OF A POSITIVE TEST

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Background: Antinuclear antibodies (ANAs) are commonly used as a diagnostic tool in connective tissue disorders. ANAs can however, be non-specific with significant numbers of false positives noted in women and the elderly. Sensitivity has also been found to be varied within different connective tissue disorders. Literature reviews calculate the positive predictive value of ANA tested by immunofluorescence assay (IFA) for the presence of connective tissue disease to be around 29%. Our objectives were to establish the proportion of inappropriate ANA requests made by general practitioners to a District General Hospital and to establish the positive predictive value of the ANA IFA testing currently in use at the hospital.
Methods: We looked retrospectively at positive ANA results that had been requested by general practitioners during a period of 12 months in 2010. The ANA pattern and titre for each positive result and the reason for the request was analysed, to see if it was clinically indicated. We also looked to see whether these patients had been referred and seen by a rheumatologist and if so what their underlying final diagnosis was to assess the relevance of the ANA request.
Results: In total there were 414 positive ANA results that were analysed [85 M: 329 F, Median age: 51, Age range: 14-88]. Approximately 30% ($n = 123$) of them were referred and seen by a rheumatologist. 71% ($n = 87$) of patients were found not to have a

connective tissue disorder, making it an inappropriate request of an ANA. The positive predictive value was found to be 26%.
Conclusions: We conclude that ANA tests are being inappropriately requested by general practitioners. This amounts to a considerable waste in terms of cost and NHS resources, with inappropriate referrals to rheumatology clinics. ANA tests are not diagnostic and therefore positive results must be considered in the clinical context.
Disclosure statement: All authors have declared no conflicts of interest.

38. AN AUDIT TO ASSESS THE EFFICACY OF THE OXFORD MUSCULOSKELETAL REFERRAL HUB SERVICE

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Background: 30% of GP consultations in primary care are musculoskeletal. In order to reduce the number of inappropriate referrals in rheumatology, a Musculoskeletal Referral Hub has been developed in Oxford. We have audited the diagnoses and outcomes of new rheumatology outpatient appointments both before and 1 year after the inception of the Hub to investigate its' effect on reducing non-rheumatological referrals. The Oxford Musculoskeletal Referral Hub uses a multi-disciplinary approach to triage patients. All rheumatology referrals are triaged at Stage 1 electronically and referred to rheumatology outpatients, back to the GP or seen face to face at Stage 2 of the Hub by either a Sport and Exercise Medicine Consultant or Specialist Rheumatology Physiotherapist. At Stage 2, patients can then be referred on for appropriate outpatient review, sent back to the GP, to community physiotherapy or orthotics services. There is limited evidence on whether remote triage systems can be effectively implemented. Morton et al. showed that remote photo-triage in Dermatology allowed more specific referrals to be made, resulting in definitive care at first visit (91% vs. 63%), as well as saving a small amount of money. Lakkaraju et al. demonstrated that ultrasound may be used to accurately triage soft tissue masses. There are also several studies ongoing into the effective deployment of triage at the primary-secondary care interface. These studies are further supported by a review of referral services in Wales, which concluded that clinical triage is a ''successful method of diverting cases to more appropriate services.''
Methods: We surveyed the diagnoses and clinical outcomes of patients referred from primary care before and after the introduction of the Hub service. We examined 2 groups of 150 newly referred patients from May to June 2010 and May to June 2011, using the rheumatology outpatient department clinical outcome forms. We evaluated the diagnoses, number of rereferrals and rate of discharge or follow up.
Results: We found there was a drop in the percentage of patients discharged at their first appointment from 48% to 39%. There was also an increase in the percentage of diagnosis of rheumatological conditions from 50% to 60%. However, there was an increase in re-referrals from 5 to 9.
Conclusions: The Hub system is shown to have an impact in reducing inappropriate referrals to rheumatology as demonstrated by the decrease in first appointment discharges and non-rheumatological diagnosis rate. In future we would like to examine how these changes have impacted on waiting times for rheumatology outpatient referrals. There do not yet exist any firm criteria which may be used to assess whether patients need to see a specialist. These could considerably improve the efficacy of the system. We await the results of studies such as the SAMBA trial which aim to determine simple prognostic factors which would enable accurate and expedient triaging of referrals from primary care.
Disclosure statement: All authors have declared no conflicts of interest.

39. DO PATIENTS WITH RHEUMATOID ARTHRITIS WANT SMS TEXT MESSAGES TO REMIND THEM ABOUT HOSPITAL APPOINTMENTS AND DRUG ADHERENCE?

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Background: Information and Communication Technology (ICT) has the potential to improve adherence to treatment and clinic attendance in order to improve prognosis and reduce costs. Sending SMS reminders of outpatient appointments has become routine in some specialties in the NHS, although not in local Rheumatology departments. We have previously shown that the majority of patients <65 with RA regularly use mobile phones despite RA disability. 48% would be willing to receive an SMS appointment reminder and 28% a medication reminder [1].
Methods: Interviews were carried out with key regional NHS Trust service managers to establish historical, technical and feasibility facts. Face-to-face interviews were conducted with 63 patients to inform a potential SMS appointment and medication reminder service. Finally, 20 patients agreed to participate in a pilot SMS reminder study in which text messages were sent 2 working days before appointments. Ethical approval was given by the Hertfordshire NHS REC; 09/H0311/105.
Results: Service manager interviews revealed no local evidence base or systematic guidance on the use of SMS. Attempts to establish these services have been affected by cost & objections from patients (intrusive). Only one service in this Trust uses SMS for appointment reminders.

60% of interviewed patients wanted an appointment reminder. Reasons given included forgetting six monthly/annual appointment times, an anticipated reduction of waiting times if all patients had reminders and having all details easily to hand. The majority who did not want reminders did not own a mobile phone, with a very small number having mobile phone restrictions at work. Only 5% expressed an interest in medication reminders for methotrexate, with the rest of the sample not wanting or needing reminders. 20 patients trialled SMS appointment reminders that were sent 2 working days before the appointment, 17 of which subsequently attended and were followed up. 100% of these patients were satisfied with the arrival of the SMS and happy with the wording indicating the usefulness of having all details being readily available. 25% admitted they would have missed the appointment without the SMS (2 forgot, 1 had wrong location and 1 wrong time of day). The majority felt that 2 working days was sufficient time although two patients would have preferred 5 days notice.
Conclusions: Overall feedback was positive for the use of ICT to remind patients of their appointments in rheumatology clinics, but not to aid adherence to drugs. Technical aspects and set up cost were the main reasons why the Trust is reluctant to establish this service as routine.
Disclosure statement: All authors have declared no conflicts of interest.

40. THE FEASIBILITY, ACCEPTABILITY AND USEFULNESS OF EXTENDED DATA COLLECTION IN RHEUMATOID ARTHRITIS

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Background: Routine consultations on patients with RA focus on assessing disease activity, monitoring drugs and adjusting treatments. The impact of the disease on the personal, recreational, occupational and psychosocial circumstances of the person is dealt with less well. The aim of this project was to look at the feasibility and usefulness of extended data collection in rheumatology outpatients.
Methods: Consecutive English-speaking patients with established RA attending routine follow up appointments were approached by their consultant. Immediately following that consultation each participating subject had a face to face interview with the research nurse and completed the following questionnaires: Scoreable SF-36v.2® Health Survey, BRAF-NRS, HAQ, Annual review of Services and Needs (similar to the Client Services Receipt Inventory) and Supplementary Annual Information (modified from the King's Mill model and addressing co-morbidities (including sexual health) and unmet therapy needs). Patients could choose nurse-assisted or self-completion of the questionnaires. Time for data collection and consultation were noted. Subjects were encouraged to discuss any issues raised by the questionnaires. They provided feedback on how useful and onerous they found the process.
Results: Forty patients, (mean age 61.5yrs; range 42-83yrs, 10M, 30F) took part. Consultations took between 20 and 40 minutes including questionnaire completion. Face to face nurse time ranged from 5 to 40 minutes. Five patients required extensive nurse assistance to complete the questionnaires because of difficulties with literacy or comprehension. One patient asked her husband to record her answers because of poor hand function. For the remainder, completion time for the questionnaires ranged from 5 to 15 minutes. Collection of additional data by the nurse took between 5 and 10 minutes. Ten subjects (including the six requiring extensive assistance) expressed a preference for completing the questionnaires with the nurse present. The remaining 30 either expressed a preference for completing the questionnaires at home prior to attendance or had no preference.

All subjects answered all questions. All expressed a willingness to provide these data on an annual basis though one subject expressed misgivings about the usefulness of the process. Previously unidentified issues were revealed or raised by 12 subjects. In all cases advice or assistance was given.

Conclusions: Collection of extended data in patients with RA is feasible, acceptable and produces new and important information in a significant proportion of subjects. It addresses a shortcoming of routine clinic consultations. Feedback suggests that this service could largely be delivered by annual postal questionnaires linked to annual nurse review clinics. Further work is required to demonstrate the applicability of this process to patients with different cultural perspectives or for whom English is a second language.

Disclosure statement: All authors have declared no conflicts of interest.

41. AN AUDIT OF ASSESSING RISK AND TREATING MYCOBACTERIAL INFECTION IN PATIENTS WITH INFLAMMATORY ARTHRITIS PRIOR TO STARTING AN ANTI-TNF AGENT

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Background: There is little consensus on the use of Elispot testing in preference to Mantoux, the appropriate length of treatment, treatment regimen and the delay in receiving anti-Tumour Necrosis Factor (TNF)treatment in the investigation and management of TB anti-TNF patients. The aim of this study was to review our hospital's practices for screening latent TB, the TB treatment prior to anti-TNF therapy and the delay in receipt of receiving anti-TNF treatments.

Methods: Data was obtained retrospectively from 301 patients receiving anti-TNF treatment over a 10 year period in a central London hospital.

Results: Prior to commencing treatment, 81% of the patients had chest radiographs within 3 months, all which were normal. All had a symptom assessment. Out of 301 patients, 29 had either a positive Mantoux or Elispot test recorded of which 52% had rheumatoid arthritis (RA), 28% had ankylosing spondylitis (AS) and 20% had psoriatic arthritis (PSA).

83% underwent Mantoux tests of which 2/3 were positive results. 93% underwent Elispot testing, with 56% positive outcome. 79% of patients received both tests of which only 26% were positive for both Mantoux and Elispot. Of interest, 66.67% with PSA had a positive Mantoux but negative Elispot. All positives had appropriate respiratory referral.

From the positive cohort, 69% were treated with TB chemoprophylaxis. 60% were treated with 3 months of Rifampicin and Isoniazid, 35% were treated with 6 months of isoniazid and 5% was treated with isoniazid for 3 months. In 15% treatment was discontinued due to side effects. The average delay between the decision to start anti-TNF and the start of anti-TNF treatment in the TB prophylactic cohort was 5 months and 27 days (range: 4 months-11 months). Patients showing positive results without TB chemoprophylaxis had an average treatment delay of 3 months 16 days (1 month 14 days- 8 months). To date, no patient has shown recurrence of TB.

Conclusions: Our study has emphasized the delay in receiving anti-TNF treatment in patients with positive Mantoux or Elispot testing. Contrary to BTS guidelines, our study has shown that prophylactic TB treatment can be successful if used for 3 months. It is important to assess the risk of reactivation of TB against the morbidity of the rheumatological disease.

It is our trust practice to perform Mantoux and Elispot on all patients as part of the screening process as Elispot has proven to have greater specificity and sensitivity. However when you apply the guidelines, 62.5% of Mantoux tests performed were unreliable as patients were on immunosuppressive treatment at the time. We found that a normal chest radiograph did not exclude latent TB. Our data demonstrates the need for a review of the guidelines on screening, length and type of chemoprophylactic treatments in inflammatory arthritis patients with positive Mantoux or Elispot results.

Disclosure statement: All authors have declared no conflicts of interest.

42. IMPACT OF SEXUAL DYSFUNCTION AND PSYCHOLOGICAL EFFECTS IN WOMEN WITH SYSTEMIC SCLEROSIS

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Background: Scleroderma (SSc) is a complex connective tissue disease associated with various life-threatening complications but also with significant co-morbidities, including sexual dysfunction. The objectives of this study were to explore the prevalence of sexual problems amongst women with SSc, to examine the effects of scleroderma on sexual relationship, sexual activities and the difficulties faced by women with SSc.

Methods: 100 women diagnosed with either limited (lcSSc) or diffuse (dcSSc) systemic sclerosis were invited to complete a validated Female Sexual Function Index Questionnaire (FSFI) which was expanded to assess the psychological effects of the sexual difficulties. The FSFI comprises of six domains including desire, arousal, lubrication, orgasm, satisfaction and pain. Severe impairment in all domains is defined as minimum full scale score range of 2 and normal function as maximal score of 36.

Results: Mean age ($n = 50$) was (mean $\pm$SD, years) 56 $\pm$1.41. 52% of the women who responded had diffuse subset while 40% had been diagnosed with the limited disease. The mean disease duration for both subsets was (mean $\pm$SD, years) 12 $\pm$2.8. 54% of the patients developed sexual difficulties after their diagnosis and the mean duration from diagnosis to emergence of sexual complications was (mean, $\pm$SD, years) 4.0 $\pm$5.8. For the 20% who developed difficulties before diagnosis the mean duration to onset of sexual dysfunction was (mean $\pm$SD, years) 9.5 $\pm$6.3.The overall FSFI domains showed that 84% of the patients had significant sexual problems (Interquartile full scale score range 3 - 17.4). 62% ($n = 31$) of the patients had a score below the mean of 10.8. Pain fared the worst of the six domains with 65% ($n = 28$) of patients having no sexual activity over the last month. 40% ($n = 20$) of patients did not have any sexual activity due to lack of lubrication. 60% of the affected women revealed that their sexual complications had caused strain in their relationships. 46% of the respondents reported to discussing their problems with their partners, whilst 30% admitted not able to discuss the problems, preferring to keep it to themselves or being embarrassed to do so. Among the 32 (64%) women who discussed the problems with their partners, 56% found it to be helpful. 76% of the subjects reported that they had never been asked about sexual health by a health professional. However 52% revealed that they would have discussed their sexual problems if they were concerned. Interestingly 72% of these women admitted to not raising any concern about their sexual problems.

Conclusions: Our study revealed that sexual health is an important aspect of life but can be of significant burden for these women. It is a subject that is usually neglected yet it has been associated with depressive symptoms and can have a negative impact for women with SSc and their partners. It is a subject worth exploring and actively enquiring in order to help our patients and improve their quality of life.

Disclosure statement: All authors have declared no conflicts of interest.

IMAGING

43. AN OBSERVATIONAL STUDY OF THE UTILITY OF CRANIAL ULTRASOUND IN SUSPECTED GIANT CELL ARTERITIS

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Background: Giant cell arteritis (GCA) is usually diagnosed from a constellation of clinical and laboratory features. Arterial duplex ultrasound scans (US) can provide valuable supportive evidence of an arteritis but its role in suspected GCA is not clearly defined. We studied the utility of US combined with a cluster of clinical and laboratory features in the evaluation of patients referred with suspected GCA.

Methods: All patients undergoing cranial duplex US scans between Jan 2005 and July 2011 were identified and clinical data obtained from electronic records, and, if necessary primary care providers. ACR criteria for GCA (3 or more of: age >50 years, a new headache, abnormal temporal artery palpation, ESR >50 mm and an abnormal temporal artery biopsy) were used to classify patients. US reports were independently classified according to whether there was evidence of an arteritis or not. Explicit US features of GCA such as a halo sign were not required to make this determination. The relationship between the ACR criteria alone or in combination with US and a final clinical

diagnosis of GCA (made after a minimum of 3-month follow-up) was analysed.
Results: Forty-eight patients, mean age 68 (range 44-92) years, were investigated by US for suspected GCA. ACR criteria for GCA were met by 47.9% (23/48) of patients: 5 of these patients and overall 8 patients had a temporal artery biopsy - all biopsies were negative. Detailed data is shown in Table 1.
Conclusions: In this cohort of patients the strongest positive predictor for GCA was the US, independent of ACR criteria. Only a minority of patients had a temporal artery biopsy, all of which were negative. Biopsy results had limited utility. ACR criteria alone were insufficient for ruling in or ruling out a diagnosis of GCA at 3 months. Patients fulfilling ACR criteria and with a positive US were highly likely to be managed as GCA regardless of biopsy result where this was done. It is possible that a blinded study, nuances of clinical presentation not examined in this study, or longer follow up and further investigation for more robust diagnostic confirmation are required to understand these relationships better.

TABLE 1 Summary of descriptive data & likelihood ratios

	Total (%)	Diagnosed GCA[a] (%)	Positive likelihood ratio (95% confidence interval)	Negative likelihood ration (95% confidence interval)
All patients	48 (100)	13/48 (27.1)	–	–
ACR criteria +ve (≥3)	23 (48)	7/23 (30)	1.2 (0.6–2.2)	0.9 (0.4–1.6)
ACR criteria −ve (<3)	25 (52)	6/25 (24)	0.9 (0.4–1.6)	1.2 (0.6–2.2)
US artery +ve	14 (29)	12/14 (86)	16.1 (4.1–62.2	1.0 (0.6–1.5)
US artery −ve	34 (71)	1/34 (3)	1.0 (0.6–1.5)	16.1 (4.1–62.2)
ACR +ve & US+ve	7 (15)	6/7 (86)	16.2 (2.1–121.7)	0.6 (0.3–0.9)
ACR +ve & US −ve	16 (33)	1/16 (6)	0.2 (0.03–1.2)	1.6 (1.2–2.2)
ACR −ve & US +ve	7 (15)	1/34 (3)	16.2 (2.1–121.7)	0.6 (0.3–0.9)
ACR −ve & US −ve	18 (37.5)	0/18 (0)	0.07 (0.004–1.1)	2.0 (1.4–2.8)
Biopsied	8 (16.7)	4/8 (50)	–	–
No biopsy	40 (83.3)	9/40 (23)	–	–

[a]Clinical judgment after a minimum of 3 months follow up.

Disclosure statement: All authors have declared no conflicts of interest.

44. DEVELOPMENT OF AN ACCREDITED, INNOVATIVE, FOCUSED ULTRASOUND TRAINING COURSE FOR REGISTERED HEALTH PROFESSIONALS

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Background: Ultrasound (US) is an important diagnostic tool recognized by NICE for use in the management of Rheumatoid arthritis (RA). Provision of US training varies widely; from short duration introductory seminars with no assessment of operator competency, to University accredited musculoskeletal US courses. Short US courses do not provide a professionally recognized certificate of sonographic training. Conversely a PgC, PgD or MSc is time-consuming, requiring large numbers of supervised scans. Such courses tend to omit the more specialist requirements of the rheumatologist diagnosing subclinical synovitis, including early RA. Our aim was to provide a standardized, rheumatologist-focussed US training course with professional sonographic accreditation, allowing the successful participant to report on Trust radiology reporting systems.
Methods: The EKHUFT US course was developed jointly by the departments of Medical Physics, Radiology and Rheumatology and has 2 core components. Firstly, a 4 day foundation course introduces the science & technology of US; anatomy, pathology and US assessment of hands, wrists and feet; and practical US training sessions. Satisfactory completion (assessed by practical and written examination) leads to the second, vocational, component wherein the practical US skills acquired in the foundation course are reinforced and extended through the completion of a series of weekly supervised training sessions in an out-patient clinic setting
Results: Scans were performed by members of the Rheumatology department, on each of the 3 Trust hospital sites and the scans reported on the Trust radiology reporting system. The final practical assessment of US clinical competency will be undertaken by consultant radiologists, at the end of the training period. Competency will be assessed by the satisfactory completion of a set of training objectives. A portfolio will be submitted for assessment to include 120 hours of documented US clinical skills learning, of which at least 50 hours must be directly mentored. A log book, case study and reflective discussion will also be assessed. It is envisaged that the first cohort of trainees will achieve accreditation in January 2012.
Conclusions: This course provides an exciting opportunity for specialist registrars, consultants and other registered health professionals to complete clinical competency and theoretical training within a relatively short time frame (6 months). CASE (Consortium for the Accreditation of Sonographic Education) has accredited this focussed ultrasound course in partnership with Canterbury Christchurch University who are acting as moderators. It provides a nationally recognized and validated qualification for the use of US as a diagnostic tool in Rheumatology, with the possibility of linking in to an established MSc programme.
Disclosure statement: P.B. has received a sessional support grant from Pfizer, and an equipment grant from Abbott. D.D. has received a training and course grant from Pfizer, a sessional grant from Pfizer, and an equipment grant from Abbott. A.R. has received a sessional grant from Pfizer. All other authors have declared no conflicts of interest.

45. THE POWER OF PET/CT

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Background: We present 4 cases in which FDG positron emission computed tomography (PET/CT) gave critical diagnostic information in difficult rheumatological cases.
Methods: See results.
Results: Case 1: Giant cell arteritis. 69 yr old woman admitted Oct 2009 c/o 3 wk history of neck and parietal pain. CT head NAD. CRP 33 mg/L, ESR 24 mm/hr. Discharged + referred to rheumatology via OPD. Seen Dec 2009. Asymptomatic. CRP 23 mg/L. Chest XR, abdo US, Igs, echocardiogram normal. Reviewed Feb 2010. Still asymptomatic. CRP 27. PET/CT: increased uptake subclavian, axillary, iliac arteries and aorta. Temporal artery biopsy (prior to steroids): prominent multinucleated giant cell infiltrate. Rx prednisolone: rapid fall in CRP.

Case 2: Large vessel vasculitis. 65 yr old woman presented with acute onset thigh weakness, malaise. CRP 76, ESR 53. MRI L-spine, thighs and CT body: NAD. Autoantibodies -ve, CK N. Symptoms settled spontaneously; recurred + sweats and fever 6 mths later. CRP 210, ESR 133. Repeat CT NAD; PET/CT:widespread uptake in large vessels. Rx prednisolone + cyclophosphamide: CRP/ESR resolved, symptoms improved.

Case 3: Non Hodgkin's lymphoma. 79 yr old woman presented with a 3 mth history of lethargy, night sweats and recent onset headache. Past history included PMR (steroids stopped 2 yr previously). ESR 104 mm/hr, Platelets 1381 × 109/L. WCC and Hb normal. Blood flim - atypical lymphocytes. IgM lambda paraprotein on electrophoresis. TA Bx: normal. CT abdo: 13 cm splenomegaly. While awaiting bone marrow results, PET/CT was performed to help differentiate between vasculitis and malignancy: diffuse activity in the spleen. Bone marrow immunophenotyping: Non-Hodgkin's Lymphoma. Rx: standard chemotherapy with improvement in symptoms.

Case 4: Polymyalgia rheumatica. 55 yr old man presented in July 2009 with bilateral VII nerve palsies following a tick bite. CSF protein 2.88 g/L, 95% lymphocytes. Lyme titres equivocal. MRI brain NAD. Responded to ceftriaxone. ESR 2 mm/hr Oct 2009. In May 2010 he developed a sudden onset of hip and shoulder girdle stiffness. CRP 110 mg/L, ESR 83 mm/hr. Because of the previous complexity of his case PET/CT arranged: marked increase in uptake in both shoulders and hips. Rx prednisolone 30 mg daily: rapid resolution of symptoms and inflammatory markers.
Conclusions: These cases show the benefit of PET/CT in rheumatology practice. Cases 1 + 2 emphasize the potential for silent large vessel involvement in GCA; also, significant vessel inflammation can occur with minimal symptoms and mildly raised inflammatory parameters. Case 3 illustrates a common conundrum where sepsis, malignancy and autoimmune disease all cross the differential diagnosis. Case 4 suggest that PET/CT may be useful in diagnosing atypical cases of PMR, as well as GCA in association with PMR. PET/CT scanning is expensive (£980 per scan) and involves significant radiation exposure (equivalent to 25mSv). However, in carefully chosen cases it can be an important rheumatological investigation.

Disclosure statement: All authors have declared no conflicts of interest.

46. ULTRASOUND GUIDED SYNOVIAL BIOPSIES: SAFETY, TOLERABILITY, AND TISSUE QUALITY

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Background: Currently, synovial tissue analysis is restricted to early phase drug trials and academic research. However, if synovial tissue analysis can be shown to have clinical utility, it is important that the harvesting procedure be well tolerated, safe and provides tissue of sufficient quality both in large and small joints. We report the safety, tolerability and tissues quality in 93 consecutive patients undergoing ultrasound (US) guided synovial biopsies at Barts and The London, as part of a MRC-funded Pathobiology of Early Arthritis Cohort (PEAC). http://www.peac-mrc.mds.qmul.ac.uk/
Methods: A questionnaire was administered to all patients asking them to grade joint pain, stiffness and swelling before and after the biopsy procedure on a VAS. In addition, patients were asked to indicate the tolerability of the procedure using a 5-point scale and whether they would consider a repeat biopsy. The post-biopsy assessment was undertaken between 3-5 days following the procedure. Complications were compared with published data for arthroscopy. Laboratory analysis assessed tissue quality and the RNA yield. Biopsies were taken from knee, elbow, wrists, MCP, MTP and PIP joints.
Results: The rate of complications for US guided synovial biopsy compared favorably with published data for arthroscopy with no reported cases of wound or joint infection, haemarthrosis, DVT, thrombophlebitis and no evidence of a flare of the underlying disease. 3 patients reported feeling faint during the procedure but satisfactory completion was achieved in all subjects. No difference was seen with either pain ($p = 0.22$), stiffness ($p = 0.25$) or swelling ($p = 0.37$) following biopsy. A higher percentage of patients reporting no discomfort in respect to small joint compared to large joint synovial biopsies (89% vs 82%), however overall no significant difference was demonstrated in patient reported tolerability ($p = 0.19$). 98% of all biopsies were able to be graded with RNA yields similar between different joints ($p = 0.224$). All patients agreed to a subsequent synovial biopsy as part of the PEAC protocol. Analysis of RNA yield depending upon US grey scale synovial thickness (ST) prior to biopsy demonstrated a significantly higher yield from joints with grade 3-4 / 4 for US ST score compared to grade 1-2 ($p = 0.002$).
Conclusions: US guided synovial biopsies appear to be well tolerated from both large and small joints providing good quality tissue for grading and RNA extraction. In our experience, there are no safety concerns and over 95% of patients agreed to a subsequent biopsy. All joints may be considered for synovial biopsy. A pre-biopsy US examination may help target joints with higher grades of synovial thickening and improve subsequent RNA yield. This approach may not be feasible in subsequent biopsies where synovial thickness may be reduced following treatment, however our data would suggest that suitable tissue can still be harvested from joints with low grade ST.
Disclosure statement: All authors have declared no conflicts of interest.

47. USEFULNESS OF NOVEL WHOLE BODY MULTIPLE JOINT MRI IMAGING IN ESTABLISHING ACCURATE AND TIMELY DIAGNOSES IN PATIENTS PRESENTING WITH INFLAMMATORY ARTHRITIS

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Background: Making an accurate and timely diagnosis of inflammatory arthritis is crucial to allow rapid instigation of appropriate therapy with prevention of long term disability. However, diagnosis can be delayed due to the reduced sensitivity of clinical examination (CE) for synovitis and plain radiographs for early bone damage. MRI offers increased sensitivity for detecting pathological changes but in early disease it may be difficult to know which joints should be imaged, and targeted joint imaging does not necessarily reflect the overall disease load or distribution. Recent developments in whole body scanning offer the potential to scan most of the joints in a single session. The aim of this work was to (i) examine the effect of MRI findings on clinical diagnosis and (ii) demonstrate the feasibility of a whole body multiple joint MRI (WBMJ-MRI) protocol in early arthritis patients.
Methods: 15 patients newly presenting to the Rheumatology Early Arthritis Clinic were studied. A clinical diagnosis was made using clinical (swollen joint count, Leeds Enthesitis Index1), laboratory (rheumatoid factor, anti-CCP antibody, CRP) and plain radiographic (hands and feet) assessments. Involvement of joints and entheses was determined clinically based on joint swelling and entheseal tenderness.

WBMJ-MRI was performed using a 3T Siemens Verio scanner with multiple radiofrequency coils. T2-weighted fat suppressed images of the spine and sacroiliac joints were acquired, followed by images of the joints and entheses using VIBE Dixon sequences post intravenous contrast.

Images were scored by a MSK radiologist blinded to the clinical findings for presence/absence of the following: (i) Spinal inflammatory change, sacroiliac oedema and erosion; (ii) Synovitis, osteitis or erosion at the glenohumeral, sternoclavicular, wrist, MCP, PIP, hip, knee, ankle, mid/hind foot, MTP and interphalangeal joints; (iii) Enthesitis at the shoulder, ASIS, greater trochanter, knee, Achilles and plantar fascia. Findings from Groups (ii)-(iv) were compared with those from clinical examination. The clinical diagnoses were then reviewed in light of the MRI findings.
Results: Clinical diagnoses at presentation were rheumatoid arthritis (RA, $n = 8$) and undifferentiated arthritis (UA, $n = 7$). MRI revealed pathology at more sites per patient than CE (10 vs. 6, $p < 0.05$, Wilcoxon) and showed abnormalities at more sites per patient in those with RA than UA (14 vs. 6, $p < 0.05$, Mann Whitney U). In 4/15 (27%) patients, MRI findings led to a change in diagnosis.
Conclusions: WBMJ-MRI is novel, feasible and more sensitive than CE. The combination of axial and peripheral imaging enables identification of both seropositive and seronegative disease patterns and disease severity. Long-term follow-up is required to confirm the accuracy of the MRI-attributed diagnoses.
Disclosure statement: All authors have declared no conflicts of interest.

Reference:

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48. PREDICTORS OF RADIOGRAPHIC PROGRESSION IN METHOTREXATE-NAÏVE PATIENTS WITH RHEUMATOID ARTHRITIS BASED ON ONE-YEAR RADIOGRAPHIC DATA FROM THE GO-BEFORE GOLIMUMAB CLINICAL TRIAL

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Background: The purpose of this study was to identify variables associated with radiographic joint damage in patients with rheumatoid arthritis (RA) before and after treatment with golimumab (GLM) + methotrexate (MTX) or MTX + placebo (PBO).
Methods: GO BEFORE was a double-blind, PBO-controlled study. 637 MTX-naïve adult patients with active RA (≥4 tender joint and 4 swollen joints) were randomized to PBO q4wks + MTX 20 mg/wk, GLM 100 mg q4wks + PBO capsules/wk, GLM 50 or 100 mg (q4wks + MTX 20 mg/wk). Radiographs of the hands and feet were evaluated at baseline, wk28, and wk52 using the van der Heijde-Sharp (vdHS) score. Linear regression modeling was performed to identify baseline

variables that predict radiographic damage at baseline or change in vdHS score from baseline at wk52.
Results: Mean (SD) disease duration was 3.5 (5.6) years, baseline vdHS was 14.7 (27.0) and baseline DAS28 (CRP) score was 5.7 (1.06). In linear regression models, baseline CRP (or baseline ESR), HAQ score, disease duration and number of swollen joints were significantly associated with baseline vdHS score ($p < 0.05$, for all). After adjusting for other baseline characteristics (age, gender, disease duration, ESR, RF, counts of swollen and tender joints, HAQ) in the linear regression model, higher baseline CRP concentration and treatment with MTX + PBO were significantly correlated with greater progression in vdHS from baseline to wk52. In separate models analysed by treatment groups, a greater correlation of baseline CRP level with radiographic progression was observed in the MTX + PBO group compared with the GLM + MTX group. GLM + MTX-treated patients demonstrated less radiographic damage, and more had no progression (change in vdH-S score ≤ 0) than MTX + PBO-treated patients regardless of baseline disease activity (DAS28 > 5.1 vs. $\leq$5.1), baseline inflammation level measured by CRP (>2 vs.$\leq$2 mg/dl) or ESR (>28 vs. $\leq$28 mm/hr), disease duration ($\leq$3 years vs. >3 years), or clinical remission (Yes/No) at wk52.
Conclusions: MTX-naïve RA patients with an elevated CRP level or high baseline disease activity had an increased likelihood for greater joint damage if treated with MTX-alone compared with GLM + MTX.
Disclosure statement: P.C. is an investigator for Janssen. P.E. is an investigator for Janssen. R.F. is an investigator for Janssen. C.H. is an employee of Janssen. E.H. is an employee of Janssen. D.V. is an investigator for Janssen. W.X. is an employee of Janssen.

49. GOLIMUMAB TREATMENT INHIBITS PROGRESSION OF JOINT DAMAGE IN PATIENTS WITH PSORIATIC ARTHRITIS REGARDLESS OF BASELINE DISEASE SEVERITY

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Background: To identify variables associated with radiographic joint damage in pts with PsA treated with golimumab(GLM) or placebo(PBO) (standard therapy with MTX or/and NSAIDs) in a Ph3 randomized, PBO-controlled study(GO-REVEAL).
Methods: Adult PsA pts with $\geq$ 3 swollen & $\geq$ 3 tender joints were randomized to subcutaneous placebo (PBO) or GLM (50 or 100 mg) q4wks. At wk16, pts with <10% improvement in swollen and tender joint counts entered early escape in a blinded fashion to GLM50mg (PBO pts) or GLM100mg (GLM50mg pts). Starting at wk 24, pts remaining on PBO were crossed over to GLM50mg. Changes from baseline in PsA modified vdH-S scores of hands and feet were compared at wk24 and wk 52 by stratification of baseline disease activity (DAS28 > 5.1 vs. $\leq$5.1) or CRP level (>0.6 vs. $\leq$0.6 mg/dL). Logistic regression model was used to adjust for covariates (age, gender, disease duration, body weight, baseline MTX use) when examining association of baseline DAS28 with joint progression from baseline to wk 24 or from wk 24-52. In logistic regression model, only pts who had no missing X-ray data were evaluated.
Results: 405 pts were enrolled with mean (SD) total PsA modified vdH-S scores of 18.15 (27.76) to 23.85 (35.41) and baseline DAS28 score of 4.9 (1.0) to 5.0 (1.1). At wk24, GLM-treated pts had significantly less radiographic damage than PBO (mean change from baseline -0.09 ± 1.32 vs. 0.27 ± 1.26, $p = 0.015$) or had no progression (change ≤ 0) than PBO-treated pts (77.7% vs. 62.7%, $p = 0.003$), These differences were greater among pts with high disease activity (DAS28 > 5.1) ($p < 0.01$) or elevated CRP (CRP > 0.6 mg/dL) ($p = 0.01$) than pts with moderate disease activity or normal CRP. After adjusting for baseline characteristics using a regression model, higher baseline disease activity was significantly associated with radiographic progression at wk24 in the PBO group ($p < 0.01$), but baseline disease activity was not associated with radiographic progression in the GLM group. Similarly, disease activity at wk24 in all pts randomized to GLM or switched to GLM at wk24 was not associated with radiographic progression from wk24 to 54, suggesting that irrespective of disease activity at wk24, there was absent or nominal progression in joint damage at wk52.
Conclusions: PsA pts with high arthritis disease activity or CRP level at baseline experience more joint damage if treated with standard therapy only. Adding GLM provides additional benefit in inhibiting radiographic progression, especially for pts with more severe disease activity. The beneficial effect of GLM on joint damage was also observed in pts with baseline DAS28 <5.1 or CRP <0.6 mg/dl but to a lesser degree than in pts with high disease activity.
Disclosure statement: A.B. is an employee of Janssen. C.C. is an employee of Janssen. D.G. is an investigator for Janssen. C.H. is an employee of Janssen. A.K. is an investigator for Janssen.

50. ULTRASOUND DETECTED BONE EROSIONS: ARE THEY SPECIFIC FOR RHEUMATOID ARTHRITIS?

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Background: Bone erosions are commonly considered to be the hallmark of RA. Although US is highly sensitive in detecting bone erosions, there are limited data about the specificity of US-detected bone erosions for the diagnosis of RA. The aims of this study were (a) to determine if the frequency of bone erosions in RA is significantly higher than seen in other arthritis groups and normal controls, (b) to determine the specificity of ultrasound detected erosions in the classical 'target' joints for RA, (c) to determine the effect of erosion size and grade on their specificity for RA.
Methods: Patients fulfilling the diagnostic criteria for RA, PsA, OA or gout in addition to healthy volunteers were included in the study. Ultrasound examination was performed with using a GE Logiq E9 ultrasound machine. Sonographer was blinded to clinical diagnosis. The following areas were examined: radial styloid, ulnar styloid, 2nd MCP, 3rd MCP, 5th MCP, 2nd PIP, 3rd PIP, 1st MTP and 5th MTP joints. All joints were scanned in four quadrants. Each quadrant was assessed for erosions using a 0-3 semi-quantitative scoring system. A mean or total score of 0-3 was then given to each joint. The diameter of the largest erosion in each joint was recorded in mm. The inter- and intra-reader reliability was examined.
Results: A total of 216 subjects were recruited including 50 RA, 50 PsA, 36 Gout, 30 OA and 50 healthy volunteers. US-detected bone erosions were more frequent in RA. However, they were not a specific finding. The presence of erosions with score >1 or large in diameter ($\geq$2.5 mm) in four target joints (2nd, 3rd MCP, 5th MTP joints and ulnar styloid) was highly specific for RA (Table 1). The presence of erosions in the 5th MTP joint was both sensitive and specific for RA. The inter- and intra-reader agreement were excellent (κw was 0.86 and 0.87 respectively, $p < 0.001$).
Conclusions: The presence of erosions per se is not specific for RA. The erosions of RA were more extensive and generally larger than other diseases. Erosions in the ulnar styloid, 2nd, 3rd and 5th MCP joints were highly specific for and predictive of RA, especially when larger in size

TABLE 1 Summary of specificity and sensitivity results

Criterion	Area	Specificity (95% CI)	Sensitivity (95% CI)
Erosion >0*	All joints	28.3 (22.0 to 35.6)	94.0 (83.8 to 97.9)
Erosion >1	All joints	84.3 (78.0 to 89.1)	52.0 (38.5 to 65.2)
Erosion >0	US/MCP2,3,5/MTP5	60.2 (52.7 to 67.4)	86.0 (73.8 to 93.1)
Erosion >1	US/MCP2,3,5/MTP5	94.0 (89.3 to 96.7)	50.0 (36.6 to 63.4)
Diameter$\geq$2.5 mm	US/MCP2,3,5/MTP5	90.4 (84.9 to 94.0)	54.0 (40.4 to 67.0)
Erosion >0	MCP2 proximal	84.9 (78.8 to 89.6)	46.0 (33.0 to 59.6)
Erosion >1	MCP2 proximal	99.4 (96.7 to 99.9)	14.0 (7.0 to 26.2)
Erosion >0	MCP3 proximal	96.4 (92.3 to 98.3)	26.0 (15.9 to 39.6)
Erosion >1	MCP3 proximal	99.4 (96.7 to 99.9)	14.0 (7.0 to 26.2)
Erosion >0	Ulnar styloid	88.6 (82.8 to 92.6)	48.0 (34.8 to 61.5)
Erosion >1	Ulnar styloid	99.4 (96.7 to 99.9)	10.0 (4.4 to 21.4)
Erosion >0	MTP5 Proximal	83.7 (77.4 to 88.6)	74.0 (60.5 to 84.1)
Erosion >1	MTP5 Proximal	98.8 (95.7 to 99.7)	42.0 (29.4 to 55.8)

*Erosion semiquantitative score > 0

Disclosure statement: All authors have declared no conflicts of interest.

51. THE USEFULNESS OF A MUSCULOSKELETAL ULTRASOUND (MUS) SCORING SYSTEM FOR 22 HAND JOINTS EXAMINATION FOR THE DETECTION OF EARLY UNDIFFERENTIATED INFLAMMATORY ARTHRITIS AND TREATMENT DECISION MAKING IN ESTABLISHED INFLAMMATORY ARTHRITIS

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Background: Our study aimed: 1) To evaluate the usefulness of a 22 hand joints scoring system, adapted from the OMERACT recommendations in assessing and differentiating patients with established rheumatoid arthritis (RA) from those with possible or definite early undifferentiated inflammatory arthritis. 2) To establish the usefulness of the MUS findings in guiding treatment decisions.
Methods: 98 patients referred to the University College London Hospital Musculoskeletal Ultrasound Service during July-October 2011, with established inflammatory arthritis and a clinical suspicion of early inflammatory arthritis, were examined. MUS examination (7.5 MHz probe) was employed for the assessment to the dorsal aspect of 22 joints (wrists and all MCP and PIP joints bilaterally). We assessed for the presence of synovial hyperthorphy (grade 2-4), joint effusions (grade 1-3), Doppler signal (grade 1-2), and erosions.
Results: 1) This scoring system allowed us to differentiate the group with established RA from the group with early undifferentiated inflammatory arthritis (the larger two groups) with respect to the presence of synovial hypertrophy grade 3 (24 patients vs. 7, $p < 0.001$) and grade 4 (5 patients versus none, $p < 0.0001$); the presence of erosions (17 patients versus 7, $p < 0.003$); the number of joints with erosions (12.3+/-4.3 vs. 3.2+/-1.4, $p < 0.002$), joint effusion grade 2 (24 patients with RA, affecting 7.5+/-2.7 joints vs. 2, affecting only one joint in the early inflammatory arthritis group, $p < 0.0001$) and grade 3 (13 patients with 4.6+/-1.2 joints involved vs. none).

2).We identified 14 patients with active synovitis with positive Doppler signal that prompted a change of treatment (9 with active, erosive RA and 5 with undifferentiated inflammatory arthritis). The majority of patients on biologics (8/9) had no signs of active disease, but all had advanced erosive disease (6 with RA, 2 with PSA and one with AS with peripheral arthritis) - no treatment changes were made as the patient with active disease was due to have the second Rituximab course.
Conclusions: This 22 hand joints US scoring addressed all the purposes of our study. The most common findings that did not correlate with any laboratory evidence of inflammatory or autoimmune abnormalities was the presence of joint effusion grade 1, affecting less than 5 joints and minimal synovial hyperthrophy affecting less than 3 joints.
Disclosure statement: All authors have declared no conflicts of interest.

METABOLIC AND CRYSTAL ARTHROPATHIES

52. AUDIT OF THE ADHERENCE TO BSR GUIDELINES ON THE MANAGEMENT OF GOUT (2007), IN TWO PRIMARY CARE CENTRES WITHIN THE MERSEYSIDE REGION

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Background: Retrospective studies have demonstrated suboptimal management of gout. Poor patient-concordance and compliance with urate-lowering therapy (ULT) are contributing factors.Despite EULAR (2006) and BSR(2007) recommendations, management remains suboptimal.We present an audit of the adherence to the BSR guidelines,4 years after publication in two primary care centres(PCC).
Methods: Adherence was audited using an agreed proforma retrospectively via electronic case-note(ECN) review of two large PCC within Merseyside. Practice A-socioeconomically affluent Vs Practice B socioeconomically-mixed.Only data available from 2006 following the commencement of ECN were captured. Cases were identified from EMIS/Synergy platforms, using the search terms ''gout'', ''acute gout'', ''gouty arthritis'' and ''chronic gout''.
Results: Total Number = 407(A:B;272:135). Please see Table 1 for demographics/risk factors.Serum Urate level (SUA) was checked in 179(44%) pts at diagnosis,of which 161(90%) were elevated. Overall,153 (35%) had SUA checked within previous 24 months.ULT was started in 213(52%) pts.Initial allopurinol dose varied considerably:74(34%)-100 mg once daily(OD);13(5%)-200mgOD;64(33%)-300mgOD;62(26%) were unknown.Only 120(38.8%) patients were co-prescribed (NSAID/Colchicine).Only 60(25%) had SUA checked after starting ULT.Of these,22(30%) had ULT elevated.Of those who started ULT,175(82%) remained on treatment based on 24 month repeat prescriptions -Compliance = 92%.Compliant pts who had SUA checked in last 24 months,mean allopurinol dose = 220.5 mg OD, mode = 300mgOD (100 mg :200 mg:300mg:400mg: > 400 mg: n = 59 (34.4%):22(11%);89(51%);3(2%);1(1%). The mean SUA was 394μmol/L. For non-compliant pts,mean SUA = 475μmol/L. Target SUA was achieved in 38(30%) compliant pts who had SUA in 24 mths.Of those who were compliant,61(42%) were co-prescribed,inversely,26(62%) non-compliant pts did not have co-prescription.Lifestyle advice given in 185(45.5%) pts
Conclusions: This audit illustrates that compliance with BSR (2007) guidelines is suboptimal particularly ULT initiation and acheivement of target SUA.Patient factors may account for some of this, but there remains much scope for improvement. Further work will aim to provide simple primary care based interactive strategies to improve outcomes with re-auditing.

TABLE 1.

	n (%)
Male	337 (83)
Female	70 (17)
Average female age	72
Average male age	64
Diagnosis: primary care vs hospital	237 (57): 16 (4)
Risk factors	
BMI > 30 kg/m^2	107 (26)
>30 units alcohol/wk	46 (11)
GFR <60 ml/min/1	101 (24.8)
Congestive cardiac failure	169 (41.5%)
Diuretic	74 (18.2) loop diuretic, 95 (23.3) thiazide diuretic
>1 risk factor for gout	121 (29.7)

Disclosure statement: D.M. has received honoraria from A. Menarini. All other authors have declared no conflicts of interest.

53. A CASE OF SPINAL GOUT

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Background: Gout is a common cause of acute peripheral arthropathy, with a prevalence of 0.2% to 0.4% in western population and an annual incidence of 0.01% to 0.015% [1]. Gouty involvement of the spine is rarely considered in routine clinical practice. However, it is likely that it is under-recognized, as a recent review identified 100 cases [2]. Spinal gout predominantly involves the lumbar region with the most common finding being facet joint erosion. In addition, the epidural space, intradural compartment, ligamentum flavum, pedicles and neural foramen can be affected. We present the challenges encountered in diagnosing axial gout.
Methods: The clinical presentation, investigation, diagnosis and management of a case of gout involving the spine is described.
Results: A 62-year old woman, with hypertension, diet controlled diabetes mellitus and history suggestive of previous untreated gouty attacks, presented with an acutely painful, swollen, red right foot. Serum uric acid level was elevated at 0.56 (0-0.30 mmol/L). She responded to Colchicine and was subsequently commenced on Allopurinol. She also reported a 2-year history of worsening lower back pain with recent onset of right sided sciatica. MR scan of the lumbar spine showed a lesion involving the L4/5 facet joint. A CT scan of the region confirmed punched-out lesions in the right facet joint at the L4/5 level. Initial CT guided biopsy of the lesion revealed a foreign body giant cell reaction with no urate deposits and no evidence of tumour on histopathology. Her urate levels remained elevated at 0.54 (0-0.30 mmol/L). Although she remained free of acute gout attacks, over the next 12 weeks her back and leg pain progressed and

ambulation became difficult.The patient underwent a L4/5 decompression and right-sided L5 foraminotomy and was found to have thick chalky waxy material on the right side of ligamentum flavum causing right lateral recess stenosis. Histopathology revealed crystalline deposits of urate crystals confirming gouty tophi. Her symptoms improved considerably following the removal of the mass. Current serum urate level is 0.28 (0-0.30 mmol/L) on Allopurinol. Her peripheral gout remains well controlled.
Conclusions: Our case highlights the importance of considering the possibility of axial involvement in those patients with gout, who also have spinal pain and associated symptoms of radiculopathy. The challenges in diagnosing spinal gout can be overcome by having a high index of clinical suspicion, supplemented by radiological investigations like CT/MRI scans especially with gadolinium protocol. A biopsy of the involved area for crystal analysis under polarized microscopy is valuable in making the diagnosis. Although medical management may be an option in some cases, surgical intervention has been reported to have good outcomes in patients with neurological compromise. A multidisciplinary approach involving Rheumatologists, Spinal Surgeons and Histopathologists will facilitate diagnosis and ensure timely management.
Disclosure statement: All authors have declared no conflicts of interest.

MISCELLANEOUS RHEUMATIC DISEASES

54. STEROID INJECTION IN PLANTAR FASCIITIS: A PLACEBO CONTROLLED TRIAL

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Background: Plantar Fasciitis is a common cause of heel pain and can be very debilitating affecting quality of life and work capacity. The aim of this study was threefold; to compare steroid injection with placebo, to compare ultrasound guided with unguided steroid injection and to establish a role for ultrasonography in the management of plantar fasciitis.
Methods: 65 patients with a clinical diagnosis of plantar fasciitis were recruited via GP and Podiatry referrals to the Belfast Health and Social Care Trust between Nov 2008 and June 2011. Patients with a history of inflammatory arthritis or who had ever received a previous steroid injection were excluded. Patients were randomized to one of three groups - ultrasound guided steroid injection, palpation guided steroid injection or ultrasound guided placebo/saline injection. The 100 mm visual analogue scale (VAS) of pain and ultrasonography of the plantar fascia were performed at the baseline visit and at the follow-up visits at 6 and 12 weeks. Blinding was applied to the participants and to the investigator performing procedures and measuring outcomes. Analysis of covariance was used to analyse the 6 week and 12 week VAS results in the three groups using the baseline VAS levels as a covariate.
Results: The median duration of symptoms was 6 months (range 2.5-60). The mean (st dev) thickness of the plantar fascia at the anterior calcaneal border on ultrasound at baseline was 6.05 (1.47) mm. 22 Patients were randomized to ultrasound guided steroid injection, 21 patients to palpation guided steroid injection and 22 to ultrasound guided placebo injection. No adverse events were reported. There was evidence of a significant difference in VAS scores between the groups both at 6 weeks and at 12 weeks ($p = 0.021$ and $p = 0.009$ respectively). There was a 20.8 mm (95% CI = 3.3-38.1) difference in mean VAS scores at 6 weeks between the ultrasound guided steroid group and the placebo group and a 22.6 mm (95% CI = 5.4-39.8) mean difference between the palpation guided steroid group and the placebo group at 6 weeks. At 12 weeks the mean difference was 23 mm (95% CI = 4-42.8) and 27 mm (95% CI = 9.2-46) respectively between both groups and the placebo group. There was no significant difference in mean VAS scores following steroid injection between the ultrasound guided and the palpation guided groups at either time point.
Conclusions: Despite the widespread use of steroid injection only two randomized controlled trials have tested its effect over placebo in plantar fasciitis. Blockey in a study published in the BMJ in 1956 with 19 patients showed no benefit over placebo and Crawford et al in 1999 showed a benefit at one month but not subsequently. In our study of 65 patients steroid injection showed a clear benefit over placebo at 6 weeks and was sustained at 12 weeks. There were no significant differences in the results achieved using ultrasound guided or palpation guided steroid injection.
Disclosure statement: All authors have declared no conflicts of interest.

55. HELPLINE AUDIT: DOES THE NRAS TELEPHONE HELPLINE SERVICE BENEFIT USERS WHO HAVE BEEN DIAGNOSED WITH RHEUMATOID ARTHRITIS?

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Background: The National Rheumatoid Arthritis Society was set up in 2001 to provide support and information to the approximately 690,000 people in the UK who live with rheumatoid arthritis (RA). The provision of a helpline is central to this and it responds to over 200 contacts a month covering a wide range of topics. Auditing the helpline is an important ongoing process but historically only quantitative data has been collected together with anecdotal evidence. However, we were fortunate to have been offered the services of a research analyst via the Rank Foundation's 'Time to Shine' programme. As a result we have been able to take a more systematic qualitative approach to demonstrate the outcomes for our callers.

Successful outcomes were identified in two ways: firstly, by establishing whether callers received the benefits they wanted. This recognizes that beneficiaries have different needs and priorities (Lieberman, 1978). Secondly, by determining whether the caller got any benefits that they didn't expect. For instance, they may have called the helpline for information but have also received support.
Methods: 15 respondents were selected to take part in a semi-structured telephone interview. Criteria for inclusion in the study was: taking part in a helpline call which lasted over 10 minutes a week before the interview, having RA and being over 18 years of age. Interviews lasted approximately 15 minutes and were carried out by our research analyst intern. Topics covered included motives for calling, content of the helpline call, the outcomes experienced and any suggested improvements to the service. Analysis was undertaken by coding transcripts of the interviews and identifying emerging themes. Demographic and other characteristics were taken into account during this process.
Results: Initial findings suggest callers felt that their knowledge increased in relation to their health, social and working lives and personal lives, and that they had a greater understanding of the healthcare systems and how to negotiate them. Emotional support represented the most important benefit for these callers. Further analysis of the data is currently being undertaken.
Conclusions: These initial findings suggest that calling the helpline has a tangible impact on beneficiaries. The audit provides the charity with the opportunity to review the helpline activities and evaluate the effectiveness of the service. Our ability to demonstrate a social return on investment will also enable NRAS to further strengthen funding applications. This will ensure the continued delivery of the service.

Future areas of research could include looking at the impact of the service on a specific subset of the population such as those newly diagnosed. It may also be possible to introduce a qualitative longitudinal element by revisiting respondents after two months. This would allow us to evaluate the longer term impact of the service.
Disclosure statement: All authors have declared no conflicts of interest.

56. PRESENTATION AND CLINICAL OUTCOME OF SARCOIDOSIS PATIENTS PRESENTING TO RHEUMATOLOGY: A REGIONAL AUDIT

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Background: Sarcoidosis is a poorly understood condition which may present to rheumatologists. There are no generally accepted treatment guidelines.Most previous studies have shown two fairly distinct groups of patients: young white adult (predominantly male) patients presenting with acute mostly self-limiting disease (Lofgren's Syndrome), and an older, often black population, with a more chronic presentation and disease course.
Methods: This was a retrospective audit of patients identified by notes review. Rheumatology departments from 8 hospitals within the South West Thames region contributed data. A proforma was completed by rheumatologists on patients referred to their departments between 1990 and 2010 in whom a diagnosis of sarcoidosis was made.
Results: We obtained data in 77 cases: 55% female, 45% male. Mean age was 51 yrs (range 25-79yrs) with an equal spread between the 30-39, 40-49 and 50-59 yr age groups. Mean age in the black population was 46yrs, in the white, 53 yrs. There was a varied ethnic composition: white 36 (47%); black 23 (30%); Asian 13 (17%); other 2 (6%). 5% were current smokers; 20% ex-smokers. The commonest occupations were television industry (4 patients) and teaching (3 patients). Most cases had several distinct presenting features. As might be expected in a rheumatology clinic, the commonest presenting features were musculoskeletal, present in 55%. This included oligoarthritis in 38% and dactylitis in 5%. Oligoarthritis appeared more common as a presenting feature in the black population (60% vs. 38%). 27% had cutaneous involvement, most commonly erythema nodosum (17%). Symptomatic respiratory involvement occurred in 34%. 13% had neurological manifestations with headache and cranial nerve palsy in 9%. 38% had hilar lymphadenopathy at presentation. Angiotensin-converting enzyme levels were raised in 32% and hypercalcaemia present in only 4%. Chest X-rays were abnormal in 79%, the commonest finding being hilar lymphadenopathy. 47% patients had past or present treatment with steroids; 17% were currently treated. The commonest second line agents used were hydroxychloroquine (18%), methotrexate (16%) and azathioprine (14%). Ciclosporin was used in 4%. Two patients with resistant disease were improved on anti-TNF therapy. Musculoskeletal features improved in 52%, respiratory features in 70%, mucocutaneous in 78%, eye in 88% and CNS in 50%.
Conclusions: This audit shows the value of regional collaboration in relatively rare conditions such as sarcoid. The prominence of articular presentation probably reflects our speciality but cutaneous and respiratory features were also common and many patients had multisystem disease involvement. Oligoarthritis appeared more common as a presenting feature in the black population. We found no biphasic age distribution amongst this cohort. Outcome was generally reasonable for respiratory and mucocutaneous features but less favourable for musculoskeletal and CNS involvement.
Disclosure statement: All authors have declared no conflicts of interest.

57. SERUM LEPTIN LEVEL IN PATIENTS WITH HYPOTHYROIDISM AND SYMPTOMS OF INFLAMMATORY ARTHRITIS IS SIGNIFICANTLY INCREASED COMPARED WITH A MATCHED GROUP WITHOUT PERIPHERAL JOINT-ASSOCIATED SYMPTOMS

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Background: Background: Previous studies have shown the potential role of leptin in modulation of the inflammatory processes associated with arthritis. Leptin is considered an important factor of bone remodeling (1), a protective agent against septic arthritis, a marker of inflammation in rheumatoid arthritis (2) and an independent regulator of the TSH levels (3).
Methods: Methods: We have investigated 31 patients with clinical mild synovitis and inflammatory symptoms affecting their hands and concomitant diagnosis of hypothyroidism in comparison with 42 patients with clinical hypothyroidism and absence of inflammatory arthritis symptoms. All the patients were evaluated before the initiation of hormone replacement therapy. The two groups were matched for sex (25.8% vs. 26.2% males), age (56.29+/-9.7 vs. 61.8+/-11.8 years old) and BMI (29.5+/- 2.7 vs. 31.6+/- 4.34 kg/m2). The leptin serum levels were quantified using a human leptin EIA kit.
Results: Results: The free T4 levels for the two groups were 0.27+/-0.12 vs. 0.31+/-0.18 ng/dl and the TSH levels were 12.8+/-2.78 vs. 13.2+/- 3.75 mU/l, showing no significant difference regarding the hormonal status of the two groups of patients ($p = 0.12$ and $p = 0.18$).There were no major differences in the level of serum inflammatory markers - CRP (6.2+/- 2.8 vs. 5.9+/-2.7 mg/dl, $p = 0.09$) and ESR (32+/-11.5 vs. 36.2+/- 12.6 mm/h, $p = 0.11$). The presence of RF was detected in 11 patients in the first group and in 7 in the second group. 4 of the patients with symptoms of inflammatory arthritis had also positive anti CCP antibodies.

The leptin levels were significantly increased within the group with symptoms of inflammatory arthritis (36.8+/-4.21 vs. 28.7+/- 5.2 ng/ml, $p = 0.04$).
Conclusions: Conclusion: We can conclude that the hypothesized role of leptin in the immune response modulation could underline the significant difference between the presence and absence of the symptoms of arthritis associated with hypothyroidism. The significant increased leptin level of the patients fulfilling the criteria of early rheumatoid arthritis could permit a differentiation between the patterns of hypothyroidism associated joint symptoms.
Disclosure statement: All authors have declared no conflicts of interest.

58. CLINICAL EFFECTIVENESS OF PAH SPECIFIC THERAPIES IN SARCOIDOSIS-RELATED PULMONARY HYPERTENSION

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Background: Pulmonary hypertension is a well-known complication of sarcoidosis. Effectiveness of PH specific therapy is not clear as there are not randomized placebo-controlled trials. In this study, we analyse clinical profile, management and outcomes of a cohort of patients with sarcoidosis and pulmonary hypertension at a national pulmonary hypertension centre.
Methods: Single centre restrospective analysis of data from patients with sarcoidosis and pulmonary hypertension diagnosed in right heart catheter (RHC) at a national pulmonary hypertension centre from 1999 to 2011. We found 23 patients and analysed baseline and follow-up RHC, baseline right ventricular function, therapy and outcomes.
Results: 23 patients were found (52.2% female, 47.8% male, age at diagnosis 57.27 ± 13.05 years) with a mean follow-up of 26 months. The rate of death/transplant was 39.1%. 39.5% of patients had some degree of right ventricular (RV) dysfunction at diagnosis and 60% received specific pulmonary hypertension (PH) therapy (sildenafil or bosentan as first line therapy). Baseline data in RHC: Wedge pressure $11{,}96 \pm 5{,}321$ mmHg, Pulmonary mean (PM) $39{,}96 \pm 11{,}621$ mmHg, Pulmonary vascular resistance (PVR) $582{,}84 \pm 421{,}786$ dyn-s-cm−5 and Cardiac Index (CI) of 2,435±,7678 l/min/m^2. When compared, no difference was found in terms of mortality/transplant referral regarding age at diagnosis in years ($55{,}5778 \pm 11{,}84$ in alive vs $59{,}9142 \pm 15{,}09$ in dead $p = 0.41$), baseline 6 minutes walking test in meters (204.09 ± 137.29 alive vs 244.67 ± 131.36 dead; $p = 0.39$), PM in mmHg (40.39 ± 13.68 alive vs 39.33 ± 8.15 dead; $p = 0.77$), PVR in dyn-s-cm−5 ($603{,}42 \pm 530{,}74$ alive vs $553{,}12 \pm 206{,}81$ dead; $p = 0.44$) or CI in l/min/m^2($2{,}55 \pm 0{,}87$ alive vs 2.24 ± 0.55 dead; $p = 0.38$). The presence of some degree of impaired RV function was the only analysed factor related to increased mortality/transplant that met statistical significance (12.5% in normal right ventricular function vs 60% in any degree of impaired right ventricular function, $p = 0.031$). No difference was found regarding mortality/transplant referral in patients who received specific PH therapy or not (50% vs 37.5%, respectively, $p = 0.85$). The factors related to receive specific PH therapy were higher PM (45.45 ± 11.77 vs 32.35 ± 6.18; $p = 0.01$) and PVR (734.93 ± 485.81 vs 31353 ± 79.71; $p = 0.038$) and lower CI (2.07 ± 0.76 vs 2.92 ± 0.53; $p = 0.02$). Despite no improved survival, patients that received specific PH therapy improved their 6MWT (+69 m, $p = 0.046$), CI (+0.45 l/m2/min; $p = 0.018$), and PVR (-189 dyn-s-cm−5; $p = 0.047$) compared with the baseline.
Conclusions: Mortality of patients with pulmonary hypertension and sarcoidosis is still very high. Echocardiograms during the follow-up can detect patients with the worst prognosis. Although with the limitations of a retrospective analysis, our data, added to other small experiences in the literature, try to confirm that specific PH therapy in selected individuals can improve haemodynamics and walking distance.
Disclosure statement: All authors have declared no conflicts of interest.

59. CLINICAL AND LABORATORY FEATURES OF PATIENTS PRESENTING TO A RHEUMATOLOGY CLINIC WITH POSITIVE ANTI-C1Q ANTIBODY SEROLOGY

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Background: Hypocomplementemic urticarial vasculitis syndrome (HUVS) is a rare disorder characterized by chronic recurrent urticaria, arthralgia, and often severe systemic involvement. Deficiency of complement and presence of C1q antibodies are the hallmarks of this disease .An independent immunological entity, HUVS was first described in 1973. Leucocytoclastic vasculitis is the main finding on skin histology and direct immunoflorescence often reveals immunoglobulin and complement deposition.
Methods: Review of 6 case records, laboratory data and radiology of patients in the immunology laboratory testing positive for C1q antibody and who presented to the rheumatology department at the Royal free hospital between 2001 to 2010, along with a literature review.
Results: Four women and 2 men, with a mean age of 34.5 years (range 24-63 years) were seen. Of the 6, 5 had multiple comorbidities including rheumatoid arthritis(RA), hypothyroidism, osteoporosis, asthma, COPD, haemochromatosis and hypertension. All patients had C1q positive antibodies with titres ranging between 16-48 (n 0-15) .Four patients had ANA $<$1:100,2 had ANA $>$1:100 and all had negative ENA.All,except one had low C4,(11- 15). C3 was within normal range in 4 patients, and low in the remaining 3. All had skin biopsy that confirmed leucocytoclastic urticarial vasculitis.All 6 patients presented with rash, 5 had arthritis,1 presented with airway obstruction in the form of wheeze which responded to steroids, one had scleritis and 2 patients had proteinuria.

All patients were given prednisolone, five were given hydroxychloroquine, out of which one maintained remission. Four were given azathioprine, with no remission. Four were given mycophenolate,with only one remission. Two patients had cyclophosphomide, causing disease remission in one. One was given rituximab and one was given dapsone resulting in disease remission.
Conclusions: HUVS is a clinical entity considered to be different from SLE. Our experience confirms a high prevalence of cutaneous and joint involvement,and the association with obstructive lung disease in severe cases.

The diagnosis was confirmed in all patients with positive anti-C1q antibodies as well as skin biopsies positive for leucocytoclastic vasculitis.

All joint and skin symptoms have undergone remission with the exception of 1 patient who had active resistant disease treated with rituximab with good results. They were all initially treated with steroids and then steroid sparing agents.

We have therefore shown that hypocomplementemic urticarial vasculitis needs to be recognized as a primary autoimmune disease.High prevelance of cutaneous and joint symptoms and potential to cause obstructive airways disease, the most feared complication and eye involvement(scleritis) necessitates the knowledge of this autoimmune entity.
Disclosure statement: All authors have declared no conflicts of interest.

RHEUMATOID ARTHRITIS: CLINICAL FEATURES

60. COMPARISON OF MOBILE AND FIXED BEARING TOTAL KNEE REPLACEMENTS IN RHEUMATOID ARTHRITIS

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Background: Mobile bearing Total Knee Replacements is a relatively new innovation and it is postulated that this would improve the results of Total Knee Arthroplasty. The aim of the study was to compare the short to medium term results of fixed and mobile bearing total knee replacements (TKR) in patients with rheumatoid arthritis (RA).
Methods: All TKRs performed in RA patients by a single firm using the same prosthesis over a four year period were included in the study. Data was collected prospectively and included demographic parameters, operative data, pre operative and yearly patient and physician derived outcome measures including the Oxford and American Knee Surgery Society (AKSS) scores and revision rates.
Results: A total of 50 patients were operated over the four year observation period with 24 in the mobile bearing group and 26 in the fixed bearing group. The average follow period was 46 (range 12 to 74) months for the mobile bearing group and 45 (range 12 to 74) months for the fixed bearing group. One patient in the mobile bearing cohort and two in the fixed bearing cohort required revision surgery. Excluding revisions, patients lost to follow up and deaths, there were 19 patients each in the fixed and mobile bearing cohorts for analysis. There were no statistically significant differences between the two cohorts with regard to demographic data, pre operative range of movement or function, duration of follow up or revision rate. Post operatively apart for a marginally significant improvement in walking time at year five for the mobile bearing cohort, there was no statistically significant difference between the two with respect to night pain, walking pain, pain score, flexion deformity, range of movement, Oxford score or AKSS score.
Conclusions: There is no difference in functional outcome between mobile and fixed bearing TKRs in RA patients on short to medium term follow up.
Disclosure statement: All authors have declared no conflicts of interest.

61. DEFINING CRITERIA FOR RHEUMATOID ARTHRITIS PATIENT-DERIVED DISEASE ACTIVITY SCORE THAT CORRESPOND TO DISEASE ACTIVITY SCORE 28 AND CLINICAL DISEASE ACTIVITY INDEX-BASED DISEASE STATUS AND RESPONSE CRITERIA

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Background: Two versions of a patient-based disease activity score (PDAS1 [with ESR] & PDAS2 [without ESR]) in rheumatoid arthritis (RA) had been developed and validated. Like DAS28, PDAS1 and PDAS2 are continuous status measures. However, thresholds for defining response to treatment and remission have not yet been established. The purpose of this study is to define criteria, based on PDAS1 and PDAS2, for disease status: remission, low, moderate and high disease activities and European League Against Rheumatism (EULAR) good and moderate responses to treatment.
Methods: Data from 299 RA patients (originally used to develop PDAS) were analysed using receiver operator characteristic (ROC) curves to determine optimal cutpoints for PDAS1 and PDAS2 to correspond to validated DAS28 and CDAI criteria for remission, low, medium and high disease activity. Data from 56 RA patients initiated on Disease-modifying Anti-Rheumatic Drugs (DMARDs) before and 6 months after treatment were used to determine optimal thresholds for PDAS1 and PDAS2 corresponding to EULAR good or moderate responses. Optimal cut-off points were obtained by maximizing the average of sensitivity and specificity. Agreement with DAS28 and CDAI response criteria was assessed with kappa (κ) statistics.
Results: Table 1 shows criteria for PDAS1- and PDAS2-based remission, low, moderate and high disease activity. Key cutpoints for PDAS1/PDAS2 were, respectively, 3.5, 4.5, 4.8, and 3.8, 4.6, 5.0. Area under curve (AUC) for the ROC curves ranged from 0.89 to 0.95. Sensitivities ranged from 79% to 99%, and specificities from 61% to 89%. Moderate to good agreement with DAS28 categories was observed: respectively, $\kappa = 0.44$ and 0.31 for PDAS1 and PDAS2. Corresponding agreements with CDAI were $\kappa = 0.3$ and 0.4. Crucially, these agreements are comparable to those of CDAI and DAS28 in the same group of patients ($\kappa = 0.54$).

The criteria that correspond to EULAR moderate and good response were 0.4, 0.8 for PDAS1 and 0.3, 1.2 for PDAS2. Area under the ROC curve ranged from from 0.88 to 0.93. Sensitivities ranged from 72% to 100% and specificities from 77% to 94%. Agreement of DAS28 response with PDAS1 and PDAS2 were $\kappa = 0.46$ and 0.38, respectively. Again, these were comparable to the agreement between DAS28 and CDAI in this patient group ($\kappa = 0.55$).
Conclusions: We have established useful criteria for defining high, medium, and low disease activity as well as remission, good and moderate response for PDAS1 and PDAS2. They have comparable agreement to assessor based criteria, and should facilitate the use of PDAS1 and PDAS2 in routine practice and research.

TABLE 1 Criteria of PDAS 1 and PDAS for different disease status

	Remission	Low disease activity	Moderate disease activity	High disease activity
PDAS1	<3.5	3.5-4.4	4.5-4.8	>4.8
PDAS2	<3.8	3.8-4.5	4.6-5.0	>5

Disclosure statement: All authors have declared no conflicts of interest.

62. PREDICTING ONGOING ACTIVE DISEASE IN EARLY RHEUMATOID ARTHRITIS USING CLINICAL MEASURES

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Background: UK guidelines for early DMARD therapy in RA favour combination DMARDs to achieve sustained low disease activity (DAS28 < 3.2) risking over or under-treatment of significant numbers of patients. A simple algorithm using commonly recorded clinical factors would enable early identification of poor responders.
Methods: Predictors of persistent disease activity (PDA; DAS28 ≥ 3.2 at both 6 and 12 months) were investigated in two early RA studies: ERAN (an observational cohort) and CARDERA (RCT of combination DMARDs/steroid). Disease activity was measured by DAS28(ESR). Logistic regression was used to assess predictive capacity of baseline variables: sex, smoking, duration, RF status, tender joint count (TJ), swollen joint count (SJ), ESR, initial therapy and HAQ.
Results: 175 patients in ERAN with data at 6 and 12 months were used to develop the predictive model (mean age 56; 111 female; 62% RF+; mean DAS28 4.7, mean symptom duration 8 months). 93% were treated with a single DMARD initially (39% SZP, 45% MTX, 7% HCQ), but treatment choice did not predict PDA. HAQ, SJ, TJ and ESR were individual predictors of PDA. TJ (OR 1.13 CI 1.03, 1.21), HAQ (OR 2.10 CI 1.16, 3.86) and ESR (OR 1.05 CI 1.02, 1.08) remained predictive in an adjusted model. A simple practical model was generated using TJ ≥ 6, HAQ ≥ 1.0, ESR ≥ 20, combined in a 4-point score. High scores (max 3) were associated with PDA. The model was validated in the CARDERA cohort (n = 465; mean age 54; 325 female; 65% RF+; mean DAS28 5.8; mean disease duration 4.4 months), showing similar predictive capacity, although MTX monotherapy increased the risk of PDA (OR 2.7, 95% CI 1.4, 5.1). Triple therapy (ciclosporin, MTX & steroids) reduced PDA in those with all 3 factors, but PDA was still present in 59%. Use of this model to predict persistent high activity (DAS28 ≥ 5.1 at 6 and 12 months) showed similar results in both early RA cohorts (Table). There were few patients with a score of 0/3 (26 patients in ERAN and 11 in CARDERA) but the majority had a good outcome, with <20% PDA.
Conclusions: Baseline TJ, HAQ, and ESR can predict PDA in early RA. Patients at high clinical risk of PDA should be treated with early aggressive combination DMARDs & steroids, although many patients will continue to have active disease despite this. Further studies are required to assess if high-risk patients should be treated preferentially with early biologics.

TABLE 1 Numbers of predictors and persistently active (DAS28 > 3.2) or very active (DAS28 > 5.1) disease

Study	Combination of TJ ≥ 6, HAQ ≥ 1.0 and ESR ≥20				p
	0	1	2	3	
Persistently active disease (DAS28 ≥3.2)					
ERAN n (%)	5/26 (19)	16/43 (37)	38/47 (81)	36/40 (90)	<0.001
CARDERA (All) n (%)	2/11 (18)	24/65 (37)	103/164 (63)	174/227 (77)	<0.001
CARDERA (MTX) (%)	0/2 (0)	6/13 (46)	25/42 (60)	50/60 (83)	0.002
CARDERA (Triple therapy) (%)	0/1 (0)	6/20 (20)	31/49 (63)	27/46 (59)	0.048
Persistent high disease activity (DAS28 >5.1)					
ERAN n (%)	0/26 (0)	2/43 (5)	9/47 (19)	18/40 (45)	<0.001
CARDERA (All) n (%)	0/11 (0)	3/65 (5)	25/15 (15)	69/227 (30)	<0.001

Disclosure statement: All authors have declared no conflicts of interest.

63. THE ROLE OF AMINO-PROPEPTIDE OF TYPE III COLLAGEN AND HYALURONIC ACID AS BIOMARKERS FOR SYNOVIAL VOLUME IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Amino-Propeptide of Type III Collagen (PIIINP) and Hyaluronic acid (HA) have previously been suggested as serum biomarkers of total body synovial volume and may be useful in the assessment of Rheumatoid Arthritis (RA) disease activity. PIIINP constitutes one of the main forms of collagen found within synovium. It has previously been documented that PIIINP correlates with inflammatory markers in RA. In addition has also been suggested that RA patients with normal PIIINP levels have a better prognosis. HA is a high molecular weight polysaccharide chain molecule that is produced by synoviocytes and chondrocytes. It has an important role in providing joint lubrication within the intra-articular surfaces. HA is found in high levels in the synovial membrane and synovial fluid. Previous studies have suggested it can be predictive of disease severity in early RA. This study aimed to investigate relationships between serum levels of PIIINP / HA and disease activity including ultrasonographic indicators of synovial volume in RA using Spearman's rank correlation.
Methods: 23 RA patients were recruited from the Early Arthritis Clinic (EAC) at the Kennedy Institute of Rheumatology, Charing Cross Hospital. All volunteers consenting to participate in the study underwent clinical assessment by a physician (DAS-28 and SJC). Serum was taken for PIIINP, HA, CRP and ESR.

Additionally all patients underwent ultrasonography of all 10 metacarpophalangeal (MCP) joints for

assessment of synovial thickness and Doppler flow.
Results: A significant correlation was noted between SJC-28 and HA ($p = 0.002$) and PIIINP ($p = 0.018$). Similarly PIIINP showed correlation with DAS-28 ($p = 0.01$). A correlation between PIIINP and CRP was also noted ($p = 0.009$). With respect to imaging, HA showed significant correlations with both synovial thickness ($p = 0.048$) and power Doppler flow ($p = 0.01$).
Conclusions: HA demonstrated strong relationships with imaging features of disease activity that were comparable with CRP. PIIINP showed correlation with both 28 SJC and DAS-28 scores. These findings support the hypothesis that serum HA and PIIINP concentrations are biomarkers of disease activity in early RA. As such, HA and PIIINP may have a potential role in stratification of poor prognosis in early RA.
Disclosure statement: All authors have declared no conflicts of interest.

64. TEMPORAL IMPROVEMENTS IN DISEASE ACTIVITY IN OUTPATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Clinical outcomes in rheumatoid arthritis (RA) should have improved over time due to the expansion of rheumatology services, use of more intensive conventional treatments and the advent of biological therapies. We measured the magnitude of improvements in disease activity in RA outpatients seen between 1997 and 2011.
Methods: We examined changes in DAS28 and its components in: (a) cross-sectional studies of 95-310 consecutive RA outpatients seen at one centre seen from 1997-2009; (b) all 4901 outpatient visits in 863 RA patients attending a second centre from 2005-2010.
Results: DAS28 and its constituent measures improved over time in both centres (Table 1). In Centre 1 mean DAS28 fell from 5.1 to 3.8 over 12 years. In Centre 2 mean DAS28 fell from 4.1 to 3.6 over 5 years, where the aim of treatment to reach a target DAS28 <2.6 was instituted in 2005. In both centres the average annual fall in DAS28 was 0.1. Mean ESRs showed comparable changes from 35 to 26 over 12 years at Centre 1 and from 25 to 20 at Centre 2. Joint counts and patient global scores followed the same general pattern, though there was greater variability with these clinical assessments. There was also a fall in the frequency of active RA (DAS28 >5.1) from 49% of patients in 1997 to 17-21% of patients in 2009-10. Increasing numbers of patients achieved DAS28 remission (DAS28 <2.6), although a

significant number of patients have persistent moderate activity in both centres.

Conclusions: Mean DAS28 scores have improved by 1.2 since 1997. The frequency of high disease activity has halved in outpatients with RA, with increasing numbers of patients achieving DAS remission. The rate of improvement is similar across adjacent UK centres. This decline preceded the biologic era but has continued within it. Improved specialist care is the most likely explanation for these substantial improvements, though other explanations cannot be excluded. Despite these improvements, many patients have persistent moderate disease activity. The current DAS28 threshold of >5.1 for accessing biologics no longer appears clinically appropriate and should be lowered if improvements are going to continue.

TABLE 1 Temporal changes in mean DAS28 scores, percentage high disease activity (DAS28 >5.1) and remission (DAS28 < 2.6)

Centre 1					Centre 2</b)				
Year	N	mean DAS28	% DAS28 >5.1	% DAS28 <2.6	Year	N	mean DAS28	% DAS28 >5.1	% DAS28 <2.6
1997	194	5.1	49	8	2005	220	4.1	24	17
2002	310	4.7	44	9	2006	802	4.0	25	19
2006	95	4.5	33	9	2007	663	3.8	22	22
2008	171	3.9	22	18	2008	806	3.8	21	26
2009	285	3.8	21	22	2009	531	3.6	17	28
					2010	732	3.6	20	30

N = number of visits recorded in each year

Disclosure statement: B.K. has received consultancy fees from Roche, Abbott, Bristol-Myers Squibb and Pfizer, and a research grant from UCB. All other authors have declared no conflicts of interest.

65. BIOMAKER SIGNATURE IN RHEUMATOID ARTHRITIS PATIENTS WITH LOW DISEASE ACTIVITY: THE REMIRA STUDY

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Background: With intensive therapy, LDA states are becoming increasingly common in RA patients. Conventional clinical tools perform poorly in discriminating true remission from persistent subclinical disease. There is an urgent need to improve the definition of LDA states. A multi-biomarker signature that combines levels of 12 serum biomarkers to produce a score between 1 and 100 was recently validated as a test for RA disease activity. We examined the use of this multi-biomarker disease activity (MBDA) test in assessing the heterogeneity of LDA states and differentiating remission vs non-remission.
Methods: RA patients on stable therapy with <10 years disease duration and DAS28ESR<3.2 were recruited into the REMIRA study, and serum samples were acquired at baseline. Concentrations of 12 protein biomarkers (VCAM-1, EGF, VEGF-A, IL-6, TNF-RI, YKL-40, MMP-1, MMP-3, leptin, resistin, SAA, CRP) were determined and used to generate MBDA scores according to a pre-specified algorithm. Association between the MBDA score and clinical remission was assessed by calculating the area under the ROC curves (AUROCs) for different remission criteria. Comparison of biomarker concentrations between remission and non-remission LDA patients was performed using the Wilcoxon test and a fixed-sequence procedure to control for the effects of multiple testing.
Results: 70 RA patients with a mean age of 58 (SD 14) and disease duration of 50 (SD 31) months were recruited. 61% were female, 82% were Caucasian, 14% were Afro-Caribbean, and 4% were Asian. 68% were seropositive. The mean DAS28ESR was 1.84 (SD = 0.83), and the mean DAS28CRP was 1.98 (SD = 0.69). Wide variation in biomarker levels and profiles was seen. SAA was most suppressed and EGF most elevated relative to historical data. The MBDA score was significantly associated with remission vs. non-remission (AUROC = 0.74, 95% CI 0.60,0.85, $p < 0.001$ for Boolean definition). Individually, IL-6, CRP, and SAA were significantly lower in remission than in non-remission patients (Table 1). Although pro-inflammatory biomarkers were generally lower in remission, a small subgroup of patients had elevated biomarkers and MBDA scores despite being in clinical remission.
Conclusions: The REMIRA LDA cohort is heterogeneous as reflected by the wide biomarker variation. The MBDA score can differentiate between LDA/remission and LDA/non-remission and has a potential role for disease activity assessment in LDA patients. Longitudinal follow-up of patients may improve our understanding of the relationship between elevated biomarkers and disease progression in patients in the absence of symptoms

TABLE 1 Concentrations of biomarkers between remission and non-remission LDA patients. IQR = Inter-Quartile Range

Biomarker	Median (IQR) LDA/ remission	Median (IQR) LDA/non-remission	p value
IL-6 [pg/ml]	6.0 (4.4-8.0)	10 (6.6-17)	0.001
CRP [mg/L]	1.4 (0.52-2.3)	2.4 (1.1-7.2)	0.009
SAA [mg/L]	0.93 (0.57-1.5)	1.6 (0.90-3.1)	0.01

Disclosure statement: G.C. is an employee with stock options at Crescendo Bioscience. D.H. is an employee with stock options at Crescendo Bioscience. S.R. is an employee with stock options at Crescendo Bioscience. All other authors have declared no conflicts of interest.

66. SENSITIVITY AND SPECIFICITY OF ANTIBODIES TO CITRULLINATED VIMENTIN IN RHEUMATOID ARTHRITIS: EXPERIENCE FROM A LARGE SECONDARY CARE CENTRE

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Background: Rheumatoid arthritis (RA) is a chronic systemic inflammatory autoimmune disease characterized by a symmetrical polyarthritis. Numerous serological markers of RA have been described including rheumatoid factor and antibodies against a range of citrullinated proteins including anti-Sa (vimentin). More recently, the anti-mutated citrullinated vimentin (anti-MCV) antibody ELISA assay has been developed for the detection of IgG antibodies to vimentin-based peptide. Anti-MCV antibody has been previously reported to have a sensitivity of 84%, specificity of 87%, positive predictive value (PPV) of 90% and negative predictive value (NPV) of 79%. We recently audited the diagnostic ability of anti-MCV in a large secondary care population.
Methods: A retrospective audit of 351 patients seen during 2010 in the rheumatology department at Northwick Park Hospital for whom anti-MCV antibodies were requested.
Results: 351 patients had anti-MCV antibodies requested by members of the rheumatology department between January and September 2010 (Orgentec anti-MCV assay ORG 248). 93 patients had a diagnosis of RA and were anti-MCV positive while 14 patients were diagnosed with RA and were anti-MCV negative. 52 patients had an alternative diagnoses and were positive for anti-MCV while 192 patients had alternative diagnoses and were negative for anti-MCV. This gave a sensitivity of 87% (C.I. 79-94%), specificity of 79% (C.I. 73-84%), PPV of 64% (C.I. 56-72%) and NPV of 93% (C.I. 89-96%).
Conclusions: Our results suggest that anti-MCV may have lower specificity and PPV together with higher NPV as compared to the literature. This may reflect the more heterogeneous nature of our secondary care population as compared to those in previously studies. The increasing use of this assay in primary care also will contribute to the drop off in specificity and PPV. Our anti-MCV sensitivity data correlates with previous studies. Further evaluation is required of the antibody cut-off values needed for a positive result together with correlation with rheumatoid factor and disease activity.
Disclosure statement: All authors have declared no conflicts of interest.

67. LONG-TERM SAFETY OF TOCILIZUMAB IN RHEUMATOID ARTHRITIS CLINICAL TRIALS

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Background: Tocilizumab (TCZ), an inhibitor of interleukin-6 receptor (IL-6R) signal transduction, has been shown to improve signs and symptoms and reduce joint damage in patients with rheumatoid

TABLE 1 Safety event rate/100 PY (95% CI) over 12-month periods.

	0-12	13-24	25-36	37-48
AEs	418.4 (411.6, 425.2)	297.9 (291.8, 304.1)	273.3 (267.1, 279.6)	251.4 (244.8, 258.0)
SAEs	15.7 (14.4, 17.1)	13.9 (12.6, 15.2)	15.2 (13.7, 16.7)	14.4 (12.8, 16.0)
Serious infections	4.6 (3.9, 5.4)	3.9 (3.2, 4.7)	5.2 (4.3, 6.1)	4.9 (4.0, 5.9)
MI	0.3 (0.1, 0.5)	0.2 (0.1, 0.4)	0.3 (0.1, 0.6)	0.5 (0.3, 0.9)
Stroke	0.3 (0.1, 0.5)	0.1 (0.0, 0.3)	0.2 (0.1, 0.4)	0.1 (0.0, 0.3)

arthritis (RA). The purpose of this analysis was to assess the long-term safety of TCZ in adult patients with RA.

Methods: Clinical trial data were pooled for patients receiving at least 1 dose of TCZ in clinical trials (OPTION, TOWARD, RADIATE, AMBITION, and LITHE), a clinical pharmacology study, and long-term extension studies (GROWTH95 and GROWTH96).

Results: Through to February 2010, a total of 4009 patients received TCZ; the median (mean [range]) duration was 3.6 (3.1 [0.0-5.1]) years, and the total observation time was 12,293 patient-years (PY). Rates of adverse events (AEs), serious adverse events (SAEs), and serious infections (Table 1) were consistent with those reported in the RA population. The overall AE rate was 314.6/100 PY (95% CI: 311.5, 317.7). Infections were the most frequent AE (103.7/100 PY, 95% CI: 101.9, 105.5) and the most common infections were upper respiratory tract infections and nasopharyngitis. The rate of AEs leading to withdrawal was

5.2/100 PY. The most common AEs leading to withdrawal were laboratory abnormalities (1.1/100 PY, transaminase elevations), infections (1.0/100 PY), and neoplasms (benign, malignant, or unspecified, 0.7/100 PY). The overall SAE rate was 14.7/100 PY (95% CI: 14.0, 15.4). Infections were the most frequent SAE (4.6/100 PY; 95% CI: 4.3, 5.0). The rate of gastrointestinal (GI) perforations was 0.24/100 PY (95% CI: 0.17, 0.37), consistent with previously reported rates. Most reported GI perforations (59%, 17/29) were colonic diverticular perforations. Rates of myocardial infarction (MI) and stroke were 0.3/100 PY (95% CI: 0.2, 0.4) and 0.2 (95% CI: 0.1, 0.3), respectively, and were stable over time (Table 1), and similar to expected rates in the RA population. Eight patients (0.1/100PY) experienced anaphylactic reactions leading to withdrawal.

Conclusions: Rates of SAEs, serious infections, and cardiovascular events have remained stable with continued exposure to TCZ in long-term clinical trials.

Disclosure statement: All authors have declared no conflicts of interest.

68. THE EFFICACY OF TOCILIZUMAB IN PATIENTS WITH SYSTEMIC JUVENILE IDIOPATHIC ARTHRITIS: 52-WEEK DATA FROM A PHASE 3 CLINICAL TRIAL

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Background: The phase 3 TENDER trial demonstrated that tocilizumab (TCZ) is effective in the treatment of patients (pts) with systemic juvenile idiopathic arthritis (sJIA). This analysis examines long-term response to TCZ during the open-label (OL) extension of TENDER according to baseline characteristics.

Methods: Pts aged 2-17 yrs with active sJIA who received TCZ or placebo every 2 wks for 12 wks (part 1) went on to receive OL TCZ in the extension study (part 2). Stable doses of nonsteroidal anti-inflammatory drugs (NSAIDs) & methotrexate (MTX) were continued, with oral corticosteroid (CS) tapering permitted according to pre-defined criteria. This post hoc analysis examines the proportion of pts with JIA ACR30-response + absence of fever & JIA ACR70-response at wk52 by baseline demographic & disease characteristics & prior/baseline treatments.

Results: There were 112 ps in part 1 with 37 randomized to placebo, & 75 to TCZ. At 52wks, at the longer-term extension data cut, the intent-to-treat (ITT) population consisted of 103 pts. In each subgroup, the majority of pts achieved JIA ACR30-response plus absence of fever &/or JIA ACR70-response at wk 52. No substantial differences in response were observed according to age, region, disease duration, number of active joints, fever status, C-reactive protein (CRP) level, oral CS dose, MTX use, & previous biologic treatment (IL-1 or TNF-a inhibitor).

Conclusions: TCZ provided a sustained response in patients with sJIA at 52wks across multiple baseline characteristics, including longer disease duration, highly active and severe disease and previous treatment with biologic therapy.

Disclosure statement: All authors have declared no conflicts of interest.

TABLE 1 Efficacy endpoints with TCZ treatment at week 52 by selected baseline characteristics (ITT population)

		N at baseline	JIA ACR30 response + fever absent at week 52, % (r/n)	JIA ACR70 response at week 52, % (r/n)
Age, y	2-5	27	88.5 (23/26)	88.5 (23/26)
	6-12	48	88.1 (37/42)	88.1 (37/42)
	13-17	37	85.7 (30/35)	85.7 (30/35)
Region	Europe	61	83.6 (46/55)	85.5 (47/55)
	North America	24	86.4 (19/22)	86.4 (19/22)
	South America	22	100 (21/21)	95.2 (20/21)
	Other	5	80.0 (4/5)	80.0 (4/5)
CRP level, mg/l	<50	31	92.9 (26/28)	85.7 (24/28)
	≥50	81	85.3 (64/75)	88.0 (66/75)
Disease duration, y	<4	56	80.8 (42/52)	90.4 (47/52)
	≥4	56	94.1 (48/51)	84.3 (43/51)
Active joints, n	0-9	35	90.3 (28/31)	90.3 (28/31)
	10-29	55	82.4 (42/51)	88.2 (45/51)
	31-71	22	95.2 (20/21)	81.0 (17/21)
Fever free[b]	Yes	50	91.3 (42/46)	82.6 (38/46)
	No	62	84.2 (48/57)	91.2 (52/57)
Oral CS dose, mg/kg/d[c]	<0.3	55	86.0 (43/50)	84.0 (42/50)
	≥0.3	57	88.7 (47/53)	90.6 (48/53)
Background MTX use	Yes	78	89.0 (65/73)	90.4 (66/73)
	No	34	83.3 (25/30)	80.0 (24/30)
Previous biologic treatment	Yes	92	88.0 (73/83)	85.5 (71/83)
	No	20	85.0 (17/20)	95.0 (19/20)
Previous IL-1 inhibitor treatment	Yes	54	87.5 (42/48)	83.3 (40/48)
	No	58	87.3 (48/55)	90.9 (50/55)

[a]Fever present (any temperature ≥37.5C in 7 days preceding week 52 visit; [b]Fever present (temperature ≥37.5C in the 14 days preceding baseline visit; [c]Prednisolone equivalent r/n = no. of responders/no. patients reaching week 52 visit + no. patients previously withdrew due to insufficient therapeutic response.

RHEUMATOID ARTHRITIS: COMORBIDITIES

69. A RANDOMIZED CONTROLLED TRIAL OF A COGNITIVE BEHAVIOURAL PATIENT EDUCATION INTERVENTION VERSUS A TRADITIONAL INFORMATION LEAFLET TO ADDRESS THE CARDIOVASCULAR ASPECTS OF RHEUMATOID DISEASE

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Background: Rheumatoid arthritis (RA)-specific European and national guidelines state that patients should have access to appropriate information about both the condition and its co-morbidities. Cardiovascular disease (CVD) is responsible for 50% of the excess mortality for patients with rheumatoid arthritis (RA), yet no information currently exists written specifically for people with RA. Generic resources are likely to be inadequate as their advice about exercise and weight control is not set in the context of the physical and psychosocial constraints associated with RA. We have previously designed a novel 8 week cognitive behavioural patient education intervention designed to effect behavioural change with regard to modifiable CVD risk factors in people with RA, informed by the Medical Research Councils' recommendations for designing and evaluating complex interventions. This study evaluates this new patient education resource.
Methods: This was a non-blinded randomized controlled trial with a delayed intervention arm. Participants were randomized 1:1 to receive the cognitive behavioural education intervention or a control information leaflet. The primary outcome measure was knowledge of CVD in RA, using a validated self-completion questionnaire; secondary measures were i) psychological measures relating to effecting behaviour changes, namely smoking cessation, increasing exercise, eating a low fat diet and losing weight; ii) actual behaviour changes, namely smoking status, participation in physical activity and dietary modifications (quantity of fruit and vegetables consumed, type of milk used, use of salt or removing fat from meat); iii) clinical risk factors, namely body mass index, blood pressure and lipid profile. Data were collected at baseline, 2 and 6 months.
Results: 110 participants consented (52 in intervention group; 58 in control group). At 6 months, those in the intervention group had significantly; higher knowledge scores ($p < .001$); improved behavioural intentions to increase exercise ($p < .001$), eat a low fat diet ($p = .01$) and lose weight ($p = .06$); lower mean diastolic blood pressure (DBP) by 3.7 mmHg, whereas the control groups' mean DBP increased by 0.8 mmHg. There was no difference between the groups on actual behaviours.
Conclusions: Patient education has a significant role to play in CVD risk factor modification for patients with RA and the detailed development of this programme likely contributed to its successful results. It is disappointing that behaviours, as we measured them, did not change; perhaps the measures we used were not sensitive enough. The challenge, as always, is how to translate behavioural intentions into action. Larger studies, powered specifically to look at behavioural changes are required.
Disclosure statement: All authors have declared no conflicts of interest.

70. OUTCOME OF WOMEN WITH PREVIOUS CARCINOMA IN SITU OF THE CERVIX WITH RESPECT TO FEMALE GENITAL CANCER, FOLLOWING TREATMENT WITH NON-BIOLOGIC DMARD OR ANTI-TNF FOR RHEUMATOID ARTHRITIS: RESULTS FROM THE BSRBR

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Background: Little is known about the relationship between anti-TNF therapy and outcomes in patients with a history of pre-malignant conditions preceding treatment. BSR guidelines advise 'exercising caution when using anti-TNF' in such patients. This analysis investigated the risk of female genital cancer in women with a previous history of carcinoma in situ (CIS) of the cervix prior to registration with the BSRBR.
Methods: The analysis was conducted in the BSRBR, a national cohort study. Patients with RA starting treatment with the TNF inhibitors etanercept, infliximab or adalimumab and a biologic-naïve comparison cohort taking non-biologic therapy (nbDMARD) were recruited 2001-2009. This analysis was restricted to women with CIS cervix prior to registration, identified by flagging with the UK cancer registry (NHS-IC) which reported cancers using ICD codes. The ICD code for CIS cervix comprised cervical intraepithelial neoplasia (CIN) 3, with or without mention of severe dysplasia. Rheumatologists were also asked to report any history of cancer, but not specifically CIS, at baseline. Subjects were followed until 31/03/2010, first female genital cancer or death, whichever came first. Incident cancers were identified in 3 ways; lifelong flagging with NHS-IC; 6 monthly patient and physician questionnaires for 3 years and annual physician questionnaires thereafter. Incident cancers were defined as any new or recurrent cancer (including CIS) of the female genital organs.
Results: 238 subjects had previous CIS cervix reported by the cancer registry among 11738 women registered with the BSRBR; anti-TNF 190/9084 (2.1%) and nbDMARD-only 48/2654 (1.8%). Only 21 (11%) prior CIS were also reported on the consultant baseline form in the anti-TNF cohort and 7 (15%) in the nbDMARD cohort. Median time from previous CIS to registration was 12 years for the anti-TNF cohort and 14 years for nbDMARD. Seventy-three (38%) anti-TNF treated patients started therapy within 10 years of CIS cervix. During 893 person-years (pyrs) of follow-up (median 5.2 years) no female genital cancers were reported in the anti-TNF cohort. In the nbDMARD-only cohort 2 were reported during 159 pyrs (median 3.9), equating to a crude incidence rate of 13 per 1000 pyrs (95% confidence interval 2, 45). These were metastatic squamous cell cancer of the vulva and metastatic cervical cancer. In both cases previous CIS cervix occurred >10 years prior to registration.
Conclusions: The low level of reporting of pre-existing CIS cervix by rheumatologists may reflect both 1) rheumatologists choosing not to report in situ cancers as prior cancers at baseline and 2) history of CIN being unknown to the prescribing rheumatologist. In this large national cohort of patients with RA, there were no female genital cancers among women with pre-existing CIS cervix selected for treatment with anti-TNF.
Disclosure statement: O.B. received research grants from Abbott, Merck, Pfizer, Roche, Swedish Orphan Biovitrium and UCB. All other authors have declared no conflicts of interest.

71. CARDIOVASCULAR MORTALITY RATES (SMR) ARE ELEVATED IN A NATIONAL COHORT OF SUBJECTS WITH RHEUMATOID ARTHRITIS COMPARED WITH THE UK GENERAL POPULATION WHETHER THEY WERE OR WERE NOT TREATED WITH BIOLOGIC DRUGS: RESULTS FROM THE BSRBR

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Background: Subjects with RA are at increased risk of cardiovascular (CV) mortality compared to the general population. However, most studies were conducted in cohorts dating from 1960s to 2000. Treatment of RA has changed in the last decade, with earlier and more aggressive use of non-biologic disease-modifying drugs

TABLE 1.

	Biologic-naive (n = 3767)				Anti-TNF (n = 12051)			
Follow-up (person-years)	14892				63811			
Mean age (SD)	60.1 (12.4)				56.1 (12.3)			
Females (%)	72.4				76.2			
Median disease duration, years (IQR)	6 (1-15)				11 (6-19)			
Mean baseline DAS28 (SD)	5.1 (1.3)				6.6 (1.0)			
Prior CVD (%)	39.2				35.6			
Ever smoked (%)	63.6				60.2			
	Observed	Expected	SMR	95% CI	Observed	Expected	SMR	95% CI
All-cause mortality	369	246.5	1.5	1.4, 1.7	1182	682.2	1.7	1.6, 1.8
All-cardiovascular disease (I00-I99)	100	80.1	1.2	1.0, 1.5	340	206.6	1.6	1.5, 1.8
Ischaemic heart disease (I20-25)	52	38.2	1.4	1.0, 1.8	184	101.4	1.8	1.6, 2.1
Stroke (I63-64)	14	11.0	1.3	0.7, 2.1	38	30.1	1.3	0.9, 1.7

(nbDMARDs) and the introduction of anti tumour necrosis factor (anti-TNF) therapy. This could lead to a reduction in CV mortality by reducing the burden of inflammation. This analysis compared CV mortality in 2 cohorts of subjects with active RA; i) treated with anti-TNF & ii) biologic-naive, treated with nbDMARDs only, to the UK general population.

Methods: This analysis included all BSRBR subjects with RA recruited between 2001-2008. They were flagged with the national death register. Baseline CV risk factors were obtained from physician questionnaires. All subjects were followed until 31/07/2010 or death, whichever came first. The underlying cause of death from death certificates was reported using International Classification for Diseases version 10 (ICD-10). Mortality from CV causes was identified using ICD-10 codes I00-I99, ischaemic heart disease I20-25 and stroke I63-64. Mortality rates of the UK general population were obtained from the Office of National Statistics. All-cause and CV-specific standardized mortality ratios (SMR) were separately calculated for both cohorts.

Results: There were 3767 subjects in the nbDMARD cohort & 12051 subjects in the anti-TNF cohort. Subjects in the nbDMARD cohort were older, with proportionally fewer females, shorter disease duration, lower disease activity and had a greater proportion of CV risk factors compared to the anti-TNF cohort. In both cohorts, subjects were at significantly increased risk from all-CVD mortality, with SMRs ranging from 1.2-1.6 (Table). This effect was lower for stroke but the point estimate suggests there is approximately a 30% increased risk.

Conclusions: Subjects with active RA treated with modern therapies remain at increased risk of CV mortality compared to the general population. SMRs only account for age and gender differences and cannot be directly compared between the cohorts.

Disclosure statement: O.T. received research grants from Abbott, Swedish Orphan Biovitrum, Merck, Pfizer, Roche and UCB. All other authors have declared no conflicts of interest.

72. AN AUDIT OF INVESTIGATION OF ANAEMIA IN RHEUMATOID ARTHRITIS

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Background: Anaemia occurs frequently in rheumatoid arthritis (RA) and may be multifactorial. We wanted to establish whether anaemic RA patients are being investigated and to what extent. There are no national guidelines in this setting.

Methods: The audit took place in the rheumatology outpatient department of Selly Oak Hospital in 2011. We identified patients who attended rheumatology clinic with positive levels of anti-CCP (>100 units) from June-December 2010. From this we selected patients found to be anaemic according to the Trust's laboratory definition (females Hb < 11.5 g/dl: males Hb < 13.5 g/dl). We recorded MCV, MCH, platelets and white blood cell count. We looked for evidence from up to a year after the test showing low Hb, that haematinics, faecal occult blood estimation, endoscopy or advice to the GP had been considered. We looked at previous clinic letters for medication lists. We set a target that 60% of anaemic RA patients should be further investigated.

Results: Because CCP tests are less likely to be carried out in patients with well-established disease, disease duration was <10 years. Sixty-two of 263 strongly CCP positive patients were anaemic. Age range 23-91 years. M:F 21:41. Twenty-one patients had CRP < 10 (no data for 9 patients). All had creatinine < 135. Nineteen patients were on aspirin. Only 13 of anaemic patients were on NSAIDs. 16 were on prednisolone. Only 1 anaemic patient was on aspirin, NSAID and prednisolone. Twenty-three were on methotrexate. 3 (4.84%) had microcytic anaemia, 56 (90.3%) normocytic and 3 (4.84%) macrocytic. One patient had Hb 5.7 and was pancytopenic. Two females had Hb < 9 g/dl. Of the 62 anaemic patients, only 7 (11.3%) had a complete set of haematinics carried out. Of these 5 had normal values and comorbidities, one had low B12, two had low folate, one of whom (a young female) had low ferritin also. 2 (3.23%) had B12 and folate only, 1 (1.61%) had iron studies only and 49 (79.0%) had none of these tests. Further full blood count (FBC) was carried out in 48 patients (77%). Further action related to the anaemia was taken in 12 patients (19.3%). 9 (14.5%) underwent imaging/endoscopy related to the anaemia, 5 (8.06%) were referred to other secondary specialties eg haematology, 4 (6.45%) had letters sent to their GPs asking for their anaemia to be monitored and 5 (8.06%) had other tests performed. Of these 12 patients, few had a definitive cause for the anaemia according to clinic letters. One was diagnosed with pernicious anaemia and others were having further investigations.

Conclusions: Anaemia in RA is commonly identified yet only a minority of patients were investigated further for this abnormality, so our target was not met. The majority of anaemic RA patients had Hb between 9 and the lower limit of normal for their gender. Extrapolating from the small number of patients where haematinics were measured suggests that although the majority have anaemia of chronic disease, occasionally treatable deficiencies may be missed.

Disclosure statement: All authors have declared no conflicts of interest.

73. ANTI-TNFα THERAPY TRANSIENTLY IMPROVES HIGH DENSITY LIPOPROTEIN LEVELS AND MICROVASCULAR ENDOTHELIAL FUNCTION IN PATIENTS WITH RHEUMATOID ARTHRITIS: A LONGITUDINAL STUDY

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Background: Rheumatoid arthritis (RA) is associated with increased morbidity and mortality from cardiovascular disease (CVD). This can be partially attributed to traditional CVD risk factors such as dyslipidaemia and their downstream effects on endothelial function. The most common lipid abnormality in RA is reduced levels of high-density lipoprotein cholesterol (HDL), probably due to active inflammation. In this longitudinal study we hypothesized that anti-tumor necrosis factor-α (anti-TNFα) therapy in patients with active RA improves HDL cholesterol, microvascular and macrovascular endothelial function.

Methods: Twenty-three RA patients starting on anti-TNFα treatment were assessed for HDL cholesterol, and microvascular endothelial function (Laser Doppler imaging with iontophoresis of acetylcholine and sodium nitroprusside) and macrovascular endothelial function (flow-mediated and Glyceryl-trinitrate-mediated dilatation) at baseline, 2-weeks and 3 months of treatment.

Results: Disease activity (CRP, fibrinogen, DAS28) significantly decreased during the follow-up period. There was a significant increase from baseline in HDL cholesterol at 2 weeks (1.4 ± 0.3 and 1.5 ± 0.3 respectively, $p < 0.05$) which was paralleled by a significant increase in microvascular endothelial-dependent function also at 2 weeks (baseline: 319 ± 217, 2 weeks: 437 ± 247, $p < 0.05$). However, both parameters returned towards baseline at 12 weeks.

Conclusions: Anti-TNFα therapy in RA patients appears to be accompanied by transient but significant improvements in HDL

cholesterol, which coexists with an improvement in microvascular endothelial-dependent function.
Disclosure statement: All authors have declared no conflicts of interest.

74. PREDICTORS OF SUBENDOCARDIAL VIABILITY RATIO IN PATIENTS WITH RHEUMATOID ARTHRITIS: THE ROLE OF INFLAMMATION AND CLASSICAL CARDIOVASCULAR DISEASE RISK FACTORS

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Background: Rheumatoid arthritis (RA) is associated with increased morbidity and mortality from cardiovascular disease (CVD). In particular, RA patients are at a greater risk from myocardial infarction when compared with the general population. There is some evidence that myocardial microvascular dysfunction in RA might be related to RA-related inflammation, but the few studies that have addressed this have included small sample sizes and have mainly used invasive assessments of coronary endothelial function. Subendocardial viability ratio (SEVR) has emerged as a novel marker of myocardial oxygen demand (coronary perfusion) and oxygen consumption (cardiac workload) and as such provides a non-invasive measure of myocardial ischaemia. The aim of the present study was to identify specific predictors of SEVR in patients with RA.
Methods: 173 consecutive rheumatoid arthritis (RA) patients (age (mean $\pm$ SD) 61 $\pm$ 12, 132 females) underwent measurements of SEVR using pulse wave analysis. Low SEVR readings reflected increased myocardial ischaemia. A blood sample was also obtained and analysed for routine laboratory biochemistry, lipids, haematology, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP).
Results: Linear and binary regression analysis was performed to determine univariate predictors of SEVR in patients with RA. This analysis revealed that ESR ($\beta = -.18$, $p = .02$) and CRP ($\beta = -.21$, $p = .005$) were associated with SEVR. From the classical CVD risk factors, only systolic blood pressure (SBP) ($\beta = -.18$, $p = .02$) was associated with SEVR. However, there were trends for an inverse association between BMI ($p = .07$), total cholesterol ($p = .07$) and SEVR.
Conclusions: Inflammation appears to be an important predictor of SEVR in patients with RA and may contribute to myocardial ischaemia in this population along with SBP. However, prospective studies which aim to examine the long-term effects of inflammation and classical CVD risk factors on SEVR are required.
Disclosure statement: All authors have declared no conflicts of interest.

75. IS THE NATURAL HISTORY OF INTERSTITIAL LUNG DISEASE IN RHEUMATOID ARTHRITIS CHANGING?

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Background: There has been increasing recognition of the importance of respiratory disease in patients with rheumatoid arthritis (RA) over the last five years. Interstitial lung disease (ILD) is the only complication of RA increasing in prevalence and accounts for around 6% of all RA deaths, with a mean survival of just 3 years following diagnosis in several historic series. However, treatment regimes have begun to change and we have assessed the effect of this on the survival rates associated with RA-ILD.
Methods: We have identified 50 patients with clinically significant (respiratory symptoms and / or signs) RA-ILD from a population of 1,600 RA patients over 10 years. Diagnosis was confirmed on high resolution computed tomography (HRCT) of the lungs. We recorded the nature and extent of ILD on HRCT. Serology was compared to a control group of RA patients without lung disease. Pulmonary function was monitored serially to assess progression. All treatment given was noted and we analysed outcome data based on all cause and pulmonary mortality.
Results: Fifty patients with confirmed RA-ILD were identified, giving a prevalence of 3.2%. Twenty patients were male, giving a female:male ratio of 3:2 Mean age at diagnosis of ILD was 67 (46-87) years, and mean duration of RA at diagnosis of ILD was 4 (0-37) years. Usual interstitial pneumonia was found in 64%, non-specific interstitial pneumonia in 28% and cryptogenic organizing pneumonia in 8%. Positive CCP antibodies were found in 86% of RA-ILD patients (controls 60%) with mean titres of 215 (controls 89). Those with progressive ILD were treated aggressively and anti-TNF therapy was avoided in all patients (see Table 1). All cause (pulmonary) mortality was 20% (10%) over 10 years, with a mean survival of over 10 years. No treatment related deaths occurred.
Conclusions: RA-ILD is a common and potentially fatal disorder which influences therapeutic decision making. The natural history of the disease may be improving. The evidence we present suggests selective therapy may contribute towards a better outcome.

TABLE 1 Treatment given to patients for progressive RA-ILD

Treatment	% of patients
Mycophenolate	40
Rituximab	20
Cyclophosphamide	12
Methylprednisone	8
Anti-TNF drugs	0

Disclosure statement: All authors have declared no conflicts of interest.

76. SEVERE URINARY TRACT INFECTIONS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: The aim of this study was to describe the incidence of urinary tract infections (UTIs) leading to hospitalization or delaying hospital discharge in a large cohort of patients with rheumatoid arthritis (RA). Comorbidity from RA has recently focussed on outcomes of cardiovascular and pulmonary disease, but serious infections are an increasingly well recognized complication of RA. Recent work has demonstrated how the incidence of pneumonia can be reduced in RA, but little attention has been paid to the incidence of UTIs in RA, or to the associated comorbidity.
Methods: This study assessed all patients with RA hospitalized over a 12 month period with a discharge diagnosis including UTI. Patients were identified through a PAS records search in a single large centre, and case controls without RA matched for age and gender were identified. Clinical notes were manually examined by 2 observers. We recorded: age, gender, duration of RA, number of UTIs, all RA therapy, all comorbidity, results of urine and blood cultures with antibiotic sensitivities, readmission rates, treatment and outcome. We calculated the relative risk of developing UTI in patients with RA and the factors influencing this.
Results: The overall annual incidence of hospitalization with a UTI amongst RA patients was 2.09%, as against 0.97% for controls (RR = 2.16). These figures derived from a population of 2,200 RA patients (90% female) with a mean age of 76 years. The use of long term oral steroids was associated with a RR of 4.46 for admission with UTI and this rose to 9.07 in those on steroids without disease-modifying anti-rheumatic drugs (DMARDs). Positive cultures for E Coli were found in 51% of RA patients. Relevant co-morbidities included permanent catheters, vaginal prolapse, cancer and diabetes. Readmission was common.
Conclusions: RA was associated with a significantly higher incidence of UTI, particularly in older females. This caused significant morbidity, although mortality was low. Predisposing factors included oral steroids, urethral trauma and diabetes. Poor hand hygiene as a result of deformity may also contribute. We recommend avoidance of long term steroids and catheters where possible, and the use of low dose prophylactic antibiotics where these factors are unavoidable or UTIs reoccur.
Disclosure statement: All authors have declared no conflicts of interest.

77. THORACIC HRCT STUDY TO ASSESS FOR PRE-EXISTENT LUNG DISEASE IN RHEUMATOID ARTHRITIS PATIENTS DUE TO START ANTI-TNF THERAPY

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Background: Anti-tumour necrosis factor inhibitor induced interstitial lung disease (aTNF-ILD) is emerging as a particularly worrying biologic associated disease with high mortality rates (one third of cases). In aTNF-ILD patients who had established ILD prior to commencing aTNF, mortality is up to two thirds of cases; with such high mortality rates in mind we investigated whether high resolution CT chest scans (HRCT) provided a better diagnostic tool than the current screening combination of chest radiography(CXR) and clinical assessment at identifying clinically significant lung disease in rheumatoid arthritis(RA) patients who are due to start aTNF.
Methods: A 1 year prospective study was undertaken between June'10 and '11 where RA patients, due to start aTNF, were pre-screened with a chest HRCT in addition to CXR and clinical assessment. Clinically significant radiological abnormalities was defined as radiographic lung findings that correlated with respiratory symptoms leading to a pulmonary diagnosis.
Results: 29 patients in total were evaluated. Mean age was 60 years with a 5:1 female/male ratio. Mean duration of RA was 8 years. 34.5% had had smoking exposure (current/ex-smoker). 66% were rheumatoid factor positive.

Two thirds of cases showed concordance between HRCT and CXR findings. Of those with nonconcordant results, 8 had a normal CXR but abnormal HRCT (however, all had minimal HRCT changes). No patient from the nonconcordance group had clinically significant findings (all were asymptomatic). 2 cases were detected to have pre-existing ILD; 1 was asymptomatic with minimal changes on HRCT not present on CXR, the other had correlating changes on HRCT and CXR and the patient reported exertional breathlessness. Only 2 cases in the whole cohort exhibited symptoms on initial assessment, both from the HRCT/CXR concordance group (the latter mentioned case with ILD and another with bronchiectasis).
Conclusions: There does not appear to be an obvious advantage in using HRCT in the initial screening armoury to assess for pre-existing lung disease in RA patients who are due to commence aTNF. 2 patients who were found to have pre-existing ILD: in one patient diagnosis was easily achieve via CXR and symptom assessment, and in the other patient subtle HRCT changes were seen which were clinically insignificant. All patients were commenced on aTNF, even in those who had abnormalities on HRCT as the changes were not deemed clinically relevant enough to preclude treatment.

With the high mortality rates of aTNF-ILD as seen in the BSR-biologics register, the question of whether aTNF should be avoided in patients with asymptomatic mild ILD remains unanswered. Using HRCT to screen patients who are symptomatic with abnormal CXRs remains the more prudent approach.
Disclosure statement: All authors have declared no conflicts of interest.

78. THE EFFECT OF ANTI-INFLAMMATORY THERAPY ON LIPID SUB-FRACTIONS AND VASCULAR FUNCTION IN RHEUMATOID ARTHRITIS: A PROSPECTIVE STUDY

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Background: Rheumatoid arthritis (RA) associates with increased cardiovascular risk. Dyslipidaemia may contribute to this via alterations in lipid levels and structure. The lipoprotein sub-fraction profile (LSFP) is altered in RA but it remains unknown whether suppression of inflammation affects the LSFP and whether this associates with alterations in vascular function. We assessed longitudinally the effects of anti-inflammatory therapy (anti-TNF, rituximab and glucocorticoids) on LSFP and vascular function in RA.
Methods: HDL2, HDL3, small dense LDL (sdLDL) levels and vascular function were measured longitudinally (baseline, 2 weeks and 3 months) in 57 RA patients receiving anti-TNF ($n=35$), intravenous glucocorticoids ($n=12$), and rituximab ($n=10$); and two control populations (15 RA on stable DMARD therapy and 40 healthy controls)
Results: At baseline, HDL2 and HDL2:HDL3 ratio were lower and HDL3 higher in RA patients compared to healthy controls. After anti-inflammatory therapy, HDL2 increased at 2 weeks, but returned to baseline levels at 3 months. Amongst patients treated with intravenous glucocorticoids HDL2 ($p=0.004$) and sdLDL levels ($p=0.002$) increased at 2 weeks (returning to baseline at 3 months) and HDL3 levels decreased at 3 months ($p \leq 0.001$). At baseline HDL3 levels negatively correlated with microvascular function ($r=-0.385$, $p=0.039$). Longitudinally, there were no robust associations between lipoprotein sub-fractions and endothelial function.
Conclusions: The LSFP is altered in RA; suppression of inflammation via anti-inflammatory therapy produces only transient changes in the LSFP, which are not reflected into improved vascular function.
Disclosure statement: All authors have declared no conflicts of interest.

79. HIGH CRP IS THE BEST MARKER OF DYSLIPIDAEMIA IN PATIENTS WITH EARLY INFLAMMATORY POLYARTHRITIS: RESULTS FROM THE NORFOLK ARTHRITIS REGISTRY

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Background: Patients with inflammatory conditions such as rheumatoid arthritis (RA) have an increased risk for cardiovascular disease (CVD). Although a number of genetic, environmental and serological factors contribute to CVD, dyslipidaemia have a pivotal role in atherogenesis. The association between disease parameters and dyslipidaemia has been widely investigated, but with controversial results.

The aim of this study is i) to characterize lipids and apolipoproteins in patients with early inflammatory polyarthritis (IP) and ii) to investigate the association between lipid profiles and disease characteristics in patients with early IP.
Methods: Patients with early IP were recruited from the Norfolk Arthritis Register (NOAR), a primary inception cohort. We included adults over 18 years old with 2 or more swollen joints for more than four weeks, who were recruited after January 1st 2000. At inclusion, we performed a detailed interview which included assessment of joint count (tender and swollen joint count), symptom onset and functional disability (HAQ). Blood samples were collected and stored for routine measurements including CRP, rheumatoid factor, anti-CCP antibodies (ACPA) and lipid profiles. The association between markers of disease activity and lipid sub-fractions was examined using linear regression with adjustment for age and gender.
Results: At baseline, the median (IQR) age of the study cohort was 58 (47, 68) years and median (IQR) of symptom duration was 8 (4.5, 15) months; 67% of the patients were female, 538 (42.7%) patients were RF-positive and 394 (31%) were ACPA-positive. The 1987 ACR criteria for RA was fulfilled by 568 (45%) and the median (IQR) DAS-28crp was 3.68 (2.82, 4.62) and CRP 11 (5.4, 20.8) mg/l. About half of the patients were treated with DMARDs, 25% were exposed to steroids. The commonest lipid abnormality in this population was low HDL (465 −37 %). A significant negative association was found between CRP and Total Cholesterol β-coeff (95% CI): −0.006 (−0.011, −0.002), LDL: −0.004 (−0.007, −0.0005), Triglycerides: −0.004 (−0.006, −0.001), and ApoA-1: −0.001 (−0.004, −0.0002). DAS-28 was associated with lower ApoA-1 β-coeff (95% CI): −0.04 (−0.069, −0.014), the tender joints was associated with higher Triglycerides: 0.005 (0.001, 0.007), and the swollen joint count with lower HDL: −0.004 (−0.009, −0.0008).
Conclusions: In patients with early IP the most prevalent lipid abnormality was low HDL which was associated with higher swollen joint counts. Other alterations in lipid sub-fractions were mainly associated with CRP which seems to be the inflammatory feature most consistently associated with dyslipidemia in this population.
Disclosure statement: All authors have declared no conflicts of interest.

80. RHEUMATOID ARTHRITIS PATIENTS ARE TOO FAT AND UNFIT

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Background: In RA there is a 1½ - 2 fold increase in the incidence of cardiovascular disease (CVD) and traditional risk factors (TRFs) do not fully explain this increased incidence. RA patients are typically known to have poor cardio-respiratory fitness (CRF) which is a known independent CVD risk factor. Yet on the whole the measurement of CRF is generally ignored because it is difficult to assess in a clinical setting. The aim of this study was to assess RA patients' CRF using a simple tool and to determine whether poor CRF correlated with TRFs and body composition.
Methods: 100 RA patients (69 female, 31 male) attending rheumatology clinics were recruited. CRF was measured using the Siconolfi Step Test. RA activity, TRFs and anthropometric characteristics (BMI, waist hip ratio and body fat percent) were assessed. Statistical associations were measured using Pearsons correlation.
Results: Table 1 shows the RA, TRF and anthropometric characteristics. This group had well controlled disease with mild disability. The main elevated TRF was the LDL-c with 41% fulfilling the metabolic syndrome (MetS) criteria. Based on body fat, 83% of patients were overweight or obese. 65% of patients were able to complete the step test however their fitness level was very poor, 20.3 and 26.3 $ml.kg^{-1}.min^{-1}$ for females and males respectively. Poor fitness was associated with the metabolic syndrome and a less favourable body composition. There was no correlation with RA, SBP, TC or LDL-c variables. 35% of patients were unable to do the step test. This group reported higher disability and pain, and had a greater prevalence of obesity and MetS when compared to those who completed the step test.
Conclusions: CRF is an independent CVD risk factor but this is not routinely measured as there has been no tool available for health professionals. We have demonstrated that the step test can provide a measurement of fitness in a clinical setting. The RA patient's fitness was very poor. Despite this poor fitness TRFs were not markedly elevated but was associated with the metabolic syndrome and levels of obesity. The obesity was even more marked in those who were unable to do the test. This study has highlighted the alarming levels of obesity and poor fitness in a typical well controlled RA population. Thus more attention and understanding is required on addressing these factors rather than the TRFs alone.

Table 1.

Age (yrs)	59.6 ± 10.2
Disease duration (yrs)	10.4 ± 9.1
DAS28 CRP	2.8 ± 1.4
HAQ	0.87 ± 0.76
Blood pressure (mmHg)	SBP 140 ± 20 DBP 81 ± 12
TC (mmol/l)	5.2 ± 1.1
TG (mmol/l)	1.5 ± 0.7
LDL-c (mmol/l)	3.1 ± 1.0
HDL-c (mmol/l)	1.5 ± 0.5
Metabolic syndrome (%)	41
Body fat %	Female 43.6 ± 12.9 Male 24.2 ± 7.2
Waist hip ratio	Female 0.87 ± 0.05 Male 0.97 ± 0.06

Disclosure statement: All authors have declared no conflicts of interest.

81. DEPRESSION AND RHEUMATOID ARTHRITIS: THE PREVALENCE AND PREDICTORS OF DEPRESSION IN A RHEUMATOID ARTHRITIS POPULATION

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Background: Rheumatoid arthritis (RA) and depression are debilitating illnesses that cause social and personal limitation. RA affects 1% and depression 2-4% of the population, these two illnesses can coexist. The prevalence of depression in RA patients is between 8% and 67% depending on the diagnostic tool and study population. Depression in RA is related to psychosocial variables such as mood, social support, coping strategies, negative life events, perceived stress and to disability and measures of function. Although a history of depression is related to current depressive symptoms, age, sex and disease duration are not often correlated with depressive symptoms. Assessing and treating coexisting depression in active RA can improve functional status.The aims of this study were to ascertain the prevalence of depression in a secondary care RA population using the PHQ 9, a short self completed questionnaire recommended for use in primary care and investigate any predictive relationship between the PHQ 9 score and routine demographic, functional status and current disease variables.
Methods: Patients were recruited from the Rheumatology outpatient clinics of St Georges Hospital, Tooting, London. The patients completed a PHQ 9 questionnaire, a HAQ and a questionnaire regarding demographic data, previous comorbidity, cardiovascular risk factors and previous mental health. Within two weeks of completing the questionnaires, patients were invited to have a physical examination. The DAS 28, ESR, CRP, duration of early morning stiffness and visual analogue scores for global arthritis activity (global VAS) and pain (pain VAS) were collected.
Results: 97 patients were recruited. 78% were female, with a mean age of 57.2 years and mean RA duration of 13.4 years. The prevalence of depression in the sample was 23.9% (score of >10 out of a possible 27). There were statistically significant differences between the groups of depressed and non-depressed in terms of HAQ, ESR, global VAS, pain VAS and the DAS 28 score on univariate analysis ($p < 0.05$). Using multivariate analysis, the global VAS had the strongest influence on the PHQ 9 score where a 1 mm change in global VAS predicts a 0.116 (0.067-0.166, 95% confidence interval) change in the PHQ9 score, i.e. a 10 mm change in the VAS will predict a 1 (1.16) unit rise in the PHQ 9 score. The composite score DAS 28 was the strongest predictor of being depressed. The odds ratio for being depressed is 1.6 for each unit increase in DAS 28.
Conclusions: Using the PHQ 9, the prevalence of depression in this population with established RA is 23.9%. The PHQ 9 is a useful tool for screening for depression in an RA population and should be considered in those with a rising VAS for global activity or high DAS 28 to ascertain the need for psychological intervention.
Disclosure statement: All authors have declared no conflicts of interest.

SCLERODERMA AND RELATED DISORDERS

82. AN AUDIT OF THE TREATMENT OF RAYNAUD'S PHENOMENON SECONDARY TO CONNECTIVE TISSUE DISEASE AND THE COST-EFFECTIVENESS STUDY OF THESE TREATMENTS

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Background: There is currently no guidance from NICE or the British Society of Rheumatology (BSR) on treating Raynaud's secondary to connective tissue disease 'CTD'. The Royal Free Hospital (RFH) has ''An algorithm for 'best treatment' of ischaemic digital ulceration in systemic sclerosis''. Aside from this, it tends to be clinical experience that governs the treatment strategy. The RFH's algorithm contains several therapies that are not licensed for treatment of Raynaud's, despite regular use in clinical practice. A cost comparison of these therapies could help utilize resources more effectively.
Methods: 56 patients with secondary Raynaud's, who attended CTD clinics at RGH from November 2010 to June 2011 were included in this audit. Data was collected using patient's medical notes retrospectively. Information recorded included patient's age, gender, underlying CTD and length of time since diagnosis, history of ulcers, current and previously tried Raynaud's treatments and whether these treatments provided symptom relief. The RFH's algorithm was used as a gold standard. Costs for sildenafil and tadalafil are from The British National Formulary (61st edition). Costs for iloprost infusions were obtained from consultation with a specialist rheumatology nurse at RGH.
Results: 23.2% of patients had never received treatment for their Raynaud's. Of the treated patients, 91% had been prescribed calcium channel blockers 'CCB', 19% statins, 19% aspirin and 28% SSRIs for their Raynaud's. This is 'background vascular therapy'. 30% of treated patients had been prescribed sildenafil, with only 5% at the 'RFH recommended' starting dose (25 mg tds). 77% of sildenafil patients experienced symptom relief. 26% of treated patients had tried iloprost. Of these iloprost patients, 73% experienced symptom relief due to the prostaglandin analogue and 91% had also been on sildenafil.

20% of patients had experienced a digital ulcer 'DU' with 16% experiencing 3+ DUs at any one time. Despite this, none had been prescribed bosentan. Instead, all patients with 3+ DUs had been commenced on sildenafil. No patients were prescribed tadalafil. A 5-day admission for an inpatient iloprost infusion totals £2032.85 whereas a day-case 5 day infusion totals £912.85. Sildenafil 25 mg tds costs £4544.25 per year, compared to 50 mg bd costing £3525.90 per year.

Tadalafil 20 mg od costs £2457.00 per year. 20 mg every other day (literature is divided between the recommended dose) costs £1228.50.
Conclusions: The prescription of background vascular therapy - especially CCBs, was consistent throughout practice. However, treatments for more severe disease (sildenafil, iloprost and bosentan) were not as consistently prescribed when compared to the gold standard, with large discrepancies between patients. Using information from the cost-effectiveness study, recommendations could be made to save money without being detrimental to patient's treatment.
Disclosure statement: All authors have declared no conflicts of interest.

83. ANTI-CENTROMERE ANTIBODY PREDICTS FALL IN ANKLE BRACHIAL PRESSURE INDEX IN PATIENTS WITH SYSTEMIC SCLEROSIS

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Background: Vascular abnormalities have long been recognized as being central to the pathogenesis of SSc,which has been suggested to be primarily a vascular disease. Although the microvasculature is primarily involved,some studies have demonstrated an increased prevalence of large (proximal) vessel disease. To detect large vessel disease early, we routinely check the ankle brachial pressure index (ABPI) on an annual basis. Prompt detection of clinically significant lower limb peripheral vascular disease, especially in patients with SSc and a compromised microcirculation, may be limb-saving. The aims of this retrospective study were to a) examine change over time in ABPI in a cohort of patients with SSc b) examine whether limited cutaneous disease subtype, disease duration, smoking habit, or anti-centromere antibody are associated with a fall in ABPI over time.
Methods: The clinical, laboratory and ABPI data of 217 patients with SSc attending between 1996 and 2011 were reviewed retrospectively. Patients were followed for a median of 8 years. When measuring ABPI, both the dorsalis pedis and posterior tibial pressures were measured, and the ABPI calculated for each lower limb, using the higher value, by dividing ankle pressure by the brachial artery pressure. For each lower limb of each patient, linear regressions were used to estimate the average gradient of each ABPI trajectory over time. Factors were assessed for their association with these gradients using multiple regression. The factors included in the multiple regression were age, gender, disease subtype, duration of Raynaud's phenomenon (RP), duration of SSc from the first non-RP clinical feature (in log), smoking habit, and anti-centromere antibody status.
Results: 204 patients (83% female, median age 60 (range 23-90) years) had at least three serial measurements of ABPI and so were included in analyses. 75% had limited cutaneous and 25% diffuse cutaneous SSc. Median duration of RP was 10 years and of SSc 5 years. 77% were non-smokers, 12 % ex-smokers and 12 % current smokers. 70 (34%) were anti-centromere antibody positive. ABPI was around 1 (normal) in most patients. Most patients had consistent APBI over time (average gradient near 0). Multiple regression analysis showed that the only factor significantly associated with a fall in ABPI was a positive anti-centromere antibody ($p = 0.008$).
Conclusions: Most patients with SSc have a normal ABPI and this remains consistent over time. A reduced ABPI in combination with SSc-related microvascular disease is potentially limb-threatening. Our findings suggest that clinicians should be particularly vigilant for the possibility of lower limb macrovascular disease in patients who are anti-centromere antibody positive. Our findings provide further evidence for the association between anti-centromere antibody and severity of vascular disease in SSc.
Disclosure statement: All authors have declared no conflicts of interest.

84. EXPRESSION PROFILING OF SKIN AND LUNG TISSUE AND EXPLANTED FIBROBLASTS IN THE TβRII△K-FIB TRANSGENIC MOUSE MODEL OF SCLERODERMA

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Background: Gene expression profiling of skin or lung tissue and fibroblasts in explant culture have been used to study intrinsic subsets and pathogenic mechanisms in systemic sclerosis. There are technical challenges integrating the results although the methods are often complementary. We have applied this strategy to analyse a transgenic mouse model that is a phenocopy of many of the histological and biochemical features of SSc. This mouse strain has ligand dependent upregulation of TGFβ signalling due to altered TβRII receptor expression in fibroblasts.
Methods: In this study we have analysed gene expression profiles of whole skin and lung from littermate TβRII△k-fib mice and fibroblasts cultured from neonatal or adult skin and lung tissue ($n = 3$ per group) using the illumina microarray platform. RNA was extracted, quantified and assessed for quality using standard methods. Validation of the data and additional quantitation of key gene expression was performed using quantitative RT-PCR assay with replicate samples.
Results: Cluster analysis identifies key gene profiles that are specific for skin or lung fibroblasts and also that are altered in whole tissues. In general the differential gene expression was much more marked in whole tissue and differences were more marked in neonatal compared with adult fibroblasts consistent with the higher levels of transgene expression previously described in younger mice. In particular, genes related to cytoskeletal and extracellular matrix structure and function (αSMA, troponin, tropomyosin 1, collagens type I, III, VI, VIII, XVII, matrix metalloproteinases 3, 9, 10, 13, 17, Timp3), endothelin (endothelin-1, Ednrb, Ednra), TGFβ (Ltbp1, TGFβ1, 2, 3, Ctgf), BMP (Bmp2, 4, Bmpr1) and VEGF (Vegfa, Vegfc) signalling axes and innate immunity (Il-6, Il-11, Il-13, Il-1r, Crp, Saa) were found to be differentially expressed both in transgenic whole skin, lung and explanted fibroblasts. In addition, genes coding for Pecam1 ($p = 0.03$) and Elastin ($p = 0.003$) were upregulated strongly in whole lung and skin. Some of these key genes that demonstrated significantly dysregulated expression in transgenic mouse skin and lung are summarized in more detail in Table 1.
Conclusions: These data are reminiscent of studies of human SSc tissue and illustrate another potential complementary strength or mouse models in better understanding the disease.

TABLE 1.

Gene	Target tissue	Relative transgenic expression	P value
Mus musculus matrix metalloproteinase 3 (Mmp3), mRNA	Lung fibroblast	1.94	0.02
Mus musculus transforming growth factor beta 1 (Tgfβ1), mRNA	Lung fibroblast	1.14	0.01
Mus musculus pleiotrophin (Ptn), mRNA	Skin fibroblast	0.59	0.1
Mus musculus dual specificity phosphatase 1 (Dusp1), mRNA	Skin fibroblast	0.28	0.0004
Mus musculus homeo box B7 (Hoxb7), mRNA	Skin fibroblast	0.49	0.01
Mus musculus annexin A1 (Anxa1), mRNA	Whole lung	0.43	0.05
Mus musculus integrin alpha 6 (Itga6), mRNA	Whole lung	1.89	0.02
Mus musculus collagen, type XII, alpha 1 (Col12a1), mRNA	Whole skin	0.82	0.01
Mus musculus similar to fibrillarin, transcript variant 1 (LOC100044829)	Whole skin	0.40	0.02
Mus musculus vascular endothelial growth factor (Vegfa) transcript variant 2, mRNA	Whole skin	1.86	0.05

Disclosure statement: All authors have declared no conflicts of interest.

85. BIG IS BEAUTIFUL: BODY SIZE AND SURVIVAL IN CONNECTIVE TISSUE DISEASE ASSOCIATED PULMONARY ARTERIAL HYPERTENSION

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Background: The relationship of body size to survival in connective tissue disease associated pulmonary arterial hypertension has not been elucidated.
Methods: Single centre retrospective analysis of data from patients with connective tissue disease undergoing diagnositc right heart catheters at a national pulmonary hypertension centre from 1999-2010. We have analysed baseline parameters at the time of right heart catheterization (RHC) and survival. Body surface area (BSA, m^2) was recorded at the time of the RHC in all patients. Weight, height and

body mass index (BMI, kg/m^2) were measured at the time of pulmonary function tests and were only included if within 3 months of the RHC.
Results: 913 patients were available for analysis. Pulmonary hypertension (as defined by mean pulmonary artery pressure, mPAP $\geq$ 25 mmHg) was diagnosed in 574 (62.9%) of these patients. Of these patients 283 had pulmonary arterial hypertension (PAH) (mPAP $\geq$ 25, wedge $\leq$ 15, no lung fibrosis). In the 283 patients with CTD-PAH, mean BSA was 1.72 m2. BMI data was only available for 90 of these patients, in whom mean BMI was 26.2 kg/m^2. We compared larger patients (BSA $\geq$ 1.72 m^2) to smaller patients (BSA $<$ 1.72m^2). Larger patients were more frequently male (34% vs 4%, $p < 0.0005$) and more frequently had systemic sclerosis (91% vs 80%, $p = 0.01$). Ages were similar (60 vs 58, $p = 0.32$) as were pulmonary artery pressures (42 vs 40, $p = 0.24$). However, cardiac output was higher in the larger patients (5.0 vs 4.0 litres/minute, $p < 0.00005$) and pulmonary vascular resistance was therefore lower (587 vs 746 dynes.s.cm-5, $p = 0.006$). Cardiac index was similar in the two groups (2.65 vs 2.53 l/min/m^2, $p = 0.20$). In patients with PAH, larger patients had a 37.3% lower mortality than smaller patients ($p = 0.01$ by log-rank). However, even after adjustment for age, gender, systemic sclerosis diagnosis, mean pulmonary artery pressure and cardiac output, a BSA above the mean was associated with approximately half the mortality (HR 0.54, $p = 0.003$, 95% CI 0.36,0.81 on Cox multivariable analysis). BMI was only available in 96 (34%) of these patients. Obese patients (BMI $\geq$ 30 kg/m^2) had a strong trend towards better survival compared to non-obese patients (BMI $<$ 30 kg/m^2) but with the smaller patient numbers this did not reach significance ($p = 0.076$).
Conclusions: We have shown that in patients with connective tissue disease pulmonary arterial hypertension, larger patients have a significantly improved survival compared to smaller patients, even after adjustment for demographics and pulmonary haemodynamics. This is a surprising finding and it raises the question of whether unmeasured confounders are likely to be responsible.
Disclosure statement: All authors have declared no conflicts of interest.

86. SURGICAL PROCEDURES ON THE FINGERS IN PATIENTS WITH SYSTEMIC SCLEROSIS

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Background: Digital ulcers (DU) are a common, disabling feature of systemic sclerosis (SSc). Even intensive medical management including vasodilator therapy, antibiotics and skilled nursing input may prove ineffective. For this reason, in our centre, limited early surgical intervention is playing an increasingly important role in minimizing the effects of infection and preventing tissue loss. Our objective was to test the hypothesis that in our tertiary centre numbers of amputations have decreased over the past 10 years in parallel with an increase in earlier, less radical surgical interventions. A secondary objective was to look for associations between type of surgical procedure and gender and autoantibody status.
Methods: In this retrospective study the annual number of digital amputations, debridements, digital sympathectomies and calcinosis excisions in patients with SSc attending between January 2001 and December 2010 were recorded. Relationships between surgical procedures, gender and autoantibody status were analysed using chi-squared and Fisher's exact tests, as appropriate.
Results: 392 patients with SSc attended the SSc clinic during the 10 year time frame of whom 55 underwent surgery for DU. A total of 139 procedures were carried out: 91 (65%) debridements, 21 (15%) amputations, 17(12%) calcinosis removals and 10 (7%) digital sympathectomies. The number of debridements and sympathectomies remained relatively constant while the number of calcinosis excisions increased over time (Table 1). The number of digital amputations decreased significantly over the ten year period ($p = 0.02$).

Male gender was associated with a higher risk of requiring an amputation (compared to the other three procedures) when compared to females ($p = 0.04$). Anticentromere or anti-Scl-70 positive patients were more likely to have had calcinosis excision ($p = 0.03$, 0.04 respectively) compared to those autoantibody negative.
Conclusions: Numbers of amputations decreased significantly over the past 10 years, reflecting a trend towards earlier referral for surgery and a more conservative surgical approach (debridement and calcinosis excision rather than amputation) as well as intensive medical management and an open door policy for DU. Gender and autoantibody status may influence the type of surgical intervention required.

Table 1 Numbers of different surgical procedures performed from 2001 to 2010

Year	Amputations	Debridements	Sympathectomies	Calcinosis excisions
2001	5	2	0	1
2002	0	3	0	3
2003	2	10	2	0
2004	4	17	1	0
2005	1	9	2	0
2006	0	7	1	3
2007	4	12	2	3
2008	2	10	2	1
2009	2	9	0	1
2010	1	12	0	5
Total	21	91	10	17

Disclosure statement: All authors have declared no conflicts of interest.

87. FAK/SRC INHIBITION ALLEVIATES THE PERSISTENT FIBROTIC PHENOTYPE OF LESIONAL SCLERODERMA FIBROBLASTS

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Background: Systemic sclerosis (SSc, scleroderma) are characterized by the excessive production and remodelling of extracellular matrix (ECM) often culminating in organ failure and death. Fibrosis, believed to result from a hyperactive tissue repair program, is characterized by the abnormal presence of the myofibroblast, a specialized type of fibroblast that overexpresses the highly contractile protein smooth muscle actin, which displays excessive adhesive properties. The precise contribution of adhesive signaling, which involves integrin-mediated activation of focal adhesion kinase (FAK)/src, to the fibrotic phenotype of cutaneous SSc fibroblasts is unclear.
Methods: Fibroblasts ($n = 6$) and skin biopsies were obtained from control and SSc tissue, and derived from mouse embryonic and mouse integrin beta1 wild-type and knockout. Proteins and RNAs including phospho-FAK, FAK, CCN2, vinculin, alpha-SMA and type I collagen antibodies were examined by immunofluorescence staining, RT-PCR and Western blot analysis. Cells were incubated for 24 hours in the presence or absence of anti-integrin beta1 antibody, N-acetyl cysteine (NAC) or PP2 (10 uM). In addition, the ability matrix remodelling in collagen contraction models and migration assays were also examined.
Results: Histological analysis of SSc dermal tissues reveals p-FAK protein expression in SSc fibroblasts, but not in fibroblasts of control dermis. FAK phosphorylation is reduced in integrin beta1 knockout mouse dermal fibroblasts. Neutralizing anti-integrin beta1 antibody or the antioxidant NAC reduces FAK phosphorylation in SSc fibroblasts. These results show integrin beta1 and reactive oxygen species (ROS) are required for the elevated FAK phosphorylation in SSc fibroblasts. The FAK/src inhibitor PP2 significantly decreases expression of pro-fibrotic mRNAs and proteins in normal and SSc dermal fibroblasts, such as CCN2, alpha-SMA and type I collagen ($p < 0.05$). When normal and SSc fibroblasts were subjected to the floating collagen gel model of ECM contraction and the scratch wound assay of cell migration, in the presence or absence of PP2 and anti-integrin beta1 antibody, both of them reduced the enhanced ability of SSc fibroblasts to contract a collagen gel matrix and migration.
Conclusions: These results suggest that the excessive adhesion of SSc fibroblasts to ECM is intimately involved with the fibrotic phenotype of this cell type; blocking adhesive signaling may be beneficial in controlling fibrosis.
Disclosure statement: All authors have declared no conflicts of interest.

88. AUTOANTIBODY PROFILE AND CLINICAL ASSOCIATIONS IN A BRITISH COHORT WITH SCLERODERMA

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Background: The autoantibody specificity of patients with systemic sclerosis (SSc) is associated with clinically distinct subgroups and can provide valuable prognostic information for clinicians. The prevalence of specific autoantibodies and their clinical associations has been shown to vary according to geographical location and ethnicity. We report the clinical features of our cohort of SSc patients whose autoantibody status has been comprehensively assessed using an array of laboratory techniques allowing characterization of the less common SSc-specific autoantibodies such as anti-U3-RNP and anti-Th/To.
Methods: Sera from 203 patients with SSc were analysed by immunofluorescence, immunoprecipitation and immunodiffusion. Case-notes were scrutinized for patient demographics and clinical phenotype.
Results: The majority of patients were female (87%) with limited disease (77%) and the mean age of diagnosis was 52 years [SD 6]. The median highest recorded modified Rodnan skin score (mRSS) was 7 (range 1-51). Mutually exclusive SSc-specific antibodies were identified in 80% with the most frequent being anticentromere antibody (ACA) at 49%. 18% had SSc-associated autoantibodies (see table 1). One patient had both anti-topoisomerase I (topo I) and anti-U1RNP. ACA was associated with limited disease, telangiectasia, calcinosis, lower mRSS and older age at diagnosis ($p \leqq 0.05$). PAH was present in 6%of ACA-positive patients (confirmed by right heart catheter) which was not significantly greater than in ACA-negative patients ($p = 0.16$). Diffuse skin involvement and interstitial lung disease were more common in those with anti-topo I ($p = 0.04$). Anti-RNA polymerase antibodies were more frequently found in those with higher mRSS, diffuse disease and renal crises ($p < 0.01$). Patients with a history of myosits were more likely to have antibodies to U1RNP, PM-Scl and Jo-1 ($p \leqq 0.02$). A small number of patients had anti-nucleolar antibodies. Anti-Th/To was associated with diffuse disease (67% of patients, $p = 0.01$) and anti-U3RNP with cardiac disease (50% of patients, $p = 0.01$).
Conclusions: The autoantibody specificity and clinical associations in this cohort of patients is similar to previous reports from Caucasian and British cohorts. The prevalence of anti-nucleolar autoantibodies was consistent with previous reports (2–5% in most studies). We were surprised by the high prevalence of dcSSc in patients with anti-Th/To, and cardiac complications associated with anti-U3-RNP, although low patient numbers in each group may account for such findings.

TABLE 1 Frequencies of antinuclear antibodies in patients with SSc

ANA type	Number of patients (%)
SSc-specific	
ACA Anti-topo I Anti-RNAP (I/II/III) Anti-Th/To Anti-U3RNP Anti-PM-Scl	99 (49) 29 (14) 17 (8) 6 (3) 6 (3) 5 (2.5)
SSc-associated	
Anti-U1RNP Anti-Ro/La Anti-Jo1 Anti-mitochondrial	14 (7) 13 (6) 4 (2) 6 (3)
Other	
Unidentified ANA negative	13 (6) 6 (3)

Disclosure statement: All authors have declared no conflicts of interest.

89. ELF SCORE: A VALIDATED SERUM TEST STRONGLY PREDICTIVE OF FIBROSIS IN SYSTEMIC SCLEROSIS

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Background: The absence of a serum test reflecting activity or severity in Scleroderma (SSc) is a major burden both for clinical intervention studies and for clinical management. Recently, a large multicentre study has identified an algorithm of three serum biomarkers as predictive of severity and clinical outcome in Chronic Liver Disease. The algorithm, known as Enhanced Liver Fibrosis (ELF), includes the measurement of serum concentrations of hyaluronic acid, tissue inhibitor of matrix metalloproteinases-1 and aminoterminal propeptide of procollagen type III. Aim: To evaluate the performance of ELF test as a surrogate measure of fibrosis in SSc.
Methods: 210 SSc patients were enrolled in the study. All patients were investigated for clinical and serological subset, disease duration (d.d.), vascular, skin, joint, tendon, muscle, esophago-gastrointestinal, lung, heart and kidney involvement, disease severity, disease activity and HAQ-DI. ELF score was determined blindly by an independent commercial service (iQur, London, UK). Correlations were calculated using Spearman's correlation test. Mann-Whitney test was used to perform comparison between groups. All the variables found to be correlated in univariate analysis were subsequently assessed by step-wise regression analysis. Data were analysed using SPSS18 software.
Results: The mean ELF score in SSc patients sera was 8.71 ± 1. ELF score significantly correlated with: mRSS ($r = 0.28$;$p < 0.0001$), FVC ($r = -0.16$; $p = 0.0287$), DLCO ($r = -0.32$; $p < 0.0001$), EScSG-Activity Index ($r = 0.23$; $p = 0.02$), total Medsger's disease severity score ($r = 0.3$; $p < 0.0001$) and severity score of skin ($r = 0.31$; $p < 0.0001$), joint/tendon ($r = 0.23$; $p = 0.0007$), muscle ($r = 0.27$;$p < 0.0001$), GI tract($r = 0.17$;$p = 0.0144$), heart ($r = 0.22$; $p = 0.0011$), HAQ-DI ($r = 0.32$; $p < 0.00001$), ESR ($r = 0.25$;$p = 0.0003$), age ($r = 0.41$; $p < 0.0001$). Step-wise regression analysis identified mRSS (standardized beta $= 0.299$, $p < 0.0001$), age (standardized beta $= 0.289$, $p = 0.001$), DLCO (standardized beta $= -0.245$, $p = 0.004$) and gender (standardized beta $= 0.235$, $p = 0.005$) as independently associated with ELF score. The median ELF score was significantly higher in patients with diffuse cutaneous SSc (dcSSc) enrolled within the first year of the disease than in age/gender-matched limited cutaneous SSc patients with >5 year-d.d. ($p = 0.0152$) and not significantly higher when compared with matched dcSSc with >3 year-d.d. The median ELF score was higher in SSc patients with chest HRCT fibrosis and DLCO $\pm$ FVC < 80% predicted value, than in SSc controls matched for age, gender, subset, mRSS and d.d.($p = 0.0079$).
Conclusions: The ELF test is a simple serum test that significantly correlates with several measures of fibrosis in SSc. It has a clear face validity for measuring the concentration of molecules involved in extracellular matrix turnover and correlates with fibrotic severity and activity in SSc. ELF test should be considered as outcome measure in clinical trials.
Disclosure statement: All authors have declared no conflicts of interest.

90. PULMONARY FUNCTION TEST ABNORMALITIES IN PATIENTS WITH SYSTEMIC SCLEROSIS AND ANTICENTROMERE AUTOANTIBODIES WITHOUT ESTABLISHED CARDIOPULMONARY DISEASE

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Background: An increased FVC:TLco ratio is an independent predictor of isolated pulmonary arterial hypertension (PAH) in systemic sclerosis (SSc). Patients with SSc, particularly in the context of anti-centromere autoantibodies (ACA), often have an isolated reduction in TLco in the absence of clinical or right heart catheter (RHC) features of PAH. We report the findings of a case control study evaluating the impact of ACA-carriage on pulmonary function test (PFT) results in patients with SSc, in the absence of known PAH or interstitial lung disease (ILD).
Methods: A retrospective case note review of all patients with SSc from our database who had attended clinic over the previous year was undertaken. Notes were scrutinized for autoantibody specificity and the previous PFT and transthoracic echocardiogram (TTE) results. Patients with ILD (confirmed on HRCT) or PAH (mean pulmonary artery pressure [PAP] of >25 mmHg at RHC) were excluded from analysis. The remaining patients were divided according to ACA carriage and a comparison of PFT results from the 2 groups was undertaken.
Results: The case notes of 93 patients with SSc were reviewed. Twenty nine patients were excluded from subsequent analysis; 17 with ILD, 9 with PAH, 2 with coexistent ILD and PAH, and 1 patient currently awaiting RHC assessment for possible PAH. Of the remaining 64 patients, 35 patients (53.8%) were ACA positive. The remainder carried uncharacterized ANA ($n = 8$), or autoantibodies to Scl-70 (5), U3-RNP (4), PM-Scl (3) U1-RNP (2), ANA negative (1), RNA Polymerase III (1), Th/To (1) and others (4).

Median age was higher in the ACA group (63 vs. 57 yrs, $p = 0.03$). The majority of patients in each group had limited cutaneous SSc (34/35 vs. 27/29, $p = 0.59$). The median FVC was significantly greater in the ACA group (109% vs 93%, $p = 0.004$) whereas the TLco was lower (61.5% vs. 71%, $p = 0.009$). The resulting FVC:TLco was significantly higher in the ACA group (1.72 vs. 1.29, $p < 0.001$). Surprisingly, the median estimated PAP on TTE (where reported) was lower in the ACA group although this trend was not statistically significant (24 mmHg vs. 30 mmHg, $p = 0.37$).
Conclusions: To our knowledge, this is the first case-control study to evaluate the impact of ACA-carriage on PFT results in patients with SSc, without established cardiopulmonary disease. In such patients, ACA carriage is associated with a lower TLco, supra-normal FVC and

secondary elevation of the FVC:TLco. Our findings suggest a high prevalence of sub-clinical indolent pulmonary vasculopathy in patients with ACA. Approximately 15% of patients with SSc develop PAH. The long-term sequelae of a sub-clinical pulmonary vasculopthy in patients who do not go on to develop clinical PAH are unknown. Similarly, studies are needed to evaluate the potentially disease-modifying impact of early intervention, based on the FVC:TLco in asymptomatic patients with SSc, on the future development of PAH.
Disclosure statement: N.M. is on the advisory board of Actlelion. J.P. has received honoraria from Actlelion. All other authors have declared no conflicts of interest.

91. IMPACT OF IL-6 TRANS-SIGNALLING IN DRIVING FIBROSIS VIA JAK2/STAT3 SIGNALLING PATHWAYS IN EARLY DCSSC

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Background: We have previously reported that a cohort of patients with diffuse cutaneous systemic sclerosis (dcSSc) with elevated serum IL-6 levels is associated with high modified Rodnan skin score (mRSS). In this study we examine the potential profibrotic effects of IL-6 and its downstream signalling pathways in patients with early dcSSc.
Methods: Using skin biopsies obtained from patients with early dcSSc ($n = 10$, mean disease duration, MeanSEM: 35 ± 9.5 months) and healthy controls ($n = 5$), colocalization of IL-6 with αSMA and phospho-STAT3 were determined with immunohistochemical techniques. The effect of IL-6 trans-signalling on extracellular matrix (ECM) production was assessed on fibroblasts grown by explant culture from skin of SSc patients and healthy controls. Downstream signalling pathways regulated by IL-6 and soluble IL-6 receptor was examined using pharmacological inhibitors. These were stimulated overnight with IL-6 (0-50 ng/ml) and sIL-6R (20 ng/ml).
Results: Compared to healthy controls, there was greater dermal IL-6 expression in patients with early dcSSc. IL-6 expression was strongly associated with vascular structures and perivascular inflammatory infiltrate in 8/10 patients. Immunostaining for downstream IL-6 signaling molecules showed an increased expression of pSTAT3 in all cases with early dSSc particularly in the perivascular inflammatory foci and vascular structures. Similar co localization of IL-6 and αSMA was observed in a majority of skin sections with early dcSSc. To explore the effect of IL-6 trans-signalling on ECM synthesis, incubation of dermal fibroblasts from healthy controls with either IL-6 alone (25–50 ng/ml) or sIL-6R (20 ng/ml) alone had no effect on collagen, αSMA and CTGF production. However, there was upregulation of collagen synthesis in normal fibroblasts (34.3 ± 2.45 vs 9.88 ± 1.54 Densitometry Image Unit (DIU) controls, $p < 0.05$) in response to IL-6 (25 ng/ml) and sIL-6R (20 ng/ml). Similar induction of αSMA and CTGF by 12-fold and 15-fold ($p < 0.01$) respectively were observed in normal fibroblasts incubated with a combination of IL-6 and sIL-6R. The IL-6 trans-signalling activation of collagen synthesis in normal fibroblasts was abrogated by AG490 (3.6-fold) and S3I-201 (3.5-fold, $p < 0.02$), that targets JAK2 and STAT3 signalling pathways respectively. Time-course analysis indicates that IL-6 trans-signalling induces maximal activation of pJAK2 and pSTAT3 at 45 min and this was diminished by 2 hours in normal fibroblasts. Constitutive activation of both JAK2 and STAT3 pathways was observed in SSc fibroblasts and further activation by the addition of IL-6 and sIL-6R occurred at 15 minutes and this was sustained at 1 hour.
Conclusions: Our results confirm overexpression of IL-6 in early stage dcSSc and demonstrate a potent profibrotic effect of IL-6 trans-signalling via the canonical JAK2/STAT3 pathways. The data also support targeting IL-6 trans-signalling as a potential antifibrotic therapy in SSc.
Disclosure statement: All authors have declared no conflicts of interest.

92. IMPACT OF ANA SUBTYPE ON PROGRESSION FROM ISOLATED RP TO SSC: IMPLICATIONS FOR CLASSIFICATION AND EARLY DIAGNOSIS

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Background: Raynaud's phenomenon often precedes the diagnosis of systemic sclerosis (SSc) and may be regarded as the first symptom of the disease in many cases. Conversely only a minority of cases of isolated Raynaud's phenomenon (RP) progress to defined connective tissue disease (CTD) including SSc. We have explored the predictive potential of ANA positivity and nailfold capillaroscopy for identifying cases of RP that may progress to CTD and explored the time between onset of RP and SSc-specific ANA pattern in a large UK patient cohort.
Methods: To ascertain progression of Raynaud's to CTD patients with isolated RP ($n = 569$) presenting to our centre were evaluated for antinuclear autoantibodies and for scleroderma-typical capillary changes using nailfold capillaroscopy. To explore the duration of isolated RP in cases evolving to SSc patients with definite SSc ($n = 2150$) were evaluated from our clinical database, which was developed to determine and follow the current disease status of SSc patients.
Results: 569 patients with isolated RP were characterized by a mean age of 43 years (+13 y), were predominantly female (85%) and had already a mean duration of Raynaud phenomenon features at presentation of 13 years (+13 y). Further evaluation revealed that 7% showed antinuclear autoantibodies (ANAs) and 17% showed grade III abnormalities in nailfold capillaroscopy at their first visit. During our follow-up period of 1500 patient years (mean = 4.6 years) only 1.5% (8/569) of cases developed further clinical features of SSc (7/8 had positive capillaries and ANAs at first presentation) and 0.5% (3/569) developed autoantibodies (3/3 had positive capillaries at presentation). Conversely, for those with definite SSc the interval between the onset of the RP and definite SSc onset varied significantly between disease subsets and autoantibodies, being shortest for the dcSSc (2.3 + 6.5years) variant and longest for the lcSSc (8.4 + 11.5years) disease variant ($p < 0.0001$). According to the antibody status, the interval between RP- and SSc-onset was shortest for patients with anti RNA-Polymerase III (ARA) (1.7 + 6.4years) and longest for ACA antibodies (10.8 + 12.5years) ($p < 0.0001$).
Conclusions: Since classification criteria for earlier diagnosis of SSc are being developed the duration of pre-existing RP may be an important determinant of the profile of SSc cases identified through screening. Our analysis revealed that over 95% of patients with isolated RP, negative autoimmune serology on more than one visit and normal capillaroscopy score (less than grade 2) showed no progression to CTD. Duration of antecedent RP differs substantially between disease subsets and SSc-specific ANA patters and so a cohort of SSc cases that is selected based upon pre-existing RP may be less likely to include diffuse disease or ARA positive cases. This study has significant implications for strategies for earlier diagnosis of SSc that focus on RP.
Disclosure statement: All authors have declared no conflicts of interest.

93. IL7 AXIS IN SSC: ANALYSIS OF LIGAND AND RECEPTOR SNP POLYMORPHISMS AND SERUM IL7 LEVELS

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Background: Systemic sclerosis (SSc) is characterized by vascular damage, autoimmunity and fibrosis. Clinical heterogeneity is a hallmark of SSc and it is likely that this is determined at least in part by genetic factors. Differences in expression and signaling through IL7 receptor (IL7R) have been identified as factors determining clinical activity in other autoimmune rheumatic diseases such as SLE but no detailed genetic studies of IL7 and IL7R in SSc have been undertaken. We investigated whether genetic alterations exist in SSc patients that may associate with clinical phenotypes and whether differences in the IL7 serum level exist among different SSc subsets.
Methods: Patients with SSc ($n = 728$) and healthy controls ($n = 260$) were genotyped for SNPs in the gene region of IL7R and IL7. All patients and controls were UK Caucasian and classified according the autoantibody status and organ involvement. Genotyping was performed by the KASPar system (allele specific PCR, KBiosciences, UK). We used logistic regression analysis to compare the distribution of IL7R/IL7 polymorphisms.

Furthermore, serum of 130 SSc patients and 44 healthy controls were used to determine the IL7 level, using a high sensitivity Human IL7 assay. The distribution of IL7 values by groups were analysed using the non-parametric Mann-Whitney test.
Results: No significant differences in the genotype distribution were observed between SSc and control group, all of which were in Hardy-Weinberg equilibrium. However, there was a significant difference

between SSc patients being positive versus negative for ATA in four SNPs located in the IL7R region, rs11567685 ($p = 0.0075$, OR for CC genotype 1.469, 95%-CI 1.11-1.95), rs11567751 ($p = 0.007$, OR for TT 1.467, 95%-CI 1.11-1.94), rs987107 ($p = 0.0081$, OR for TT 1.456, 95%-CI 1.10-1.92) and rs3194051 ($p = 0.0072$, OR for GG 1.466, 95%-CI 1.11-1.94).

Median IL7 serum levels were increased in patients suffering from the diffuse (14.90 ± 7.48 ng/ml) compared to patients with the limited form (8.95 ± 5.27 ng/ml; $p < 0.0001$). Patients, positive for ACA showed a significant lower median IL7 serum level ($p < 0.005$), whereas patients with anti-RNAP antibodies showed a significant higher IL7 serum level compared to patients without or with other antibodies ($p < 0.007$).

Conclusions: Here we report that homozygous carriers of the minor allele in four SNPs of the IL7R gene region were significantly associated with a positive ATA status in SSc patients. This gene has been described to be associated with immune regulation in other autoimmune diseases opening a possibility of a common autoimmune genetic pathway. This is the first study which reports a potential association of Il7R gene in SSc susceptibility. Additional independent cohorts should be analysed to confirm our findings. In addition, due to the significant differences of IL 7 serum levels in different SSc subsets, indicates that IL7 expression may be a potential candidate biomarker in disease assessment.

Disclosure statement: All authors have declared no conflicts of interest.

94. THE HAND ISCHAEMIA SCORE: A NOVEL HAND ISCHAEMIA OUTCOME MEASURE IN SYSTEMIC SCLEROSIS

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Background: Raynaud's phenomenon (RP) and hand ischaemia cause significant morbidity in patients with systemic sclerosis (SSc). The Raynaud's Condition Score (RCS) is used to assess severity but is limited by subjectivity. The Hand Ischaemia Score (HIS) has been developed in conjunction with input from patients and clinicians with expertise in systemic sclerosis. We present interim data from an ongoing study, which explores the reproducibility of the HIS and compares the ability of HIS and RCS to discriminate between patients with/without digital ulcers, either using a protocol suitable for use in clinical trials or a simulated clinic setting.

Methods: Recruitment to date includes: 8 patients with SSc (3 with digital ulcers) and 16 healthy controls. RCS and HIS were performed on 3 different occasions. Two visits used a ''Trial'' protocol involving abstinence from vasoactive drugs, alcohol and caffeine for 12 h prior to the visit and equilibriation seated on a couch in a calorimeter at 22°C for 20 minutes before recording whereas the ''Clinic'' protocol involved measurements taken with patient seated in standard clinic setting, with no preparation. HIS consisted of separate Vasomotor, Established Ischaemia and Progressive Ischaemia domains, which can be summed to give a total.

Results: The dynamic range of the HIS was greater than the RCS ranging from 0 to 32 (RCS; 0-5.9). The correlation between HIS scores taken at Trial visits 1 and 2 was good (8 data pairs; Spearman r (for SSc data) is 0.84; p value = 0.01). Correlation between Trial visits (average HIS) and the clinic visits also appears reasonable but increased patient numbers are required to evaluate (6 data pairs; Spearman r 0.81; p value not significant).

Conclusions: The HIS is reproducible in a Trial protocol and initial data suggest that it will also be usable in a Clinic setting. The HIS appears a better tool for discriminating severe from mild hand ischaemia, based on presence/absence of digital ulcers.

	HC Median (IQR)	SSc Median (IQR)	SSC_DU negative Median (IQR)	SSc_DU positive Median (IQR)	Significance of differenceDU negative vs DU positive
HIS	0 (0)	19 (5.5)	13 (7)	23 (NA)	$p < 0.04$
RCS	0 (0)	3.2 (2.8)	2.4 (2.0)	3.9 (NA)	P = not significant

Disclosure statement: All authors have declared no conflicts of interest.

95. REGIONAL OXYGEN SATURATION AS A NOVEL OUTCOME MEASURE IN SYSTEMIC SCLEROSIS-ASSOCIATED HAND ISCHAEMIA

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Background: Hand ischaemia may herald the onset of the multi-system vasculopathy in systemic sclerosis (SSc). Objective, quantitative measures of microvascular disease are required to evaluate therapeutic strategies. Outcome measures currently used include digital ulcer count (DUC) and the Raynaud's Condition Score (RCS), which are limited by subjectivity and/or inadequate dynamic range. We present interim data from an ongoing pilot exploring two novel techniques: measurement of regional oxygen saturation (RSO2) and measurement of regional tissue perfusion (TP). The utility of each type of measurement was considered by comparing dynamic range, reproducibility and ability to distinguish between patients and controls or patients with/without digital ulcers (DU).

Methods: Patients with SSc were recruited from the connective tissue disease clinic and healthy controls by advertisement in the hospital. Severity of hand ischaemia was assessed using RCS, TP (by laser Doppler flowimetry) and RSO2 (using near-infrared spectroscopy). The dynamic range of each measure was recorded as the difference between highest and lowest value recorded in the cohort. The significance of differences in measurements between groups was assessed using the Mann-Whitney U test. Measurements were made at two separate visits, using a Trial Protocol to minimize variance (abstinence from vasoactive drugs, alcohol and caffeine for 12 h prior to the visit, and postural and temperature (22°C) equilibriation for 20 minutes before recording). The reproducibility of each type of measurement was assessed between the two visits using the Spearman rank correlation coefficient (r).

Results: Recruitment to date includes: 9 patients with SSc (4 with digital ulcers) and 16 healthy controls. The dynamic range of RCS was ~10-fold smaller than for RSO2 and ~ 100-fold smaller than TP (see Table 1). RCS and TP values were significantly different between patients and controls but not between SSc patients with/without DU. In contrast RSO2 did not discriminate between patients and controls but was significantly lower in the SSc patients with DU. The reproducibility of both RCS and TP were poor, despite the measures taken to reduce variance. However, reproducibility of RSO2 was good between Trial Protocol visits and also between Trial Protocol and a simulated Clinic visit (no abstinence from vasoactive agents, or equilibriation) ($r = 0.7$; $p < 0.001$)

Conclusions: RSO2 emerges as the most promising outcome measure for clinical trials of vasoactive agent in SSc-hand ischaemia. It combines adequate resolution with reproducibility and an ability to report on degree of severity of tissue ischaemia.

TABLE 1.

	Dynamic range	Median (interquartile range)			Significance		Reproducibility
		Healthy controls	SSc (DUneg)	SSc (DUpos)	HC vs all SSc	DUneg vs DUpos	all SSc
RCS	0-6	0.0 (0)	2.4 (2.0)	3.9 (N/A)	$p = 0.001$	p (ns)	$r = 0.46$ (ns)
TP	0-600 (PU)	334 (215)	168 (362)	82 (177)	$p = 0.02$	p (ns)	$r = 0.31$ (ns)
RSO2	50-98 (%)	76 (14)	71 (12)	61 (8)	p (ns)	$p = 0.01$	$r = 0.55$ ($p < 0.01$)

Disclosure statement: All authors have declared no conflicts of interest.

SPONDYLOARTHROPATHIES (INCLUDING PSORIATIC ARTHRITIS)

96. DISCOVERTEBRAL EROSION IN PATIENTS WITH ENTEROPATHIC ARTHRITIS DETECTED BY MRI

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Background: Discovertebral erosion (DE) is a well known manifestation of Ankylosing Spondylitis (AS), which diagnosis is sometimes delayed, particularly in patients with an insidious mode of onset and non-specific symptoms. In other spondyloarthritis (SpA) the data on the prevalence of DE are lacking. MRI, an accepted modality for imaging the axial involvement of SpA is considered the modality of choice for the radiological diagnosis of DE. Aim of this study was to analyse the prevalence and clinical features of DE in patients with enteropatic arthritis (EA) using MRI.
Methods: 72 EA patients (39/33 F/M; mean age ± SD: 39.68+/-7.65), and 50 healthy subjects as controls, entered in this study. All patients and controls underwent a rheumatological and gastroenterological clinical examination and demographic features were recorded and performed MRI. For each patients we recorded the following data: disease duration of IBD and arthritis, history of tuberculosis, staphylococci, streptococci and gram-negative bacteria infections and occurrence of previous trauma to the spine. The clinical disease activity were assessed using the BASMI, BASFI, BASDAI, Harvey-Bradshaw Index (HBI) and the Simple Clinical Colitis Activity Index (SCCAI). The MRI images were read by two observers, who were blinded to the status of the subjects.
Results: On the basis of ASAS criteria 43 EA patients (24/19 F/M; mean age: 34.72 ± 6.88), were included in the study. 23 patients had axial subset (axEA) (53.5%) and 20 peripheral subset (phEA) (46.5%). 22 patients with EA showed DE (30.55%) ($p < 0.05$). Among the 22 subjects, 15 had axEA (68.18%) and 7 phEA (31.82%) ($p = 0.009$). Stratifying according to arthritis subset, the number of DE resulted significantly higher in subjects with axEA than those with phEA (45 vs 9, $p < 0.001$), in addition in the axEA subset the lesions showed a significant direct correlation with arthritis duration ($r = 0.431$, $p = 0.040$). Patients with DE showed a BASDAI, BASMI and BASFI significantly higher than patients without ($p < 0.05$). Age at enrolment, age at IBD and arthritis onset, IBD duration, arthritis duration and IBD activity resulted similar in subjects with and those without DE ($p > 0.05$).
Conclusions: In our study the prevalence of DE in EA patients was 30.55%, an higher frequency than the other SpA. We found an high prevalence of DE among axEA patients (68.18%), confirming that DE are an important characteristic aspect of the axial involvement in SpA. The high prevalence in our patients may be ascribable to the persistent inflammation in the gut of IBD patients which cause a persistent inflammation at mesenteric and paraaortic lymphonodes, which, becoming chronic, would cause inflammation of ligaments and joint structures at the spine as suggested by Romanus and Yden. Moreover, we found an high prevalence also in phEA patients (31.82%) suggesting that DE are an important aspects of all subsets of EA patients and may be a characterizing features of the overlap subset (type 3).
Disclosure statement: All authors have declared no conflicts of interest.

97. USE OF THE WORLD HEALTH ORGANIZATION FRACTURE RISK ASSESSMENT TOOL IN ANKYLOSING SPONDYLITIS

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Background: Osteoporosis and vertebral fractures are well recognized complications of ankylosing spondylitis (AS), but there is evidence that rheumatologists do not routinely assess patients with AS for osteoporosis. There are no agreed guidelines for screening AS patients for osteoporosis. ASAS / EULAR recommendations for the management of AS state that rheumatologists should be aware of an increased risk of osteoporosis, but due to the lack of evidence base, do not make any recommendations on management.
Methods: Consecutive AS patients (who fulfilled mNYC criteria) attending an inpatient rehabilitation course completed an osteoporosis risk factor questionnaire (age, sex, low trauma fracture in adulthood, parental hip fracture, current smoking, alcohol intake more than 21 units per week, diagnosis of rheumatoid arthritis (RA), and ever taken glucocorticoids). Risk factors were entered into the online FRAX tool, and National Osteoporosis Guideline Group (NOGG) advice was recorded (''lifestyle advice and reassurance'', ''measure bone mineral density (BMD)'', or ''treat''). Notes were reviewed for patients who had a non-reassuring NOGG outcome.
Results: 108 patients (71.3% male) completed the questionnaire. Mean age was 46.6 y. Mean body mass index was 27.4. 10/108 (9.2%) had a BMI <22 kg/m2. 16/108 (14.8%) had sustained a fracture. 12/108 (11.1%) had a history of parental hip fracture. 24/108 (22.2%) were current smokers. None had RA. 10/108 (9.3%) drank more than 21 units alcohol per week.

Using FRAX, 88/108 (81.5%) had a reassuring outcome. In 12/108 (11.1%) the outcome was ''measure BMD''. Notes were available for 8 patients: BMD had been measured in 5/8 (normal in 2/5, osteopenia in 3/5). Of the 3 patients with osteopenia, one was intolerant of bisphosphonates and was taking calcitonin with calcium and vitamin D, one was on calcium and vitamin D alone, and one had been advised about dietary calcium intake.

In 8/108 (7.4%) the outcome was ''treat''. Notes were available for 7/8. None were taking antiresorptive therapy or calcium with vitamin D. One patient was taking vitamin D supplements alone. BMD had been measured in 5/7 patients (normal in 2/5, osteopenia in 3/5).

Of the 16 patients who reported a previous fracture, reassurance was advised in 3 patients, measurement of BMD was advised in 6, and treatment advised in 7.
Conclusions: Using FRAX and NOGG guidance, BMD measurement and/or treatment of osteoporosis were advised in 18.5% of this group of AS patients. Use of FRAX identified patients at risk who had not had BMD measured and were not being treated for osteoporosis. Using FRAX routinely may help clinicians to identify AS patients at risk of osteoporosis. However, long term prospective studies are required to evaluate the effectiveness and risks of osteoporosis treatments in AS, especially given the young age of many patients.
Disclosure statement: All authors have declared no conflicts of interest.

98. PREDICTING JOINT AND SKIN REMISSION AT 24 WEEKS IN PATIENTS WITH PSORIATIC ARTHRITIS

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Background: In patients with persistent, active psoriatic arthritis (PsA), therapy adjustment is recommended in order to achieve low disease activity (LDA) or remission. The purpose of this analysis was to determine the optimal timing for adalimumab (ADA) treatment adjustment in subjects with PsA who fail to demonstrate a significant clinical response, when combined joint and skin remission or LDA at week 24 is the treatment target.
Methods: ADEPT was a 24-week, phase 3, randomized, placebo-controlled trial of ADA for the treatment of active PsA. Treatment groups were randomized following stratification of subjects according to methotrexate usage (>3 months duration) and extent of psoriasis (≥3% BSA). This post hoc analysis evaluated intent-to-treat subjects with ≥3% BSA involvement at baseline. The probability of combined joint and skin remission (defined as DAS28 < 2.6 + PASI90) or LDA (defined as DAS28 < 3.2 + PASI75) following 24 weeks of therapy was calculated on a continuous scale as a function of joint improvement (ΔDAS28, improvement >0.6), skin improvement (PASI50 responder), or both from baseline at weeks 4, 8, 12, and 16. A 15% probability was defined as the threshold below which treatment adjustment would be recommended.
Results: Subjects randomized to placebo failed to achieve the less stringent LDA criteria and were not considered in further analyses. In contrast, 27% and 43% from the ADA group achieved remission and LDA at 24 weeks, respectively. Despite a lack of significant joint improvement (ΔDAS28 ≤0.6) prior to 16 weeks of ADA treatment, some subjects remained able to achieve joint and skin remission criteria at 24 weeks. In contrast, subjects failing to demonstrate improvements in both joint and skin (ΔDAS28 ≤ 0.6 and PASI50 non-response) by week 8 were unlikely to achieve combined remission at 24 weeks. When the treatment target was changed to LDA, subjects lacking significant improvements in joint and skin maintained a >15% probability until 16 weeks.
Conclusions: Treatment with ADA led to significantly higher percentages of subjects in combined clinical remission (DAS28 < 2.6 + PASI90) or LDA (DAS28 < 3.2 + PASI75) when compared with placebo. When treatment adjustment recommendations are made on the basis of a 15% probability threshold, clinicians should consider waiting up to 16 weeks before adjusting ADA therapy in patients without significant

clinical improvement (ΔDAS28 $\leq 0.6 +$ PASI50 non-response) when combined remission or LDA are the treatment targets.

TABLE 1 Percentage of subjects predicted to achieve remission[a]/LDA[b] at 24 weeks on the basis of joint or combined joint and skin improvements

Parameter	Adalimumab			
Wk 4	Wk 8	Wk 12	Wk 16	
Joint improvement ΔDAS28 ≤ 0.6	25 / 33	18 / 18	18 / 18	10 / 10
Joint and skin improvement ΔDAS28 ≤ 0.6 and/or PASI50 non-responder	18 / 32	8 / 17	10 / 15	7 / 7

[a]Remission was defined as DAS28 $< 2.6 +$ PASI90 response; [b]LDA was defined as DAS28 $< 3.2 +$ PASI75 response.

Disclosure statement: M.D. received research grants and consultancy fees from Abbott, Pfizer, Roche, UCB, BMS and Merck. M.H. is an employee of, and may hold stock/options in, Abbott. E.K. received research grants from Abbott, Amgen, AstraZeneca, Bristol-Myers Squibb, Centocor, F Hoffmann-LaRoche, Genzyme, Merck, Novartis, Pfizer and UCB, consultancy fees or other remuneration from Abbott, AstraZeneca, Biotest, Bristol-Myers Squibb, Centocor, F Hoffmann-LaRoche, Genentech, Merck, Nycomed, Pfizer and UCB, and is a member of the speakers bureaus of Abbott, Bristol-Myers Squibb, F Hoffman-LaRoche, Merck, Pfizer and UCB. P.M. received research grants and consultancy fees or other remuneration from Abbott, and is a member of the speakers bureau of Abbott.

99. SEVERITY OF BASELINE SKIN DISEASE DOES NOT CORRELATE WITH CLINICAL, PATIENT-REPORTED OR RADIOGRAPHIC RESPONSES IN PATIENTS WITH PSORIATIC ARTHRITIS TREATED WITH ADALIMUMAB

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Background: Treatment with adalimumab (ADA) diminishes joint and skin disease activity, improves quality of life, and limits radiographic progression in patients with active psoriatic arthritis (PsA). The extent to which psoriasis severity [measured as a function of the psoriasis activity and severity index (PASI)] correlates with clinical, patient-reported, and radiographic outcomes in response to ADA treatment is unknown. This analysis explored the relationship between baseline psoriasis with joint and skin disease activity, quality of life measures, and radiographic progression in patients with active PsA following treatment with ADA or placebo (PBO).
Methods: ADEPT was a phase 3, randomized, PBO-controlled, 24-week trial of ADA for the treatment of active PsA. Treatment groups were stratified by methotrexate usage (>3 months duration, 51% of patients) and extent of psoriasis ($\geq$3% BSA, 45% of patients). In this post hoc analysis, 24-week observed data from patients with active skin involvement at baseline ($\geq$3% BSA) were categorized by severity of psoriasis (PASI <10 or ≥ 10). Joint disease was assessed through the 28-joint disease activity score (DAS28), and as 50%/70% improvements in the American College of Rheumatology (ACR) criteria and moderate/good responses in European League Against Rheumatism (EULAR) criteria. Skin disease was assessed as 50%/75%/90% improvements in PASI. Patient-reported outcomes included the Dermatology Life Quality Index (DLQI) and Patient Global Assessment (PaGA). Radiographic progression was assessed as the change from baseline in modified total Sharp score (ΔmTSS).
Results: A total of 69 patients with baseline skin disease from each group (PBO and ADA) had disease activity measures at week 24; 50 and 53 patients randomized to PBO and ADA had PASI involvement <10, whereas 19 and 16 from the PBO and ADA arms had PASI involvement ≥ 10 at baseline, respectively. Compared with PBO, treatment with ADA led to significant improvements in joint disease activity (mean DAS28, ACR50/70 responses, and moderate/good EULAR responses) at week 24, irrespective of psoriasis involvement at baseline. No differences were detected in joint disease improvements between the PASI categories within either treatment arm. Similarly, treatment with ADA led to significant improvements in PASI 50%/75%/90% responses as well as in DLQI and PaGA at week 24 when compared with PBO that were not different between baseline PASI categories. Further, by week 24, radiographic progression was significantly reduced in the ADA arm in both PASI categories (PBO: PASI $<10 = 1.0$, PASI $\geq 10 = 1.4$; ADA: PASI $<10 = 0.1$, PASI $\geq 10 = -0.4$, both $P < .05$).
Conclusions: Regardless of the severity of baseline skin disease, treatment of patients with ADA led to similar and significant improvements in joint, skin, quality of life, and radiographic progression over patients treated with PBO.
Disclosure statement: M.H. is an employee of, and may hold stock or options in, Abbott. R.L. received research grants/research support from Abbott, Amgen, Centocor, Pfizer/Wyeth, UCB and BMS, is a consultant to Abbott, Amgen, Centocor, Pfizer/Wyeth, UCB and BMS, and is a member of the speakers bureaus of Abbott, Amgen, Centocor, Pfizer/Wyeth, UCB, BMS. P.M. received research grants and consultancy fees or other remuneration from Abbott, and is a member of the speakers bureau of Abbott. D.N. is an employee of, and may hold stock or options in, Abbott.

100. BASDAI: IT IS EASIER AND QUICKER TO USE NUMERIC RATING SCALES RATHER THAN VISUAL ANALOGUE SCALES

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Background: Disease activity in ankylosing spondylitis (AS) is generally measured using the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) which focuses on fatigue, spinal pain, peripheral pain, enthesopathy and morning stiffness (1). The BASDAI is normally measured using VAS, a 100 mm horizontal line on which an individual marks the degree of a certain symptom for example pain or stiffness. An alternative method of measuring the BASDAI is with the NRS which is an 11 point scale in which subjects mark their answer by putting a cross through the appropriate number. Arguably the VAS is more accurate as the number of potential answers is greater, however Jensen et al. discovered that this is not necessarily the case (2). Others also advocate the use of the NRS as it is easier to use. Van Tubergen et al. pointed out that the NRS can be used verbally whereas the VAS is only used in written form (3). The VAS is also subject to measurement and reproduction errors (e.g. with photocopying the line is frequently less than 100 mm).

Given the above we hypothesized that the NRS would be easier to use and quicker to calculate. We wanted to assess whether there would be any difference between the two scoring systems.
Methods: Consecutive subjects attending an AS clinic (54 patients) were asked to complete a VAS-BASDAI / spinal pain and handed it in. Fifteen minutes later they were asked to fill out the NRS-BASDAI / spinal pain. The results of both were calculated and the difference between the two recorded. Checking for significant difference between the scores was calculated using t-testing.
Results: The NRS-BASDAI took 13 seconds to calculate on average while the VAS-BASDAI took over 1 minute 15 seconds to calculate. This may mean an extra 10 minutes or so for an average clinic spent calculating BASDAI results. This could enable a clinician to see one extra patient per clinic. There were fewer errors on the NRS-BASDAI compared to the VAS-BASDAI and all but one patient found the NRS-BASDAI easier to fill in.

When comparing the BASDAI scores between the VAS and NRS there was no significant difference on t-testing ($p = 0.43$). There was also no significant difference when comparing the spinal pain scores on t-testing ($p = 0.23$).
Conclusions: NRS-BASDAI is easier and quicker to use and is more patient friendly. Using the NRS-BASDAI may enable clinicians to see more patients in an average clinic. There is no significant difference between the VAS or NRS scores for either the BASDAI or the spinal pain score.
Disclosure statement: All authors have declared no conflicts of interest.

101. ASSESSING FATIGUE IN ANKYLOSING SPONDYLITIS: THE IMPORTANCE OF FREQUENCY AND SEVERITY

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Background: Current guidance recommends assessment of AS fatigue severity using a single item visual analogue scale (VAS) [1]. The BSR-AS Register assesses fatigue severity with the Chalder

Fatigue Scale. Although considered important by AS patients [2], little is known about the value of assessing fatigue frequency, and its relationship with severity.
Methods: Single-items taken from the EASi-QoL [2] and the BASDAI [1] were used to measure fatigue frequency and severity, respectively. These items were included in a questionnaire containing AS-specific and generic measures, completed by participants in a large UK-wide survey at baseline and 6-months [2]. Respondents were categorized at baseline into four groups according to item cut-off points for fatigue frequency (non/a little of time Vs. some/most/all of time) and severity (<5 Vs. ≥ 5 on a scale 0-10, where 10 is most severe): 1) no fatigue; 2) frequent not severe; 3) severe not frequent; 4) frequent and severe. The four groups were compared across all measures at baseline and on fatigue status at six months.
Results: 611/621 (98.4%) respondents completed both items at baseline and 467/470 (99%) at 6-months. Of baseline responders who experienced fatigue (n = 451;74%), 75% reported frequent and severe, 15% frequent not severe, and 10% severe not frequent. There was no difference between groups on gender, age, or years with AS. Patients reporting frequent and severe fatigue had worse scores than other groups across all measures (Table 1). Patients reporting only frequent fatigue had similar scores to those reporting only severe fatigue but worse than those without fatigue. 81% of non-fatigued patients and 79% of those with frequent and severe fatigue at baseline did not change their level of fatigue at 6-months. However, 80% of patients with frequent or severe fatigue at baseline changed, mainly to no fatigue (43%) or to both frequent and severe fatigue (30%).
Conclusions: Routinely assessing both frequency and severity of fatigue are important in understanding the impact of fatigue and its change over time. Not assessing frequency could result in the failure to identify patients with significant fatigue. However, the multi-dimensional nature of fatigue should be further explored in AS to identify the most appropriate and acceptable method of assessment.
Disclosure statement: K.H. received an unrestricted educational research grant for this study from Wyeth. K.J. received an unrestricted educational research grant for this study from Wyeth. J.P. received an unrestricted educational research grant for this study from Wyeth.

TABLE 1 Health status by level of fatigue [mean (SD)]

	No fatigue	Frequent only	Severe only	Frequent and severe	*p-value*
n	160	67	45	339	
SF36 Vitality[a]	52.5(7.7)	43.3(8.4)	42.3(7.0)	33.1(8.3)	<0.001
HADS depression (0-12)	2.4(2.2)	4.7(2.8)	4.8(2.9)	7.9(4.1)	<0.001
EasiQoL Physical (0-24)	3.4(3.2)	6.0(3.7)	6.3(4.1)	11.8(5.4)	<0.001
EasiQoL Social (0-20)	2.1(2.0)	4.9(2.8)	4.4(3.4)	10.4(4.5)	<0.001
ASQOL (0-18)	1.9(2.4)	5.0(3.8)	5.5(3.8)	11.6(4.4)	<0.001
BASFI (0-10)	1.9(1.6)	3.2(1.9)	4.1(2.4)	6.2(2.4)	<0.001

[a] Mean general population 50, < 50 worse health

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102. SELF-MANAGING FATIGUE IN ANKYLOSING SPONDYLITIS AND POTENTIAL INTERVENTIONS: A QUALITATIVE STUDY OF PATIENTS' PERSPECTIVES

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Background: Fatigue is a major component of living with ankylosing spondylitis (AS) and has been identified as a priority research area. This study examines the effects of fatigue, self-management techniques, and the acceptability of future research strategies aimed at alleviating fatigue in AS.
Methods: This qualitative study involved participants who are members of an existing population-based ankylosing spondilytis (PAS) cohort. Participants with a score of >5/10 on the fatigue component of their BASDAI were invited to participate in one of two focus groups. Topics discussed included, (1) effects of fatigue, (2) self-management strategies and (3) future research ideas to help combat fatigue. All participants gave informed consent. The focus groups were audio-recorded and the transcripts were analysed using thematic analysis.
Results: Participants consisted of 3 males/4 females (group 1) and 4 males/3 females (group 2), aged between 35 and 73 years (mean age 53 years). All participants were Caucasian and resided in the Abertawe Bro-Morgannwg University Health Board area. (1) The effects of fatigue are multi-dimensional including physical, emotional and psychological components, with pain/stiffness, disruption of social activities (socializing with family/friends) and low mood identified as frequent symptoms and consequences of fatigue. (2) The most commonly reported self-management strategy for fatigue was a balanced combination of activity (exercise) and rest. (3) In terms of future research strategies for managing the multidimensional aspects of fatigue, participants expressed a preference for investigating psychological therapies rather than pharmacological 'medication'. Mindfulness-Based Stress Reduction was introduced and felt to be a therapy worth researching for both pain and fatigue in AS. Group course delivery of therapy was popular, with the option of homework based delivery for people who were not able to attend a group course.
Conclusions: Fatigue has significant effects on multiple aspects of AS patients' lives. Patients are however usually left to manage their fatigue without any formal guidance or support. From this research we can conclude there is a need for future research to evaluate innovative therapeutic interventions to address the multi-faceted aspects of fatigue in AS, rather than research which focuses purely on medication.
Disclosure statement: All authors have declared no conflicts of interest.

103. QUALITY OF LIFE IN PSORIATIC ARTHRITIS: COMPARATIVE RESULTS WITH RHEUMATOID ARTHRITIS USING SF36 IN TRIALS USING METHOTREXATE

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Background: Treating inflammatory arthritis with disease-modifying anti-rheumatic drugs (DMARDs) like methotrexate should improve quality of life (QoL) as well as improving synovitis. We assessed 6-month changes in SF-36 in: (a) a placebo controlled trial of methotrexate in psoriatic arthritis (PsA); (b) another trial of methotrexate in rheumatoid arthritis (RA). Our aims were: (a) to define the impact of PsA on QoL; (b) to compare this with RA; (c) to evaluate the impact of methotrexate in PsA.
Methods: We studied SF-36 profiles in 112 PsA patients treated with placebo, 109 PsA patients treated with methotrexate. We also studied 117 RA patients receiving methotrexate. No patient had previously had methotrexate (given to target dose of 15 mg weekly). We related our results to ''Normal'' SF-36 scores in published data from 2042 healthy UK controls.
Results: Baseline SF-36 scores were low in PsA and RA (Table). PsA patients showed small improvements over 6 months across all SF36 domains (mean 14%, range 7-31%); these improvements were similar with methotrexate and placebo. However, PsA patients treated with methotrexate had higher 6 month changes in health scores than those receiving placebo (mean 62 (SD 27) vs 51 (29); p = 0.004). PsA patients who were PsARC responders at 6 months also had higher changes in all SF-36 domains and significantly greater change in health scores ($p < 0.01$ for methotrexate and placebo groups). In RA initial QoL scores were worse; there were also larger changes with methotrexate across all SF-36 domains (mean 38%, range 7%-125%). The largest differences in initial values and 6-month changes between PsA and RA were in role physical and role emotional (indicating RA has more effects on roles due to physical and mental problems). The 6-month change in health score in RA patients receiving methotrexate was similar (mean 62 (SD 32)) to PsA patients receiving methotrexate.
Conclusions: PsA and RA both reduced QoL. It was lowest in RA, though PsA substantially impaired QoL. PsA showed small improvements in SF-36 domains over 6 months with no evidence methotrexate gave more benefit than placebo; but methotrexate improved patients' global assessments of health, reflecting its symptom-modifying effect. There was no placebo-control group for the RA patients.

TABLE 1 Initial and 6-month percentage change in SF-36 scores in psoriatic arthritis and rheumatoid arthritis patients

Domain	Normal	PsA placebo		PsA methotrexate		RA methotrexate	
	n = 2042	*n* = 112		*n* = 109		*n* = 117	
		Initial	*6-month change*	*Initial*	*6-month change*	*Initial*	*6-month change*
Physical functioning	84	49	8	56	11	34	24
Role physical	81	36	31	45	36	16	125
Pain	80	42	21	47	32	35	34
General health	72	46	7	49	12	45	7
Vitality	64	41	20	47	11	32	25
Social functioning	87	62	15	70	11	49	27
Role emotional	88	53	21	60	18	40	53
Mental health	77	64	−17	67	−7	60	13

Disclosure statement: All authors have declared no conflicts of interest.

104. EARLY AND SUSTAINED REMISSION ASSOCIATED WITH NORMALIZED PHYSICAL FUNCTION, HEALTH-RELATED QUALITY OF LIFE AND SIGNIFICANTLY IMPROVED PRODUCTIVITY IN PATIENTS WITH ACTIVE PSORIATIC ARTHRITIS TREATED WITH GOLIMUMAB: 2-YEAR DATA FROM PHASE III GO-REVEAL TRIAL

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Background: To evaluate the impact of golimumab(GLM) on disease remission, physical function, work productivity and healthcare utilization in patients with psoriatic arthritis (PsA) over 2yrs.
Methods: GO-REVEAL was a multicentre, randomized, placebo-controlled study. Adult patients with active PsA ($n = 405$) were randomized to GLM (50 or 100 mg) q4wks or placebo. At wk16, patients with inadequate response entered early escape. All placebo-treated patients received GLM50mg from wk24. Clinical responses were analysed using 20% improvement by the American College of Rheumatology criteria(ACR20) and 75% improvement by Psoriasis Area and Severity Index(PASI75); remission was measured by disease activity score (DAS28 <2.6). Patient reported outcomes included health assessment questionnaire(HAQ), self-reported productivity and medical visits. Comparisons between GLM and placebo-treated patients before wk24 were performed using ANOVA on van der Waerden normal scores for continuous outcomes or Chi-square test.
Results: At baseline, mean age was 47.0 yrs and 63% of patients were male. Baseline HAQ was 1.02 and PASI score was 7.8. Compared to placebo, a greater proportion of patients treated with GLM achieved DAS28 remission as early as wk4 (16.3% vs. 3.6%, $p < 0.001$) and wk14 (30.6% vs. 1.9%, $p < 0.001$). Increased remission was observed over time with over 50% of patients treated with GLM achieving remission at wk104. A greater proportion of GLM-treated patients achieved ACR20 and PASI75 response, a normalized physical function ($HAQ \leq 0.5$) or quality of life, or had significantly improved work productivity compared to placebo-treated patients at wk14 (all p-values < 0.01). These improvements were sustained over time through wks52 and 104. A greater proportion of patients in DAS28 remission also achieved normal physical function, or had significantly improved work productivity from baseline at wks 52 and 104, when compared to those not in remission. Improvement in employability, reduced time lost from work by patients and care-givers and reduced healthcare utilization were observed at wks 52 and 104, especially among those who achieved DAS28 remission. The overall safety profile of GLM through wk 104 was similar to other anti-TNFα agents used for the treatment of PsA.
Conclusions: GLM treatment induced early and sustained remission (DAS28 < 2.6), resulting in long-term improvements in physical function, health-related quality of life, work productivity and reduction in healthcare utilization in PsA patients.
Disclosure statement: A.B. is an employee of Janssen. C.C. is an employee of Janssen. T.G. is an employee of Janssen. D.G. is an investigator for Janssen. C.H. is an employee of Janssen. A.K. is an investigator for Janssen. G.K. is an investigator for Janssen. M.M. is an employee of Janssen. I.M. is an investigator for Janssen. P.M. is an investigator for Janssen. S.M. is an employee of Janssen. N.T. is an employee of Janssen.

105. EFFECT OF SECUKINUMAB ON SIGNS AND SYMPTOMS OF PSORIATIC ARTHRITIS: RESULTS OF A 24-WEEK MULTICENTRE, DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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Background: This study evaluated the preliminary efficacy and safety of secukinumab, an anti-Interleukin (IL)-17A monoclonal antibody in PsA.
Methods: 42 patients with active PsA fulfilling CASPAR criteria received in 2:1 ratio 2 injections of secukinumab (10 mg/kg) or placebo (3 wks apart). Primary endpoint was proportion of ACR20 responders at Wk 6 in active vs placebo (one-sided p-value <0.1).
Results: 35 (83.3%) patients completed the study (secukinumab $n = 25$; placebo $n = 10$). Due to protocol violations 4 patients on secukinumab and 1 on placebo were excluded from efficacy analysis. 3 patients on secukinumab and 4 on placebo discontinued prematurely (lack of efficacy/withdrawal of consent). Demographics and baseline characteristics were balanced between groups for age, sex and parameters including mean (SD) SJC (secukinumab vs placebo): 8.3 (5.6) vs 9.5 (5.4); TJC 23.5 (19.4) vs 22.6 (11.0); DAS28 4.8 (1.2) vs 4.8 (1.2); MASES 3.0 (4.1) vs 3.4 (2.3). Co-existing psoriasis, prior TNFi exposure and co-medication with DMARDS were present in 23, 11 and 21 patients on secukinumab and in 11, 5 and 10 on placebo, respectively. At Wk 6, ACR20 response rate was 39% (9/23) on secukinumab vs 23% (3/13) on placebo ($P = 0.27$). ACR20 response rates at Wk 12 and 28 were 39% (9/23) vs 15% (2/13) and 43% (10/23) vs 18% (2/11) for secukinumab vs placebo, respectively. ACR50/70 response rates at Wk 6 on secukinumab vs placebo were 17% vs 8 % and 9% vs 0%, respectively. CRP reductions at Wk 6 compared to baseline were greater on secukinumab (median [range]: 4.9 [0.3, 43.0] at baseline vs 3.0 [0.2, 15.2] at Wk 6) than on placebo (6.2 [1.3, 39.7] at baseline vs 5.0 [0.8, 29.6] at Wk 6). Post-hoc comparisons between TNFi naïve vs TNFi pre-exposed subgroups of patients suggested that ACR20/50/70 response rates may be higher in TNFi naïve subgroup. Further, post-hoc inspection of response rates in the polyarticular vs. oligoarticular subgroups did not reveal clinically relevant differences. Overall rate of AEs was comparable in secukinumab vs placebo: 26 (94%) vs 11 (79%). One severe AE (cellulitis hand) occurred on secukinumab (not suspected as study drug-related by investigator). 7 serious AEs were reported in 4 secukinumab patients- tendon rupture/carpal tunnel syndrome/cellulitis, obesity, fall, breast cancer (diagnosed prior to dosing and inclusion constituting a protocol violation) and 1 with placebo- polyarthritis. Infections were reported in 16 (57%) patients on secukinumab and 7 (50%) on placebo.
Conclusions: The primary endpoint was not met, but a substantial proportion of patients showed rapid and sustained improvements of clinical scores and acute phase parameters up to Wk 28. The safety profile of secukinumab was favorable. Trends towards a beneficial clinical effect support the rationale for larger clinical trials to assess clinical effectiveness.
Disclosure statement: A.B. is an employee of Novartis. S.G. is an employee of Novartis. W.H. is an employee of Novartis. I.M. received consultancy fees and/or research grants from AstraZeneca, BMS, Centocor, GSK, Merck, Novartis, Novo Nordisk, Pfizer, Roche and UCB. P.T. received consultancy fees and/or research grants from Abbott, Arthrogen, AstraZeneca, Bristol-Myers Squibb, Chemo Centryx, Eli Lilly, Novartis, NovImmune, NovoNordisk, Pfizer, Merck, MerckSerono, Roche, and is an employee of GlaxoSmithKline. D.V. received consultancy fees and/or research grants from Abbott,

Amgen, AstraZeneca, BMS, Centocor, Chugai, Eli Lilly, GSK, Merck, Novartis, Otsuka, Pfizer, Roche, Sanofi-Aventis, Schering-Plough, UCB and Wyeth.

106. A *CCR6* VARIANT STRONGLY ASSOCIATED WITH RHEUMATOID ARTHRITIS IN TWO POPULATIONS IS NOT ASSOCIATED WITH ANKYLOSING SPONDYLITIS

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Background: There is genetic overlap between the inflammatory conditions ankylosing spondylitis (AS), rheumatoid arthritis (RA) and Crohn's disease (CD). Two single nucleotide polymorphisms (SNPs) in *CCR6* are strongly associated with RA in Europeans (rs3093023, $p = 3.3 \times 10^{-7}$) and Japanese (rs3093024, $p = 7.7 \times 10^{-19}$); also a robust association ($p = 1.0 \times 10^{-12}$) between rs2301436 (in the *CCR6* region) and CD has been reported. We tested rs3093024 for association with AS; rs3093024 is in strong linkage disequilibrium (LD) with a trialleleic dinucleotide polymorphism that affects *CCR6* expression.
Methods: AS patients were either members of the National Ankylosing Spondylitis Society (UK), attendees at the Nuffield Orthopaedic Centre (Oxford, UK) or referrals from rheumatologists elsewhere in the UK. All patients gave informed consent, fulfilled the modified New York criteria for the diagnosis of AS and were of British white European origin. DNA was prepared by standard methods from peripheral blood or saliva. KASPar technology (KBiosciences, Hoddesdon, UK) was used to genotype 2081 AS cases and 1807 controls (720 blood donors and 1127 individuals with osteoarthritis) for rs3093024. Additional control data came from the 1958 British Birth Cohort (58BBC) (deposited by P Deloukas, Wellcome Trust Sanger Institute, Hinxton, Cambridge CB10 1SA, UK; http://www.b58cgene.sgul.ac.uk/index.php October 2008). This study makes use of data generated by the WTCCC under award 076113.3, the list of investigators who contributed to the data is available at http://www.wtccc.org.uk.
Results: Genotypes adhered to Hardy-Weinberg equilibrium ($p > 0.2$). We found no association between rs3093024 and AS: allelic chi-square test $p > 0.5$, genotypic Cochrane-Armitage test for trend $p > 0.9$, odds ratio 1.0, 95% confidence interval (95% CI) = 0.9-1.1, case and control minor allele frequency (MAF) = 0.44. We extended our control group to include rs3093024 genotypes on a further 1414 individuals from 58BBC (MAF = 0.43) and again found no association with AS, Cochrane-Armitage test for trend $p > 0.4$, OR = 1.0, 95% CI = 1.0-1.1. We performed a meta-analysis (3533 cases and 6974 controls) of our study and data from the Wellcome Trust Case Control Study 2 (after removing overlapping samples). The Mantel-Haenszel fixed effects pooled odds ratio = 1.1, $p = 0.04$, 95% CI 1.00-1.1, Cochran Q statistic $p = 0.1$, power >90% to detect an OR of 1.1, a genetic effect size equivalent to that seen in the RA studies.
Conclusions: Our findings suggest no association between rs3093024 and AS. Four SNPs, rs3093003, rs3798315, rs3093009 in *CCR6* and rs2301436 in the *CCR6* region have previously been genotyped in AS case control studies none has shown an association. These SNPs are not in strong LD with rs3093024 ($r^2 < 0.007$). Taken together these findings suggest that there is no genetic association between *CCR6* and AS.
Disclosure statement: All authors have declared no conflicts of interest.

107. THE EFFECT OF PHYSICAL ACTIVITY AND MOTIVATION ON FUNCTION IN ANKYLOSING SPONDYLITIS

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Background: Exercise is reported to improve function for people with ankylosing spondylitis (AS) but it is not clear if this association is causal or if patients with milder disease find it easier to exercise. This study examines the effect of exercise and motivation to exercise on function, while controlling for disease severity.
Methods: Participants who were members of an existing AS cohort were asked to complete questionnaires about physical activity (IPAQ-SF), motivation to exercise (BREQ-2), function (BASFI) and disease severity (BASDAI). Path analysis on STATA was used to examine the correlation between factors associated with function.
Results: The response rate to the questionnaire was 97% (326/336). The majority of participants reported to be physically active at a moderate to high level (71%, 238/336) using the IPAQ-SF. Both exercise and motivation to exercise independently improve function for people with AS, especially for those with more severe disease (BASDAI >3.5). Patients with milder disease (BASDAI <3.5)need to be highly motivated and to undertake high levels of activity to see an improvement in functional level. The motivation to exercise not only has a direct effect on function, but also an indirect effect of improving activity levels which in turn, improves function.
Conclusions: Exercise does improve function in AS, particularly for those with severe disease. In addition, motivation alone improved function as much as exercising itself. Therefore, interventions targeting motivation to exercise would have as much effect on improving function as interventions just offering exercise opportunities. Future interventions to improve the function of AS patients should therefore target both motivation to exercise and opportunities to exercise.
Disclosure statement: All authors have declared no conflicts of interest.

108. A RAPID SINGLE-TUBE METHOD FOR TYPING *RS4349859*, THE SNP THAT TAGS *HLA-B27*

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Background: Ankylosing spondylitis (AS) is an inflammatory arthropathy affecting up to 5 per 1000 Europeans. It is strongly familial with heritability estimated at >90%. The association with *HLA-B27* is very strong but only represents about 30% of the total genetic component of the disease. Recently a single nucleotide polymorphism (SNP), rs4349859, that tags *HLA-B27* with high sensitivity and specificity (≥98%) has been identified, simplifying *HLA-B27* typing in AS patients. Here we describe a single tube assay for rs4349859 using asymmetric PCR followed by unlabelled probe melting analysis (ULPMA) that is performed in a real time PCR machine.
Methods: AS patients were either members of the National Ankylosing Spondylitis Society (UK), attendees at the Nuffield Orthopaedic Centre (Oxford, UK) or referrals from rheumatologists elsewhere in the UK. All patients gave informed consent, fulfilled the modified New York criteria for the diagnosis of AS and were of British white European origin. DNA was prepared by standard methods from peripheral blood or saliva. The ULPMA PCR is carried out in a real time PCR machine in the presence of EvaGreen PCR master mix (VWR International). In this assay the forward primer is at one tenth the concentration of the reverse primer and the PCR is carried out in the presence of an unlabelled 29mer 3'phosphate-blocked probe complimentary to the product of the reverse primer with the SNP in the middle. Genotypes are distinguished from the melting curves of the unlabelled probe and PCR product. To confirm the accuracy of the ULPMA method, 200 patients were typed both by restriction fragment length polymorphism analysis of PCR products using Taq$^{\alpha}$I and by ULPMA. Thereafter patients were typed by ULPMA.
Results: There was 100% concordance between the two assays for rs4349859. In our patient cohort we found 4% patients were homozygous for *HLA-B27* (AA for rs4349859), 80% were heterozygous (GA for rs4349859) and 16% were *HLA-B27* negative (GG for rs4349859) making 84% *HLA-B-27* positive and 16% *HLA-B27* negative.
Conclusions: We have developed a single tube method for a SNP rs4349859 that accurately types the *HLA-B27* status. This method allows the PCR amplification and the detection of genotypes to be carried out rapidly in a single closed tube obviating the need for time-consuming post-PCR sample transfer or manipulation. It is highly suitable for medium scale assessment of *HLA-B27* status in AS patients.
Disclosure statement: All authors have declared no conflicts of interest.

109. REFERRAL RECOMMENDATIONS FOR AN EARLY INFLAMMATORY BACK PAIN SERVICE

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Background: Inflammatory back pain (IBP) is the key presenting feature of axial sponlyloarthropathy (SpA). Several IBP criteria sets exist such as Calin, Berlin and ASAS to help differentiate from mechanical low back pain (MLBP). Only one criteria set defined by ASAS has been validated in early disease. Limited referral criteria exist for Early Inflammatory Back Pain Services (EIBPS). We examine individual clinical features of axial SpA, compare the different criteria sets and suggest new referral criteria for an Early Inflammatory Back Pain service.
Methods: Patients were referred to an EIBPS with possible inflammatory back pain and a symptom duration >3M. They were diagnosed with axial SpA if they fulfilled the Modified New York or ASAS criteria. Patients with back pain due to causes other than axial SpA were labelled Non-SpA. Individual and combinations of parameters were compared. ROC Curve analysis assessed the specificity, sensitivity and likelihood ratios of each clinical parameter.
Results: 92 referred cases were analysed. 36 patients were diagnosed with axial SpA. 56 did not fulfil the criteria for a specific SpA. Age of onset was <40years, alternating buttock pain, improvement with exercise, no improvement with rest, morning stiffness >30 minutes yielded the best balance between sensitivity (91%) and specificity (45%) if at least 3 of these parameters were fulfilled (NPS 4 – Table 1).
Conclusions: Among the 3 published IBP criteria sets, Berlin and Calin demonstrate the highest sensitivity. All criteria sets performed poorly with differentiating axial SpA patients with IBP from patients without any evidence of SpA. Our proposed referral criteria (NPS4) for Early Inflammatory Back Pain Services identified the largest number of axial SpA patients when compared with the other sets. This is fundamental to any referral criteria designed to capture all IBP patients. Future studies to validate this criteria set is recommended.

TABLE 1 Individual and combinations of parameters associated with IBP (letters refer to individual parameters)

Individual Parameter/ criteria set	Minimum Parameter Number	Sensitivity	Specificity	Positive LR (95% CI)	Negative LR (95% CI)
Back Pain >3 M (h)		1	0.05	1.05	0
Onset of pain < 40yrs (e)		0.89	0.09	0.97	1.24
Insidious onset (g)		0.81	0.32	1.19	0.60
Not improved with rest (c)		0.86	0.45	1.52	0.33
AM stiffness (a)		0.80	0.48	1.49	0.46
Nocturnal waking pain (f)		0.67	0.52	1.38	0.64
Improve with exercise (b)		0.72	0.55	1.57	0.53
Alternating buttock pain (d)		0.53	0.77	0.27	0.61
Calin(a,b,e,g,h)	4 out of 5	0.80	0.46	1.47	0.44
Berlin (a,b,d,f)	2 out of 4	0.81	0.46	1.50	0.42
ASAS (b,c,e,f,g)	4 out of 5	0.69	0.52	1.44	0.59
New Parameter Set (NPS) 1 (a,b,c,e)	3 out of 4	0.86	0.57	1.51	0.32
NPS 2 (b,a,d,e)	3 out of 4	0.72	0.57	1.69	0.49
NPS 3 (b,c,a,d,e)	4 out of 5	0.69	0.59	1.69	0.51
NPS 4 (b,c,a,d,e)	3 out of 5	0.91	0.45	1.66	0.19
NPS 5 (b, a,d,f,e)	3 out of 5	0.81	0.46	1.50	0.42
NPS 6 (a,b,c,d,f)	4 out of 5	0.62	0.67	1.90	0.59

Disclosure statement: All authors have declared no conflicts of interest.

110. ASSESSING PSORIATIC ARTHRITIS: A MODULAR APPROACH

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Background: Psoriatic arthritis is a complex condition that can involve the combination of peripheral arthritis, enthesitis, dactylitis, axial symptoms and psoriasis. Assessment of these components can lead to new composite disease activity measures, which can be used in the future to guide therapy in clinic.

As part of an initiative promoting the concept of 'Treat-to-Target' in routine practice, a group of rheumatologists, dermatologists and nurse specialists considered the challenge of comprehensively assessing all components of psoriatic disease in routine clinics. They proposed a modular approach for assessing psoriatic disease, with skin and axial disease initially assessed by questionnaire. We investigated the use of this questionnaire approach in routine outpatient clinics.
Methods: A trained receptionist gave out 2 questionnaires to all patients with psoriatic arthritis, attending routine follow up appointments at our hospital. It asked 2 simple questions:

1. Have you been suffering from any neck or back pain recently?
2. Do you have psoriasis at the moment?

If they answered yes to question 1, they proceeded with the Bath Ankylosing Spondilitis Disease Activity Index (BASDAI). If they answered yes to question 2, they completed the Dermatology Life Quality Index (DLQI). A BASDAI score >4 would indicate active spondylitis. DLQI >5 showed significant skin involvement, and a DLQI >10 would warrant a Dermatology review.

Questionnaires were formatted in a tick-box format, and collected over a trial period of 1 month. Patients completed the questionnaires in the waiting area prior to their appointment, which were reviewed at their consultation with the doctor.
Results: 32 questionnaires were given out and completed. All patients found them easy to understand and straightforward to answer. 25 patients (78.1%) had co-existing neck or back pain. 16 patients (64%) had a BASDAI score >4. 21 patients (65.6%) were identified with co-existing psoriasis, of which 6 patients (28.6%) had a DLQI >5 and 2 patients had a DLQI >10.
Conclusions: These screening questionnaires were acceptable to patients and easy to complete. 78.1% of our patients reported axial involvement, with over half having a BASDAI score >4.0, indicating active spondylitis. This could have a significant implication on their disease management, as a similar score 3 months later may make them eligible for tumour necrosis factor (TNF) inhibitor therapy. 65.6% of our patient group reported skin involvement, of whom 6 had a DLQI >5, illustrating the significant impact it had on their lives.

We propose the use of these simple questionnaires in routine practice, to promote a modular approach for the assessment of psoriatic arthritis. The questionnaires identify skin and axial skeleton involvement early, so that appropriate referrals can be instigated quickly, and treatment optimized in all aspects of the psoriatic spectrum. We suggest this will help identify patients' needs and help best treatment choice.
Disclosure statement: B.K. received research grants from Abbott, Pfizer, BMS and UCB. All other authors have declared no conflicts of interest.