

## 1

**SIMPLE EDUCATIONAL INTERVENTION TO IMPROVE THE RECOVERY FROM ACUTE WHIPLASH: RESULTS OF A RANDOMIZED, CONTROLLED TRIAL** Robert Ferrari, Brian H. Rowe, Sumit R. Majumdar, J. David Cassidy, Sandra Blitz, Susan C. Wright, Anthony S. Russell (University of Alberta, Edmonton, Alberta, University of Toronto, Toronto, Ontario)

**Objective:** To determine if an educational intervention in the acute stage of whiplash injury may improve the recovery rate.

**Methods:** Consecutive subjects were randomized to one of two treatment arms, an educational intervention or usual care. The intervention group received an educational pamphlet based on the current evidence. The control group did not receive these materials, but received usual ED care and a standard non-directed discharge information sheet. Both groups underwent follow-up by telephone interview at 2 weeks and 3 months. The primary outcome measure of recovery was the patient's response to the: How well do you feel you are recovering from your injuries?

**Results Obtained and Conclusion:** A total of 112 subjects agreed to participate. The age, gender, pre-collision employment level and health, initial symptoms, collision parameters and emergency treatments were similar between the groups. At 2 weeks post-collision, 7.3% of the treatment group reported recovery compared to 8.8% in the control group (absolute risk difference: -1.5%; 95% CI: -12.6% to 9.7%). At 3 months post-collision, 21.8% of the treatment group reported complete recovery compared to 21.0% in the control group (absolute risk difference: 0.8%; 95% CI: -14.4% to 16.0%). At 3 months there were no clinically or statistically significant differences between groups in severity of remaining symptoms, limitations in daily activities, therapy use, medications used, lost time from work, or litigation.

**Brief Conclusion:** An evidence-based educational pamphlet provided to patients at discharge from the emergency department is no more effective than usual care for patients suffering grade 1 or 2 whiplash-associated disorder.

## 2

**ANALYSIS OF AVAILABLE DATA ON THE RECOVERY RATES FOR GRADE 1 AND 2 WHIPLASH-ASSOCIATED DISORDERS IN ALBERTA** Robert Ferrari, Anthony S. Russell, Allan J. Kelly (University of Alberta, Edmonton, Alberta, Medicentres Incorporated, Edmonton, Alberta)

**Objective:** To examine the available data from clinical outcome studies of the recovery rates for grade 1 and 2 whiplash-associated disorders in Alberta.

**Methods:** Existing data from research conducted in Edmonton, Alberta on clinical population samples of whiplash victims suffering with grade 1 or 2 whiplash-associated disorders were considered. These studies were analysed to extract information on the clinical sample studied, the measures of recovery, and the recovery rates found.

**Results Obtained and Conclusion:** The two available data sets concerning clinical outcome studies of whiplash-associated disorders grade 1 and 2 in Alberta were: 1) a study conducted in 2003 of the outcome for acute whiplash injury in consecutive whiplash victims attending the University of Alberta Hospital Emergency Department; and 2) a study conducted in 2005 of the outcome for acute whiplash injury in consecutive whiplash victims attending one of 15 primary care clinics in Edmonton.

In the University of Alberta Emergency Department study of 2003, the measure of recovery at 3 months post-injury was the response to the question "How well do you feel you are recovering from your injuries?" The possible responses ranged from "all better" to "much worse", and the subjects responding with "all better" were defined as recovered. In the Edmonton Primary Care Clinic study of 2005, the measure of recovery at 3 months post-injury was the response to the question Do you feel you have recovered fully from your accident injuries? A response of "yes" to this question was defined as recovered. This outcome measure was also compared to scores on the Whiplash Disability Questionnaire, and to responses to the question "How well do you feel you are recovering from your injuries?" (The possible responses ranged from "all better" to "much worse", with the subjects responding "all better" defined as recovered.) The Edmonton Primary Care Clinic study (2005) involved an evaluation for any

differences between the latter 3 measures of recovery and none were found. The Edmonton Primary Care Clinic study (2005) also assessed for any differences in recovery rate between those whiplash victims who attended an Emergency and also attended a primary care clinics versus those who attended a primary care clinic only. Comparing these two types of patients, no differences were found in recovery rate.

The proportion of 112 consecutive whiplash victims with complete recovery in the University of Alberta Emergency Department study of 2003 was 21% at 3 months post-injury. The proportion of 131 consecutive whiplash victims with complete recovery in the Edmonton Primary Care Clinic study of 2005 was 39.7% at 3 months post-injury.

**Brief Conclusion:** Based on limited data, an improvement in the rate of recovery for whiplash grade 1 and 2 victims has occurred in Alberta between 2003 and 2005. Additional outcome studies are warranted.

## 3

**THE WHIPLASH DISABILITY QUESTIONNAIRE VERSUS A SINGLE PATIENT-CENTRED OUTCOME QUESTION IN ASSESSING WHIPLASH RECOVERY** Robert Ferrari, Anthony S. Russell, Allan J. Kelly (University of Alberta, Edmonton, Alberta, Medicentres Incorporated, Edmonton, Alberta)

**Objective:** To compare the responses of whiplash patients on two measures: the patient's response to Do you feel you have recovered fully from your accident injuries? and the total scores on the Whiplash Disability Questionnaire (WDQ).

**Methods:** We conducted telephone interviews of consecutive motor collision victims who attended one of 15 primary care clinics in Edmonton, Alberta Canada in March and April 2005. Subjects were identified through the daily diagnostic codings of consenting physicians, and contacted approximately 3 months post-injury. Potential subjects were then interviewed by telephone survey and further examined for inclusion and exclusion criteria at the time of interview. Subjects were included if they attended because they were seated within a car, truck, or van in a collision, were 18 years or older, and presented within 72 hours of their collision. They were excluded if they were told they had a fracture or neurological injury (i.e., grade 3 or grade 4 WAD), were unable to communicate in English, were injured in a non-motor vehicle event, or were admitted to hospital. The primary outcome measure was the patient's response to: Do you feel you have recovered fully from your accident injuries? Recovery was defined as answering "yes" to the recovery question, other choices being "no" and "not sure". The total score on the Whiplash Disability Questionnaire was also measured and correlated to recovery question responses to test the agreement between these two measures.

**Results Obtained and Conclusion:** Of the nearly 250 subjects available from billing records, a total of 147 subjects remained eligible, and were interviewed by telephone. After initial questioning, 16 chose not to participate (89% participation rate). The mean age of participating subjects was 35.9 (s.d. = 10.9, range = 18 - 71). Of these subjects, 52 (39.7%) reported that they felt they had recovered from their injuries. For the cohort as a whole, the mean WDQ score was 19.2 (s. d. 17.4, range 0 - 82). Those who reported complete recovery had a mean WDQ score of 2.5 (s. d. = 3.6, range 0 - 12) and those who reported they had not recovered has a mean WDQ score of 29.9 (s. d. = 13.9, range 13 - 82). All the subjects who responded "yes" to the recovery question had a WDQ score below 13, while all those responding "no" to the recovery question had a WDQ score of 13 or more. Like Pinfold et al. (2004), we also found a high internal consistency, with Cronbach's alpha = 0.95.

The results of this study suggest that the global recovery question correlates well with a WDQ score below 13. Conversely, the WDQ captures the patient's global sense of recovery well.

**Brief Conclusion:** The WDQ is thus useful in detecting recovery, and in those not recovered it identifies specific areas of concern for the patient (i.e., their sense of a lack of recovery may be related not so much to pain itself, but to, for instance, a limitation in returning to their normal leisure activities).

## 4

**ALBERTA RODEO ATHLETES DO NOT DEVELOP THE CHRONIC WHIPLASH SYNDROME** Ashley L. Shannon, Robert Ferrari, Anthony S. Russell (University of Alberta, Edmonton, Alberta)

**Objective:**The biopsychosocial model of the chronic whiplash syndrome is based in part on the commonly held view of whiplash injury as a serious injury and anticipation of chronic pain and disability engenders a post-injury behaviour that encourages chronic pain. Considering that this behaviour may be less prevalent in athletes, we sought to determine if an unselected group of rodeo athletes would report a more benign outcome to their motor vehicle whiplash injuries than a group of spectators at Rodeo events. **Methods:**This survey compares the self-reported outcome of motor vehicle collision whiplash injuries (neck and/or back sprain) in rodeo athletes and spectators attending rodeo events. Subjects were asked to recall motor vehicle collision experiences, the type of vehicle they were in, the presence of symptoms as a result, and the outcomes for those symptoms.

**Results Obtained and Conclusion:** Forty-seven percent of rodeo athletes and 59% of spectators recalled being in a motor vehicle collision. A total of 33% of rodeo athletes who had collisions recalled acute symptoms they associated with the collision compared to a recall of symptoms in 61% of spectators who had collisions. The vehicle types during the collisions and the occupation type at the time of the survey were the same for both groups. The duration of symptoms, however, was 30 days (s.d. 14) in rodeo athletes and 73 days (s. d. 61) in spectators. None of the rodeo athletes recalled symptoms lasting for more than 60 days compared to 15% of spectators who had symptoms more than 60 days. Rodeo athletes took no more than 3 weeks off work, whereas among spectators, it was common to take more than six weeks off.

**Brief Conclusion:** Rodeo athletes appear to be in at least as many motor vehicle collisions as rodeo spectators, and 33% suffered the acute whiplash syndrome. Rodeo athletes appear, however, to be more resistant than spectators from developing prolonged pain and disability.

## 5

**A RE-EXAMINATION OF THE WHIPLASH-ASSOCIATED DISORDERS (WAD) AS A SYSTEMIC ILLNESS** Robert Ferrari, Anthony S. Russell, Linda M. Carroll, J. David Cassidy (University of Alberta, Edmonton, Alberta, University of Toronto, Toronto, Ontario)

**Objective:**To describe the systemic nature of the illness reported after motor vehicle collisions using data from a large, population-based cohort of individuals making an injury insurance claim.

**Methods:**We examined all subjects who submitted a claim or were treated for whiplash injury following motor vehicle collision in Saskatchewan, Canada during an 18-month period. Demographics of claimants, collision-related data, pre-collision health data, symptom prevalence, and Short Form-36 scores were obtained on average within 1 month post-collision.

**Results Obtained and Conclusion:** Of 9006 potentially eligible claimants, 7462 (83 percent) met criteria for whiplash injury and provided information regarding demographics and injury-related symptoms. A total of 45% of these consented to complete the Short Form 36 at baseline. For most subjects, neck pain was only one of many diffuse and intense symptoms, including, often, low back pain. The range of symptoms including fatigue, dizziness, paresthesiae, headache, spinal pain, nausea, and jaw pain could be interpreted as a systemic disorder. SF-36 scores showed low physical and mental functioning one month post-collision.

**Brief Conclusion:** What is commonly referred to as whiplash-associated disorders (WAD) is best appreciated as a syndrome extending itself well beyond what can be labeled as a neck injury. More research is needed to better understand the underlying mechanisms involved so that treatment can be directed at the broad spectrum of the illness rather than focusing on finding a focal neck injury.

## 6

**A CROSS-CULTURAL COMPARISON BETWEEN CANADA AND GERMANY OF SYMPTOM EXPECTATION FOR WHIPLASH INJURY** Robert Ferrari, Christoph G. J. Lang (University of Alberta, Edmonton, Alberta, University of Erlangen, Erlangen Germany)

**Objective:**To compare the frequency and nature of expected "whiplash" symptoms in Germany with that in Canada.

**Methods:**A symptom checklist was administered to 2 subject groups selected from local companies in Germany and Canada, respectively. Subjects were asked to imagine having suffered a neck sprain [whiplash injury] with no loss of consciousness in a motor vehicle collision, and to check which, of a variety of symptoms, they would expect might arise from the injury. For symptoms they anticipated, they were asked to select the period of time they expected those symptoms to persist. Considering that German subjects

may simply be naive to any chronic problems arising from musculoskeletal disorders, the subjects were also asked to fill out a symptom checklist of rheumatoid arthritis - the Stanford Health Assessment Questionnaire HAQ Results Obtained and Conclusion: There were no significant differences between the two subjects groups so there was no multivariate analysis conducted with respect to the subject characteristics. The responses of the German and Canadian subjects in their expectation of chronic disability due to rheumatoid arthritis were very similar. The mean estimated HAQ score for Germans was 0.990 (median = 0.997, range = 0.56-1.55). The mean HAQ score for Canadians was 1.03 (median = 1.05, range = 0.580-1.44). The difference between the means is not statistically significant ( $p = 0.598$ ), nor is the difference between the medians ( $p = 0.449$ ). The acute whiplash injury symptoms anticipated by Germans and Canadians were also similar, but we found a markedly different expectation of the duration of these common symptoms. Canadians commonly expect certain symptoms to be chronic, while Germans do not. For headache, 32% of Canadians expected this symptom to be chronic, while only 1% of Germans had this expectation. For neck pain, 50% of Canadians expected this symptom to be chronic, while 19% of Germans had this expectation. Finally, for chronic back pain, the percentages were 40% for Canadians and 9% for Germans.

**Brief Conclusion:** In Germany, despite the documented occurrence of neck sprain symptoms in individuals following motor vehicle collisions, there is a very low rate of expectation of any sequelae from this injury. What current or previous aspects of society that underlie this remain uncertain. This lack of expectation of chronicity in Germany may, in part, determine the low prevalence of the chronic whiplash syndrome there. Further studies of symptom expectation as an etiologic factor in the chronic whiplash syndrome are needed.

## 7

**ARE DEPRESSIVE SYMPTOMS ASSOCIATED WITH PAIN AFTER TAKING INTO CONSIDERATION DEMOGRAPHICS, DISABILITY, AND CONTEXTUAL VARIABLES IN OLDER ADULTS WITH OSTEOARTHRITIS?** Joanna Sale, Gillian Hawker, Monique Gignac, Elizabeth Badley (Sunnybrook & Women's College Health Sciences Centre, Toronto, ON, Sunnybrook & Women's College Health Sciences Centre, Toronto, ON; University of Toronto, Toronto, ON, Arthritis Community Research and Evaluation Unit, Toronto, ON)

**Objective:**The purpose of this study was to determine the relationship between osteoarthritis (OA) pain and depressive symptoms after accounting for important demographic, disability, and contextual variables.

**Methods:**A prior study established a population cohort of 2,411 individuals 55+ years with hip/knee OA. Detailed information was collected on sociodemographics, and arthritis severity (WOMAC). In the fifth year of follow-up, we administered additional scales: Clinical Health Assessment Questionnaire (ClinHAQ) fatigue, Centre for Epidemiologic Studies Depression (CES-D), Life Experiences (number of both positive and negative stressful life events in the past year), Coping Behaviour (extent to which respondents give up activities, optimize or modify behaviours, and receive help to manage their arthritis pain), and Coping Efficacy (respondents' appraisal of their success in coping). In a linear regression model with WOMAC pain as the dependent variable and the CES-D forced in as the first independent variable, the effect of each of the following variables on the strength of the relationship between pain and depressive symptoms was examined: sex, age, living arrangements, WOMAC function, fatigue, life events, coping behaviour, and coping efficacy.

**Results Obtained and Conclusion:** The overall response rate was 82.4% ( $n=1,227$ ). The mean CES-D score was 9.4 with 21.3% individuals scoring  $\geq 16$  (indicative of significantly depressed mood). As expected, CES-D scores were significantly correlated with WOMAC pain ( $r=.54$ ,  $p<.01$ ), accounting for 29% of the variation in pain scores. The only variable that influenced the relationship between pain and depressive symptoms in the regression model was arthritis disability (WOMAC function). The remaining variables, alone or together, had little effect on the significance, or strength, of the CES-D standardized coefficient.

**Brief Conclusion:** Among older adults with OA, the prevalence of depressive symptoms is high and the association between pain and depressive symptoms is consistent regardless of the demographic and contextual variables considered. However, the association between pain and depressive symptoms is significantly influenced by disability. The role of disability is unclear and needs to be examined further before a decision is made to treat depressive symptoms as a regular part of OA pain management.

## 8

**WHAT ARE THE FACTORS ASSOCIATED WITH DEPRESSIVE SYMPTOMS IN OLDER ADULTS WITH OSTEOARTHRITIS?** Joanna Sale, Gillian Hawker, Monique Gignac, Elizabeth Badley (Sunnybrook & Women's College Health Sciences Centre, Toronto, ON, Sunnybrook & Women's College Health Sciences Centre, Toronto, ON; University of Toronto, Toronto, ON, Arthritis Community Research and Evaluation Unit, Toronto, ON, Arthritis Research and Evaluation Unit, Toronto, ON)

**Objective:** To determine the factors associated with depressive symptoms in older adults with osteoarthritis (OA).

**Methods:** A prior study established a population cohort of 2,411 individuals 55+ years with hip/knee OA. Detailed information was collected on sociodemographics, and arthritis severity (WOMAC). In the fifth year of follow-up, we administered additional scales to measure depressive symptoms (CES-D), pain, fatigue, life events, and coping. The following variables were entered in a stepwise linear regression model with CES-D scores as the outcome: sex, age, current use of acetaminophen or painkillers with codeine, ever treated for depression or other major mental illness, fatigue, life events, coping behaviour, coping efficacy, WOMAC pain and function, SF-36 pain, and Chronic Pain Grade.

**Results Obtained and Conclusion:** The overall response rate was 82.4% (n=1,227). The mean CES-D score was 9.4 with 21.3% individuals scoring  $\geq 16$  (indicative of significantly depressed mood). Variables significantly associated with CES-D scores were worse coping efficacy (perception that they are not coping well), greater number of life events, greater disability, yes to treatment for a mental health disorder, greater coping behaviours, greater pain (SF-36), being female, and increasing age. This model accounted for 62.1% of the variability in the CES-D score. The change in R<sup>2</sup> during the stepwise procedures demonstrated that coping efficacy accounted for 49.6% of the variation in the CES-D score.

**Brief Conclusion:** Among older adults with OA, the prevalence of depressive symptoms is high. Depressive symptoms appear to be higher among females, and those who are older, report greater pain, have been treated for a mental health disorder in the past, have experienced a high number of life events, have greater disability, and are trying to cope but perceive that their coping efforts are unsuccessful. These results suggest that strategies to maximize coping efforts may assist OA sufferers who experience depressive symptoms.

## 9

**ADHERENCE TO PAIN MEDICATION IN ADULTS WITH OSTEOARTHRITIS: A QUALITATIVE STUDY** Joanna Sale, Gillian Hawker (Sunnybrook & Women's College Health Sciences Centre, Toronto, ON, Sunnybrook & Women's College Health Sciences Centre, Toronto, ON; University of Toronto, Toronto, ON)

**Objective:** The purpose of this phenomenological study was to explore the experience of adherence to pain medication, in older adults with osteoarthritis (OA).

**Methods:** Individuals were recruited from an existing cohort (n=1,300) with disabling hip and knee OA. Twenty-seven individuals who reported previous physician visits for their arthritis, were English speaking, Toronto residents, and identified from their calling logs as receptive to interviews were approached by the cohort telephone interviewer to discuss their experiences with prescribed painkillers for OA. Semi-structured face-to-face interviews were conducted by a qualitative researcher in participants' homes. Interview data were transcribed verbatim and analyzed according to standard phenomenological procedures.

**Results Obtained and Conclusion:** Nineteen adults (10 females, 9 males) aged 67 to 92 agreed to participate (7 refused and 1 was very ill). Interviews lasted 1-4 hours with 4 participants interviewed twice. Participants varied in their socioeconomic status and education levels. Most had co-morbidities, such as heart disease and diabetes, for which they were also being treated. Findings indicated that adherence to pain medication differed from that of other prescribed medications. Participants were reluctant to take painkillers, and when they did, generally took them at a lower dose or frequency than prescribed. This behaviour did not reflect their recommendations for others who were expected to be treated appropriately for pain and to adhere to pain medication. Perceptions and attitudes to pain played an integral role in participants' adherence to painkillers. Despite obvious physical limitations, participants belittled their pain and claimed to have a high pain tolerance.

**Brief Conclusion:** Participants in this study exhibited low adherence to painkillers compared with that to other medications. These findings suggest that re-evaluation of the prescription of pain medication for OA is warranted and that the effectiveness of pain management in OA needs to account for adherence behaviour in older adults.

## 10

**UPPER EXTREMITY DIABETIC MUSCLE INFARCTION — A CASE SERIES OF THREE PATIENTS.** Reen, Bajinder, Joshi, Raman (Division of Nephrology, Department of Medicine, William Osler Health Centre, Brampton Campus, Division of Rheumatology, Department of Medicine, William Osler Health Centre, Brampton Campus)

**Objective:** Diabetic muscle infarction is a rare complication of diabetes. Since first reported in 1965, approximately 115 cases have been described in the literature. Only one case has been described affecting the upper extremity. In this case series we report on three men (ages 40-63) with diabetic muscle infarction involving the arm.

**Methods:**

**Results Obtained and Conclusion:** The patients had symptoms 4-18 days before presenting to the Emergency department and all required admission for their pain. Only one of the patients was febrile. The patients had diabetes for 10-30+ years and two were on hemodialysis for endstage renal disease. The third started peritoneal dialysis shortly after therapy for his diabetic muscle infarction. Hemoglobin A1C ranged from 0.049-0.095. Creatine Kinase ranged from 69-125 U/L, and the white blood cell count ranged from 9600-12 000 /mm<sup>3</sup>. MRI images were obtained in two of the men and were consistent with diabetic muscle infarction. Serial ultrasound images were obtained in the third patient and were also consistent with diabetic muscle infarction. All patients responded rapidly and favorably to narcotics. None required surgery nor biopsy. The pathophysiology of this rare condition is discussed.

## 11

**LONG-TERM OUTCOME IN A KAWASAKI DISEASE COHORT TREATED WITH INTRAVENOUS IMMUNOGLOBULIN AND LOW DOSE ASPIRIN: EVALUATION WITH ECHOCARDIOGRAPHY AND EXERCISE CHALLENGE** Rosie Scuccimarrì, Marie Béland, Luc Jutras, Adrian Dances, Raymond Lambert, Charles Rohlicek, Karen Watanabe Duffy, Marzia Cortopassi, Ciarán Duffy (Montreal Children's Hospital / McGill University Health Centre, Montreal, Quebec)

**Objective:** Patients with Kawasaki disease (KD) may be at risk for late cardiac complications. We have followed a cohort of KD patients since 1985. Here we report on their long-term outcome, including the results of a subgroup evaluated by combined exercise stress single photon emission computed tomography using 99mTc-Sestamibi (stress-MIBI testing).

**Methods:** We reviewed the records of 221 patients admitted with a diagnosis of KD between 1985 and 1999 and treated in the acute phase with IVIG and low dose aspirin. This cohort was contacted to conduct late follow-up echocardiograms (echo). KD patients identified as having echo abnormalities on early (within 8 weeks of diagnosis) or late follow-up were matched 1:1 with KD patients (controls) who showed no echo abnormalities, and both groups were recruited to undergo stress-MIBI testing with continuous ECG monitoring.

**Results Obtained and Conclusion:** Of the 221 patients, 159 underwent late follow-up echos a mean of 8.2 years (2.2 - 17.1) after diagnosis. Retrospective evaluation of early follow-up data revealed that 38/159 (23.9%) had echo abnormalities, of whom 12/38 had coronary artery lesions (CAL) for an incidence of 7.5% (12/159); 121/159 had no echo abnormalities. All 38 had complete resolution of original abnormalities, while 8 of the 38 (21.1%) developed new pathology on long-term follow-up; 1/8 had new CALs. Seven of the 121 patients (5.8%) without cardiac abnormalities on early follow-up had echo abnormalities on late follow-up (including 1/7 with a new CAL). Thirty-five patients underwent stress-MIBI testing on late follow-up, 18 with echo abnormalities either at early or late follow-up, and 17 without abnormalities. Of the 18 with abnormalities, 1 had an abnormal stress ECG. Of the 17 controls, 1 had an abnormal stress ECG and 1 had an abnormal stress-MIBI.

**Brief Conclusion:** Late cardiac abnormalities are uncommon. However, our study shows that cardiac abnormalities may appear late, even in patients with no previous evidence of cardiac involvement. Long-term cardiology follow-up is warranted in all patients with a history of KD.



## 12

**METHOTREXATE USE BY PEDIATRIC RHEUMATOLOGISTS IN CANADA** Gaëlle Chédeville, Rosie Succimarri, Ciarán Duffy (Division of Rheumatology, Department of Pediatrics, Montreal Children's Hospital and McGill University, Montreal, Quebec, Canada, )

**Objective:**To determine Methotrexate (MTX) use and the degree to which Canadian pediatric rheumatologists adhere to the American College of Rheumatology (ACR) "guidelines" for MTX monitoring.

**Methods:**A 20-item questionnaire was e-mailed to 37 pediatric rheumatologists in 17 centres in Canada. A total of 28 (75.7%) responded.

**Results Obtained and Conclusion:** Route of administration: The oral route (PO) was preferred initially by 78.6% for most cases, but for more "severe" cases, this fell to 42.8%. Those who chose not to start PO used the subcutaneous route (SQ). Of those who commenced PO, 54.5% switched to SQ because of dose escalation or lack of efficacy, and 32% because of GI toxicity.

**Dose:** An initial mean dose of 0.35 to 0.5 mg/kg/wk was prescribed by 51.8%. For 75%, the maximum dose was 1 mg/kg/wk (up to 25 mg); 18.2% used a maximum dose of 30 mg.

**Monitoring:** CBC, AST and ALT were done by 100% at baseline and in follow-up. Albumin and creatinine were done at baseline by 85.7%, but by only 71.4% and 67.8% respectively in follow-up. After a change in dose, 96.3% requested blood tests at least monthly, and when the dose was stable, 78.6% did them at least every 6 to 8 weeks. Response by the physician to abnormal results varied considerably.

**Side effects:** Recurrent nausea/vomiting was reported to occur frequently. No severe toxicity, and in particular, no case of cirrhosis, was reported.

Prophylactic folic acid was prescribed by all but one physician. Prior to MTX commencement, varicella vaccine is given by 46.4%.

**Brief Conclusion:** Most pediatric rheumatologists in Canada follow ACR guidelines to monitor for MTX toxicity in children. The variation in monitoring and response to toxicity raises the question as to whether specific pediatric guidelines should be developed.

## 13

**LOW RATES OF INFLUENZA VACCINATIONS IN A COHORT OF SLE PATIENTS** E Hazel, S Bernatsky, A E Clarke, G L Cooper, L Joseph, C A Pineau (McGill University, Montreal, QC)

**Objective:**Systemic Lupus Erythematosus (SLE) is a chronic illness and it is thus recommended that patients receive the influenza vaccine annually. Previous studies have indicated an adequate immune response to the vaccine and have shown no increase in disease flares after its administration. Our objective was to evaluate the proportion of SLE patients in a tertiary care centre who received this vaccine as well as to identify factors which may be associated with the occurrence of this intervention.

**Methods:**We conducted a survey of vaccination status in a cohort of patients fulfilling American College of Rheumatology (ACR) criteria for SLE. Using a self-administered questionnaire, the patients documented if they had received the influenza vaccine the previous season. We calculated the percentage of individuals who had received an influenza vaccine, and then determined if the vaccinated group differed from the non-vaccinated group with respect to age, recent physician visits and medication exposures. Disease activity was measured using the SLE Disease Activity Index (SLEDAI), and cumulative damage was evaluated with the Systemic Lupus International Collaborating Clinics/ACR Damage Index (SLICC/ACR DI). **Results Obtained and Conclusion:** 119 consecutive clinic attendees were invited to participate in the study and all agreed to complete the questionnaire. The mean age of the participants was 43 years (SD=13.9) and the patients were predominately women (88.2%). Of the 119 patients only 46 (38.7%) had reportedly received the influenza vaccine the previous season. The patients who were vaccinated were not more likely to have seen a physician either in the last year or within the preceding 3 months. This group tended to be older (OR 1.03, 95% CI 1.00, 1.07) and had a greater damage score (OR 1.44, 95% CI 1.11, 1.85). The vaccinated group was more likely to be using prednisone (OR 8.4 95%CI 1.4, 49.4) and immunosuppressive medications (OR 6.1, 95% CI 1.0, 37.9).

**Brief Conclusion:** We report a surprisingly low rate of influenza vaccination in this cohort of lupus patients despite the fact that they were undergoing regular care in a tertiary care centre.

## 14

**THE APPLICATION OF A NORMOGRAM FOR EXERCISE CAPACI-**

**TY IN WOMEN IN PATIENTS WITH SLE** E Hazel, D DaCosta, K Dasgupta, S Bernatsky, A Clarke, C Pineau (McGill University, Montreal, PQ)

**Objective:**Systemic Lupus Erythematosus (SLE) is associated with an excess of cardiac events given traditional risk factors. A normogram to predict exercise capacity for age in women from the general population has recently been established (NEJM 2005;353:468-75) Our objective was to examine the relative fitness of a cohort of SLE patients to determine if disease activity or cumulative damage were associated with exercise capacity. **Methods:**We recruited women who fulfill American College of Rheumatology (ACR) criteria for SLE to participate in a study of fatigue. These patients were asked to perform a symptom-limited maximal exercise stress test (EST) according to the Bruce protocol. We compared their performance on the EST with the normogram (predicted mets= 14.7-(0.13 x age)). Lupus disease activity was measured using the SLE Activity Measure-2 (SLAM) and cumulative damage was evaluated with the Systemic Lupus International Collaborating Clinics/ACR Damage Index (SLICC/ACR DI).

**Results Obtained and Conclusion:** 64 of 102 participants from the fatigue study agreed to perform an EST. Their mean age was 50.3 years (SD= 10.2). Twelve of 64 women were under the age of 35 and were excluded from analysis as the normogram was not validated for this age group. The remaining participants (N= 52) were predominantly white (88%) with an average disease duration of 13.6 years (SD= 8.6), an average SLAM score of 8.0 (SD= 9.4) and an average SLICC/ACR DI score of 1.3 (SD= 1.4). They had an average BMI of 24.7 kg/m<sup>2</sup> (SD= 4.7). 62% were current/previous smokers. 59.6% performed at a level equal to, or higher than, predicted, with the mean performance of 110% of this value. 21.2% performed at a level <85% predicted, a factor associated with twice the risk of death in the general population. We were unable to identify any lupus related factors that predicted poor exercise capacity.

**Brief Conclusion:** The application of this newly established normogram for exercise capacity in women could help identify a high risk subpopulation of lupus patients who would benefit from aggressive risk reduction strategies.

## 15

**RELIABILITY OF THE DERMLITE® DERMATOSCOPE FOR NAIL-FOLD CAPILLAROSCOPY** Murray Baron, Maura Buchignani, James Dunne, Marie Hudson, Sindhu R Johnson, Niall Jones, Jean-Pierre Mathieu, Russel Steele, Suzanne Taillefer, and the Canadian Scleroderma Research group (McGill U, UBC, U of Toronto, U of Alberta, U of Montreal)

**Objective:**Assess the reliability of the DermLite® dermatoscope for nailfold capillaroscopy.

**Methods:**The nailfolds of 6 SSc patients and 2 normals were examined by 6 rheumatologists with the DermLite® dermatoscope. 2 fingertips of each hand of each subject were examined. Only gloved hands, with tips of the gloves of the 3rd and 4th fingertips cut off, were exposed. Each finger was examined independently, each examiner studied each hand in a random order determined by a Latin square design, and each finger was examined twice by each examiner in 2 separate rounds. Each examiner saw 32 fingers and made a total of 64 observations, all within one 2 hour period. The presence or absence of dilated loops, giant capillary loops and/or avascular areas for each digit was noted. No scoring was done. Before the examinations, the examiners reviewed photographs representing capillaroscopic abnormalities and also examined together all fingers of 2 patients with SSc and discussed the abnormalities found. Dilated vessels were enlarged capillary loops, generally 4 to 6-fold normal size and giant loops were > 10 fold normal size. Avascularity was any confluent area free of capillary loops.

The Kappa coefficient was calculated to demonstrate the percent agreement with chance eliminated. Above 0.6 is considered substantial and between 0.4 and 0.6 moderate agreement.

**Results Obtained and Conclusion:** Mean age of subjects was 42.3 years. Average disease duration 7.8 years. The median number of years of experience of the rheumatologists was 5 years. Inter-rater Kappa values: 0.63, 0.40, 0.20; intra-rater values: 0.71, 0.55, 0.40 for dilated capillaries, giant capillaries and avascular areas respectively.

**Brief Conclusion:** The dermatoscope provides moderate to substantial reliability to detect the presence of giant and dilated capillaries but poor inter-rater agreement for avascular areas. We recommend that if this dermato-

scope is used, avascular areas not be assessed but that assessment of dilated and giant capillaries may have potential for use in the development of new diagnostic criteria for scleroderma. This dermatoscope is convenient to use and provides slight incremental reliability compared to the office ophthalmoscope.

## 16

**SUSTAINED REMISSION OF LUPUS NEPHRITIS** Claire E H Barber , Laurette Geldenhuys , John G Hanly (Division of Rheumatology, Department of Medicine, and Division of Anatomical Pathology, Department of Pathology, Queen Elizabeth II Health Sciences Center and Dalhousie University, Halifax, Nova Scotia, Canada)

**Objective:**To describe the clinical course of patients with lupus nephritis (LN) who attain a sustained remission (SR) and identify predictors of SR. **Methods:**A retrospective study was conducted of patients with biopsy-proven LN who were followed for up to 10 years. SR was defined as normal renal function, urine protein <0.5g/day, and an inactive urine sediment without significant immunosuppressive maintenance therapy for at least 3 years. Control patients had LN but did not fulfill the criteria for SR. Data was collected at diagnosis of LN (T0), at onset of remission (T1), and at final follow-up (T2). Overall disease activity (SLEDAI) and cumulative organ damage (SDI) were measured at all 3 time points. Demographic, clinical, serological and histopathological differences between the two groups were compared to identify predictors of SR.

**Results Obtained and Conclusion:** A total of 35 patients were identified, 16 with a SR of LN and 19 controls, with a mean  $\pm$  SD followup of  $126.4 \pm 8.5$  months. Remission of LN was achieved following  $37.7 \pm 6.8$  months of therapy. At diagnosis (T0) the WHO classification of nephritis, activity and chronicity scores of renal biopsies were comparable in the two groups. At final follow-up (T2), the mean estimated creatinine clearance for the SR group was significantly higher than in controls ( $P = 0.009$ ) and SLEDAI scores were lower ( $P = 0.002$ ). Cumulative damage (SDI scores) in the SR group did not increase after patients entered remission ( $P = 0.250$ ), whereas the mean SDI score in the control group increased significantly ( $P = 0.014$ ) even when renal variables were excluded ( $P = 0.016$ ). Multivariate analysis revealed that female gender ( $P = 0.023$ ), older age ( $P = 0.034$ ), higher non-renal SLEDAI scores ( $P = 0.016$ ) at the time of diagnosis of LN and absence of azathioprine ( $P = 0.010$ ) were predictive of SR.

**Brief Conclusion:** Remission of LN occurs in a substantial proportion of SLE patients and may be sustained without maintenance immunosuppressive therapy. Once achieved it is associated with a significantly slower accrual of both renal and non-renal damage over the ensuing 7 years.

## 17

**THE EFFECT OF DIFFERENT DEFINITIONS OF EXTENT OF MAXIMUM CUTANEOUS INVOLVEMENT IN SYSTEMIC SCLEROSIS (SSC)** Murray Baron , Marie Hudson, and the Canadian Scleroderma Research Group (McGill University)

**Objective:**To determine the effect of 2 different definitions of limited (LCD) vs. diffuse (DCD) cutaneous disease on the ability to differentiate between subsets of SSC.

**Methods:**Patients in the Canadian Scleroderma Research Group registry were assessed. The Scleroderma Disease Activity Score (SDAS) and disease severity scores (DSS) for various systems were calculated. The World Health Organization Disease Assessment Schedule II (WHODAS II), the Medical Outcomes Study Short Form Version 2 (SF 36V2), the Stanford Health Assessment Questionnaire Disability Index (HAQDI), the Center for Epidemiology Depression scale (CES-D) and the McGill Pain Questionnaire (MPQ) were administered. SF-36v2 Physical Component Summary (SF36-PCS) and Mental Component Summary (SF36-MCS) scores were calculated. Definition 1 defined LCD as skin involvement distal to the metacarpal-phalangeal (MCP) joints. Definition 2 defined LCD as skin involvement distal to the elbows and knees. Differences between means were assessed with Student t tests; significance was  $p < 0.05$ .

**Results Obtained and Conclusion:** 76 patients were assessed. 22 met definition 1 for LCD and 39 definition 2. For either definition, mean scores for patient global assessment of health, patient assessed pain, severity of Raynaud's, finger ulcers, intestinal problems and breathing on 11 point numerical rating scales did not differ between LCD and DCD. There was also no difference in scores of DSS-heart, kidneys, lung or peripheral vascular disease, or depression or SF36-MCS.

By definition 1, Physician global disease damage, Scleroderma Disease

Activity Score, DSS- general, - muscle, - skin, - gastrointestinal, HAQDI, SF36-PCS, WHODAS II were worse in DCD. By definition 2 Physician global disease activity, DSS- general, - gastrointestinal, - muscle, - skin were worse in DCD and Physician global severity and Physician global disease damage were worse in LCD.

**Brief Conclusion:** Disease outcomes are likely to be worse in diffuse cutaneous disease if limited disease is defined as distal to the MCPs than if LCD is distal to the elbows or knees. A narrow definition is more helpful if it is used to predict outcome. Subsetting disease may prove valuable to identify biologic and genetic differences underlying different phenotypes.

## 18

**RARE CAUSE OF PULMONARY HEMORRHAGE IN A PATIENT WITH WEGENER'S GRANULOMATOSIS: A CASE REPORT.** SAI YAN YUEN, JEAN-PIERRE MATHIEU (CHUM, MONTREAL, QUEBEC, HOPITAL MAISONNEUVE-ROSEMONT)

**Objective:**To report a case of pulmonary hemorrhage related to vascular erosions by an infected pacemaker lead.

**Methods:**Results Obtained and Conclusion: A 56-year-old man with Wegener's Granulomatosis (WG) was admitted for a possible relapse. He presented with recurrent hemoptysis and fever. An extensive pulmonary investigation were negative. C-ANCA was 291U/ml (normal <5 U/ml) one month prior to admission. Echocardiography showed significant tricuspid stenosis and severe pulmonary artery hypertension.

This patient had had a permanent pacemaker implanted for sick sinus syndrome. Ten years prior to this admission, he had undergone replacement of his pacemaker and leads. During the extraction procedure, the proximal extremity of the lead was fixed firmly in the right ventricle and the physician was unable to extract it. He therefore left the lead in place and planted the distal end under the skin. Four months later, the patient complained of pain around the surgical scar. This distal end of the lead was cut off, capped and loosely left in the blood vessel.

Retrospectively, on various chest X-rays, progressive migration of the distal lead from the left subclavian artery into the right pulmonary artery was observed. The other extremity of the lead remained fixed in the right ventricle. We suspected that the hemoptysis and the tricuspid valve destruction were related to the dislodgment of the lead. The patient underwent cardiac surgery to withdraw the lead and replace the tricuspid valve, coagulase-negative Staphylococcus was present in blood cultures. During surgery, an inflammatory tissue mass was identified at the junction of the posterior and septal leaflets and was resected.

Ten months following the operation, no more bleeding occurred.

We have reported a case of pulmonary hemorrhage not related to WG disease, but caused by vascular erosions secondary to a pacemaker lead dislodgement. To our knowledge, no similar case has been reported in the literature, though lead infection and dislodgement are known complications in cardiology. This rare cause should be added to the possible diagnosis for pulmonary hemorrhage in WG patients with pacemaker.

## 19

**ARTHRITISU.COM: AN ACCREDITED CHE LEARNING TOOL FOR GPS** Paul Davis MD FRCPC, Carter Thorne FRCPC (University of Alberta, The Arthritis Program, Southlake Regional Health Center)

**Objective:**To develop and utility an interactive Web-based site for the management of clinical problems in rheumatology

**Methods:**arthritisU.com was developed with the assistance of rheumatologists and family physicians and the University of Alberta, in accordance with accepted principles of adult Continuing Health Education (CHE). The program materials and resources have been recently updated and reviewed and endorsed as an appropriate self-directed learning activity by the University of Alberta (Mainpro-M2 credits).

Primarily designed for general practitioners, a key feature of the site is the interactive cases for users to work through. Cases are accompanied by expert opinion, a review quiz, which assesses learning achievements, as well as a summary of overall learning points. Also included are practice tools to assist in the daily management of patients with musculoskeletal complaints including a Pharmacy Databank, matrices and algorithms. The site also contains patient information on various MSK conditions. Case studies and lectures examine pertinent issues in the management of musculoskeletal diseases. Access to reference materials including abstracts and links to other relevant sites are provided. Future additions include a video script of a recent Q&A session with Canadian and US specialists.

**Results Obtained and Conclusion:** To assess the value of providing Internet-based learning, a number of activities have and will take place: a needs assessment prior to site development, hard copy assessments completed by a diverse group of family physicians; an evaluation component has also been added to the site. Following a recent update of the site, on-line evaluation continues to assess aspects of the site that users find of interest and relevant to their practice. The names of responders will be kept confidential; results will be compiled and considered for future additions/visions to the site.

**Brief Conclusion:** To ensure that arthritisU.com remains a useful resource to family physicians, its content has been evaluated via an On-line evaluation form. The form offers users the opportunity to rate the site's different components, list strengths and weaknesses, as well as indicate the relevance of the site's materials to their practices. The detailed results of this evaluation will be presented at CRA 2006.

## 20

**POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME – AN UNDER RECOGNIZED MANIFESTATION OF RHEUMATIC DISEASE** Jason Kur, John Esdaile (University of British Columbia, Vancouver, BC)

**Objective:** Posterior Reversible Encephalopathy Syndrome (PRES) is a rare neurologic condition identifiable on MRI and associated with renal insufficiency, hypertension, and rheumatologic diseases. Patients present with headache, altered mental function, seizures and loss of vision with findings on imaging studies of predominantly posterior leukoencephalopathy. With advances in radiologic imaging, there is a high likelihood of presentation of this syndrome to a rheumatologist.

**Methods:** Two recent cases of systemic lupus erythematosus (SLE) with PRES are compared / contrasted with five previously reported cases identified by literature review.

**Results Obtained and Conclusion:** Both patients presented with seizures and subacute visual changes in association with a background of lupus nephritis. The first patient presented with hypertension, complete visual field loss and status epilepticus two weeks after initiating oral cyclosporine therapy for refractory lupus nephritis. The second patient was normotensive and presented with seizures and visual symptoms while in hospital with SLE related pancreatitis. Head MRI showed predominantly posterior signal abnormalities on T2 weighted images, which resolved after cessation of cyclosporine in the first case and treatment with IV cyclophosphamide in the second case.

Literature review showed that PRES is a manifestation of SLE or a consequence of immunosuppression with calcineurin inhibitors or rituximab. The hallmark features are visual loss and seizures. Severe hypertension (>170/110 mmHg) and renal failure were present in all five previously identified cases of SLE and PRES. Our second case was normotensive but had marked disease lupus activity. PRES can lead to cerebral infarction.

**Brief Conclusion:** With increasing availability of MRI, PRES will be identified more frequently. Swift action to identify potential offending agents, controlling hypertension and treating active disease can lead to reversal of radiologic and neurologic findings.

## 21

**TRIAGE OF REFERRALS TO AN OUTPATIENT RHEUMATOLOGY CLINIC: ANALYSIS OF REFERRAL INFORMATION AND TRIAGE** Sara Graydon, Andrew Thompson (University of Western Ontario)

**Objective:** Many rheumatologists triage referrals to assess those patients who may benefit from early intervention. Success of triage strategies requires accurate transfer of clinical information between the primary care giver and rheumatologist. We describe a prototype triage system and formally evaluated the quality of referral content to a rheumatologist's practice.

**Methods:** Referrals were reviewed by the rheumatologist and, based on the information conferred, assigned a grade based upon a prototype triage system. This grade reflected each case's suspected urgency and guided the timing of consultation. After the initial rheumatologic consultation a post-hoc grade was assigned to each case based on the clinical information gathered. Agreement between referral and consultation grades was assessed. All cases graded as urgent at the time of consultation, and thus felt to be truly urgent, were examined for the quality of content of their referral letters.

**Results Obtained and Conclusion:** Ninety seven referrals were evaluated. Fifty one cases (53%) experienced a grade change between referral and consultation. Thirteen cases (13%) were upgraded to urgent status after consultation, reflecting inappropriately triaged truly urgent patients. Of these, the most common reason for inappropriate triage was the absence of important clinical information in the referral note.

Analysis of referral letters for truly urgent cases revealed the absence of a presumptive diagnosis, symptom duration, and documentation of involved joints in more than 30 percent of referrals. Joint stiffness was not reported in 77 percent of referrals and a functional assessment was missing from 92 percent. Physical exam for joint swelling was absent from 64 percent of referrals. More than 30 percent of referrals did not include inflammatory laboratory examinations such as CBC, ESR and CRP.

**Brief Conclusion:** Absence of basic historical, physical exam, and laboratory markers accounted for inappropriate triage of urgent cases. This paucity of referral details may be due time constraints, inadequate musculoskeletal knowledge, lack of interest, lack of a standardized referral form, or a lack of awareness of triage systems. This study recognizes dysfunction within the current model of care and questions the development of standardized referral tools as a solution. Other models of care should be investigated for this patient population.

## 22

**A PROSPECTIVE, RANDOMIZED CLINICAL TRIAL OF CORTICOSTEROID INJECTION IN MANAGEMENT OF CHRONIC ROTATOR CUFF IMPINGEMENT SYNDROME** Regina Taylor Gjevre, Janet Markland, Bindu Nair, John Gjevre, John Sibley, Haydar Sengul (University of Saskatchewan, University of Saskatchewan)

**Objective:** To evaluate the longitudinal efficacy of corticosteroid injection in treatment of chronic rotator cuff impingement syndrome (RCIS)

**Methods:** This is a single site, prospective, single-blinded clinical trial. Patients with 3-11 month history and physical examination consistent with RCIS were randomized to a subacromial injection of either triamcinolone and xylocaine or xylocaine alone. All patients received standardized instruction in a home physiotherapy program. The primary outcome measure employed was the validated self-administered L'Insalata total shoulder score (TSS), applied at baseline, three and six months post-intervention.

**Results Obtained and Conclusion:** Thirty-two patients were randomized, 16 to each group. The mean age was 55.13 (27-91) years. The population was 68.75% female. No significant differences in baseline characteristics or scores were found between treatment groups. Both groups demonstrated improvement in TSS scores from baseline at both three and six months. Repeated measures analysis utilizing a general linear mixed-effects model determined TSS as well as two domain subscores (global and pain) differed between groups, with the control group demonstrating significantly better scores than the corticosteroid group ( $p < 0.01$  to  $< 0.05$ ). We conclude that a single subacromial corticosteroid injection does not provide significant additional long-term benefit when combined with exercise therapy in treatment of chronic rotator cuff impingement syndrome.

**Brief Conclusion:** We conclude that a single subacromial corticosteroid injection does not provide significant additional long-term benefit when combined with exercise therapy in treatment of chronic rotator cuff impingement syndrome.

## 23

**COMPARISON OF PATIENT REPORTED SYMPTOM LOCALIZATION AND ELECTROPHYSIOLOGIC STUDY RESULTS IN A POPULATION WITH SUSPECTED CARPAL TUNNEL SYNDROME** Regina Taylor Gjevre, John Gjevre, Cheryl Geddes, Carol Boyle, Bindu Nair, John Sibley (University of Saskatchewan, Royal University Hospital)

**Objective:** To assess the relationship between symptoms and nerve conduction study (NCS) results in patients with suspected carpal tunnel syndrome (CTS).

**Methods:** This was a prospective, self-administered questionnaire study of patients with suspected CTS referred for NCS. The questionnaire included demographic information, symptom duration, localization and the validated Levine scoring instrument.

**Results Obtained and Conclusion:** The survey was completed by 211 patients, of whom 156 (73.9%) were female. Population mean age was 46.7 (21-88) years. Median body mass index (BMI) was 28.25 kg/m<sup>2</sup>. The



right hand was dominant in 191 (90.5%) patients. Bilateral symptoms were reported by 139 (65.9%) and isolated unilateral symptoms by 72 (34.1%) patients. Mean symptom duration was 29.3 (1-300) months. Patients with positive NCS for CTS were significantly older and had significantly higher BMIs. Poor concordance between symptom lateralization and electrophysiologic findings was observed. Patients with bilateral symptoms had the highest concordance rate of 38.9%, those with isolated left side symptoms the lowest rate at 13.8%. Employing NCS data as a standard, the sensitivity of reported symptoms was 86.4%, specificity 20.1%, positive predictive value 49.1%, negative predictive value 62.5%, and accuracy was 51.4%. The positive and negative likelihood ratios were 1.131 and 0.702 respectively.

Patients with positive NCS for CTS were significantly older with higher BMIs. Poor concordance existed between symptom lateralization and electrophysiologic data in this population. Clarification of the relationship between clinical presentations and electrophysiologic changes would assist in the diagnostic process.

**Brief Conclusion:** Patients with a positive NCS for CTS were significantly older with higher BMIs. Poor concordance existed between symptom lateralization and electrophysiologic data in this population. Clarification of the relationship between clinical presentations and electrophysiologic changes would assist the diagnostician.

## 24

**FREQUENCY OF THERAPEUTIC INTERVENTIONS IN SUSPECTED CARPAL TUNNEL SYNDROME** Regina Taylor Gjevre, John Gjevre, Carol Boyle, Lannae Strueby, Bindu Nair, John Sibley (University of Saskatchewan)

**Objective:** To evaluate the prevalence of use of therapeutic interventions in a population with suspected carpal tunnel syndrome (CTS).

**Methods:** This was a single site, prospective, self-administered questionnaire study of patients with suspected CTS referred for nerve conduction studies (NCS). The questionnaire included demographics, the Levine symptomatic/functional scoring instrument and therapeutic interventions. A follow-up telephone questionnaire was administered one year post-NCS. **Results Obtained and Conclusion:** 211 patients completed the survey, 73.9% were female with a mean age of 47.4 (21-88) years. Mean age of the 55 men was 44.9 (23-83) years. Mean symptom duration was 29.3 (1-300) months. Wrist splints were prescribed to 33.2% of patients, with 13% of this group undergoing splint adjustment and 78.3% of users reporting subjective benefit. Vitamin B6 use was reported by 8.5% of patients. Four individuals (1.9%) received intra-canal corticosteroid injection. No significant differences in age, body mass index, gender, symptom duration, Levine scores, or NCS results were noted between patients prescribed these therapeutic interventions and the remainder of the population, nor between those who reported subjective improvement and those who did not. Follow-up one year post-NCS revealed an interval increase in frequency of both conservative and surgical treatment recommendations. However, there continued to be no significant differences in treatment recommendations between groups based on the NCS results one year later.

A substantial proportion of patients with suspected CTS are not offered therapeutic interventions. NCS results did not appear to influence physicians' treatment recommendations in this study population.

**Brief Conclusion:** A substantial proportion of patients with suspected CTS are not offered therapeutic interventions. NCS results did not appear to influence physicians' treatment recommendations in this study population.

## 25

**MULTISITE ULTRASOUND AND VERTEBRAL DEFORMITY: FINDINGS FROM THE CANADIAN MULTICENTRE OSTEOPOROSIS STUDY (CaMOS).** Wojciech P. Olszynski, George Ioannidis, Jacques P. Brown, David A. Hanley, J.D. Adachi, K. Shawn Davison (University of Saskatchewan, Saskatoon, SK, McMaster University, Hamilton, ON, University of Laval, Quebec City, PQ, University of Calgary, Calgary, AB) **Objective:** The use of multisite ultrasound to assess fracture risk is an attractive technology due to its simplicity of use, lack of ionizing radiation, low capital cost, and portability. This investigation used a subset of the Canadian Multicentre Osteoporosis Study (CaMOS) dataset to cross-sectionally assess the association between ultrasound (speed of sound) at the distal radius, phalanx or tibia and vertebral deformity (>3 SD lower than population mean in anterior, middle, or posterior vertebral height) in

women aged 50 years or greater.

**Methods:** Data from Saskatoon, Quebec, St. John's, Calgary and Hamilton were used in this analysis. A Sunlight OmniSense Multisite Ultrasound (Israel) was used for all ultrasound assessments and all ultrasound data was collected at year 5 of CaMOS. A general linear model analysis was used to assess the association between ultrasound measures at all sites and vertebral deformity risk with correction for height, weight, age, and CaMOS centre.

**Results Obtained and Conclusion:** Following a radiograph of the spine at year 5 of CaMOS, 744 women (74.4%) were found to have no vertebral deformity, whereas 256 women had a vertebral deformity (25.6%). Women without a vertebral deformity had higher ultrasound measurements at the distal radius by 30.2 points (95% CI: 5.5, 55.1), at the tibia by 32.3 points (95% CI: 9.6, 55.0), and at the phalanx by 10.6 points (95% CI: -20.8, 42.0; NS). This analysis has shown that the Sunlight OmniSense Multisite Ultrasound has the ability to discriminate between women with or without vertebral deformity whether used at the distal radius or tibia, but not the phalanx, site. Since the data analysis for vertebral deformities and non-vertebral fractures in CaMOS is ongoing and soon to be completed, updated analyses investigating the use of Sunlight OmniSense Multisite Ultrasound for discriminating between those with a risk for both vertebral deformity and non-vertebral fracture will be reported at the meeting.

**Brief Conclusion:** Multisite ultrasound is a promising technology for the stratification of fracture risk in postmenopausal women.

## 26

**EXISTING PAIN MEASURES FAIL TO CAPTURE THE EXPERIENCE OF PAIN IN PEOPLE WITH OA.** Melissa French, Angela Wall, Lucy Frankel, Monique Gignac, Gillian Hawker (Sunnybrook and Women's College Health Sciences Centre, University Health Network, Arthritis Community Research and Evaluation Unit, Sunnybrook and Women's College Health Sciences Centre and The University of Toronto)

**Objective:** The purpose of this study was to: a) increase our understanding of the pain experience in people with OA; and b) assess the adequacy of available pain measures to capture this experience.

**Methods:** Focus groups were conducted separately in men and women aged 64+ years with symptomatic hip/knee OA. Participants completed a questionnaire to determine level of education, OA pain (WOMAC pain and VonKorff Pain Intensity [VPI] scales) and disability (WOMAC physical function scale). Focus groups were conducted until we reached saturation. The sessions were audio taped and transcribed verbatim. Two researchers independently reviewed the transcripts and a list of themes (domains), and items within each domain, were identified. These domains and items were then mapped onto those identified in existing pain measures to assess the content validity of the latter in the context of OA.

**Results Obtained and Conclusion:** Forty-two individuals participated in 6 focus groups (14 men and 28 women). Participants' mean age was 74.9 years (SD 7.0); 95.2% were Caucasian, 73.8% had = high school education, and 45.2% had undergone hip/knee replacement. Mean WOMAC and VPI scores were 7.9/20 (0-16) and 52/100 (10-87), respectively. Mean WOMAC function score was 25.9/68 (7-40). Five OA pain domains were identified: pain characteristics (intensity, quality, location, frequency and duration, and variability), factors affecting pain (e.g. activity, weather and temperature), modifications made to cope with pain (e.g. medications, gadgets/devices, keeping active), pain impact (e.g. on social activities, mobility, and mood), and discussion about pain with others (e.g. social comparisons). Twelve pain measures met our eligibility criteria (valid, reliable, suitable for use in elderly). Of these, 9/12 assessed pain characteristics, 7/12 assessed pain impact, and 1 each assessed factors affecting pain, modifications made to cope with pain, and pain discussions.

**Brief Conclusion:** Existing pain measures do not adequately capture the pain experience of people living with disabling OA. Improved evaluation of pain in OA would facilitate assessment and treatment of OA, as well as the choice of outcome measures for OA clinical trials.

## 27

**DAYTIME SLEEPINESS MAY BE AN UNDER-IDENTIFIED CONTRIBUTOR TO FATIGUE IN OSTEOARTHRITIS** Brian Murray, Cahyee Cheung, Dana Jewell, Gillian Hawker (Division of Neurology, Sunnybrook and Women's College Health Sciences Centre, the University

of Toronto, Division of Rheumatology, Sunnybrook and Women's College Health Sciences Centre, the University of Toronto, Toronto)

**Objective:**Determine the prevalence of sleepiness in individuals with disabling osteoarthritis (OA).

**Methods:**Subjects of an OA cohort were assessed with a "maintenance of wakefulness test" (MWT). The MWT consisted of 40-minute periods (1, 3pm) where the participant tried to stay awake. Shorter sleep latencies indicated increased sleepiness. A daytime polysomnographic (sleep study) assessment was also performed. Subjects completed psychomotor vigilance reaction time tasks (PVT), which correlates with sleep deprivation. Subjective sleepiness was assessed with the Epworth Scale. Information about sleep habits were collected, as well as pain (WOMAC), fatigue (FACIT) and depression (CES-D). Data is available on the first 10 subjects (9 female), and 9 MWTs are analyzed.

**Results Obtained and Conclusion:** Mean age was 75 years. Mean Epworth was 8.1 (SD 5) - minimal subjective sleepiness. Mean WOMAC was 7.2 (SD 3.8) and mean CES-D was 12.7 (SD 8.9). Only half of subjects knew if they snored; of the remaining, 4/5 reported snoring. 70% reported a sensation suggestive of restless legs. Only 3 subjects were on medications that influence sleepiness (opiate-1, sleeping pills-1, neuropathic pain agent-1). Mean latency at 1pm assessment was 27mins (4/9 slept; all reached stage 2, 1 reached stage 3). For the 3pm assessment, mean latency was 20mins (8/9 slept; 4 reached stage 2, and 1 reached stage 3). 5/8 subjects that slept denied sleeping. 3 subjects had findings compatible with sleep apnea. Median reaction time correlated with sleep latency ( $r=-0.60$ ,  $P<0.05$ ). Fatigue was associated with prolonged reaction times ( $r=0.70$ ,  $P<0.05$ ). Current pain (modified Von Korff 0-10 scale) was inversely related to sleep latency ( $r=-0.80$ ,  $p<0.01$ ).

**Brief Conclusion:** Sleepiness is a significant factor for patients with OA, and represents an intervention target. Patients with OA report sleep complaints and the degree of sleep problems in these patients should be clarified. The inverse relation between pain and sleep latency argues against the suggestion that pain alone interrupts sleep (in the day) in OA.

## 28

**RADIOGRAPHIC PREVALENCE OF DEGENERATIVE SPINAL CHANGES, SCHEUERMANN'S DISEASE, CALCIFICATIONS AND DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS IN AN ELDERLY RANDOM POPULATION AND THEIR EFFECTS ON OSTEOPOROSIS DIAGNOSIS** Sai Yan Yuen, Sonia Jean, Marc Gendreau, Louis Bessette, Jacques P Brown, CaMos Research Group (University of Montreal, Montreal, Quebec, Laval University, Ste-Foy, Quebec, McGill University, Montreal, Quebec)

**Objective:**To determine the radiological prevalence and distribution of degenerative spinal changes, Scheuermann's disease, calcifications, and skeletal hyperostosis (DISH) in a randomly selected Canadian population and to determine their impact on bone mineral density (BMD) and osteoporosis diagnosis

**Methods:**Subjects 50 years and older who had hip and spine BMD measurements (Hologic QDR 4500-A) and posterior-anterior and/or lateral thoracic and lumbar spine radiographs at baseline, were randomly selected from one of the nine centre (Quebec City) participating in the Canadian Multicentre Osteoporosis Study (CaMos).

Radiographic findings and their spinal level were recorded and reported as follow: Scheuermann's disease, diffuse idiopathic skeletal hyperostosis (DISH), ankylosing spondylitis, aortic calcifications, inter-vertebral disc calcifications, disc space narrowing, intra-spongious herniated disc, well-defined sclerotic vertebral margins, osteophytes, apophyseal joints osteoarthritis, scoliosis  $>15^\circ$ , thoracic kyphosis  $>50^\circ$ , Schmorl's nodes, spondylolisthesis, enostosis and hemivertebra. The impact of hyperostosis, calcifications and degenerative spinal changes on BMD measurements and the potential misclassification of Scheuermann's disease as osteoporotic vertebral fractures were analysed.

**Results Obtained and Conclusion:** 441 radiographs were studied. The mean age ( $\pm$ SD; range) was 67.1 yrs ( $\pm$ 8.5 yrs; 50-91) and 72.8% were female. With the exception of Scheuermann's disease, the incidence of various degenerative changes, DISH, and aortic calcifications increased linearly with age. DISH, osteophytes, Schmorl's nodes and aortic calcifications were more frequently present in men. Lumbar spine BMD were significantly increased with the presence of DISH, disc space narrowing, well-defined sclerotic vertebral margins, osteophytes, apophyseal joints

osteoarthritis or Schmorl's nodes. Total hip BMD were significantly increased with the presence of DISH and vertebral osteophytes. Scheuermann's disease was diagnosed on 26 radiographs and only one (3.8%) was misclassified as an osteoporotic fracture.

**Brief Conclusion:** Several radiological anomalies are highly prevalent in this population. These findings have an influence on the interpretation of lumbar spine and total hip BMD measurements and may be sources of error in the diagnosis of osteoporosis.

## 29

**STATIC WRIST SPLINT USE IN THE PERFORMANCE OF DAILY ACTIVITIES BY INDIVIDUALS WITH RHEUMATOID ARTHRITIS** Ada Pagnotta 1,2,3, Nicol Korner-Bitensky 3,4,5, Babara Mazer 3,4, Murray Baron 2,5,6, Sharon Wood -Dauphinee 3,4,5 (1.Occupational Therapy Department of the Jewish Rehabilitation Hospital, 2.Rheumatology of the Jewish Rehabilitation Hospital, Chomedey., Laval, Quebec, Canada, 3.Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain (CRIR), 4.School of Physical and Occupational Therapy, 5.Faculty of Medicine, McGill University, Montreal, Quebec, Canada, , 6.Jewish General Hospital, Montreal, Quebec, Canada.)

**Objective:** The primary objective of this study was to identify, in individuals with rheumatoid arthritis (RA), the impact of wrist splint wear on pain, work performance, endurance, perceived task difficulty and perceived splint benefit while performing various upper limb tasks as simulated on a work simulator.

**Methods:** This crossover study included 30 individuals having RA with wrist involvement. Participants were eligible if they were using a commercially available, circumferential fabric-type wrist splint for at least one month. Work performance (amount of work done over 30 seconds) was assessed on 10 Baltimore Therapeutic Equipment (BTE) work simulator activities, each activity being performed under two conditions, with the splint on and with the splint off. Four work performance tasks were chosen to assess endurance (the amount of work done for a maximum of 7 minutes) Pain, perceived task difficulty and perceived splint benefit were rated using a 10 cm horizontal visual analog scale. Order of splint use was randomly assigned such that half of individuals were assessed first with the splint, the other half first without the splint.

**Results Obtained and Conclusion:** With the splint on, pain was significantly lower in five tasks as was perceived difficulty in task performance. Work performance did not differ significantly with the splint on versus off. While mean endurance scores were always better with the splint on, differences reached significance on only one. task. The task with greatest overall perceived splint benefit was "chopping with a knife". Results demonstrated that for most tasks, there was generally a positive effect of splint use on hand function, however, perceived splint benefit was marginal. For most tasks, splint use improved or did not change pain levels, did not interfere with work performance, increased or maintained endurance and did not increase perceived task difficulty

**Brief Conclusion:** The findings suggest that the impact of wrist splint use on hand function is highly task specific and does not make splint prescription a simple process; clinicians and clients need to work together to determine the daily wear pattern that maximizes benefit and minimizes inconvenience according to the client's individual needs.

## 30

**COLONY FORMING ENDOTHELIAL PROGENITOR CELLS ARE REDUCED IN SYSTEMIC SCLEROSIS** Julia Hlynsky, James Dunne, Beth Whalen, Anna Meredith, Stephan van Eeden (iCapture Centre St. Paul's Hospital and UBC. Vancouver BC, div. Rheumatology and Int Medicine St Paul's Hospital and UBC. Vancouver BC, iCapture Centre St. Paul's Hospital Vancouver.BC, iCapture Centre ,St.Paul's Hospital Vancouver BC, iCapture Centre, and Dept of medicine, St. Paul's Hospital and UBC Vancouver. BC)

**Objective:**Endothelial progenitor cells (EPC) circulate in human peripheral blood and participate in vascular repair. To measure EPC colony forming units (CFU) ,and CD34+ cells in the peripheral blood of Systemic Sclerosis (SSc) patients and normals.and relate them to disease activity

**Methods:** We measured the number of EPC colony forming units (CFU) in the peripheral blood of 17 patients with SSc and 15 normal subjects. CD34+ cells were quantified by flow cytometry.Peripheral mononuclear



cells were cultured in Endocult growth medium, replated after two days of incubation and then stained and counted on day five. Colonies were defined by multiple thin flat cells emanating from a central core of round cells. Colony counts were performed in a minimum of 3 wells. Disease activity was measured by Valentini's et al. Disease activity index (DA). Results Obtained and Conclusion: CD34+ cell numbers were not significantly different between normals and SSc patients. A significant positive correlation was found between CD34+cell numbers and SSc disease activity. (r = 0.43, p < 0.05). There was no correlation between circulating CD34+cells and CFU's in either normals or SSc patients. Colony numbers were significantly less in SSc patients than in normals (normals mean 39.0 ± v SSc mean 19.6 ± 16, p < 0.05). The colonies appeared to be smaller in size with disrupted architecture in some SSc patients when compared to normals. CFU numbers did not correlate with SSc disease activity. Brief Conclusion: SSc Endothelial progenitor cells as measured by their ability to form colonies were less and of different architecture when compared to normals. Whether this defect is intrinsic or extrinsic to these cells will require further study

## 31

**DETERMINING EMPIRICALLY COMPONENTS OF TREATMENT FOR DEPRESSED EARLY RA PATIENTS** Patricia L. Dobkin, Marta Filipski, Murray Baron, Sasha Bernatsky, Karl Looper, Early RA Group (McGill University)

Objective: Identify target areas for psychosocial treatment of depression in early RA patients.

Methods: Patients enrolled in the McGill Early Arthritis Registry (N = 122) were screened for depression using the Center for Epidemiology Studies Depression Scale, using a cut score of 19 or greater. Depressed (n = 27) and non-depressed (n = 95) patients were compared on psychosocial measures (e.g., coping with illness, satisfaction with social support, self-efficacy for pain management) and clinical indices of disease activity (DAS28) and functioning (HAQ).

Results Obtained and Conclusion: The registry currently consists of 71.3% women with an average age of 54.8 (SD = 15.4). At the first assessment (i.e., entry into the registry) 28.4% screened positive for depression. The mean score on the CES-D scale for the depressed group was 27.4 (SD = 7.4) which indicates that a diagnosis of depression most likely would be made with a clinical interview (the gold standard). The depressed patients differed significantly from their non-depressed counterparts on the following variables: more emotional preoccupation coping (p = .000), less palliative coping (p = .000); higher pain intensity (p = .000); lower self-efficacy for pain management (p = .000); more disability as measured on the HAQ (p = .000), but differences on the DAS28 (a more objective measure of disease activity) were not significant, once a Bonferroni correction for multiple testing was employed. There were no significant differences on satisfaction with social support between the two groups.

Brief Conclusion: Psychosocial treatment for depressed early RA patients needs to include components aimed at decreasing emotional preoccupation, increasing self-efficacy for pain management, and dealing better with pain and disability. This could be done within a group Cognitive-Behavioural Therapy context or on an individual basis. Given that depression is associated with poor treatment adherence and high health service utilization it behooves us to offer empirically supported adjunct psychosocial treatment for this subgroup of early arthritis patients early on so as to reverse the downward spiral likely to occur in this at-risk group.

## 32

**PREVALENCE OF MUSCLE SYMPTOMATOLOGY IN HYPERLIPIDEMIC PATIENTS TREATED WITH LIPID LOWERING AGENTS.** Tony Wassef, Tom Wilson, Bindu Nair, Regina Taylor-Gjevre (University of Saskatchewan)

Objective: The rare complication of rhabdomyolysis has been recognized with statin therapy. Lesser degrees of muscle injury and symptomatology have also been associated with use of lipid lowering agents. In this study we sought to evaluate the frequency of musculoskeletal complaints in a population treated with lipid lowering agents.

Methods: This was a prospective, questionnaire study of patients attending hyperlipidemia clinic at a university hospital outpatient clinic. Our questionnaire instrument included demographic data, questions on diagnoses of

myositis or elevated CK levels, as well as the standardized rheumatologic scales, the modified HAQ, the MSK component of the SF-36, and the London Fibromyalgia Epidemiology Study Survey (LFESSQ). Medical records were accessed to determine CK measurements.

Results Obtained and Conclusion: Of the 117 patients approached to participate in this study, 112 consented and completed the questionnaire. Of these 81 were treated pharmacologically with 64 receiving a statin, 12 receiving fibrates, and 5 on combination therapy. Diet and exercise therapy were used without pharmacotherapy in 31 patients. The overall mean age for the study population was 56.7 (20-78) years. The mean age for the drug treatment group was 58.6 (22-78) years, and for the diet treatment group was 51.9 (20-74) years. The pharmacologic treatment group had 43 women (53.1%), the dietary treatment group had 18 (58%). A diagnosis of myositis had been made previously in two patients in the pharmacologic treatment group and four patients had previously elevated CK levels. In the dietary group, no patients had been diagnosed with myositis, but one had an elevated CK previously. Pre-existing diagnoses of fibromyalgia were reported in 5 pharmacologic treated patients and 3 from the diet therapy group. No significant differences between treatment groups were observed for the LFESSQ, mHAQ, or MSK SF-36 scores.

We found no significant differences in musculoskeletal symptoms or functioning between the hyperlipidemic patients on pharmacotherapy and those on dietary therapy. We found no evidence in our population for a low-grade myositis in patients on lipid lowering pharmacotherapy.

Brief Conclusion: We found no significant differences in muscle symptoms between treatment groups.

## 33

**PREVALENCE OF ANTIBODIES AGAINST CYCLIC CITRULLINATED PEPTIDE IN DIFFERENT SUBSETS OF PATIENTS WITH ARTHRITIS** Edith Villeneuve, Boulos Haraoui (Centre hospitalier de l'Université de Montréal)

Objective: Rheumatoid arthritis (RA) is associated with several antibodies including antibodies against cyclic citrullinated peptide (anti-CCP) that were discovered recently. This novel autoantibody has mostly been evaluated as a diagnostic and a prognostic marker but its usefulness in daily practice has yet to be established. Its advantage over the rheumatoid factor (RF) in RF+ positive patients is unclear as well as in patients who are RF- but still fulfill the diagnostic criteria for RA. We therefore evaluated the prevalence of anti-CCP in different subsets of patients with arthritis in order to correlate with certain clinical features or markers of severity other than joint erosions.

Methods: Anti-CCP were measured in serum samples from 11 patients with juvenile inflammatory arthritis (JIA) who are of adult age now, 25 patients with RF- polyarthritis meeting RA criteria and in 21 patients with atypical erosive RA. We defined atypical erosive RA as patients meeting RA criteria but who developed more erosions and destructive changes, often requiring surgery, in medium and large joints while small joints of the hands and feet were relatively spared. Each patient was seen once to evaluate the activity and severity of the disease by questionnaire, physical exam, review of the medication and blood tests. Xrays were also ordered if they had not been done in the past few months or did not already show erosive changes. Severity was based on the HAQ, need for surgery, DMARDs usage, importance of erosive changes and duration of the disease.

Results Obtained and Conclusion: Anti-CCP were positive in 33% of patients with JIA of adult age, 35% of patients with seronegative RA and 80% of patients with atypical erosive disease. Anti-CCP did not correlate with any subset of JIA nor any clinical features or marker of severity of the disease in adult patients.

Brief Conclusion: Anti-CCP measurement is not useful in patients with an already established arthritis as it does not seem to discriminate between patients with more typical or atypical course or to be associated with markers of severity.

## 34

**SEVERE FATAL COMPLICATIONS ASSOCIATED WITH INFlix-IMAB THERAPY IN RHEUMATOID ARTHRITIS** Liam Martin, Susan G. Barr, Francis Green, Marvin J. Fritzler (University of Calgary)

Objective: Anti-TNF therapies can be associated with severe adverse events for which patients require close monitoring. Pulmonary adverse events

have been reported, most often upper airways congestion and occasional opportunistic infections. A number of cases of interstitial pneumonitis associated with infliximab have been reported. We report the occurrence of two fatal episodes of interstitial pulmonary disease associated with infliximab therapy.

**Methods:**The first patient, a 73 year old Caucasian female, had severe RA for 23 years. She had RA associated interstitial lung disease, which was asymptomatic, for 5 years. She had failed conventional second line therapies and was started on infliximab. Her pre-treatment chest x-ray showed changes of chronic interstitial lung disease. Her mantoux test was negative. She received 2 infusions of infliximab at 3mg/kg body weight. Three weeks after her second dose she was admitted to ICU with severe dyspnoea and a cough. She was afebrile, and had negative blood cultures and bronchoalveolar lavage. Her chest x-ray showed changes consistent with interstitial lung disease. She was treated with high dose steroids but her pulmonary status continued to deteriorate. She died 3 weeks later. The family refused permission for an autopsy. The second patient, a 68 year old Caucasian female, had RA for 10 years. She was diagnosed with interstitial lung disease, which was mildly symptomatic, for 12 years. After failing conventional therapies for RA, she was started on infliximab at 3mg/kg body weight. Her pre-treatment chest x-ray showed no acute changes and her mantoux test was negative. Four weeks after her eighth infusion she was admitted to hospital with acute dyspnoea and required admission to ICU for respiratory support. Blood cultures and bronchoalveolar lavage were negative for infection. A CT scan of the chest was consistent with ARDS and she was treated with high dose steroids. She did not respond and died 8 days later. An autopsy revealed ARDS and pulmonary fibrosis.

**Results Obtained and Conclusion:** Although severe pulmonary complications are uncommon in patients treated with anti-TNF therapies, these 2 cases suggest that we need to be vigilant when treating patients with pre-existing pulmonary fibrosis.

## 35

**MEASUREMENTS OF HAND RANGE OF MOTION CORRELATE WITH FUNCTION IN SYSTEMIC SCLEROSIS** Elizabeth M Hazel, Marie Hudson, Suzanne Taillefer, Murray Baron (McGill University, Montreal, QC)

**Objective:**To examine the role of three different measurements of hand range of motion (ROM) as predictors of functional ability in patients with Systemic Sclerosis (SSc).

**Methods:**Fingertip-to-palm distance in full flexion (F-P), hand span (tip of thumb to tip of 5th digit) and hand length (distal wrist crease to tip of 3rd digit) were measured in 136 patients (78.3% female) with a mean age 56.5 years and mean disease duration of 8.17 years (SD= 7.9) participating in the Canadian Scleroderma Research Group (CSRG). The sum of right and left-hand values were correlated with functional ability using the Health Assessment Questionnaire Disability Index (HAQ-DI), the self care domain of the WHO Disability Assessment Schedule II (WHODAS II) and the physical component of the Short Form 36 survey (SF36-PCS). A HAQ-DI upper extremity score was constructed from relevant HAQ questions. We computed the modified Rodnan total skin score (TSS). To determine the independent contribution of hand ROM to function, we performed stepwise multiple regression analysis of F-P, TSS and physician global assessment on the HAQ DI.

**Results Obtained and Conclusion:** All three hand measurements correlated with the HAQ-DI (in particular the upper extremity domain), the self care domain of the WHODAS II, and the SF36-PCS, with F-P appearing to have the highest correlation (Pearson correlation coefficients 0.58 for HAQ-DI, -0.39 for SF36-PCS and 0.53 for WHODAS II Self Care, all with  $p < 0.01$ ). TSS correlated well with F-P ( $r = 0.50$ ) and handspan ( $r = -0.30$ ) but poorly with hand length ( $r = -0.09$ ). In regression analysis, F-P was a significant predictor of the HAQ-DI when controlling for TSS and physician global assessment of disease. ( $\beta = 0.412$ ,  $p = 0.001$ )

**Brief Conclusion:** Measurements of hand range of motion in patients with SSc provide the clinician with an objective tool that correlates with functional status and quality of life. F-P is an important predictor of global function when controlling for TSS and physician global evaluations.

## 36

**NIGHT PAIN HAS AN ADVERSE EFFECT ON WELLBEING IN**

**RHEUMATOID ARTHRITIS** Yoram Shir, Mark Ware, Deborah Da Costa, Mary-Ann Fitzcharles (McGill Pain Centre, McGill University, Montreal, Quebec, Department of Medicine, McGill University, Montreal, Quebec, Division of Rheumatology/McGill Pain Centre/Department of Medicine, McGill University, Montreal, Quebec)

**Objective:**Night joint pain in patients with rheumatoid arthritis (RA) may cause disturbed sleep. Poor sleep may in turn impact upon health and well-being. Current measures of disease status in RA do not include night pain as a variable. This study examined factors associated with self-report of night pain in patients with RA.

**Methods:**A cross-sectional study of consecutive RA patients was conducted. Patients were questioned regarding night pain. Night pain was categorised as present if patients reported that pain occurred at least nightly or repeatedly during a single night, and not present, if it occurred less often than each night. Measures of disease status included: joint swelling (JS), HAQ, DMARD and steroid use. Measures of distress included: Depression and anxiety on the relevant subscales of the AIMS questionnaire, McGill pain questionnaire (MPQ), patient global assessment (PTG) on a 10cm VAS, and report of distress caused by pain on a 4 point Likert scale.

**Results Obtained and Conclusion:** Sixty RA patients, (54 female), mean age 57 years ( $\pm 13$ ), and positive rheumatoid factor 42 (70%) were studied. RA disease characteristics for the whole group were as follows: disease duration  $15 \pm 13$  yrs, JS  $8 \pm 6$ , HAQ  $1.14 \pm 0.74$ , currently on DMARD 54 (93%), and use of  $> 3$  DMARDS 23 (39%), and on steroids 20 (33%). 29 (49%) patients reported at least nightly occurrence of pain. The group with night pain compared to those without night pain had more depression 4.1 vs 3.1 ( $p = 0.05$ ), scored higher on the MPQ 23 vs 12.5 ( $p < 0.001$ ), reported more distress due to pain 2.9 vs 1.9 ( $p < 0.001$ ), rated global disease status higher 5.5 vs 2.4 ( $p < 0.001$ ), and had a higher HAQ 1.4 vs .85 ( $p = 0.002$ ). There were no differences between the groups for measurements of joint swelling, DMARD or steroid use, or measurements of anxiety.

**Brief Conclusion:** Night pain is significantly associated with distress in patients with RA and is less related to standard measures of disease activity. Reduction in night pain may greatly improve overall well-being in RA patients.

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**ADJUVANT MEDICATION USE IN RA** Mary-Ann Fitzcharles, Deborah Da Costa, Mark Ware, Yoram Shir (Division of Rheumatology/McGill Pain Centre/Department of Medicine, McGill University, Montreal, Quebec, Department of Medicine, McGill University, Montreal, Quebec, McGill Pain Centre, McGill University, Montreal, Quebec)

**Objective:**Pain, mood and sleep disturbance are factors impacting on quality of life in rheumatoid arthritis (RA). These complaints may be moderated by use of pharmacologic treatments. We examined the use of adjuvant medication, other than disease modifying drugs (DMARDS), nonsteroidal drugs (NSAIDs) and corticosteroids in RA patients.

**Methods:**Consecutively attending RA patients reported pain intensity on a visual analogue scale (VAS) and mood was measured by AIMS anxiety and depression scale. Adjuvant medication use and concerns regarding pharmacologic treatments were recorded.

**Results Obtained and Conclusion:** Sixty RA patients, (54 female), mean age 57 years ( $\pm 13$ ), disease duration  $15 \pm 13$  yrs were studied. Median current pain intensity was  $4.2 \pm 2.7$  (range 0-9.5), with 30 reporting pain  $> 4.0$ . AIMS depression and anxiety were  $3.6 \pm 2$  and  $2.1 \pm 1.4$  respectively. Adjuvant medications were being used regularly (at least 5 times/ week) by 26 (43%) as follows: simple analgesics 13, tranquilizers 9, codeine and opioids 5, antidepressants 4, muscle relaxants 1 and others including antiepileptics in 5. Adjuvant users reported significantly longer pain duration 19 vs 12 ( $p = .04$ ) yrs, more pain 5.2 vs 3.5 ( $p = .02$ ), global disease 5.2 vs 2.9 ( $p = .001$ ), depression 4.5 vs 2.9 ( $p = .003$ ) and anxiety 2.5 vs 1.7 ( $p = .04$ ). Examination showed more tender points 6.2 vs 3.1 ( $p = .04$ ) and tender joints 12 vs 7 ( $p = .04$ ) in users, but no significant differences for age, number of swollen joints, HAQ, or DMARD, NSAID or steroids use. Concerns regarding medication use were common for the whole group, but did not differ between users and non-users. Concerns included side effects of medication in 80%, dislike for taking many medications in 63%, drug interactions in 57%, drug addiction in 35%, and masking of disease in 27%. **Brief Conclusion:** Factors other than traditional measures of RA disease severity are associated with use of adjuvant medications. Pain and mood disturbance are associated with adjuvant use, but users remain more symp-

tomatic than non-users. Distress in RA patients may be an important dimension of suffering different from disease activity.

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**PAIN REPORTING IN RHEUMATOID ARTHRITIS MAY BE A CHARACTERISTIC OF INDIVIDUAL PAIN SENSIBILITY RATHER THAN DISEASE STATUS** Mark Ware, Mary-Ann Fitzcharles, Deborah Da Costa, Yoram Shir (McGill Pain Centre, McGill University, Montreal, Quebec, Division of Rheumatology/Department of Medicine/McGill Pain Centre, McGill University, Montreal, Quebec, Department of Medicine, McGill University, Montreal, Quebec)

**Objective:** Patients' report of pain intensity (PTP) as recorded on a visual analogue scale is an important component of measurement of disease status in rheumatoid arthritis (RA). It is possible that PTP may be more closely aligned with generalized pain hypersensitivity rather than with disease activity. The purpose of this study was to explore factors correlating with PTP in patients with RA.

**Methods:** A cross-sectional study of consecutively attending RA patients was conducted. The following variables were measured: duration of disease, age, joint swelling (JS), joint tenderness (JT) (68 joint count), patient global assessment (PTG), health assessment questionnaire (HAQ), ESR, DMARD and steroid use. Additional pain measures were: PTP, tender point count (TP) and the McGill pain questionnaire (MPQ). Depression and anxiety were measured on the relevant subscales of the AIMS questionnaire.

**Results Obtained and Conclusion:** Sixty RA patients, (54 female), mean age  $\pm$  SD,  $57 \pm 13$  yrs, and positive rheumatoid factor 42 (70%) were studied. RA disease characteristics were as follows: disease duration  $15 \pm 13$  yrs, JS  $8 \pm 6$ , HAQ  $1.14 \pm 0.74$ , currently on DMARDs 54 (93%), use of  $> 3$  DMARDs 23 (39%), and on steroids 20 (33%). PTP was significantly correlated with JT ( $p=0.001$ ), PTG ( $p<0.001$ ), TP ( $p=0.01$ ), HAQ ( $p<0.001$ ), and the total MPQ ( $p<0.001$ ), as well as the evaluative, sensory and affective subcategories of the MPQ, but not with duration of disease, age, JS, ESR, DMARD or steroid use, or the depression and anxiety subscales of the AIMS.

**Brief Conclusion:** The pain reported by patients with RA might, therefore, more closely represent a specific characteristic of pain sensibility as unique to an individual patient, rather than being a reflection of RA disease or psychological status. Further study should address objective measures of pain in order to better clarify the weight given to pain report in global assessment of RA status.

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**DEVELOPMENT AND VALIDATION OF THE EDMONTON ANKYLOSING SPONDYLITIS METROLOGY INDEX (EDASMI)** Walter P. Maksymowych, Catherine Mallon, Rhonda Richardson, Barbara Conner-Spady, Edwin Jauregui, Cecilia Cheung, Lisa Zappala, Kevin Pile, Anthony S. Russell (University of Alberta, Edmonton, CAYRE Arthritis and Rehabilitation Clinic, Bogota, Columbia, James Cook University, Queensland, Australia)

**Objective:** Assessment of spinal and hip mobility has been recommended by the Assessments in AS Working Group (ASAS) though 2 of the 3 recommended measures, occiput-to-wall and the modified Schober's, primarily reflect structural damage. One composite measure has also been developed, the Bath AS Metrology Index (BASMI), though 2 of the 5 measures primarily reflect structural damage. Our objective was to validate a simple, 4-item composite measure of spinal and hip mobility, the Edmonton AS Metrology Index (EDASMI), which measures cervical rotation, chest expansion, lateral lumbar flexion, and internal rotation of the hip, but only requires the use of a tape measure.

**Methods:** We assessed the EDASMI and the BASMI in a total of 263 patients from 3 countries, Canada ( $n = 205$ ), Australia ( $n = 29$ ), and Colombia ( $n = 29$ ), that included patients from community and tertiary-based practice. Intra- and inter-observer reliability was assessed in 44 patients by ANOVA. The Bath AS Disease Activity (BASDAI), and Function (BASFI) Indices, and the modified Stoke AS Spinal Score (mSASSS), were recorded to assess construct validity. Responsiveness was assessed in a subset of 33 patients that were either randomized to anti-TNF therapy: placebo ( $n = 22$ ) or received open label infliximab ( $n = 4$ ) or pamidronate ( $n = 7$ ) over 24 weeks.

**Results Obtained and Conclusion:** The measures comprising the EDASMI, as well as the composite itself, were normally distributed whilst 3 of the BASMI measures, tragus-to-wall, modified Schober's, intermalleolar distance, and the BASMI itself, demonstrated substantial floor effects. Both the EDASMI and the BASMI were highly reliable (ICC  $>0.90$  for both intra- and inter-observer reproducibility) and demonstrated similar construct validity (correlations for EDASMI with age (0.44), disease duration (0.52), BASDAI (0.24), BASFI (0.61), BASRI (0.79), mSASSS (0.75);  $p < 0.001$  for all). The change in EDASMI was significant after 24 weeks of therapy (standardized response mean = 0.40;  $p = 0.03$ ) but not for the BASMI.

**Brief Conclusion:** The EDASMI is a simple, rapid, and reliable tool for the routine assessment of hip and spinal mobility in AS that is responsive to therapeutic intervention.

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**EVALUATION AND VALIDATION OF THE PATIENT ACCEPTABLE SYMPTOM STATE (PASS) IN PATIENTS WITH ANKYLOSING SPONDYLITIS (AS)** Walter P. Maksymowych, Rhonda Richardson, Catherine Mallon, Désirée van der Heijde, Annelies Boonen (University of Alberta, Edmonton, University of Maastricht, The Netherlands)

**Objective:** The PASS state constitutes an absolute level of patient well-being and therefore represents a more ambitious target for disease management. Our objectives were (1) To estimate the level of pain, patient global, fatigue, disease activity, function at which patients considered themselves in PASS, (2) To assess the contributors to PASS and influence of PASS on quality of life (QoL) and (3) To validate the PASS estimate according to reported need for physician evaluation and flare status

**Methods:** A cross-sectional study was performed in 302 patients. To estimate the level of disease at which patients considered themselves in PASS, we used an anchoring method and targeted the 75th centile of the cumulative distribution of patients in PASS. Stepwise logistic regression addressed the contribution of disease activity or function to PASS after controlling for age, sex, disease duration, education and comorbidities. The PASS was validated by analyzing proportions of patients correctly classified as reporting need for physician evaluation and in current flare.

**Results Obtained and Conclusion:** PASS data were available for 279 patients. 165 of 279 (59%) reported that they were in a PASS and these were significantly older with longer disease duration. PASS estimates were 4 (BASG), 22.8 (FACIT), 4.8 (BASDAI), 4.0 (BASFI), and 8.0 (ASQoL). Attainment of PASS was independent of disease duration, gender, education and comorbidities but was associated with worse BASDAI (Exp(B) 0.67 [95%CI: 0.53-0.84]  $p<0.001$ ), and BASFI (Exp(B) 0.78 [95%CI: 0.65-0.959]  $p<0.01$ ). Conversely, after adjusting for age and gender, PASS was significantly contributory to quality of life (B:-5.99 [95%CI:-7.16 to -4.08]). PASS accurately reflected need to consult the physician and in current flare (71% and 73% correctly classified, respectively) Significantly greater numbers of patients on anti-TNF therapy reported being in PASS (6.7%) versus those not on biologics (1.8%) ( $p = 0.05$ ).

**Brief Conclusion:** Almost 60% of patients surveyed reported being in a PASS condition. Levels of pain and functioning below which patients considered themselves in PASS were unexpectedly high suggesting good coping.

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**CARDIAC INVOLVEMENT IN WEGENER'S GRANULOMATOSIS** Jeremy FitzGerald, Regina Taylor-Gjevre (University of Saskatchewan)

**Objective:** Cardiac involvement in patients with Wegener's Granulomatosis (WG) has been increasingly recognized in recent years, but is often clinically silent. In this study we wished to determine both the prevalence of electrocardiac abnormalities in our WG population and the frequency with which patients were screened for cardiac involvement.

**Methods:** This was a retrospective study of medical records from all three of our city hospitals. We examined hospital chart data of all patients admitted with diagnoses of WG between January 2000 and September 2005. Data collected from each chart included electrocardiogram (ECG) and echocardiogram reports.

**Results Obtained and Conclusion:** A total of 55 patients were admitted to a Saskatoon hospital with a diagnosis of WG over the study period. Of these 55, only 30 (54.5%) had an electrocardiogram performed during their



admission. Of these thirty patients who did have an ECG, ten (33%) were found to have conduction abnormalities. Atrioventricular block was seen on ECGs from 6 patients, three patients had premature ventricular complexes, and one patient was seen to have a left bundle branch block. Transthoracic echocardiograms were performed on 6 patients (10.9%) during their admission, all six were reported to be abnormal. Multiple valvular abnormalities, compromised left ventricular function and dilatation of multiple cardiac chambers were reported.

In conclusion, cardiac abnormalities are not rare in our patients with Wegener's Granulomatosis. Increased cardiac screening of this patient population appears warranted.

**Brief Conclusion:** Increased cardiac assessment in the Wegener's Granulomatosis population appears warranted.

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**THE MAASTRICHT AND SPONDYLOARTHRITIS RESEARCH CONSORTIUM OF CANADA ENTHESITIS SCORES (MASES AND SPENT): A COMPARISON OF THEIR RELIABILITY AND RESPONSIVENESS.** Walter P. Maksymowych, Wojtek Olczynski, John Sampalis, Kam Shojania (University of Alberta, Edmonton, University of Saskatchewan, Saskatoon, JSS Medical Research, University of British Columbia, Vancouver)

**Objective:**Enthesitis is a characteristic pathophysiological feature of spondyloarthritis (SpA) and is one of several domains proposed by the Assessments in Ankylosing Spondylitis Working Group (ASAS) in a core set for the evaluation of disease-controlling therapies. However, there is no agreement on a scoring system. The MASES composite score (range 0-13) assesses entheses primarily at axial sites whilst the SPENT composite score (range 0-16) assesses those peripheral entheses that are anatomically readily localized and have previously been shown by imaging to be those most commonly affected in patients with SpA.

Our objective was to compare the reliability and responsiveness of the MASES and SPENT scoring systems for the assessment of enthesitis in patients with SpA.

**Methods:**The study was conducted at 3 sites (Universities of Alberta, Saskatchewan, and British Columbia) that were participating in a randomized (1:1), double-blind, placebo-controlled trial of Adalimumab 40mg on alternate weeks in the treatment of active AS. Entheses were scored dichotomously for tenderness (yes/no) by two observers at screening (- 2 weeks), baseline, weeks 12 and 24. Intra- and inter-observer reliability was assessed by intra-class correlation coefficient. Responsiveness was assessed by effect size (ES) and standardized response mean (SRM) at the 12 and 24 week visits

**Results Obtained and Conclusion:** A total of 22 patients were assessed (Alberta = 11, British Columbia = 6, Saskatchewan = 5). Median scores were 2.0 and 3.5 for the SPENT and MASES scores, respectively, and scores were highly correlated (Spearman's rho = 0.85;  $p < 0.0001$ ). Intra-observer ICC was 0.90 and 0.76, whilst inter-observer ICC was 0.81 and 0.89, for the MASES and SPENT scores, respectively ( $p = 0.001$  for all comparisons). For individual items, reliability was particularly good for assessment of the supraspinatus (SPENT) and iliac crest (MASES) entheses (kappa  $> 0.60$ ). At 24 weeks SRM was 0.95 and 0.74, and ES was 0.63 and 0.54, for the MASES and SPENT indices, respectively.

**Brief Conclusion:** The MASES and SPENT have comparable reliability and responsiveness and either index can be used in multicenter trials.

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**DNA TOPOISOMERASE I BINDING TO FIBROBLASTS INDUCES MONOCYTE ADHESION AND ACTIVATION IN THE PRESENCE OF ANTI-TOPOISOMERASE I AUTOANTIBODIES FROM SYSTEMIC SCLEROSIS PATIENTS.** Jean-Luc Senécal, Jill Hénault, Geneviève Robitaille, Yves Raymond (Laboratory for Research in Autoimmunity, Centre Hospitalier de l'Université de Montréal, Montréal, Québec)

**Objective:**Systemic sclerosis (SSc) is an autoimmune disease characterized by fibrosis due to excessive and deregulated collagen production by fibroblasts. Previously, we reported that anti-DNA topoisomerase I antibodies (anti-topo I), one of the major autoantibody specificities in SSc, bound specifically to fibroblast surfaces, without however having identified their antigenic target (Arthritis Rheum 50:3265-3274, 2004). In the present study, we characterized the target of anti-topo I on fibroblasts and the

effects of their binding.

**Methods:**Purified DNA topoisomerase I (topo I), or topo I released from apoptotic cells, were tested for surface binding to a number of human cell types and to SSc patient fibroblasts by cell-based ELISA, flow cytometry and indirect immunofluorescence. An anti-topo I monoclonal antibody, IgG purified from SSc patient and normal control sera, and anti-topo I affinity-purified from SSc patient sera were used to detect topo I binding to cell surfaces. The consequences of topo I and anti-topo I binding to fibroblasts were assessed by co-culture with THP-1 monocytes.

**Results Obtained and Conclusion:** The autoantigen topo I itself was found to bind specifically to fibroblasts in a dose-dependent and saturable manner where it was recognized by anti-topo I from SSc patients. The binding of anti-topo I subsequently stimulated adhesion and activation of co-cultured monocytes. Topo I released from apoptotic endothelial cells was also found to bind specifically to fibroblasts.

**Brief Conclusion:** This report thus confirms and extends our previous study by showing that topo I binding to fibroblast surfaces is both necessary and sufficient for anti-topo I binding. Secondly, topo I/anti-topo I complex binding can then trigger the adhesion and activation of monocytes, thus providing a plausible model for the amplification of the fibrogenic cascade in anti-topo I positive SSc patients.

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**THE ROLE OF IMMUNODULATORY AGENTS IN THE PREDICTION OF MORTALITY IN AN INCEPTION COHORT OF PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)** Raja Bobba, Jiandong Su, Annaliese Tisseverasinghe, Paul Corey, Murray Urowitz, Dafna Gladman, Zhaleh Shariati, Paul R. Fortin (McMaster University, Department of Medicine, UHN - Toronto Western Hospital, Division of Rheumatology, Queens University, Medical Student, University of Toronto, Department of Public Health, University of Toronto, Department of Medicine, UHN - Toronto Western Hospital, Division of Rheumatology)

**Objective:**To evaluate whether immunomodulatory agents prevent death in SLE

**Methods:**We studied an inception cohort formed of consenting patients seen at the University of Toronto Lupus Registry since 1970 diagnosed within one year of entry using time-dependent analysis. SLE was defined as 4 ACR criteria. The outcome variable was death. Predictor variables were defined as individual immunomodulatory agents including antimalarials, prednisone, azathioprine, cyclophosphamide and methotrexate. The following covariates were also studied: demographic variables (age, gender, and education), cardiovascular risk factors (diabetes, cholesterol, hypertension, smoking), SLE disease characteristics [Systemic Lupus Erythematosus Disease Activity Index, (SLEDAI), Systemic Lupus Erythematosus International Collaborating Clinics damage index (SDI), SLE duration and anticholipin positivity (aCL) (on two occasions at least six weeks apart)], organ specific disease activity (DA) [musculoskeletal, cutaneous, renal, vasculitic, and neurologic DA]. Univariate, then multivariate Cox proportional hazard regression were performed.

**Results Obtained and Conclusion:** The cohort consisted of 536 individuals followed for an average of 9.7 +/- 8.1 years. At entry, the mean age ( $\pm$ SD), SLEDAI-2K, and SLICC were 35.7 +/- 14.0, 11.2 +/- 8.6, and 0.63 +/- 0.85 respectively. Approximately 60% had a college degree. Percentage of HBP, smoking, DM, and female gender was 19.0%, 22.9%, 1.8%, and 86.6% respectively. In univariate analyses, prednisone (Hazard Ratio, 95%CI = 3.1, 1.9-5.2), azathioprine (1.9, 1.2-3.1) and cyclophosphamide (3.9, 1.2-12.4) were associated with a higher risk of death while antimalarials use (0.3, 0.2-0.6) was associated with a lower risk. In multivariate analysis prednisone (2.2, 1.3-3.7) and antimalarial use (0.5, 0.3-0.9) remained statistically significant while azathioprine, cyclophosphamide and methotrexate were no longer significant. Age, male gender, hypertension, SLEDAI-2K, shorter disease duration, aCL and renal disease were associated with a higher risk of death.

**Brief Conclusion:** The use of prednisone in SLE is associated with a doubling of the risk of dying after accounting for several relevant covariates while the use of antimalarials appears to be protective with a decrease of the risk by half.

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**RECORDING CLINICAL AND ACADEMIC ACTIVITIES** Graham

Reid, Douglas Courtemanche, Kent Hayden (University of British Columbia, Vancouver, BC, Resilience Software, Vancouver, BC)

Objective: Keeping a record of clinical and academic activities is an increasingly important obligation.

For students, residents and fellows documentation of the number and types of patient encounters ensures that educational objectives are fulfilled during training. Logging attendance at hospital rounds, seminars, journal clubs, and other academic events will complete the record of a trainee's education. Licensing authorities will likely soon all require such documentation.

Similarly, attending rheumatology staff are required to keep a record of time spent in clinical, academic, teaching and research activities in a variety of employment settings

Methods: Resilience Software has developed a palm-based system called T-Res which has been configured for rheumatology trainees and staff. It provides a very quick and easy method for recording information on a day-to-day basis, which can be readily transferred and presented in reports required for a permanent record. The system also allows for evaluation of the educational value of individual activities by trainees and evaluation of trainees by attending staff. In addition the system will provide data in a standardised format which will aid in evaluation of a teaching programme at an individual centre and if widely adopted comparison of teaching programmes at a national level.

Results Obtained and Conclusion: Preliminary data from use in a pilot project in the Rheumatology Training programme at the University of British Columbia will be presented

Brief Conclusion: T-Res is a palm based system which allows for easy recording of clinical and academic activities and will aid in the evaluation process of individual trainees and comparison of teaching programmes.

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PARADOXICAL INFLUENCE OF GLUCOCORTICOID TREATMENT ON GENE EXPRESSION IN CONNECTIVE TISSUE OF THE RABBIT KNEE FOLLOWING EARLY INDUCTION OF INFLAMMATORY ARTHRITIS Alison Kydd, Carol Reno, Helen Tsao, David Hart (McCaig Centre, Faculty of Medicine, University of Calgary, Calgary, Alberta)

Objective: Despite the widespread use of glucocorticoids for the treatment of inflammatory arthritides, the mechanisms of action of these powerful drugs in connective tissues has yet to be fully elucidated. Examining the action of glucocorticoids in a model of early inflammatory arthritis will provide a framework for increased understanding of drug action in this disease.

Methods: A cohort of skeletally mature rabbits underwent either a bilateral induction of antigen-induced arthritis or remained untreated as non-arthritic control animals. In the early stage of the disease (5 days post-induction), animals underwent either intra-articular or intra-muscular treatment with glucocorticoids (5mg/leg or 10mg/kg, respectively), or an equivalent volume of saline. 24 hours following treatment, connective tissues of the knee (synovium, articular cartilage, and menisci) were collected and analysed for changes in mRNA levels for a number of relevant genes.

Results Obtained and Conclusion: The response of the arthritic tissues to glucocorticoids differed from that of normal tissues in a manner dependent on the route of glucocorticoid administration. For example, collagen I exhibited depressed mRNA levels following glucocorticoid treatment of normal joints, but levels were paradoxically elevated following glucocorticoid treatment of animals with early inflammatory arthritis. In contrast, other genes such as the matrix metalloproteinases had decreased mRNA levels following glucocorticoid treatment regardless of the condition of the joint. Interestingly, the impact of glucocorticoids on mRNA levels for some molecules exhibited tissue-specific variations in depression vs. elevation in levels. Thus, this study points to a number of factors that may influence the action of glucocorticoids including the presence of inflammation, the cell and tissue types involved, the relative dose of glucocorticoids to which the cells are exposed (influenced by the route of administration and overall dose), and the impact of glucocorticoids on systemic (nonarticular) systems that may alter the response of the downstream joint tissues.

Brief Conclusion: The complex responses of normal and arthritic tissues to glucocorticoid treatment indicate that the response of connective tissues in patients are likely not as uniform as previously thought, and may change depending on the stage of the disease, a finding that needs to be further investigated.

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VALIDATION OF THE LOWER EXTREMITY FUNCTIONAL SCALE ON IN-PATIENTS ATTENDING AN ORTHOPAEDIC REHABILITATION PROGRAM Teresa Yeung (McMaster University, Hamilton, ON, West Park Health Care Centre, Toronto, ON)

Objective: To estimate the reliability and longitudinal validity of the Lower Extremity Functional Scale (LEFS) on inpatients attending an orthopaedic rehabilitation program.

Methods: 49 subjects from an orthopedic inpatient rehabilitation program had the LEFS, the Timed Up and Go (TUG) and the Numeric Pain Rating Scale (NPRS) conducted within 3 days post admission (T1), 7-10 post admission (T2) and 3 days prior to discharge (T3). Clinician and subject rated Global Functional Change Surveys (GFCs) were administered at T3. The Functional Independent Measure (FIM) was collected at T1 and T3. 24 subjects who participated in the reliability estimation had the LEFS, TUG and NPRS repeated one day post T1. To focus on lower extremity function, two versions of FIM data were collected: the transfer and locomotion TLFIM and the modified motor MMFIM that excludes the 'Sphincter control' items. Two pooled indexes of change were created. Each included the TUG, NPRS and either the TLFIM or MMFIM. Analyses included Pearson's correlations of change scores of the LEFS with change scores of the other measures, intraclass correlation coefficient (ICC) to examine reliability of the LEFS, and standardized response mean (SRM) to examine the ability of the measures to evaluate change.

Results Obtained and Conclusion: The majority of subjects had osteoarthritis (78%) or rheumatoid arthritis (12%) with involvement of multiple joints. 42 subjects (86%) were admitted following a primary (n=18) or revision (n=24) total joint replacement. The type (1, 1) ICC for test-retest reliability of the LEFS was 0.88 (95% C.I. 0.73-0.94). The SRMs of the LEFS, TUG, NPRS, TLFIM and MMFIM were 1.59, -1.13, -0.91, 2.72 and 2.91 respectively. The change scores of the LEFS was poorly correlated with the change scores of TLFIM ( $r = 0.134$ ), MMFIM ( $r = 0.126$ ), TUG ( $r = -0.032$ ), NPRS ( $r = -0.113$ ) and the two pooled indexes of change ( $r = 0.160$  and  $0.157$ ).

Brief Conclusion: The LEFS demonstrated good reliability and responsiveness. Correlations of the LEFS with the comparison measures were poor, suggesting that the LEFS evaluates a construct different from the performance-based TUG and FIM.

## 48

TREATMENT OF SYSTEMIC ONSET JUVENILE IDIOPATHIC ARTHRITIS WITH HIGH-DOSE INFlixIMAB. Elizabeth Stringer, Bianca Lang, Suzanne Ramsey, Adam Huber (Department of Pediatric Rheumatology, IWK Health Centre, Dalhousie University, Halifax, Nova Scotia, Canada)

Objective: Systemic onset juvenile idiopathic arthritis (SoJIA) is characterized by arthritis, fever, rash, lymphadenopathy, and hepatosplenomegaly. Its course can be devastating with frequent relapses and potential for destructive arthropathy. Poor response to therapy is not uncommon. Infliximab is effective in adult rheumatoid arthritis, but experience in SoJIA is anecdotal. We report the use of high-dose infliximab in 2 patients with steroid-dependent, refractory SoJIA who had not responded to multiple second line agents.

Methods: Case 1 is a 20 year old male with severe SoJIA since 3 years of age. At the start of infliximab, he had 28 active joints and was unable to perform many activities of daily living. Infusions were started at 3 mg/kg q 6 weeks but increased to 7.5 mg/kg q 4 weeks to achieve an adequate effect. At 27 months follow-up, the number of active joints has decreased to 4, and there has been a marked improvement in physical function. Prednisone has been discontinued.

Case 2 is a 10 year old female with severe SoJIA since 15 months of age. At the start of infliximab, she had 31 active joints and impaired physical function. Infusions were started at 3 mg/kg q 8 weeks but increased to 10 mg/kg q 4 weeks. At 38 months follow-up, she has only 5 active joints and has had a dramatic improvement in physical function and growth. Prednisone has been discontinued.

Results Obtained and Conclusion: The recommended maintenance dose of infliximab is 3 mg/kg q 8 weeks. Based on our experience, we suggest that infliximab can be an effective therapy in SoJIA. However, substantially larger and more frequent doses may be necessary to achieve adequate disease response.

**Brief Conclusion:** A therapeutic trial of infliximab in refractory SoJIA is reasonable acknowledging that high doses and more frequent dosing may be necessary.

## 49

**THE FRENCH-CANADIAN VERSIONS OF THE BATH ANKYLOSING SPONDYLITIS DISEASE ACTIVITY INDEX (BASDAI), THE BATH ANKYLOSING SPONDYLITIS FUNCTIONAL INDEX (BASFI) AND THE BATH ANKYLOSING SPONDYLITIS PATIENT GLOBAL SCORE (BAS-G): RELIABILITY, VALIDITY AND SENSITIVITY TO CHANGE** Vinet E, Raynauld J-P, Haraoui B (Department of Medicine, Division of Rheumatology, Centre Hospitalier de l'Université de Montréal, Montréal, Canada)

**Background:** Ankylosing spondylitis (AS) can be a very debilitating disease. With the introduction of the anti-TNF agents who were shown to improve the signs and symptoms as well as the physical function and possibly the radiographic progression of AS, validated outcome measures are needed in order to evaluate response. The BASDAI, BASFI and BAS-G were developed in English and in order to be used in non-English speaking patients they have to be translated and validated in the patients' language. **Objective:** The aim of this study was to translate into French-Canadian the BASDAI, BASFI and the BAS-G and to evaluate their reliability, validity and sensitivity to change, in French speaking patients seen at one rheumatology clinic in Quebec.

**Methods:** The French-Canadian versions of the BASDAI, BASFI and BAS-G were obtained using a translation and back-translation process. Thirty patients with AS and 20 normal subjects were included in this study and had to complete the questionnaires. For evaluation of reliability, the 30 AS patients completed two sets of questionnaires at baseline; one self-administered and one interview-administered. A third set was self-administered and returned by mail after 2 weeks. To assess validity, the patients were evaluated with the BASDAI, BASFI, BAS-G, Health Assessment Questionnaire (HAQ) score, physician's global assessment, patient's pain assessment, patient's global assessment, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), morning stiffness, tender joint count, swollen joint count, Schober's test, occiput-to-wall distance and chest expansion. To evaluate sensitivity to change, at 6 month, all patients will complete again the questionnaires and the 30 AS patients will be reassessed to measure changes over time in the other disease activity parameters.

**Results Obtained and Conclusion:** Thirty AS patients were evaluated; 29 males and 1 female, with a mean age of 40,7 years. Twenty normal subjects were assessed; 11 males and 9 females. All study patients were Caucasian. All patients and normal volunteers completed the first 2 sets and will return shortly for their evaluations.

Complete results will be available for the meeting.

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**ASSESSMENT RELIABILITY FOR INFLAMMATORY ARTHRITIS BY AN ALLIED HEALTH PROFESSIONAL** Susanna Tam, Ieva Fraser, Elizabeth Badley, Wendy Young, Peter C. Coyte (University of Toronto, Toronto, ON, Southlake Regional Health Center, Newmarket, ON)

**Objective:** To assess the reliability of an experienced occupational therapist (OT) in rheumatology to identify patients with or without inflammatory arthritis.

**Methods:** Eight-hundred sixty-nine referrals were sent to two community rheumatologists' offices. Of these referrals, 227 of these patients were referred for assessment by an experienced rheumatology OT in an Early Arthritis Clinic (EAC). Of the individuals referred to the EAC 149 of these individuals agreed for their chart information to be used in the study. The OT's clinical findings for joint counts were compared with those of the rheumatologists. The accuracy (sensitivity, specificity), the predictive value of the therapist's decision on the presence of inflammatory arthritis, and the degree of agreement with the final diagnoses made by rheumatologists were calculated. The overall agreement to determine which patient had clinical presentation of inflammatory arthritis, non-inflammatory arthritis or undetermined presentation was measured using an unweighted kappa statistic to compare the therapist's decision with the rheumatologists. **Results Obtained and Conclusion:** The difference in the number of effused joints found by the therapist and the rheumatologists was not statistically

significant ( $p > 0.05$ ). The difference in the number of active joints found by the therapist and the rheumatologists was marginally significant ( $p=0.04$ ). The sensitivity value of the therapist's assessment of inflammatory arthritis was 92.5% using the rheumatologists' assessment as the gold standard. The probability that the therapist could identify patients without inflammatory arthritis was 61.0% (specificity). The overall agreement between the therapist and rheumatologists was moderate ( $\kappa=0.44$ ). The agreement for the presence and absence of inflammatory arthritis was moderate with  $\kappa=0.59$  and  $0.50$ , respectively. There was poor agreement for the undetermined cases ( $\kappa=0.23$ ).

**Brief Conclusion:** Our results showed that a skilled OT with rheumatology training had moderate agreement with rheumatologists when identifying inflammatory, non-inflammatory or undetermined arthritis patients. Further work is needed to determine how the accuracy of the therapist's assessment might be improved, especially if such therapists are going to have a role in triaging cases in early arthritis clinics.

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**VALIDATION OF THE DAS-28 IN A COHORT OF PATIENTS WITH EARLY INFLAMMATORY ARTHRITIS** Shahin Walji, Vivian Bykerk (University of Toronto)

**Objective:** The primary objective is to validate the DAS-28 in patients with EIA using physician global assessment as the construct of disease activity. The secondary objective is to correlate the DAS-28 to the simplified disease activity index (SDAI), and health assessment questionnaire (HAQ) scores in patients with EIA.

**Methods:** Patients were seen in Toronto's Early Arthritis Cohort (TEACH) from May 1, 2004 to August 31, 2005. Details of this cohort have been published elsewhere. Every three months, data was collected according to a standardized protocol. DAS-28 and SDAI scores were calculated on all patients AFTER each protocol visit. Convergent construct validity between DAS-28 and MDGA, HAQ and SDAI scores was assessed for all patients at the three month visit. All variables were compared as continuous using the Pearson correlation coefficient.

**Results Obtained and Conclusion:** 36 patients with EIA had data available at 3 months. Pearson correlation at 3 months of DAS28-CRP was 0.56, 0.96, and 0.86 with HAQ, SDAI, and MDGA respectively. Pearson correlation of DAS28-ESR at 3 months was 0.59, 0.89, and 0.85 with HAQ, SDAI, and MDGA respectively.

**Brief Conclusion:** In this group of patients with early inflammatory arthritis, there was excellent correlation between DAS-28 scores and MDGA, suggesting that it is a valid measure of disease activity in EIA. There was also high correlation with SDAI. Interestingly, there was poor correlation between DAS28 and HAQ scores, suggesting that HAQ scores may not reflect disease activity in patients with EIA.

## 52

**EFFECT OF TUMOR NECROSIS FACTOR ANTAGONISTS ON CONSUMPTION OF NARCOTIC ANALGESICS AND CORTICOSTEROIDS OVER THE FIRST 12 MONTH PERIOD IN RHEUMATOLOGY PATIENTS.** Denis Choquette, Tom Einarson, John Paul Leombruno (University of Montreal, Montreal, Québec, University of Toronto, Toronto, Ontario, Schering Canada Inc, Montreal, Canada/university of Toronto, Toronto, Ontario)

**Objective:** To investigate the effect of tumor necrosis factor antagonists (anti-TNFs) on concomitant use of corticosteroids and narcotic analgesics in rheumatology subjects.

**Methods:** This was a retrospective analysis using using RAMQ database. Prescription (RX) claims data on patients who received at least one RX for either etanercept (ETA) or infliximab (IFX) prescribed between Jan 1, 2002 and Dec 31, 2004 were requested. Corticosteroid (CS) and narcotic analgesic (NA) usage 6 months prior to anti-TNF (baseline) was compared to the first 3 month, the first 6 month and the second 6 month period with anti-TNF therapy. All doses of CS and NA were converted to prednisone or morphine equivalents<sup>1,2</sup>.

**Results Obtained and Conclusion:** The study period contained 497 subjects (303 ETA, 194 IFX), average age per group was 54. At baseline 24% and 16% of ETA and IFX subjects were receiving narcotic analgesics. The mean daily dose (MDD) was  $7.9 \pm 22.2$  and  $10.3 \pm 24.9$  mg of morphine equivalents in ETA and IFX subjects respectively ( $p=0.46$ ). During the first



3 and 6 month follow up period the MDD of NA was stable for ETA and IFX subjects. During months 7-12 the MDD of NA decreased in the IFX subjects but not the ETA subjects.

At baseline 60% and 47% of ETA and IFX subjects were receiving oral or injectable CS, the MDD in prednisone equivalents was similar in ETA and IFX subjects. In the first three months of anti-TNF therapy, ETA subjects experienced a significant increase in CS dose, in contrast the CS dose in IFX subjects remained stable. By month 7-12 subjects in both groups were able to reduce their CS dose

**Brief Conclusion:** Both etanercept (ETA) and infliximab (IFX) reduce corticosteroid (CS) consumption by rheumatology patients after 6 months of anti-TNF therapy. Subjects who received ETA experienced increases in CS consumption during the first 3 months of ETA therapy, this phenomenon was not noted in IFX subjects and may be due to the relative quicker onset of action for IFX. Only IFX reduces consumption of narcotic analgesics after 6 months of anti-TNF therapy.

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**PROSTAGLANDINS AS AUTACOIDS IN HUMAN OSTEOCLASTS.** Hugues Allard-Chamard, Josette Hackett, Maxime A. Gallant, Artur J. de Brum Fernandes (Faculty of Medicine and Health Sciences, Université de Sherbrooke)

**Objective:** Introduction: Osteoclasts are central elements in the pathophysiology of rheumatoid arthritis and osteoporosis. Prostaglandins, which are produced by bone and present in high levels in inflammatory exudates have complex actions on bone metabolism through multiple influences on both osteoblasts and osteoclasts., but little is known about PG production and receptors in osteoclasts. Our objective was to determine if human osteoclasts present the enzymes needed for prostaglandin synthesis, phospholipase A2 (PLA2) and cyclooxygenase (COX), if they actually produce prostaglandins and to determine the eventual impact of these eicosanoids on cell functions.

**Methods:** Experiments were performed on human osteoclast-like (hOCL) cells differentiated from peripheral blood mononuclear cells in the presence of M-CSF and RANKL. COX and PLA2 activities were evaluated at the single cell level using fluorescent probes and immunohistochemistry. hOCL were partially purified, allowing the recovery of a fraction enriched in multinucleated cells used to investigate bone resorption and total prostaglandin production.

**Results Obtained and Conclusion:** Human osteoclasts present strong cytosolic PLA2 as well as COX-1 and COX-2 activities, results confirmed by immunohistochemistry in human bone. An enriched population of hOCL ( $82.5 \pm 2.2\%$  of the cells were TRAP-positive and had more than 3 nuclei) produced prostaglandins in basal conditions and this production was inhibited by cyclooxygenase inhibitors. Specific inhibition of COX-1 increased bone resorption but COX-2 inhibition had no effect on this parameter.

**Brief Conclusion:** This is the first study to show that human osteoclasts present phospholipase A2 and cyclooxygenase activity and actively produce prostaglandins. They support the hypothesis that prostaglandins could be autacoids implicated in the autoregulation of osteoclast activity. More interestingly, although both COX-1 and COX-2 were present and active in these cells, only the COX-1 pathway seems to be implicated in the inhibition of bone resorption by osteoclasts. Further studies are being performed to identify the specific prostaglandins produced by these cells and to characterize the receptors implicated in their effects.

## 54

**PPAR-GAMMA CODING POLYMORPHISMS NOT ASSOCIATED WITH PSORIATIC ARTHRITIS IN A CAUCASIAN POPULATION** Christopher Butt, Sean Hamilton, Dafna Gladman, Proton Rahman (Memorial University of Newfoundland, Toronto Western Hospital)

**Objective:** Recently, (Bongratz et al. 2005) showed moderate success in treatment of PsA using a ligand of peroxisome proliferator-activated receptor gamma (PPAR-gamma). PPAR-gamma activation has previously been shown to play a role in suppressing both angiogenesis and inflammation, both important pathological features of PsA. Given the potential physiological role for PPAR-gamma in PsA, and the apparent success of PPAR-gamma-agonist treatment in PsA, we examined known coding polymorphisms in the PPAR-gamma gene in a Caucasian population.

**Methods:** PsA was diagnosed as an inflammatory arthritis in patients with psoriasis, in the absence of other etiologies for inflammatory arthritis. The control subjects were ascertained from the same population and were all Caucasian. DNA Samples were genotyped for four PPAR-gamma variants by time-of-flight mass spectrometry using the Sequenom platform. All four SNPs were previously reported coding variations three of which caused an amino-acid change: Pro12Ala (rs1801282), Pro40Ala (rs1805192), Pro115Gln (rs1800571), while the fourth SNP was synonymous; C161T (rs3856806). All primers were designed using Sequenom SpectroDESIGNER software, scanned using a mass spectrometry workstation (Bruker).

**Results Obtained and Conclusion:** Of the four SNPs examined, two (rs1805192 and rs1800571) were found to be non-polymorphic in our population. SNPs rs1801282 and rs3856806 were both observed to have no significant differences between our patient and control populations. Minor allele frequency for PsA subjects and controls for rs1801282 (G) were 9.0% vs. 13.8% ( $p=0.01$ ) and for rs3856806 (T) 10.7% vs. 12.0% ( $p=0.56$ ), respectively. No differences were observed when analyzed by early-onset patients, pattern of arthritis. All genotypes satisfied the Hardy-Weinberg equilibrium.

**Brief Conclusion:** An association between PsA and a known coding SNP of the PPAR-gamma gene was observed in our Caucasian population. Further studies are now warranted regarding validation of our findings in an independent cohort.

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**EARLY ARTHRITIS IN CANADA: DATA FROM THE CLEARER GROUP** Shahin Walji, Murray Baron, Gilles Boire, Carol Hitchon, Vivian Bykerk (University of Toronto, McGill University, University of Sherbrooke, University of Winnipeg)

**Objective:** (1) To describe and compare baseline patient characteristics from 4 Canadian early arthritis cohorts (2) To describe the impact of inclusion criteria on patient characteristics

**Methods:** Methods: Early Arthritis cohorts from Montreal, Sherbrooke, Toronto, and Winnipeg were compared (the CLEARER Group: Canadian Leaders in Early inflammatory Arthritis and Early Rheumatoid arthritis). Recruitment strategies, inclusion criteria, clinic procedures and patient baseline characteristics were analyzed. Similarities and differences were identified.

**Results Obtained and Conclusion:** Results: All 4 cohorts include adult patients with joint symptoms for > 4-6 weeks and < 12 months. The requisite number of inflamed joints varies (from minimal of 1-3). Baseline characteristics (mean values) are as follows:

Montreal Registry: 131 patients, age 56y, 73% female, symptom duration 8.35 months, HAQ 0.86, DAS28-CRP 4.76, 42.7% RF (+) and 23% meet ACR criteria for RA.

Sherbrooke Cohort: 265 patients, age 57.6y, 60% female, symptom duration 4.58 months, HAQ 0.86, DAS3-CRP 3.88, 39% RF (+), and 83% meet ACR criteria

Toronto Cohort: 88 patients, age 45.21y, 83% female, symptom duration 6.9 months, HAQ 0.85, DAS28-CRP 4.82, 22% RF (+), and 62% meet ACR criteria

Winnipeg Cohort: 150 patients, age 46 years, 76% female, symptom duration 14 months, DAS28-CRP 3.6, and 44% RF (+).

**Brief Conclusion:** Conclusion: The inclusion criteria and disease duration differ among cohorts, emphasizing the lack of a clear definition of EIA. Despite this, baseline disease activity and physical function were similar in all cohorts. The cohort with the fewest inflamed joints required also had the least patients meeting ACR criteria, where the cohort with the most inflamed joints required had the most patients meeting ACR criteria. Symptom duration and fulfillment of ACR criteria were not correlated. The next step will be to develop a consensus on the definition of EIA and determine patient characteristics most responsible for fulfillment of ACR criteria.

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**TREATED INFECTIONS WITH ANTI-TNF AGENTS: ESTIMATING INCIDENCE FROM A PHARMACY CLAIMS DATABASE USING PRESCRIPTION CLAIM DATA FOR ANTI-INFECTIVE MEDICATIONS** Denis Choquette, Tom Einarson, John Paul Leombruno (University

of Montreal, Montreal, Québec, University of Toronto, Toronto, Ontario, Schering Canada and University of Toronto, Ontario)

Objective: To investigate the relationship between tumor necrosis factor antagonists (anti-TNF) and the use of anti-infectives (AI).

Methods: This was a retrospective analysis using data from the RAMQ. Prescription claims data for all patients who received at least one prescription (RX) for either etanercept (ETA) or infliximab (IFX) between Jan 1, 2002 and Dec 31, 2004 were requested. All patients with rheumatology indications were included. All RXs for AIs (excluding anti-malarials) in the 6 months preceding and following the first RX for anti-TNF therapy were identified. The number of anti-infective RXs prior to the first RX for anti-TNF therapy was compared to the number after. For example, if there were 10 RXs for anti-fungals six months prior to an anti-TNF therapy and 20 RXs in the six months after the rate ratio (RR) would be 2.0, an RR greater than 1 signals an increase usage.

Results Obtained and Conclusion: 693 subjects (418 ETA, 275 IFX) were included. Average age was similar between the two groups. Mean total prescriptions per month prior to anti-TNF therapy was 5.1 +/- 6.0 for ETA and 4.4 +/- 5.0 for IFX. In total, 1369 anti-infective RXs were identified (365 before ETA, 463 after ETA, 257 before IFX, 284 after IFX). The mean increase in anti-infective RXs for ETA subjects was 0.47 RXs per pt/year v.s. 0.20 for IFX, this represented a 27% and 11% increase respectively (p=0.39). Of note, 4.3% of ETA and 4.3% of IFX subjects received prophylactic anti-TB therapy prior to initiating anti-TNF therapy. The difference in incidence rate ratio seen in this analysis may be explained by longer pre-anti-TNF treatment times in the IFX group.

Brief Conclusion: ETA subjects experienced statistically significant increases in their use of macrolides, anti-TB drugs, anti-virals and total anti-infectives within the first six months of ETA use. No statistically significant increases in any anti-infective subclass or overall anti-infective use was noted with IFX use, however, total anti-infective use did trend towards an increase.

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HEPATOBIILIARY TOXICITY WITH ANTI-TNF AGENTS: ESTIMATING INCIDENCE FROM PHARMACY AND PHYSICIAN CLAIMS DATABASES Denis Choquette, Tom Einarson, John Paul Leombruno (university of Montreal, Montréal, Québec, University of Toronto, Toronto, Ontario, Schering Canada and University of Toronto, Toronto, Ontario)

Objective: The objective of this study was to investigate the relationship between initiation of tumor necrosis factor inhibitor (anti-TNF) therapy and physician visits with liver related diagnosis.

Methods: This was a retrospective analysis using linked pharmacy and physician claims data from the province of Quebec. The individuals covered by this health plan received insured coverage for physician, hospital, and prescription drug services.

All prescription and physician service claims data for patients who received at least one prescription (RX) for either etanercept (ETA) or infliximab (IFX) and at least one RX for methotrexate between Jan 1, 2002 and Sept. 30, 2004 were requested. Physician claims with hepatobiliary (HB) ICD-9 codes were identified. If the first service for one of these diagnosis occurred after the first RX for an anti-TNF agent an event was claimed.

Results Obtained and Conclusion: During the study period, there were 327 ETA subjects and 363 IFX patients with exposures of 346 and 415 pt-years respectively. Nine hepatobiliary (HB) diagnosis were noted. Average time to onset of a physician service with a HB diagnosis after initiation of anti-TNF was 149 ± 87 and 170 ± 128 days in ETA and IFX patients respectively. The events which are listed as "Other" include 3 cases of noninfectious hepatitis (2 IFX and 1 ETA) and one unspecified disorder of the liver (IFX).

In the ETA subjects, one of the 4 subjects continued ETA therapy for 184 days, one discontinued (D/C'd) ETA at the time of the HB diagnosis, and two subjects D/C'd ETA 211 and 173 days prior to the HB diagnosis. In the IFX subjects, 4 of the 5 subjects continued IFX therapy after the HB diagnosis and were still receiving IFX by Sep 30, 2004, average duration of IFX therapy after HB diagnosis was 330 ± 118 days, the fifth subject D/C'd IFX 118 days prior to the HB diagnosis.

Brief Conclusion: Patients who received the anti-TNF therapies ETA or IFX had a low incidence of new diagnosis of hepatobiliary disorders. No significant differences between the two agents was observed. Analysis of larger databases is required.

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ASSOCIATION OF STAT3 VARIANTS AND PSA – NO EVIDENCE FOR ASSOCIATION IN TWO INDEPENDENT CAUCASIAN POPULATIONS Tara Snelgrove, Dafna Gladman, Katrin Zipperlen, Shuying Sun, Celia Greenwood, Lynette Peddle, Proton Rahman (Memorial University of Newfoundland, University of Toronto)

Objective: Sano et al (Nat Med 2005) recently reported that epidermal keratinocytes in psoriatic lesions are characterized by activated Stat3. Furthermore, transgenic mice with keratinocytes expressing a constitutively active Stat3 develop a skin phenotype resembling psoriasis. Thus Stat3 polymorphisms are a logical high priority candidate gene that should be further evaluated in PsA. Thus we set out to examine the association between Stat3 variants and PsA in two distinct Canadian populations.

Methods: We assessed 248 PsA patients and 250 ethnically matched healthy controls from Newfoundland (a recognized founder population) and 247 PsA patients and 248 geographically matched controls from Toronto (an ethnically diverse population). All PsA subjects and controls were genotyped for Stat3 variants by time-of-flight mass spectrometry. Eleven Stat3 SNPs were tested: rs1064116; rs2293152; rs3816769; rs1803125; rs6503697; rs9912773; rs744166; rs957971; rs7211777; rs12721585; rs4796793

Results Obtained and Conclusion: Three SNPs were removed from further analysis as they were not polymorphic. Of the remaining 8 SNPs, univariate analysis revealed NO association between cases and controls, in any of the SNPs for either population. Haplotype analysis using the PHASE software also noted no significant differences in haplotype frequencies between cases and controls.

Brief Conclusion: We failed to observe an association between Stat3 variants and PsA in two distinct populations. Thus these variants are unlikely to be associated with PsA.

SNP ID	NF Cases	NF Controls	TO Cases	TO Controls
2293152 (C)	40.69%	39.92%	41.4%	39.09%
3816769 (C)	32.59%	35.48%	36.4%	36.83%
6503697 (T)	25.51%	27.37%	30.32%	28.22%
9912773 (G)	24.89%	26.61%	29.32%	27.16%
744166 (C)	38.46%	41.30%	42.45%	45.02%
957971 (G)	32.99%	35.48%	36.75%	37.60%
7211777 (G)	33.20%	35.63%	36.95%	37.65%
4796793 (G)	25.31%	27.27%	32.19%	29.54%

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DID MORTALITY RATE IMPROVE IN PSORIATIC ARTHRITIS (PSA) PATIENTS IN THE LAST DECADE? Yaser Ali, Brian Tom, Catherine Schentag, Vern Farewell, Dafna Gladman (Toronto Western Hospital, Toronto, Ontario, MRC Biostatistics Unit, Cambridge, United Kingdom)

Objective: We reported that patients enrolled in PsA clinic between 1978 and 1993 had an increased mortality risk. The standardized mortality ratio (SMR) was 1.62. Since there have been advances in managing PsA patients, we sought to investigate whether mortality risk has changed over the last decade. The objective was to identify causes of death and mortality risk in patients with PsA followed at a single center over 27 years.

Methods: Patients followed at the PsA clinic between January 1, 1978 and December 31, 2004 were included in the study. Patients are followed at 6-12 month intervals according to a standard protocol. Information on patient deaths was collected prospectively and ascertained through periodic linkage with provincial cancer database, interviews and correspondence with relatives and family physicians, and since 1980, through daily checks of death notices in the newspaper. Death certificates were used, where possible. This cohort of patients was compared with the general population of Ontario. Standardized Mortality Ratio (SMR) was computed, based on the assumption that patients lost to follow up were alive at the end of the study.

Results Obtained and Conclusion: Of 680 patients with PsA (295 women and 385 men) 106 (15.6%) (55 women and 51 men) have died. The average age at first visit was 43.7 years and the average follow up duration was 8.4 years. The known causes of death were diseases of the circulatory system (26.4%), malignant neoplasm (23.6%), diseases of the respiratory system (9.4%), gastrointestinal (7.6%) and injuries/poisoning (6.6%). Cause was unknown in 28 (26.4%). The overall SMR was 1.36 (95% CI 1.1,1.6); for women it was 1.47 (95% CI 1.1,1.9) and for men it was 1.25 (95% CI 0.9,1.6). On further analysis, the overall mean expected life years lost was

3.0 (3.6 female, and 2.3 male).

**Brief Conclusion:** The drop in SMR in this clinic suggests mortality risk in PsA has improved over the last decade. This needs to be further investigated.

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**HIGH HEALTH ASSESSMENT QUESTIONNAIRE DISABILITY INDEX (HAQ-DI) SCORES ARE ASSOCIATED WITH WORK DISABILITY (WD) IN SCLERODERMA** Janine Ouimet, Janet Pope, Iris Gutmanis, John Koval (University of Western Ontario)

**Objective:** To estimate the frequency of WD in SSc in a Southwestern Ontario (SWON) cohort compared to RA (with a known high frequency of WD), and to determine if higher Health Assessment Questionnaire Disability Index (HAQ-DI) scores were associated with WD in SSc, as this has not been studied.

**Methods:** Cross-sectional data on WD status were obtained from a questionnaire that had been sent to all SSc (n = 35 limited [lcSSc], 26 diffuse [dcSSc]) and a subset of RA patients (n=104) from the same rheumatology practice. WD data, HAQ-DI scores, and demographic/clinical features (age, sex, high school education, disease duration and SSc disease subtype [dcSSc vs. lcSSc]) were entered into a database. Bivariate and logistic regression analyses were conducted.

**Results Obtained and Conclusion:** The proportion with WD was 0.56 in SSc (95% CI: 0.43-0.68) vs. 0.35 in RA (95% CI: 0.25-0.44),  $p = 0.009$ . HAQ-DI scores were significantly higher in work-disabled SSc and RA patients compared to those who were employed ( $p = 0.0001$ , and  $p < 0.0001$ ). Multivariate logistic regression analysis demonstrated that higher HAQ-DI scores ( $\beta = 1.86$ ,  $p < 0.001$ ), having dcSSc ( $\beta = 1.31$ ,  $p = 0.022$ ) or lcSSc ( $\beta = 1.24$ ,  $p = 0.024$ ) compared to RA, longer disease duration ( $\beta = 0.04$ ,  $p = 0.069$ ), and physically demanding work ( $\beta = 1.12$ ,  $p = 0.013$ ), were significantly associated with WD. In a subset analysis, WD was higher in dcSSc (65%) vs. lcSSc (49%), OR = 2.00, 95% CI: 0.70-5.63,  $p = 0.21$ . Longer disease duration was a determinant of WD in lcSSc but not in dcSSc.

**Brief Conclusion:** The frequency of WD in SSc was high and was greater than in RA. DcSSc had more WD than both lcSSc and RA; the determinants of WD in dcSSc may be different from those in lcSSc. The HAQ-DI was strongly associated with WD in SSc (and in RA). Results support continued research WD in SSc, and perhaps eventual WD interventions. Such programs could be timely and important in this difficult to treat disease.

## 61

**PULMONARY SARCOIDOSIS DEVELOPING DURING INFLIXIMAB THERAPY** Finbar D. O'Shea, Theodore K. Marras, Robert D. Inman (Division of Rheumatology, Toronto Western Hospital, Toronto, Ontario., Division of Respiratory Medicine, Toronto Western Hospital, Toronto, Ontario.)

**Objective:** Anti-TNF agents are thought to inhibit granuloma formation, possibly accounting for the reactivation of TB seen with this therapy. These agents have also been reported to be effective in treating sarcoidosis. We report a case which challenges both of these concepts.

**Methods:** The patient is a 34 year-old man with a 15-year history of severe psoriatic arthritis with both peripheral and axial disease. Optimal disease control was never achieved despite sulfasalazine, methotrexate, oral and intra-articular corticosteroids, and multiple NSAIDs.

In July 2000, Infliximab was initiated. Baseline chest X-ray and TB skin test were negative. There was a dramatic and sustained improvement in his arthritis. In May 2005, he developed pleuritic chest pain, a productive cough and dyspnea. Chest X-ray was normal and he was treated with azithromycin. One week later his symptoms persisted, a repeat chest X-ray revealed a small left pleural effusion with airspace opacification in the left lower lobe. A chest CT scan showed mediastinal and hilar adenopathy, a small pleural effusion, pleural thickening with patchy lower lobe consolidation.

A follow up chest X-ray showed fullness of the right hilum, and improvement in the pleural effusion and pulmonary opacity. The differential diagnosis included resolving bacterial pneumonia, tuberculosis, lymphoma, and sarcoidosis. A TB skin test was negative.

Over the following month chest pains persisted, but no dyspnea, fevers, chills, night sweats or weight loss. He proceeded to mediastinoscopy and pleural biopsy. Lymph node biopsy revealed numerous tight, well-formed

granulomas surrounded by a thin rim of fibrosis. The granulomas were judged to be non-necrotizing. The pleural biopsy revealed chronic inflammation, fibrosis and reactive mesothelial hyperplasia, without granulomas or malignant cells. Stains of the pleural tissue and lymph node were negative for pathogens and cytology was negative for malignant cells. Sarcoidosis was felt to be the most likely diagnosis. Prednisone 40 mg/day was started for persisting cough and chest discomfort with resolution of these symptoms.

**Results Obtained and Conclusion:** While isolated cases of mediastinal lymphadenopathy have been reported concurrent with biologic therapy, this is the first case of biopsy-proven sarcoidosis developing during infliximab therapy.

## 62

**VALIDATION OF THE FACIT-FATIGUE IN PSORIATIC ARTHRITIS (PSA)** Sita Bhella, Vinod Chandran, Catherine Schentag, Dafna Gladman (Toronto Western Hospital, Toronto, Ontario)

**Objective:** To determine the reliability and validity of The Functional Assessment of Chronic Illness Therapy Fatigue Scale (FACIT-Fatigue) in PsA.

**Methods:** Consecutive patients attending the PsA Clinic were given the 13-item FACIT-Fatigue (scored 0-52, lower scores > fatigue) and modified Fatigue Severity Scale (mFSS, scored 0-10, lower scores < fatigue) to complete once in clinic and again one week later. Patients were assessed clinically using a standardized PsA protocol. Internal consistency of the 13 items was measured using Cronbach's alpha; test-retest reliability by the intraclass correlation coefficient (ICC), and validity by the correlation with other fatigue measures and disease characteristics.

**Results Obtained and Conclusion:** There were 135 patients, 59% male, mean age  $52 \pm 13$  yrs, disease duration  $17 \pm 10$  yrs, actively inflamed joint count (AJC)  $4.5 \pm 7$ , swollen joint count (SJC)  $1.3 \pm 2$ , and clinically damaged joint count (CDJC)  $8.7 \pm 12$ . The mean FACIT-Fatigue score was  $35.8 \pm 12.4$ , and mean mFSS was  $4.9 \pm 2.7$ . Cronbach's alpha was 0.96 and the ICC for first and repeat scores 0.95. The correlation between the FACIT-Fatigue and mFSS was  $-0.79$  (95% CI  $-0.85$ ,  $-0.72$ ). The FACIT-Fatigue score of patients with and without overwhelming fatigue on clinical assessment was  $24.8 \pm 13.9$  and  $38.5 \pm 10.4$ , respectively ( $p < 0.0001$ ). The FACIT-Fatigue was correlated with AJC ( $-0.43$ , 95% CI  $-0.56$ ,  $-0.28$ ), less with SJC ( $-0.27$ , 95% CI  $-0.42$ ,  $-0.01$ ) but not with the CDJC ( $-0.06$ , 95% CI  $-0.23$ ,  $0.11$ ). The FACIT-Fatigue score was lower in patients with fibromyalgia ( $19.6 \pm 9.0$ ) compared to those without fibromyalgia ( $38.1 \pm 11.3$ ) ( $p < 0.0001$ ). Scores for males ( $37.2 \pm 11.0$ ) and females ( $33.6 \pm 14.2$ ) were similar ( $p = 0.12$ ).

**Brief Conclusion:** The FACIT-Fatigue was reproducible, correlated with other fatigue measures as well as with disease activity. Therefore, the FACIT-Fatigue is a valid and reliable instrument to measure fatigue in PsA, and is a suitable measure for clinical trials.

## 63

**THE INFLAMMATORY ARTHRITIS ACT EARLY INITIATIVE** Mary Bell, Susan Robarts, David Northrup (Sunnybrook & Women's College Health Sciences Centre, Institute for Social Research)

**Objective:** Inflammatory Arthritis (IA) is a systemic disease that results in rapid, permanent joint damage and disability if left untreated. A critical window of opportunity exists to treat symptoms of IA in order to prevent joint destruction; however many individuals are not receiving timely care due to barriers in the current health system.

**Objectives:** 1. To identify individuals with symptoms of IA in the community requiring medical assessment and treatment through a public awareness campaign. 2. To apply a 2-step screening process for triage and rapid referral that integrates existing services.

**Methods:** A public awareness campaign was developed for implementation in a multicultural community of 250,000. Individuals responding to the key messages called 1.877.Act.Early for telephone screening by a trained telepractice nurse. If target symptoms were identified, the caller was referred for a joint examination by Arthritis Society therapists. Individuals with probable IA based on the screening received an expedited referral to local rheumatology clinics facilitated by their family physician.

**Results Obtained and Conclusion:** The campaign generated 358 calls in 3 months. 253 callers in the target community were screened and 59 indi-



viduals were referred for the joint examination. 15 individuals received an expedited referral to rheumatology, 8 of whom have been diagnosed with IA. Mean time from initial screening to rheumatology consult was 2 months. Campaign recall and public perceptions of arthritis were assessed through 800 random telephone surveys in the target(400) and control(400) communities by an independent researcher. Public perceptions include common myths about arthritis. Campaign reach in the target community did not vary significantly from the control community.

**Brief Conclusion:** Early treatment by rheumatologists has been shown to improve longterm outcomes of individuals with IA. A public awareness campaign combined with preliminary screening may offer an opportunity to reduce wait times, expedite care and ensure appropriate referrals to rheumatology; however, the current bombardment of health-based information may limit potential impact.

## 64

**CYTOKINE PROFILES OF SERUM PROTEOMIC PATTERNS IN THE SERA OF PEDIATRIC PATIENTS WITH MACROPHAGE ACTIVATION SYNDROME (MAS): IMPLICATIONS FOR RAPID DIAGNOSIS** Paivi MH Miettunen, Yu Ding, Aru Narendran (Division of Pediatric Rheumatology, Alberta Children's Hospital and University of Calgary, Division of Pediatric Oncology, University of Calgary, Division of Pediatric Oncology, Alberta Children's Hospital and University of Calgary) **Objective:**Macrophage activation syndrome (MAS) is a life threatening clinical entity caused by pathological activation and proliferation of mature macrophages. It can be primary (familial hemophagocytic lymphohistiocytosis) or secondary to rheumatic diseases, infections or malignancies. Currently the diagnostic gold standard for MAS is biopsy documented hemophagocytosis in the bone marrow, liver, spleen, or lymph nodes. Limitations to biopsy include patchy disease with a high false negative rate, risk of anesthesia and post-procedural bleeding. Delay in diagnosis often contributes to delayed treatment and subsequently high morbidity and mortality.

We postulated that diverse immunological pathways that ultimately lead to the common end result of activated macrophages would involve distinct set of cytokines. Our objective was to test known MAS patients' sera with a high-throughput multiplexed antibody array technique to identify possible "MAS cytokine signature" to aid in rapid diagnosis.

**Methods:**Sera were collected from three patients at time of MAS diagnosis (biopsy confirmed) before treatment was initiated. Sera from age and sex matched normal children was used as controls.

Sera (50 microliters) diluted in blocking buffer were incubated with arrays containing antibodies to an extensive set of inflammatory cytokines and peptides. Proteins bound to respective antibodies were detected by pooled secondary antibodies labeled with biotin and avidin linked HRP and developed with luminescent reagents. Resulting images were captured with a digital camera and quantified using Image J visual analysis software.

**Results Obtained and Conclusion:** All patients had elevated IL-6. Compared to controls, patients had distinct patterns of increased cytokines and related proteins, including enhanced expression of IL-8, IL-10, MCP-1, RANTES, MIG and GRO. These findings were validated by conventional ELISA. The test provided rapid results in 3 hours.

**Brief Conclusion:** 1) Common inflammatory cytokine IL-6 was consistently elevated in all MAS patients' sera tested. 2) Each patient had a specific cytokine profile but a small group of cytokines were common to all patients. 3) If these "signatures" are consistently found in an expanded sample size, these findings can be used as a tool for rapid and non-invasive diagnosis of MAS. Such signatures would also facilitate accurate classification of MAS and related conditions.

## 65

**RHEUMATIC DISEASE IN ABORIGINAL MANITOBANS** Cheryl Barnabé, Brenda Elias, Judy Bartlett, Christine Peschken (Department of Medicine, University of Manitoba, Winnipeg, Manitoba, Centre for Aboriginal Health Research, University of Manitoba, Winnipeg, Manitoba) **Objective:**To describe the prevalence and spectrum of rheumatic disease in Manitoba's Aboriginal (First Nations/ Métis) people.

**Methods:**The prevalence of rheumatic disease was ascertained using three separate data sources: Physician visits for 3 common ICD-9 musculoskeletal diagnoses were abstracted from the Manitoba Health (MH) database for

Registered First Nations (RFN) Manitobans compared to all other Manitobans. Self-reported arthritis rates were obtained from the Manitoba First Nations Regional Longitudinal Health Survey (MFNRLHS), which surveyed Manitoba First Nations on-reserve. Data on ethnicity and diagnoses was abstracted from the Arthritis Centre (AC) research database, which contains records of all patients seen at the AC.

**Results Obtained and Conclusion:** MH data demonstrated twice the rate of rheumatoid arthritis (RA), degenerative arthritis, and undifferentiated arthropathy in RFN Manitobans compared to all other Manitobans. MFNRLHS data identified rates of self-reported arthritis of 20%, with rates of RA of 3.0%. Thirty percent of RFN Manitobans reported stiff and painful joints in the last year; only 51% consulted a physician for these symptoms. Data for 687 Aboriginal patients, and 4135 Caucasian patients was abstracted from the AC database. The number of Aboriginal patients was proportional to the provincial representation at 13.4%, in spite of the higher rates of arthritis identified above. Prevalence rates of inflammatory rheumatologic diseases, including RA, lupus, juvenile RA, vasculitis and reactive arthritis, were two to four times higher than that seen for Caucasians, while referrals for osteoarthritis and other non-inflammatory conditions were significantly less frequent in Aboriginal patients compared to Caucasians. Aboriginal patients had an earlier disease onset of arthritis (34 vs. 43 years) using both MH and AC data, adding to the burden of disease.

**Brief Conclusion:** The data highlights increased prevalence of a wide spectrum of rheumatic disease in Aboriginal Manitobans. However, many Aboriginal people not accessing care for their symptoms, and for those that do, there is a relative under-referral to specialists. There are large gaps in our knowledge of how, why and when Aboriginal Manitobans access medical care, and how they experience interaction with the medical system. Further research into these areas is urgently needed.

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**REVIEW OF PREDISPOSING FACTORS FOR SEPTIC ARTHRITIS** Dr. Latha Naik, Dr. Bindu Nair, Dr. Regina Taylor-Gijevre, Dr. John Sibley (Royal University Hospital, University of Saskatchewan, Saskatoon, SK)

**Objective:**The aim of this study is to assess predisposing factors, causative agents, clinical features and the type of consultations obtained for patients presenting with septic arthritis.

**Methods:**A retrospective chart review was done for admissions of septic arthritis from 1999 to 2001 at Royal University Hospital, Saskatoon, Saskatchewan.

**Results Obtained and Conclusion:** During 3 years 31 admissions of septic arthritis were identified. The mean duration of hospital stay was 10 days (minimum 2 days to maximum 6 weeks). The mean age of these patients was 53 years (24 to 90 years). Sixty-one percent of the patients were male. The knee was the most frequent joint involved (45%) followed by hip, shoulder, wrist and SI joint. Preexisting joint disease such as osteoarthritis or rheumatoid arthritis was noted in 39%. Prior surgical intervention of the involved joint occurred in 19% of the cases. Septicemia was present in 19% of the admissions. Concurrent wound infection was found among 13% of the patients. Prior intraarticular corticosteroid injection cases were 6%. Synovial fluid cultures were positive in 65% of the cases. *Staphylococcus aureus* was isolated in 39%. Eighty-seven percent of the patients had monoarticular symptoms. The majority of the patients had fever (55%). Sixty percent of the patients demonstrated leucocytosis. Three percent of patients received antibiotics prior to synovial fluid aspiration. Arthroscopy, irrigation and debridement were performed in 60% of the cases. Infectious disease & orthopedics services were consulted for all the patients. A rheumatology consult was sought for only one patient.

**Brief Conclusion:** At our institution, preexisting joint disease and prior surgical intervention of the joint are important predisposing factors for septic arthritis. Synovial fluid cultures were negative in 35% of the cases that were still managed as septic arthritis. Surgical interventions were performed in over half of the cases.

## 67

**INTRAVENOUS PAMIDRONATE IN CHRONIC RECURRENT MULTIFOCAL OSTEOMYELITIS (CRMO) LEADS TO RESOLUTION OF PAIN, NORMALIZATION OF RADIOLOGIC ABNORMALITIES, AND NORMALIZATION OF ELEVATED URINE-N-TELOPEPTIDE (NTX): 4 CASE REPORTS** Paivi M H Miettunen, Deepak Kaura, James D Kellner

(Division of Pediatric Rheumatology, University of Calgary, Alberta Children's Hospital, Division of Pediatric Radiology, University of Calgary, Alberta Children's Hospital, Division of Pediatric Infectious Diseases, University of Calgary, Alberta Children's Hospital)

**Objective:** CRMO is an inflammatory, non-infectious osteopathy in children. No helpful laboratory markers or effective long term treatment is known. We describe successful treatment with the osteoclast suppression agent, pamidronate, in 4 children with refractory CRMO with intolerable pain, increased urine NTX (marker for increased bone turnover) and radiologic findings of bone inflammation.

**Methods:** Evaluation before and after treatment and at clinical recurrence included: visual analog scale for pain (VAS); urine NTX and creatinine; serum calcium and alkaline phosphatase, ESR, CRP, WBC; and x-rays and MRI of the affected site(s). Four children (3 boys, 1 girl; median age 14 years) were treated with 3-day cycles of IV pamidronate: 0.5mg/kg/day on day 1; 1 mg/kg/day subsequently. The first 2 children were treated monthly for 2-4 courses and the second 2 children were treated every 3 months for 3 courses. The endpoints included pain reduction and radiologic improvement.

**Results Obtained and Conclusion:** Index case. Four cycles of pamidronate were given. The VAS reduced from 10/10 to 0/10 by day 3 of first cycle. Elevated urine NTX (702.4 nmol/mmol creatinine at baseline) decreased by 54% by the second cycle. Other investigations were normal. MRI of right radius and ulna at baseline and at week 6 showed increased T1 signal, periostitis and bone edema, which resolved by month 4.

Cases 2, 3 and 4: All had similar results, with complete resolution of pain by day 3 of first cycle; resolution of initially elevated urinary NTX and of abnormal signals on MRI.

Two patients had clinical and MRI documented recurrence at 10 and 18 month follow-up after last pamidronate infusion at previously active sites. The symptoms resolved with 1 day of pamidronate re-treatment. Followup of all children is ongoing.

**Brief Conclusion:** 1. IV pamidronate lead to rapid and sustained pain relief in cases of severe CRMO. 2. Recurrences responded to a much shorter duration of pamidronate than initial therapy. 2. Urine NTX was elevated with active CRMO, and the value decreased with pamidronate treatment. This reduction correlated with pain resolution and normalization of bone MRI.

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**INTER-EXAMINER RELIABILITY OF THE STANDARDIZED OA**  
Carlo Marra, Jolanda Cibere, Patrick Embley, Ross Tsuyuki, Louise Gastonguay, Judith Soon, Peilin Shi, John Esdaile (Arthritis Research Centre/UBC, Mary Pack Arthritis Centre, c/COMPRIS/U of A, Centre for Clinical Epidemiology and Evaluation, Faculty of Pharm. Sciences, UBC)  
**Objective:** To assess the inter-examiner reliability of the standardized knee examination in osteoarthritis(OA) between a rheumatologist and physiotherapist.

**Methods:** Subjects with knee pain and no prior diagnosis of knee OA were recruited from community pharmacies from the Vancouver area. Pharmacists used a simple screening questionnaire (less than 10 minutes to administer) to identify those with likely knee OA. Twenty-five of these subjects with knee pain were examined by both a rheumatologist and physiotherapist, experienced in the assessment of knee OA, using a standardized knee examination approach (Cibere J et al. Arthritis Rheum 2004;50:458-68). Agreement was determined for the American College of Rheumatology (ACR) clinical diagnostic criteria for knee OA and for each of the knee examination signs. For those signs with dichotomous scales, agreement was calculated as the prevalence-adjusted, bias-adjusted kappa (PABAK), while the for the signs with continuous and ordinal scales, a reliability coefficient (Rc) was calculated using analysis of variance. A PABAK of >0.60 and an Rc of >0.80 were considered to indicate adequate reliability.

**Results Obtained and Conclusion:** Of the 25 subjects recruited, 60% were female, 88% were Caucasian, and the mean age was 65 years (standard deviation 9). Using the ACR clinical criteria for knee OA, the rheumatologist and physiotherapist exam resulted in diagnostic agreement in 23 of the 25 patients assessed (PABAK= 0.84). Of the 11 physical signs evaluated, 7 were reliable. The most reliable signs identified by physical exam were end of range stress pain (PABAK = 0.92), flexion range of motion (Rc=0.94), lateral tibiofemoral tenderness (PABAK=0.83), medial

tibiofemoral tenderness (PABAK =0.68), and warmth (PABAK = 0.67). Signs that were most unreliable were joint effusion (PABAK= 0.36), and knee flexion contracture(Rc= 0.40).

**Brief Conclusion:** Using a comprehensive standardized knee exam resulted in high reliability for the ACR diagnostic criteria for knee OA between a rheumatologist and a physiotherapist. The reliability of was high for most, but not all, individual knee examination signs.

## 69

**EFFECTIVE TREATMENT OF INFANTILE ONSET MACROPHAGE ACTIVATION SYNDROME/HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS (MAS/HLH) WITH ETANERCEPT** Paivi MH Miettunen, Victor Lewis, Doan Le, Aru Narendran (Division of Pediatric Rheumatology, University of Calgary and Alberta Children's Hospital, Division of Pediatric Oncology, University of Calgary and Alberta Children's Hospital, Division of Pediatric Hematology, University of Calgary and Alberta Children's Hospital)

**Objective:** MAS/HLH is a rare but life threatening condition that can be primary (familial HLH) or secondary to rheumatic diseases, infections, or malignancies. Pro-inflammatory cytokines, such as IL-6, are thought to be central in pathological manifestations of this disease. There is no data on IL-6 levels in infantile MAS/HLH, nor is uniformly effective treatment available. We describe successful treatment of infantile MAS/HLH with anti-tumor necrosis factor agent Etanercept and provide IL-6 data.

**Methods:** Serum cytokine levels including pro-inflammatory IL-6 and non-proinflammatory IL-11 and VEGF were measured by ELISA pre and days two and six post Etanercept administration. Patient had genetic analysis for FHLH, and measurement of T-cell function, soluble IL-2 receptor and perforin level.

**Results Obtained and Conclusion:** Case: Diagnosis of MAS/HLH was made in a 3-week old female infant with fever, respiratory failure, rash, lymphadenopathy and hepatosplenomegaly. Laboratory features included thrombocytopenia (Plt 7), anemia (Hb 77), increased ferritin (1192), fibrinogenemia (<0.8), increased D-dimer (>0.8), prolonged INR and PTT. Lymph node biopsy confirmed hemophagocytosis. Infectious workup was negative for bacterial and viral agents (EBV, Parvovirus, Toxoplasmosis, CMV, Rubella, Mycoplasma, HSV, and HHV6).

Patient received IV Methylprednisolone, IV Cyclosporine and IV IG. On day four of treatment she developed renal failure and deep vein thrombosis. Cyclosporine was held, and subcutaneous Etanercept initiated with rapid resolution of clinical and laboratory abnormalities. Pre-Etanercept serum IL-6 level was significantly higher (959 pg/ ml) than normal (46 pg/ml). IL-11 and VEGF levels were not elevated. IL-6 level decreased to 27 pg/ml within two days of treatment with Etanercept. Patient remains clinically well with normal neurologic development at 18 month follow up and continues on SC Etanercept and q 6 week IVIG infusions. FHLH gene mutations were not present; and NK function, perforin studies, IL-11, and soluble IL-2 receptor levels were normal.

**Brief Conclusion:** 1) Etanercept with Corticosteroids and Cyclosporine resulted in sustained remission in an infant patient with MAS/HLH. 2) IL-6 levels may aid in diagnosis and in monitoring effectiveness of treatment.

## 70

**LONGITUDINAL FOLLOW-UP STUDY OF ANTIPHOSPHOLIPID ANTIBODIES AND ASSOCIATED NEUROPSYCHIATRIC MANIFESTATIONS IN 137 CHILDREN WITH SYSTEMIC LUPUS ERYTHEMATOSUS** Tadej Avcin, Susanne M. Benseler, Pascal N. Tyrrell, Earl D. Silverman (The Hospital for Sick Children, University of Toronto, Toronto, ON, Canada )

**Objective:** To determine the prevalence and clinical associations of antiphospholipid antibodies (aPL) with neuropsychiatric manifestations in a large cohort of children with systemic lupus erythematosus (SLE).

**Methods:** A single center retrospective cohort study of children diagnosed with SLE between June 1995 and August 2005 was performed. The study population consisted of 137 children with SLE, 25 boys and 112 girls, mean age at diagnosis 13.0 yrs (range 3.1-17.7 yrs). Neuropsychiatric manifestations were classified according to the 1999 ACR case definitions for neuropsychiatric syndromes. aPL were determined at the time of diagnosis and then at yearly intervals as part of routine clinical care. Patients were followed up for a mean period of 31 months (range 1-118 months). Statistical

analyses were performed using Chi-square and Fischer exact tests.

**Results Obtained and Conclusion:** Initial assessment: A total of 23/137 (17%) children with SLE presented with neuropsychiatric manifestations. At the time of diagnosis 83/128 (65%) children had positive aCL and 22/84 (26%) had positive LA. Analysis of the association between the presence of aPL and individual neuropsychiatric manifestations at the time of diagnosis showed statistically significant association of positive LA with cerebrovascular disease (5 patients;  $p=0.015$ ).

**Follow-up:** During the study period neuropsychiatric manifestations occurred in 35/137 (26%) children with SLE; headache (16%), psychosis (10%), cognitive dysfunction (9%), cerebrovascular disease (5%), seizures and mood disorder (3% each), chorea and transverse myelitis (2% each). Persistently positive aCL occurred in 69/137 (50%) and LA in 20/125 (16%). Among those with neuropsychiatric manifestations, 17/35 (49%) had persistently positive aCL and 7/34 (21%) had persistently positive LA. Comparison for specific neuropsychiatric manifestations showed statistically significant association between persistently positive LA and chorea ( $p=0.02$ ), however, there were only 2 patients with chorea.

**Brief Conclusion:** Persistently positive aCL was found in 49% and LA in 21% of pediatric SLE patients with a history of neuropsychiatric manifestations, which was not statistically different than in those without neuropsychiatric manifestations. Our data suggest an association between LA and cerebrovascular disease and chorea, but not between aCL or LA and other neuropsychiatric manifestations.

## 71

**RITUXIMAB THERAPY FOR CHILDHOOD-ONSET SYSTEMIC LUPUS ERYTHEMATOSUS** Elie Haddad, Marjolaine Willems, Patrick Niaudet, Isabelle Koné-Paut, Albert Bensman, Pierre Cochat, Georges Deschênes, Fadhi Fakhouri, Thierry Leblanc, Brigitte Llanas, Chantal Loirat, Pascal Pillet, Remy Salomon, Tim Uliniski, Brigitte Bader-Meunier, for the French pediatric-onset SLE study group (Hôpital Sainte-Justine, Montréal, Canada, Hôpital de Bicêtre, Le Kremlin-Bicêtre, France, Hôpital Necker, Paris, France, Hôpital Trousseau, Paris, France, Hôpital Edouard Herriot, Lyon, France, Hôpital Saint-Louis, Paris, France, Hôpital Pellegrin, Bordeaux, France, Hôpital Robert Debré, Paris, France)

**Objective:** To describe the safety and efficacy of rituximab in the treatment of childhood-onset systemic lupus erythematosus (SLE)

**Methods:** French multicenter retrospective study of childhood-onset SLE treated with rituximab

**Results Obtained and Conclusion:** 11 patients with severe SLE, including 8 with class IV or V lupus nephritis were treated with rituximab. Mean age at onset of rituximab treatment was 13.9 years. Remission was achieved in 6/8 patients with lupus nephritis and in 2 patients with autoimmune cytopenia. Steroid therapy was tapered in 5 responders and 1 was maintained on low-dose prednisone treatment. Mean follow-up was 13.2 months (range, 6-26 months), and remission lasted in all responders but one who was successfully retreated with a second course of rituximab. Anti-dsDNA antibody levels decreased in 6/11 patients, and anticardiolipin antibodies in 3/4 patients. Five patients developed severe adverse events that consisted on septicemia in 2 and severe hematologic toxicity in 4. Effective depletion of peripheral blood B cells was observed in 7/8 evaluated patients, and paralleled the remission

**Brief Conclusion:** Rituximab may be an effective co-therapy whose safety requires further investigations

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**STRONTIUM RANELATE FOR PREVENTING AND TREATING POST-MENOPAUSAL OSTEOPOROSIS** Siobhan O'Donnell, Ann Cranney, George Wells (Clinical Epidemiology Program, Ottawa Health Research Institute, Clinical Epidemiology Program, Ottawa Health Research Institute; Division of Rheumatology, Ottawa Hospital and Faculty of Medicine, University of Ottawa, Institute for Population Health, University of Ottawa; Faculty of Medicine and Department of Epidemiology & Community Medicine, University of Ottawa)

**Objective:** To assess the efficacy and safety of strontium ranelate (SR) for the treatment and prevention of post-menopausal osteoporosis through a systematic review of the literature.

**Methods:** We searched MEDLINE, Embase and the Cochrane Library from 1996 to 2005 and examined citations of relevant articles and conference

proceedings. Trials that randomized women to SR or placebo and were at least one-year in duration were included. Unpublished data was sought from authors and industry sponsors. Two reviewers determined study eligibility, assessed methodological quality using a validated tool and abstracted data independently. Meta-analysis was conducted using the random effects model.

**Results Obtained and Conclusion:** A total of four trials met our inclusion criteria. SR relative to placebo increased lumbar spine BMD as demonstrated by two trials ( $n = 804$ ) over a two-year period using the recommended dose of 2 g per day (4.40%, 95% CI 0.64-8.17 adjusted and 11.4%, 95% CI 10.17-12.51 not adjusted for strontium content). Similarly, there was an increase in femoral neck (4.77%, 95% CI 2.71-6.83) and total hip BMD (5.41%, 95% CI 2.01-8.81) over the same follow-up period and 2g daily dose.

A reduction in vertebral fractures was demonstrated by two trials ( $n = 2536$ ) over a three-year period with 2 g of SR daily (relative risk (RR) 0.63, 95% CI 0.56-0.71). However, the reduction in non-vertebral fractures was less according to the pooled RR from two trials ( $n = 3198$ ) over the same follow-up period and 2 g daily dose (0.86, 95% CI 0.75-0.99).

2 g of SR daily may increase the risk of diarrhea (RR 1.38, 95% CI 1.02-1.87,  $p=0.04$ ) however adverse events did not affect the risk of discontinuing SR relative to placebo.

**Brief Conclusion:** SR increases BMD at all sites. Pooled estimates are consistent with a reduction in vertebral fractures; however there is less of a reduction in non-vertebral fractures. Adverse events leading to study withdrawal were not increased in the SR group relative to controls.

## 73

**A NATIONAL COMMUNITY-BASED EDUCATIONAL INTERVENTION FOR THE DIAGNOSIS AND TREATMENT OF ARTHRITIS IN PRIMARY HEALTH CARE** Mary Bell, Jennifer Boyle, Sydney Lineker, Elizabeth Badley (Sunnybrook and Women's College Health Sciences Centre, Toronto, Ontario, Arthritis Community Research & Evaluation Unit, Toronto, Ontario, The Arthritis Society, Toronto, Ontario)

**Objective:** The objective of this study is to evaluate a community-based educational intervention designed to improve the diagnosis and treatment of rheumatoid arthritis and osteoarthritis in primary health care.

**Methods:** Getting a Grip on Arthritis was designed by a taskforce consisting of primary health care providers, adults with arthritis, health services researchers, and government representatives and was successfully piloted in Ontario. The content of the intervention was designed around arthritis best practices, which were adapted from published arthritis guidelines. The intervention consists of 30 MAINPRO-C accredited workshops across Canada, educational materials for patients and providers and follow-up reinforcement for providers working in primary health care sites across Canada. The impact of the intervention will be determined through surveys to providers and patients at baseline and follow-up surveys at 6 and 12 months after the workshop.

**Results Obtained and Conclusion:** Results: As of October 31, 2005, 260 primary health care facilities and their providers (830) have participated in one of thirty workshops. Providers (789) and patients (744) have completed baseline surveys and will be resurveyed 6 and 12 months post workshop. Anticipated results include improved provider delivery of arthritis best practices.

**Conclusions:** It is expected that the Getting a Grip on Arthritis initiative will build the capacity of primary health care providers, communities and patients to manage arthritis through improved implementation of arthritis best practices, increased community and patient involvement, and increased intersectoral and interprofessional collaboration. This study will provide insights on how to translate arthritis best practices into action by providers in primary health care across Canada.

**Brief Conclusion:** This study will provide insights on how to translate arthritis best practices into action by providers in primary health care across Canada.

## 74

**AN ORANGE A DAY MIGHT HAVE KEPT THE RHEUMATOLOGIST AWAY** Eman Loubani, Bianca Lang, Matthias Schmidt, Adam Huber, Sarah Shea (IWK Health Centre, Halifax, Nova Scotia)

**Objective:** To present a case of scurvy in a child, and increase awareness of



the pediatric presentation of scurvy.

**Methods:** We report a 4 year old previously healthy Caucasian boy who presented with a 4-month history of musculoskeletal pain, fatigue and a 1-month history of refusal to walk. He had no fevers, rashes, bruising or bleeding, and a review of systems was negative. His diet consisted almost exclusively of milk, french fries and hot dogs. Vital signs, growth parameters and general physical exam, including skin and gingiva, were normal. There was no arthritis, but he refused to weight bear and had significant proximal muscle weakness. CBC showed a microcytic anemia (Hb97g/L), but was otherwise unremarkable. ESR, CRP, immunoglobulins, CPK, AST, ALT, LDH, renal function and lead levels were normal. Plain x-rays showed prominent metaphyseal lucent bands with a thin sclerotic interface between the metaphysis and physis. Two bone marrow biopsies were negative for leukemia. The lack of inflammatory features of his illness, and the negative work up for malignancy and infection, lead to the consideration of scurvy, which had been raised by the appearance of his x-rays and the unusual dietary history. The serum Vitamin C level was 4µmol/L (normal 40-130). Vitamin C supplementation was started leading to dramatic clinical and radiological improvement.

**Results Obtained and Conclusion:** Our case report illustrates the predominance of musculoskeletal complaints in the presentation of scurvy in children. Well-recognized clinical features of scurvy in adults include disordered bleeding and gingival inflammation. In contrast, musculoskeletal symptoms are the most common presenting features of scurvy in children. These include musculoskeletal pain and weakness, as well as limp and inability to walk. Leukemia may be suspected given the radiologic features. Once scurvy is diagnosed and Vitamin C supplementation initiated, recovery is dramatic.

**Brief Conclusion:** Although scurvy is a rare disease in North America, it must be part of the differential diagnosis for a child presenting with unexplained musculoskeletal pain and weakness. Prompt recognition of the clinical and radiologic manifestations of scurvy will lead to fewer unnecessary interventions, and rapid institution of curative treatment.

## 75

**THE PHYSICAL FUNCTION AND HEALTH-RELATED QUALITY OF LIFE OF RHEUMATOID ARTHRITIS PATIENTS WITH INADEQUATE RESPONSES TO ANTI-TNF THERAPY WERE SIGNIFICANTLY IMPROVED FOLLOWING TREATMENT WITH ABATACEPT AS PART OF THE ATTAİN TRIAL** Fedra Irazoque, Yvonne Sherrer, Tracy Li, Maxime Dougados, Majed Khraishi (Hospital Angeles Mocel, San Miguel Chapultepec, Mexico, Centre for Rheumatology Immunology and Arthritis, Fort Lauderdale FL, USA, Bristol-Myers Squibb, Princeton NJ, USA, Rene Descartes University, Service de Rhumatologie B, Paris, France, St. Clare's Mercy Hospital, St. John's, Canada)

**Objective:** The effects of abatacept on health-related quality of life (HRQoL) and physical function in rheumatoid arthritis (RA) patients were assessed as part of the ATTAİN (Abatacept Trial in Treatment of Anti-TNF INadequate responders) trial.

**Methods:** ATTAİN was a 6-month, randomized, double-blind, placebo-controlled, multicenter, Phase III trial of a fixed dose of abatacept (~10 mg/kg) vs. placebo in patients with active RA and an inadequate response to ≥3 months of anti-TNF-α therapy (etanercept and/or infliximab). All patients remained on ≥1 background DMARD (abatacept vs. placebo: MTX, 75.6 vs. 82.0%; anakinra, 2.7 vs. 2.3%; all other non-biologic DMARDs were <10% in each group). Study medication was administered on Days 1, 15, 29 and every 28 days thereafter. HRQoL was assessed using the SF-36 which contains four physical and four mental domains, including physical and mental component summary scores (PCS and MCS, respectively). The Health Assessment Questionnaire (HAQ) measured physical function; patients with a decrease of ≥0.3 units from baseline (greater than the minimum clinically meaningful improvement of 0.22 units) were considered HAQ responders.

**Results Obtained and Conclusion:** A total of 391 patients were randomized to abatacept or placebo in a 2:1 ratio. Baseline characteristics were similar between groups (HAQ: 1.8±0.6 vs. 1.8±0.6; for abatacept vs. placebo, respectively). At 6 months, clinically meaningful and statistically significant improvements were observed for all eight SF-36 domains as well as both PCS (6.6 vs 1.1; p<0.001) and MCS (5.2 vs. 2.1; p=0.005) for abatacept vs. placebo. Mean change from baseline in HAQ score was significantly greater in the abatacept vs. placebo groups (-0.45 vs. -0.11; p<0.001) and

the percentage of HAQ responders in the abatacept group was double that of the placebo group (47.3 vs 23.3%; p<0.001).

**Brief Conclusion:** In the 6-month ATTAİN trial, abatacept-treated patients experienced clinically meaningful improvements in all eight domains of the SF-36, in the PCS and MCS, and in physical function. All were statistically significant compared with patients receiving background DMARDs only.

## 76

**HORMONE REPLACEMENT THERAPY IN WOMEN WITH SLE AND RISK OF CARDIOVASCULAR DISEASE** Jackie Hochman, Dominique Ibanez, Murray Urowitz, Dafna Gladman (Toronto Western Hospital)

**Objective:** To determine the impact of HRT on the incidence of coronary heart disease (CHD) in women with SLE using a cohort design.

**Methods:** Since 1970, SLE patients have been followed prospectively at the Lupus Clinic. Information collected according to a standardized protocol is stored on a computer database. The database was searched for women who had taken HRT without history of CHD (angina or myocardial infarction) at the start of HRT. Only the first CHD event was analyzed in each patient. HRT-users were compared to all post-menopausal female patients from the same cohort without history of HRT use or CHD prior to menopause. Chi-squared and t-tests were used to compare the risk factors of CHD in both groups. The following factors were allowed into a proportional hazard survival analysis with the outcome being time to CHD: age; use of immunosuppressives, antimalarials, HRT; and number of classic cardiac risk factors.

**Results Obtained and Conclusion:** 115 patients were identified as HRT-users without history of CHD at the start of HRT. These HRT-users were compared with 236 post-menopausal SLE controls. The controls were older at SLE diagnosis and at menopause; had higher disease activity, shorter disease duration; and used less antimalarials and immunosuppressives than HRT-users. The groups were similar in the presence of lupus anticoagulant, antiphospholipid antibody, cumulative steroid dose, and classic cardiac risk factors. A similar percentage of patients developed CHD in the control (13.1%) and HRT groups (12.2%). There was no difference between the two groups in the time to development of CHD following menopause. In the multivariate analysis, HRT was not a risk factor for CHD; only the number of classic cardiac risk factors was significantly associated with the risk of CHD (p=0.03, HR=1.55, 95% CI = 1.05, 2.30). **Brief Conclusion:** In this study, HRT did not appear to increase the incidence of CHD over a mean follow-up of 15 or more years. However, the number of cardiac risk factors did increase the risk of CHD.

## 77

**MATHEMATICAL MODELLING TO IMPROVE THE OPERATION OF RHEUMATOLOGY CLINICS** Steven M. Edworthy, Paul Rogers, Huayin Qu (University of Calgary, Calgary, Alberta)

**Objective:** This abstract describes preliminary research on the use of mathematical modelling tools from the general domain of "operations research" to improve the operation of rheumatology clinics.

**Methods:** The initial model developed is a simple, probabilistic one that represents the clinic patient flow in a highly aggregated manner and that involves five independent variables and three dependent variables. The independent variables are: rate of new patient referrals (RNPR); time between follow-up appointments (TBFA) for patients; attrition rate (AR) of patients; average new patient visit time (NPVT); average follow-up patient visit time (FPVT). The dependent variables are: number of appointments the physician must deal with each month (APM); the number of hours the physician must devote to appointments each month (HPM); the size of the population of patients (PP) that might need a follow-up appointment. The model predicts how each of the dependent variables will vary over time (the transient behaviour), and at what levels they will stabilize (when steady-state is reached). It also permits "sensitivity analysis" that shows how each dependent variable changes as the independent variables are altered.

**Results Obtained and Conclusion:** Example: RNPR = 10 per month; TBFA = 3 months; AR = 20% per year; NPVT = 1 hour; FPVT = 30 minutes. These values result in the following steady-state performance: APM = 191; HPM = 100.5; PP = 543. Assume a 20% drop in physician work time availability (100 hours to 80 hours per month). Each of the following alternatives would yield the desired physician workload: reduce RNPR by 20% to 8 per

month; increase TBFA by 29% to 3.9 months; increase AR by 43% to 25% per year; reduce FPVT by 23% to 23 minutes.

**Brief Conclusion:** Research is continuing in two directions: (i) development of models to address related questions (e.g. how can a stream of new patient referrals be shared between two physicians so as to best meet their individual target workloads); (ii) development of higher fidelity models that represent the real situation more accurately and can be used to test different approaches to access to care, such as "just in time" appointment setting.

## 78

**PATIENT SATISFACTION WITH CARE PROVIDED IN TWO RHEUMATOLOGY CLINICS** Jackie Hochman, Dominique Ibanez, Simon Carrette (University of Toronto Rheumatology Clinics, Toronto Western Hospital)

**Objective:**The aim of this study was to measure patient satisfaction with care provided in two academic rheumatology out-patient clinics.

**Methods:**Patient satisfaction was measured using the Leeds Satisfaction Questionnaire (LSQ) that has been validated in rheumatology patients. The LSQ measures six dimensions of care: giving of information; empathy with the patient; attitude towards the patient; access to and continuity with the caregiver; technical quality and competence; and overall satisfaction. It was distributed to 75 consecutive patients of 18 participating physicians. Return envelopes identified physicians with randomly derived numbers to maintain confidentiality. Patients were assured of anonymity. Group and individual physician scores were computed for each dimension of care. Individual results were handed to each physician with comparisons to group scores and other physicians' global scores. Comparisons of each dimension between physicians were obtained through linear regression analysis, adjusting for first versus follow-up visit, and staff versus trainee care provider.

**Results Obtained and Conclusion:** 623 patients returned questionnaires (46.1% response rate). The majority of patients, 499 (83.2%) received follow-up care, while 101 patients (16.8%) received "first-visit" care. Satisfaction scores for follow-up and first visit care were similar in all domains. Satisfaction scores were significantly higher in all domains when patients were seen first by a staff rheumatologist. There was no significant difference in patient satisfaction between the two sites. Overall satisfaction with the group of physicians was relatively high at 7.8 (maximum 10). Scores for individual physicians varied ie. overall satisfaction ranged from 7.8 to 8.7. Statistical differences were seen between physicians' scores in all domains aside from technical quality and competence.

**Brief Conclusion:** Overall, patients were satisfied with care received at two out-patient rheumatology clinics. Satisfaction was higher with care received first from a staff rheumatologist rather than a trainee. There was a range in satisfaction with care provided by individual physicians in multiple domains. Knowledge of individual scores may lead to a change in physician behavior and subsequent improvement in patient satisfaction.

## 79

**MALIGNANCY IN PSORIATIC ARTHRITIS (PSA)** Sherry Rohekar, Agnes Hassa, Catherine Schentag, Dafna Gladman (Toronto Western Hospital, Toronto, Ontario)

**Objective:**To determine the prevalence and types of malignancy that develop in a large cohort of patients with PsA.

**Methods:**A cohort analysis of 680 patients with confirmed PsA, followed prospectively from 1978-2005 at an urban tertiary care center, was performed. Patients were followed at 6-12 month intervals according to a standard protocol, which included recording of malignancy. All data was tracked on a computer database, which was searched for evidence of malignancy. Paper charts were also reviewed to confirm pathology and linkage with Cancer Care Ontario data was performed to ensure completeness. Data were analyzed using descriptive statistics and logistic regression. Non-melanoma skin cancers (NMSCs) were not counted among the malignancies.

**Results Obtained and Conclusion:** A total of 91 separate malignancies developed in 83 of the 680 patients (13.2%). Three patients had two malignancies, and two had three separate malignancies. The most frequent malignancies were breast (18.7%), lung and prostate (11.0% each) and renal (7.7%). Malignant melanoma, uterine and colorectal cancers each occurred with a frequency of 6.6%. The average age at diagnosis of cancer

was 61 years. More women (16.2%) than men (9.4%) developed cancer ( $p=0.008$ ), but statistical significance disappeared with an analysis controlling for age. Comparing patients with malignancy to those who did not develop malignancy, there was no difference in the degree of joint inflammation at presentation to clinic. However, patients who developed malignancies were older at diagnosis of both psoriasis (35.5 years versus 28.0 years) and psoriatic arthritis (43.6 years versus 35.1 years) and at presentation to clinic (52.6 years versus 42.4 years). Logistic regression analysis revealed only age at presentation to clinic to be associated with malignancy. **Brief Conclusion:** 13.2% of the PsA cohort developed cancer. The most frequent cancers were breast, lung, prostate and renal. Only age at presentation to clinic was associated with the occurrence of malignancy. Whether there is an increased risk for malignancy in PsA remains to be determined.

## 80

**IN ABATACEPT-TREATED RHEUMATOID ARTHRITIS PATIENTS, RAPID AND SIGNIFICANT IMPROVEMENTS WERE OBSERVED IN THE COMPONENTS OF THE ACR CRITERIA FOR THE PHASE III AIM (ABATACEPT IN INADEQUATE RESPONDERS TO METHOTREXATE) TRIAL** Carlos Abud-Mendoza, Serge Steinfeld, Richard Aranda, Jean-Claude Becker, Joel Kremer, Carter Thorne, Julie Teng (Hospital Central Dr Ignacio Morones Prieto, San Luis Potosi, Mexico, Department of Rheumatology, Erasme University Hospital, Brussels, Belgium, Bristol-Myers Squibb, Princeton NJ, USA, Center for Rheumatology, Albany NY, USA, The Arthritis Program, Southlake Regional Health Center, Newmarket, Canada)

**Objective:**This study examined the individual components of the American College of Rheumatology (ACR) criteria over time in rheumatoid arthritis (RA) patients in the AIM trial

**Methods:**AIM was a 1-year, randomized, double-blind, placebo-controlled, multicenter Phase III trial of a fixed dose of abatacept approximating 10mg/kg versus placebo in patients with active RA despite methotrexate (MTX) treatment. Patients on background MTX were randomized 2:1 to receive abatacept or placebo treatment. Study medication was administered on Days 1, 15, 29, and then every 28 days thereafter. The ACR responses were measured at randomization and at every visit prior to infusion. Sample size varied for individual endpoints depending on data availability

**Results Obtained and Conclusion:** A total of 433 and 219 patients were randomized to receive abatacept and placebo treatment, respectively, with 385 (88.9%) of the abatacept group and 162 (74.0%) of the placebo group completing 1 year of treatment. Baseline characteristics were similar between the groups. Mean disease duration  $\pm$  SD was  $8.5 \pm 7.3$  years for abatacept and  $8.9 \pm 7.1$  years for placebo. Abatacept-treated patients achieved sustained and increasing improvements in the signs and symptoms of RA through 1 year, with significant improvements in ACR 20 responses compared with placebo, following the first dose. Rapid and significant improvements (mean percent improvements from baseline) were seen in disease activity, assessed at 3, 6 and 12 months, by both the patient (39.6%, 42.0% and 48.3% at 3, 6 and 12 months, respectively [ $p < 0.001$  vs. placebo for all]) and the physician (53.6%, 62.2% and 68.0%, respectively [ $p < 0.001$  vs. placebo for all]). Reductions in patient assessed pain were significant following the first dose. Significant improvements were also observed by 3 months in all other components and all ACR responses, which continued to increase through 6 and 12 months. Abatacept was generally safe and well tolerated in this population

**Brief Conclusion:** Abatacept significantly improves all components of the ACR criteria and provides increasing improvements over time versus placebo. In particular, pain and patients' and physicians' global assessments of disease activity showed rapid, significant and increasing improvements following the first dose of abatacept

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**EVIDENCE FOR ABNORMAL B AND T CELL ACTIVATION IN LUPUS PATIENTS BUT NOT THEIR PARENTS** Emily Kelly, Yong-Chun Cai, Tamara McKenzie, Nan Chang, Sooyeol Lim, Heather Harrison, Thomas Hudson, Glinda Cooper, Celia Greenwood, Paul Fortin, Joan Wither (University of Western Ontario, Toronto, Ontario, University Health Network, Toronto, Ontario, Hospital for Sick Children, Toronto, Ontario, McGill University, Montreal, Quebec, National Institutes of Health, Bethesda, Maryland)

**Objective:**SLE is a complex genetic disease, with multiple genetic and environmental factors contributing to its pathogenesis. In animal models of lupus, mice with a single or small cluster of lupus susceptibility genes demonstrate abnormal lymphocyte activation in the absence of full-blown symptoms of lupus, suggesting that abnormal lymphocyte activation may be a useful marker of genetic susceptibility to lupus. To examine this possibility in humans, we characterized the lymphocyte activation phenotype in SLE patients and investigated whether their family members have a similar activation profile.

**Methods:**Peripheral blood was obtained from 99 patients with SLE and their parents, and 25 healthy controls. Peripheral blood mononuclear cells were isolated over a Ficoll gradient, stained with various combinations of differentiation and activation markers, and subjected to flow cytometry with 20,000 to 200,000 events being acquired, depending on the stain. Information on age, gender, ethnicity, drug treatment, and disease activity was obtained using a standardized protocol as part of the Canadian Network for Improved Outcomes in Systemic Lupus Erythematosus (CaNIOS). Non-parametric statistical methods were used to compare measures of differentiation and activation in cases and controls. A regression analysis, accounting for family clustering, gender, and age, was performed to compare parental results to cases and controls.

**Results Obtained and Conclusion:** Several peripheral blood lymphoid subsets were altered in lupus patients as compared to controls. There was a significantly increased proportion of naïve B cells and significantly decreased proportions of memory B cells, CD4+ T cells, and NKT cells. Lupus patients also had evidence of increased lymphocyte activation, with increased proportions of recently activated CD69+ B and T cells, and increased expression of B7.2 on both naïve and memory B cells. Our preliminary analysis of the parents of lupus patients revealed no evidence of abnormal lymphocyte activation, however we are continuing to recruit siblings and additional age-matched controls.

**Brief Conclusion:** Lupus patients have increased B cell and T cell activation. At present we do not have strong evidence for abnormal lymphocyte activation in the parents of these patients.

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**MEASUREMENT OF DISEASE ACTIVITY IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) USING MICROARRAY GENE EXPRESSION ANALYSIS** Mandana Nikpour, Adam Dempsey, Murray Urowitz, Dafna Gladman, Debra Barnes (Toronto Western Hospital, MetriGenix Canada & USA)

**Objective:**Assessment of disease activity in SLE incorporates measurement of multiple clinical and laboratory variables. As a-dsDNA antibodies (Ab) are present in only 70% of patients at diagnosis and up to 25% of patients are serologically discordant, there is a need for better biomarkers of SLE disease activity. We sought to determine whether the gene expression profile of SLE patients, measured using microarray technology correlates with disease activity measured using SLEDAI.

**Methods:**RNA isolated from peripheral blood of 253 SLE patients was profiled on a custom SLE focus microarray comprised of 423 probes (329 genes) selected from a pilot study comparing profiles generated on Affymetrix Genechips from 72 SLE and 81 comparison samples. A heat map was generated and hierarchical clustering yielded two major clusters: 'high' and 'low' interferon (IFN)-regulated gene expression profiles. Clustering was refined to 146 probes (100 genes). Factors associated with IFN-regulated gene expression were determined using statistical methods. Categorical and continuous variables were analyzed using Fishers exact (or Chi-square) and Mann-Whitney test respectively. Stepwise logistic regression was performed.

**Results Obtained and Conclusion:** 152 patients had high and 101 patients had low IFN-regulated gene signature. SLEDAI was higher in those with high IFN-regulated gene expression (SLEDAI 4.5 vs. 2.9,  $p<0.001$ ). Patients with high IFN signatures were younger (42.2 vs. 49.6 years,  $p<0.001$ ). In logistic regression analysis, age, arthritis, positive a-dsDNA Ab and low complement ( $p<0.007$ ) were significantly associated with high IFN-regulated gene expression. Only 72 (47%) of 152 patients with high IFN-regulated gene signature and 18 (18%) of 101 patients with low IFN-regulated gene signature had a-dsDNA Ab.

**Brief Conclusion:** Disease activity was higher in SLE patients with high IFN-regulated gene expression. Anti-dsDNA Ab was a significant but not the sole correlate of IFN-regulated gene expression. The role of microarray

gene expression analysis in assessment of SLE disease activity, especially in the subset of patients with serologically discordant disease merits further investigation in a longitudinal study.

## 83

**BENEFICIAL EFFECTS OF THE SELECTIVE CO-STIMULATION MODULATOR ABATACEPT ON BIOMARKERS OF RHEUMATOID ARTHRITIS IMMUNOPATHOLOGY IN PATIENTS WITH AN INADEQUATE RESPONSE TO METHOTREXATE OR TNF-INHIBITOR TREATMENT** Boulos Haraoui, Paul Emery, Richard Aranda, Jean-Claude Becker, Maxime Dougados, Mario Garza, Julie Teng (Department of Rheumatology, Université de Montréal, Montréal QC, Canada, Department of Rheumatology and Rehabilitation, University of Leeds, Leeds, UK, Bristol-Myers Squibb, Princeton NJ, USA, Rene Descartes University, Service de Rhumatologie B, Paris, France, Jefe del servicio de Reumatología del Hospital Universitario, Monterrey NL, México)

**Objective:**The upstream activity of the selective co-stimulation modulator abatacept, acting on T-cell activation, was assessed for its effects on levels of multiple downstream inflammatory biomarkers and markers of rheumatoid arthritis (RA) immunopathology in RA patients with an inadequate response to methotrexate (MTX) or anti-TNF treatment.

**Methods:**AIM (Abatacept in Inadequate responders to Methotrexate) and ATAIN (Abatacept Trial in Treatment of Anti-TNF INadequate responders) were randomized, double-blind, placebo-controlled, multicenter Phase III trials assessing the efficacy and safety of abatacept, in which patients were randomized to receive a fixed dose of abatacept (~10 mg/kg) or placebo. In the AIM study, patients continued with background MTX. All patients in the ATAIN study washed out anti-TNF therapy prior to the start of the trial but remained on background DMARDs. Serum levels of soluble interleukin (IL)-6, rheumatoid factor (RF) and matrix metalloproteinase (MMP)-3 were measured by immunoassay in both trials.

**Results Obtained and Conclusion:** Baseline characteristics were similar between the abatacept and placebo groups in both trials. Greater reductions in the levels of all serum biomarkers (mean and percentage change from baseline) were seen with abatacept compared with placebo in both trials. Abatacept-treated patients experienced larger reductions in the following factors vs. placebo-treated patients: RF (AIM: 26 vs. 3.2%; ATAIN: 30.2 vs. 11.7 %); the proinflammatory cytokine IL-6 (AIM: 66.3 vs. 4.8%; ATAIN: 52.8 vs. 10.9%); a contributor to cartilage destruction, MMP-3 (AIM: 51.5 vs. 18.9%; ATAIN: 42.8 and 11.4%). Abatacept was generally safe and well tolerated.

**Brief Conclusion:** Abatacept treatment leads to decreases in the serum levels of multiple proinflammatory mediators, markers characteristic of T-cell activation and molecules involved in RA immunopathology. This was seen in both patients with an inadequate response to MTX and in patients with an inadequate response to anti-TNF therapy. These data are consistent with the unique upstream action of abatacept in selectively modulating T-cell activation, which results in reductions in the levels of multiple mediators of inflammation and joint destruction.

## 84

**ENDOBRONCHIAL VASCULITIS AND PULMONARY HEMORRHAGE IN AN ADULT WITH HENOC SCHONLEIN PURPURA** John Gjevre, Bindu Nair, Regina Taylor-Gjevre, John Sibley (University of Saskatchewan)

**Objective:**We present a patient with HSP complicated by hemoptysis and endobronchial vasculitis.

**Methods:**A 35 year old man presented with a 2 month history of increasing erythematous papular rash confined to the buttocks and lower extremities, pedal edema, polyarthralgia and diffuse pain and stiffness throughout the lower extremities causing gait disturbance. He was otherwise well. There was extensive purpuric rash, pain and tenderness throughout both lower extremities. The remainder of the exam was normal.

Urinalysis revealed proteinuria and hematuria. ALT, AST, and CK were elevated but the other labs were normal including RF, ANA, dsDNA, and ANCA. With prednisone, his rash and leg pain improved and CK normalized. However, hematuria and proteinuria remained unchanged and he developed hemoptysis and exertional dyspnea. Pulmonary function studies were normal. Bronchoscopy revealed significant widespread erythematous endobronchial lesions consistent with vasculitis. Bronchial washings were



negative for infection and malignancy. There was no improvement with monthly IV cyclophosphamide prompting renal biopsy which revealed changes only of IgA nephropathy. Repeat bronchoscopy was little changed. Oft repeated ANCA remained negative. Cyclophosphamide was discontinued after six months and prednisone after 18 months. The patient remains stable but with near daily hemoptysis and asymptomatic hematuria/proteinuria.

**Results Obtained and Conclusion:** We had difficulty abandoning the working diagnosis of Wegner's granulomatosis but his clinical course, negative ANCA, and renal histology eventually led to our diagnosis of HSP. Pulmonary involvement in HSP is rare, especially pulmonary hemorrhage. Pulmonary hemorrhage may be more likely in adults. We feel our patient has diffuse alveolar hemorrhage from HSP. We wonder whether the endo-bronchial vasculitic lesions are part of HSP diffuse alveolar hemorrhage or represent a new manifestation of HSP respiratory involvement.

**Brief Conclusion:** This case describes a rare manifestation of an uncommon disease. It is important to consider HSP in patients presenting with polyarthralgia, rash, and hemoptysis.

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**IN RHEUMATOID ARTHRITIS PATIENTS WITH AN INADEQUATE RESPONSE TO ANTI-TNF THERAPY IN THE ATAIN TRIAL, ABATACEPT EFFECTIVELY REDUCED PAIN AND FATIGUE, AND IMPROVED SLEEP QUALITY** Anthony Russell, Tracy Li, Mark Genovese, Carlos Pineda (University of Alberta Hospital, Edmonton, Canada, Bristol-Myers Squibb, Princeton NJ, USA, Stanford University Medical Center, Stanford CA, USA, Instituto Nacional de Cardiología, Mexico City, Mexico)

**Objective:**The effects of abatacept on pain, fatigue and sleep quality were assessed as part of the ATAIN (Abatacept Trial in Treatment of Anti-TNF INadequate responders) trial.

**Methods:**ATAIN was a 6-month, randomized, double-blind, placebo-controlled, multicenter, Phase III trial of a fixed dose of abatacept approximating 10 mg/kg versus placebo in patients with active rheumatoid arthritis (RA) and with an inadequate response to  $\geq 3$  months of anti-TNF- $\alpha$  therapy (etanercept and/or infliximab). Study medication was administered on Days 1, 15, 29, and then every 28 days thereafter. All patients also received  $\geq 1$  background DMARD (abatacept vs. placebo: MTX, 75.6 vs. 82.0%; anakinra, 2.7 vs. 2.3%; all other non-biologic DMARDs were  $<10\%$  in each group). Pain and fatigue severity were assessed using a 100 mm Visual Analog Scale and sleep quality using the Medical Outcomes Study Sleep Scale (MOS-Sleep), a validated instrument measuring sleep problems (e.g. sleep disturbances, quantity and adequacy). A sleep problems index (0–100, with higher scores indicating more problems) was also generated.

**Results Obtained and Conclusion:** A total of 258 and 133 patients with longstanding disease ( $\sim 12$  years), were randomized to the abatacept and placebo groups, respectively. Baseline characteristics were similar between the groups (abatacept vs. placebo; mean  $\pm$  SD): elevated pain ( $70.9 \pm 19.7$  vs.  $69.5 \pm 18.9$ ), fatigue ( $73.8 \pm 19.7$  vs.  $72.2 \pm 19.4$ ) and MOS-Sleep values ( $49.0 \pm 19.0$  vs.  $46.0 \pm 18.4$ ), indicating severe sleep impairment. At 6 months, ANCOVA adjusted mean improvements [SE] in sleep quality and fatigue were significantly greater in the abatacept versus placebo group (sleep quality,  $-9.4$  [1.0] vs.  $-2.8$  [1.3]; fatigue,  $-21.9$  [1.6] vs.  $-6.0$  [2.3];  $p < 0.001$  for both measures). Significant improvements in pain were noted on Day 29 in the abatacept versus placebo group and were maintained to the end of the study. Abatacept was generally safe and well tolerated.

**Brief Conclusion:** Abatacept is effective at reducing pain and fatigue and improving sleep quality in RA patients with inadequate responses to anti-TNF- $\alpha$  therapy.

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**PYGENIC ARTHRITIS, PYODERMA GANGRENOsum, AND CYSTIC ACNE SYNDROME (PAPA SYNDROME) PRESENTING AS RECURRENT KNEE MONO-ARTHRITIS IN A CHILD.** Sandhya Satyanarayana, Suzanne Ramsey, Sarah Dyack, Bianca Lang, Cathy Coady, Oliva Ortiz-Alvarez, Andrew Issekutz (IWK Health Centre)

**Objective:**To describe an unusual presentation of PAPA syndrome (pyogenic sterile arthritis, pyoderma gangrenosum, cystic acne).

**Methods:**We report a 6-year-old male who presented in 2004 with a third

episode of right knee mono-arthritis. No medical attention was sought for the first episode at age 2 years. During the second episode (2003), purulent synovial fluid was sterile. During the third episode, fever and arthritis persisted despite eleven days of broad-spectrum antibiotics, recurrent arthroscopy and debridement. General examination was normal. Peripheral blood WBC was  $7.9 \times 10^9$  with 59% neutrophils; 15% bands, CRP 110 mg/L, ESR 63 mm/hr. Synovial fluid WBC count was  $19,000 \times 10^6$ /L, with 90% neutrophils. Synovial fluid bacterial culture and Mycobacterial PCR and culture were negative. Synovial biopsy showed acute and chronic inflammation, necrosis, and granulation tissue. Streptococcal serology and Ureaplasma culture were negative. The patient had protective levels of Diphtheria and Tetanus toxoid, and an NBT reductase was normal. Bonescan showed increased uptake in the distal right femoral and proximal tibial epiphyses and MRI showed florid soft tissue edema, thickened, nodular, enhancing synovium and effusion. Further investigation revealed the presence of the PSTPIP1 mutation, the mutation known to cause PAPA syndrome. Intraarticular injection with triamcinolone hexacetonide at a dose of 1 mg/kg resulted in rapid resolution of fever, pain and swelling on day 14 of admission. Repeat synovial fluid aspiration of a small residual knee effusion was non-inflammatory. To our knowledge, this is the first report of PAPA syndrome with recurrent episodes involving a single joint. The patient has been managed successfully with indomethacin, intermittent intraarticular corticosteroid injections, and a brief course of oral prednisone in 2005 for a fourth flare of acute right knee mono-arthritis.

**Results Obtained and Conclusion:** This case highlights the importance of maintaining a high index of suspicion for PAPA syndrome in patients with sterile pyogenic arthritis to promote early recognition of this rare but possibly debilitating disorder. In particular, the presence of recurrent sterile pyogenic arthritis in a single joint should not preclude one from considering PAPA syndrome, which may have implications for future treatment.

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**TRENDS IN DISEASE ACTIVITY AND CORTICOSTEROID REQUIREMENT FOLLOWING DEVELOPMENT OF CHRONIC RENAL INSUFFICIENCY (CRI) IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE)** Mandana Nikpour, Dafna Gladman, Dominique Ibanez, Murray Urowitz (Toronto Western Hospital)

**Objective:**To determine whether disease activity, flare rate and corticosteroid requirements diminish following development of CRI in SLE.

**Methods:**Using the lupus database all patients with CRI – 'cases' – (serum creatinine  $>200$   $\mu\text{mol/L}$  for  $>6$  months and/or long-term renal replacement therapy [RRT]) due to lupus nephritis were identified. Controls from the same cohort were matched for sex, age, disease duration, duration of follow-up and decade of clinic entry. Cumulative disease activity measured using adjusted mean SLEDAI (AMS), mean number of flares (increase in SLEDAI  $\geq 4$ ) and mean cumulative steroid dose for the time pre and post development of CRI up to last clinic visit were determined in cases, and for an identical time in paired controls. Comparisons were made using McNemar and paired t-tests.

**Results Obtained and Conclusion:** 50 cases and 50 controls were identified from a cohort of 1197 patients. 44(88.0%) patients in each group were female. Age at first visit in cases was  $34.7 \pm 12.1$  years. Follow-up from time of CRI to last visit was  $4.4 \pm 4.7$  years. Among cases, mean serum creatinine at last visit was  $476 \pm 340$   $\mu\text{mol/L}$ . 32 patients commenced RRT during follow-up. AMS from first visit to time of CRI was greater in cases than for controls measured for an identical time period ( $8.4 \pm 4.4$  vs.  $5.5 \pm 4.3$   $p=0.004$ ), as was flare rate per annum ( $0.8 \pm 1.0$  vs.  $0.2 \pm 0.4$   $p=0.01$ ). There was no significant difference in AMS ( $6.2 \pm 4.3$  vs.  $4.9 \pm 4.7$   $p=0.2$ ), flare rate per annum ( $0.5 \pm 0.9$  vs.  $0.5 \pm 1.0$   $p=0.9$ ) and cumulative steroid dose ( $55.7 \pm 66.1$  vs.  $35.8 \pm 49.4$   $g$   $p=0.2$ ) measured from time of CRI to last clinic visit in cases and for an identical time period in controls.

**Brief Conclusion:** Patients with SLE who develop CRI due to lupus nephritis continue to have active disease with corticosteroid requirements that are at least equal to SLE patients who do not have CRI.

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**ABATACEPT INDUCES SUSTAINED IMPROVEMENTS IN PHYSICAL FUNCTION AND PAIN OVER 3 YEARS IN RHEUMATOID ARTHRITIS PATIENTS WITH INADEQUATE RESPONSES TO METHOTREXATE** Boulos Haraoui, Anthony Russell, Ye Zhou, Oksana

Moklatouch , Tracy Li, Larry Moreland, C Garcia , Julie Teng (Department of Rheumatology, Université de Montréal, Montréal QC, Canada, University of Alberta Hospital, Edmonton AB, Canada, Bristol-Myers Squibb, Princeton NJ, USA, University of Alabama School of Medicine, Birmingham AL, USA, Hospital General de Mexico, Mexico DF) Objective: The effect of abatacept on pain and physical function in patients with rheumatoid arthritis (RA) was examined in the Phase III AIM (Abatacept in Inadequate responders to Methotrexate [MTX]) trial and a Phase II trial with a similar patient population.

Methods: AIM was a 1-year, double-blind, placebo-controlled trial evaluating a fixed dose of abatacept approximating 10mg/kg plus MTX. Also presented are data from a 1-year, double-blind Phase II trial with a 2-year open-label long-term extension (LTE) where patients received abatacept 10mg/kg or placebo plus MTX up to 1 year and a fixed dose approximating 10mg/kg abatacept plus MTX thereafter. All patients had active RA despite MTX treatment. Physical function was assessed using Health Assessment Questionnaire Disability Index (HAQ-DI) in AIM and the modified HAQ-DI (mHAQ-DI) in the Phase II study. The proportion of patients demonstrating a HAQ-DI response (improvement of  $\geq 0.3$  units in HAQ-DI or mHAQ-DI for AIM and Phase II, respectively) was evaluated. Pain was measured using a 100mm Visual Analog Scale during assessment of ACR responses. Responses were measured prior to study drug administration.

Results Obtained and Conclusion: In AIM, 88.9% (n=433) of abatacept-treated patients and 74.0% (n=219) of placebo-treated patients completed 1 year. In the Phase II trial, 84(73.0%) abatacept-treated patients and 67 (56.3%) placebo-treated patients entered the LTE. Mean percent improvements in HAQ-DI were significantly higher than placebo in the AIM trial at 6 months (35.2 vs. 20.9%;  $p < 0.001$ ) and 1 year (37.3 vs. 19.6%;  $p < 0.001$ ). Similar improvements in mHAQ-DI were seen through 3 years in the Phase II trial (1 year, 49.4%; 2 years, 46.3%; 3 years, 49.3%) with sustained reductions in patient assessed pain also reported (1 year, 52.4%; 2 years, 50.2%; 3 years, 55.6%).

Brief Conclusion: Abatacept demonstrated rapid, significant and clinically meaningful improvements in physical function and reductions in pain in patients with inadequate responses to MTX, providing tangible, sustained benefits to RA patients.

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POTT'S DISEASE IN A TEENAGER PRESENTING AS MULTIFOCAL OSTEOMYELITIS Oliva Ortiz-Alvarez, Suzanne Ramsey, Andrew Issekutz, Robert Bortolussi, Bianca Lang (IWK Health Centre)

Objective: To illustrate the challenge of making the diagnosis of Pott's disease in a patient with multifocal osteomyelitis.

Methods: We report a 17 year old Caucasian girl who presented with a 3 month history of headache, myalgias, bone pain, night sweats and weight loss. She had one day of fever of 39C. On admission to the IWK Health Centre, she looked unwell, and emaciated. Abnormal findings included bone pain, and subcutaneous nodules.

Investigations showed normal WBC count and differential with increased platelet count ( $558 \times 10^9/L$ ), ESR  $>100$ , and CRP 185. Bacterial blood culture was negative. CXR showed lytic areas in 3 ribs. Technetium bone scan demonstrated increased uptake in multiple areas. CT/MRI confirmed multiple lytic lesions of the left humerus, scapula, ribs, ileum, T6 and L2, as well as 2 splenic lesions, and 2 enlarged abdominal lymph nodes. Bone marrow biopsy showed no signs of malignancy. Bone biopsy reported necrotic bone, acute and chronic inflammation, and negative gram stain, AFB and bacterial and Mycobacterial cultures. She started indomethacin for suspected chronic recurrent multifocal osteomyelitis (CRMO).

Bone pain persisted and inflammatory indices remained high. Three months later, bone pain increased. She had soft tissue abscesses overlying the left 10th rib and T6. CNS exam was normal. Spine MRI showed swelling of intervertebral space (T3- T5). PPD test was strongly positive. Acid-fast bacteria were isolated from the rib abscess aspirate and culture identified Mycobacterium avium complex (MAC). Immunological investigations confirmed an interferon gamma receptor defect. Treatment for MAC was started. Back pain, fever and night sweats resolved with no neurological sequelae.

Results Obtained and Conclusion: Pott's disease still represents a diagnostic challenge; a high index of suspicion is required as delay in diagnosis is common. Early PPD skin testing and biopsy for Mycobacterium should be done in patients presenting with bone lesions and a clinical picture sugges-

tive of CRMO. If only necrotic bone is obtained on biopsy, repeated biopsy and cultures may be required. When MAC is isolated, immunodeficiency is likely, and the patient should be investigated for interferon gamma signaling defects.

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THE PREVALENCE AND CORRELATES OF SELF-REPORTED FATIGUE IN A RHEUMATOID ARTHRITIS COHORT Debbie Norrie, Janine Ouimet, Janet Pope (University of Western Ontario)

Objective: Standard data forms collected at one rheumatology clinic include 100mm visual analog scales (VAS) assessing fatigue, sleep problems and overall status; and 5-point Likert scales assessing fatigue change from last visit.

Objectives were to determine the prevalence and correlates (age, sex, overall status, functional disability (HAQ-DI), pain and sleep problems) of self-reported current fatigue and change in fatigue since last visit in a prospective outpatient Rheumatology cohort.

Methods: RA patients seen during a 6-month period with complete questionnaire data for 2 consecutive visits were included (n=245). The correlation between VAS fatigue score and VAS pain, sleep and health status, as well as HAQ-DI was determined. Change in fatigue (better, same, worse) was compared with change in pain, health status and functional disability (separately) using Chi square tests.

Results Obtained and Conclusion: Mean age was  $60.5y \pm 0.89$  (SEM), 82% were female; and mean fatigue VAS score was  $40.6 \pm 1.8$ . The prevalence of fatigue in RA (VAS score of  $>20$  mm) was 72.5%. VAS pain ( $r=0.58$ ,  $p < 0.0001$ ), sleep problems ( $r=0.46$ ,  $p < 0.0001$ ) and overall status ( $r=0.69$ ,  $p < 0.0001$ ), as well as HAQ-DI ( $r=0.54$ ,  $p < 0.0001$ ) were correlated with high fatigue, but age was not ( $r=0.04$ ,  $p=0.5$ ).

5-point Likert scales of change in fatigue, pain and overall status were dichotomized to worse vs. the same or improved; worsening occurred in fatigue (31% of patients), pain (28%), overall status (26%), and the HAQ-DI (44%). Worsening of pain, overall status, and HAQ-DI ( $p=0.0003$ ) were each associated with worsening fatigue. Linear regression of VAS scores, HAQ-DI and age on fatigue VAS demonstrated that HAQ score ( $\beta=0.5$ ,  $p=0.03$ ), pain VAS ( $\beta=0.15$ ,  $p=0.04$ ) and overall VAS ( $\beta=0.5$ ,  $p < 0.001$ ) were determinants of concurrent higher fatigue.

Brief Conclusion: The prevalence of self-reported fatigue was high in this RA cohort. Fatigue is correlated with higher HAQ-DI and VAS scores for pain, sleep problems and worse overall status.

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PARTICIPATION RATES IN AN INTERNET-BASED STUDY OF PHYSICAL ACTIVITY AND OSTEOARTHRITIS Paul Doerfling, Jacek A. Kopec, Jolanda Cibere, Matt Liang, Donna McIntire, Dave Wilson, Victoria Combes, Eric C. Sayre, John M. Esdaile (Arthritis Research Centre of Canada, Vancouver, BC, Arthritis Research Centre of Canada, Vancouver, BC; University of British Columbia, Vancouver, BC, Arthritis Research Centre of Canada, Vancouver, BC; Harvard University, Boston, MA, University of British Columbia, Vancouver, BC)

Objective: To describe recruitment strategies and baseline participation rates in a longitudinal study of physical activity and osteoarthritis of the knee and hip using a web-based data collection system.

Methods: Direct email was sent to 28,000 members of 50plus.com inviting them to participate in a survey of physical activity and joint health. Reminders were sent after 1 and 2 weeks. Advertisement in an online newsletter was also circulated to 99,424 people in two consecutive publications. All messages contained hyperlinks/banner advertisements directing subjects to the website. Incentives included \$1,500 in lottery prizes. After completing an electronic consent form, subjects were given password access to the questionnaire. The survey included questions on demographics, general health, knee and hip pain, osteoarthritis, and lifetime participation in recreational, domestic and occupational activities. Embedded skip logic ensured that subjects only saw relevant questions. Data was stored in a format compatible with statistical software.

Results Obtained and Conclusion: 4,258 subjects completed the questionnaire. 1,750 registered but did not complete the survey. Participation rates were 9.7% for email recipients and 1.6% for the newsletter group. The sample included 1,570 (36.9%) men and 2,688 (63.1%) women. Mean age of the participants was 61.5 years, ( $<50 - 1.8\%$ ,  $50-59 - 40.4\%$ ,  $60-69 - 41.5\%$

and 70+ - 13.8%). Of 1,749 questions (check boxes, radial buttons or pull down menus), the average subject answered 361 (range 178-847). 76.8% of participants completed the survey in one sitting. Prevalence of self-reported knee OA was 15.5% in men and 22% in women. Prevalence of hip OA was 6.3% in men and 11.3% in women.

**Brief Conclusion:** Directed email provided higher response rates than targeted online newsletters. Both methods are effective recruitment strategies for web-based studies; however, response rates are expected to be lower than in mailed surveys. The number of incomplete surveys could be reduced by shortening the questionnaire; however, maximum achievable response rate would be <15%. A simplified log-in procedure, stronger financial incentives, and additional reminders/advertisements may improve participation rates.

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**IN RHEUMATOID ARTHRITIS PATIENTS WITH INADEQUATE RESPONSES TO METHOTREXATE, ABATACEPT INDUCES SUSTAINED IMPROVEMENTS IN QUALITY OF LIFE, SLEEP QUALITY AND FATIGUE OVER 3 YEARS** Jacques Brown, Paul Emery, Anthony Russell, Ye Zhou, Oksana Mokliatchouk, Tracy Li, Rene Westhovens, Carlos Abud-Mendoza, Julie Teng (CHUL du CHUQ, Quebec, Canada, Department of Rheumatology and Rehabilitation, University of Leeds, Leeds, UK, University of Alberta Hospital, Edmonton AB, Canada, Bristol-Myers Squibb, Princeton NJ, USA, Universitaire Ziekenhuizen, Leuven, Belgium, Hospital Central Dr Ignacio Morones Prieto, San Luis Potosi, Mexico)

**Objective:** The effects of the selective co-stimulation modulator abatacept on quality of life (QoL), fatigue, pain and sleep quality were examined in the Phase III AIM (Abatacept in Inadequate responders to Methotrexate [MTX]) trial and in a similar patient population treated with abatacept for up to 3 years as part of a Phase II trial.

**Methods:** AIM was a 1-year, double-blind, placebo-controlled trial evaluating a fixed dose of abatacept approximating 10 mg/kg plus MTX. Also presented are data from a 1-year, double-blind, Phase II trial with a 2-year, open-label, long-term extension (LTE). Physical and mental health was measured using the Short Form (SF)-36, encompassing four physical and four mental subscales, and physical and mental component summaries (MCS and PCS, respectively). In AIM, sleep quality was measured using the validated Medical Outcomes Study Sleep Scale (MOS-Sleep). Fatigue was measured using a 100 mm Visual Analog Scale.

**Results Obtained and Conclusion:** In AIM, 88.9% of the 433 patients were randomized and treated with abatacept and 74.0% of the 219 patients who received placebo completed 1 year of treatment. In the Phase II study, 84 (73.0%) abatacept-treated patients and 67 (56.3%) placebo-treated patients entered the LTE. The abatacept-treated patients in AIM demonstrated both clinically meaningful (change of  $\geq 3$  points) and statistically significant improvements in all subscales of the SF-36 vs. placebo. Adjusted mean change from baseline for PCS and MCS were significantly higher for abatacept versus placebo in the AIM trial at 1 year: 9.1 vs. 5.0;  $p < 0.001$  and 6.9 vs. 4.7;  $p < 0.05$ . In the AIM study, adjusted mean improvements in MOS-Sleep and fatigue at 1 year were -10.4 vs. -6.8 for placebo ( $p < 0.05$ ) and -26.5 vs. -16.4 for placebo ( $p < 0.001$ ), respectively.

**Brief Conclusion:** In AIM, abatacept significantly improved sleep quality, reduced pain and fatigue and resulted in clinically meaningful improvements in all subscales of the SF-36 and MCS and PCS. Similar improvements were observed through 3 years in the Phase II trial.

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**ABATACEPT INHIBITS STRUCTURAL DAMAGE PROGRESSION IN RECENT-ONSET AND MORE ESTABLISHED RHEUMATOID ARTHRITIS: RESULTS FROM THE AIM TRIAL** Mario Garza, Joel Kremer, Richard Aranda, Jean-Claude Becker, Oksana Mokliatchouk, Harry Genant, Carter Thorne, Julie Teng (Jefe del servicio de Reumatología del Hospital Universitario, Monterrey NL, México, The Center for Rheumatology, Albany NY, USA, Bristol-Myers Squibb, Princeton NJ, USA, University of Alberta Hospital, Edmonton AB, Canada, The Arthritis Program, Southlake Regional Health Center, Newmarket, Canada)

**Objective:** The effect of abatacept on structural damage progression was compared with placebo in rheumatoid arthritis (RA) patients with an inadequate response to methotrexate (MTX). A sub-analysis evaluating the

impact of disease duration was performed.

**Methods:** AIM (Abatacept in Inadequate responders to Methotrexate) was a 1-year, randomized, double-blind, placebo-controlled, multicenter, Phase III trial of a fixed dose of abatacept approximating 10 mg/kg vs. placebo with background MTX in patients with active RA and an inadequate response to MTX. Radiographs of hands and feet were performed at randomization and at 1 year or upon early termination (if applicable). Paired radiographs were independently scored for erosions, joint-space narrowing (JSN) and total score by two trained radiologists, blinded to treatment group assignment and chronologic order of the radiographs, using the Genant-modified Sharp score. For this sub-analysis, radiographic endpoints in patients with baseline disease durations of  $\leq 2$  years,  $> 2$  to  $\leq 5$  years,  $> 5$  to  $\leq 10$  years and  $> 10$  years were evaluated.

**Results Obtained and Conclusion:** A total of 433 and 219 patients were randomized and treated with abatacept or placebo, respectively, with 385 (88.9%) of the abatacept group and 162 (74.0%) of the placebo group completing 1 year. Mean disease duration was  $\sim 9$  years. Baseline clinical and radiographic characteristics were similar among groups. Overall, abatacept significantly inhibited the progression of structural damage; the mean change from baseline in erosion scores were 0.63 vs. 1.14 for abatacept vs. placebo at 1 year ( $p = 0.029$ ). When the progression of erosions was sub-analyzed by baseline disease duration (mean change from baseline), a positive trend was seen with abatacept treatment in all sub-groups for abatacept vs. placebo:  $\leq 2$  years, 0.59 vs. 2.12;  $> 2$  to  $\leq 5$  years, 1.03 vs. 1.34;  $> 5$  to  $\leq 10$  years, 0.54 vs. 0.76;  $> 10$  years, 0.44 vs. 0.79. Similar results were observed for JSN and total scores.

**Brief Conclusion:** In AIM, abatacept inhibited the progression of structural damage in patients with recent-onset as well as more established RA; this inhibition was most pronounced in patients with  $\leq 2$  years of disease.

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**ABATACEPT INDUCES ZERO JOINT TENDERNESS AND INFLAMMATION IN RHEUMATOID ARTHRITIS PATIENTS WITH AN INADEQUATE RESPONSE TO METHOTREXATE OR ANTI-TUMOR NECROSIS FACTOR THERAPY** Proton Rahman, Michael Schiff, Carlos Abud-Mendoza, Richard Aranda, Jean-Claude Becker, Oksana Mokliatchouk, Allison Covucci, Piet van Riel, Fedra Irazoque, Julie Teng (Memorial University, Newfoundland, Canada, Denver Arthritis Clinic, Denver CO, USA, Hospital Central Dr Ignacio Morones Prieto, San Luis Potosi, Mexico, Bristol-Myers Squibb, Princeton NJ, USA, University Hospital Nijmegen, Nijmegen, The Netherlands, Hospital Angeles Mocel, San Miguel Chapultepec, Mexico)

**Objective:** The proportion of rheumatoid arthritis (RA) patients with zero swollen and tender joints was assessed in two Phase III trials of the selective co-stimulation modulator abatacept in patients with active RA and an inadequate response to methotrexate (MTX) or anti-TNF therapy.

**Methods:** AIM (Abatacept in Inadequate responders to MTX) and ATTAIn (Abatacept Trial in Treatment of Anti-TNF INadequate responders) were randomized, double-blind, placebo-controlled, multicenter, Phase III trials assessing the efficacy and safety of a fixed dose of abatacept approximating 10 mg/kg or placebo for 6 and 12 months, respectively. In AIM, patients had active RA despite MTX treatment. In ATTAIn, all patients had active RA and inadequate efficacy responses to  $\geq 3$  months of anti-TNF therapy (etanercept, infliximab or both). All patients washed out anti-TNF therapy prior to the trial start. A total of 68 joints were assessed for tenderness and 66 for swelling at randomization and prior to monthly study drug administration. Patients were required to have  $\geq 10$  swollen joints and  $\geq 12$  tender joints for inclusion.

**Results Obtained and Conclusion:** A total of 433 and 219 patients in AIM and 258 and 133 patients in ATTAIn were randomized and treated with abatacept and placebo, respectively. Of these, 424 and 214 patients in AIM, and 256 and 133 patients in ATTAIn, respectively were available for efficacy assessments as a few patients were excluded from one site due to compliance issues. Baseline characteristics including average tender and swollen joint counts were similar between groups ( $> 30$  tender joints and  $> 20$  swollen joints for all). In both trials, abatacept increased the number of patients with zero joint inflammation vs. placebo at 6 months (AIM, 4.0 vs. 0.5%; ATTAIn, 3.5 vs. 0.0%). This significant proportion continued to increase through 1 year in the AIM trial (8.5 vs. 0.5%).

**Brief Conclusion:** The selective co-stimulation modulator abatacept induced zero joint tenderness and swelling in two populations of RA



patients: those with inadequate responses to MTX and/or to anti-TNF therapy. These results demonstrate that abatacept treatment translates into real-life benefits for RA patients.

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**ABATACEPT FOR THE TREATMENT OF RHEUMATOID ARTHRITIS PATIENTS RECEIVING BACKGROUND DISEASE-MODIFYING ANTIRHEUMATIC DRUGS (DMARDs): SAFETY AND PATIENT-REPORTED OUTCOMES FROM THE ASSURE TRIAL** Carlos Pineda , Bernard Combe, Allison Covucci, Tracy Li, Jean-Claude Becker, Richard Aranda, Kam Shojania (Instituto Nacional de Cardiología, Mexico City, Mexico, Hôpital Lapeyronie, Montpellier, France, Bristol-Myers Squibb, Princeton NJ, USA, Arthritis Research Centre, Vancouver, Canada)

**Objective:**The ASSURE (Abatacept Study of Safety in Use with other Rheumatoid arthritis (RA) therapies) trial was designed to assess the safety of abatacept through 1 year as add-on treatment with 1 or more non-biologic DMARD and/or biologic DMARD in patients with active RA; patient-reported outcomes (PROs) were also assessed.

**Methods:**Patients with active RA were randomized to receive a fixed dose of abatacept (~10 mg/kg) or placebo once per month for 1 year. All patients were receiving background non-biologic or biologic DMARDs. The primary endpoint was safety; PROs were assessed quarterly as follows: patient physical function (via the Health Assessment Questionnaire) and patient global assessments of disease activity and pain (using a visual analog scale).

**Results Obtained and Conclusion:** A total of 1441 patients were randomized and treated; 1274 receiving non-biologic DMARDs (856 abatacept, 418 placebo) and 167 receiving biologic DMARDs (103 abatacept, 64 placebo). Improvements from baseline were observed with abatacept in all PROs, with benefit over placebo being greatest in patients receiving non-biologic background DMARDs (percent improvement vs. placebo: physical function 30.1 vs. 9.0; disease activity, 41.2 vs. 20.6; pain, 37.2 vs. 18.6), compared to patients on background biologic DMARDs (physical function, 22.5 vs. 14.9; disease activity, 35.7 vs. 26.5; pain, 33.5 vs. 22.4). There were no differences in the incidence of neoplasms and serious infections between treatment groups in patients receiving background non-biologic DMARDs; increases in serious adverse events and infections were seen in the smaller group of patients receiving abatacept plus background biologic DMARDs (neoplasms, 6.8 vs. 1.6% for placebo; serious infections, 3.9 vs. 1.6% for placebo).

**Brief Conclusion:** Abatacept improved PROs in patients receiving background DMARDs, with the greatest benefit seen in patients receiving background non-biologic DMARDs. The safety profile of abatacept in these patients was also favorable. In contrast, the PRO benefit and safety profile in patients receiving background biologic DMARDs was less favorable. Overall, these data support the use of abatacept in combination with non-biologic DMARDs.

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**ABATACEPT IMPROVES PATIENT-REPORTED OUTCOMES IN RHEUMATOID ARTHRITIS PATIENTS RECEIVING BACKGROUND DMARDs: 1-YEAR SAFETY RESULTS OF THE ASSURE TRIAL** Ignacio Garcia-De La Torre, Bernard Combe, Allison Covucci, Tracy Li, Michael Weinblatt, Kam Shojania (University of Guadalajara, Guadalajara, Mexico, Hôpital Lapeyronie, Montpellier, France, Bristol-Myers Squibb, Princeton NJ, USA, Brigham and Womens Hospital Rheumatology and Immunology, Boston MA, USA, Arthritis Research Centre, Vancouver, Canada)

**Objective:**Patient-reported outcomes were assessed in the ASSURE (Abatacept Study of Safety in Use with other RA therapies) trial, which was designed to assess the safety of abatacept during 1 year of add-on treatment with one or more non-biologic (non-bio) DMARD and/or biologic (bio) DMARD in patients with active RA.

**Methods:**Patients were randomized to receive a fixed dose of the selective co-stimulation modulator abatacept (~10 mg/kg) or placebo monthly for 1 year. All patients were receiving background non-bio or bio DMARDs. The primary endpoint was safety; patient-reported outcomes were assessed as follows: patient physical function (using the Health Assessment Questionnaire); patient global assessments of disease activity and pain (using the Visual Analog Scale).

**Results Obtained and Conclusion:** A total of 1441 patients were randomized and treated (abatacept/non-bio: 848; abatacept/bio:100; placebo/non-bio: 418; placebo/bio: 59; 16 patients were excluded from the efficacy analysis but not the safety analysis, due to compliance issues). In both abatacept groups, percent improvements from baseline were observed in all patient-reported outcomes vs. placebo, particularly in patients receiving non-bio background DMARDs (physical function, 30.1 vs. 9.0; disease activity, 41.2 vs. 20.6; pain, 33.5 vs. 22.4) compared to those receiving bio background DMARDs (physical function, 22.5 vs. 14.9; disease activity, 35.7 vs. 26.5; pain, 33.5 vs. 22.4). At 1 year, 47.3% of patients treated with abatacept achieved a clinically meaningful HAQ response (improvement of  $\geq 0.3$  HAQ units from baseline) vs. 34.6% of placebo-treated patients ( $p < 0.001$ ). Abatacept demonstrated a favorable safety profile in patients receiving background non-bio DMARDs; an increase in serious adverse events and infections was observed in the smaller group of patients receiving abatacept plus background bio DMARDs. Discontinuation rates for all patients were lower for abatacept (13%) vs. placebo (18%).

**Brief Conclusion:** Abatacept treatment leads to improvements in patient-reported outcomes in patients receiving background DMARDs with the greatest improvements in patients receiving background non-bio DMARDs.

## 97

**DIFFERENCES IN THE MINIMALLY CLINICALLY IMPORTANT DIFFERENCE (MCID) IN THE HEALTH ASSESSMENT QUESTIONNAIRE DISABILITY INDEX (HAQ-DI) BETWEEN IMPROVEMENT AND WORSENING IN RA PATIENTS** Debbie Norrie , Janet Pope, Janine Ouimet (University of Western Ontario)

**Objective:**We wanted to determine the relationship between patients changing on a 5 point likert overall scale (from much worse, worse, same, better, much better) and the change in HAQ-DI.

**Methods:**The MCID for the HAQ-DI in RA (rheumatoid arthritis) from RCTs has been described as 0.2 to 0.22 on a 0 to 3 scale. 245 patients with RA serially seen by one rheumatologist and followed for a subsequent visit completed the HAQ-DI and global likert scale. Statistical analyses were done to determine those who were the same, worse or much worse and what the mean HAQ-DI change (most recent subtract baseline) and range was in each group, and likewise comparisons were made between same, better and much better.

**Results Obtained and Conclusion:** The mean age was 60.5 years; 82% were women and mean HAQ was  $1.0 \pm 0.05$ . The mean HAQ-DI change to move one point on the likert scale from same to worse was 0.15 and from same to better was -0.09. There was a dose response where the change for much worse or much better was large (0.50 for much worse, 0.15 for worse, 0.028 for same, -0.09 for better, and -0.57 for much better,  $p < 0.0001$ ).

**Brief Conclusion:** In RA clinical practice, the MCID is similar or better than that in clinical trials. There may also be directional asymmetry. This has been described by others in global assessments where patients are more apt to be optimistic, requiring more change to rate themselves as worse (vs. same or better). The MCID results are bidirectionally different and this should be considered when interpreting RA studies that use the HAQ-DI.

## 98

**IMMUNIZATION WITH BACTERIAL HSP65 INDUCES A BREAK IN TOLERANCE TO SELF-HSP60** Mélanie Dieudé, Joyce Rauch (Research Institute of the McGill University Health Center - Montreal General Hospital)

**Objective:**Anti-heat shock protein (hsp) 60 autoantibodies from SLE patients induce endothelial cell apoptosis in vitro, and are associated with an increased frequency of thrombosis in patients with lupus anticoagulant antibodies (Dieudé et al. Arthritis Rheum., 2004). However, little is known about the trigger that leads to the break in tolerance against this self-protein. We propose two hypotheses to explain the appearance of these autoantibodies. The first is that endothelial activation induces overexpression and secretion of hsp60, thereby presenting high amounts of a normally intracellular protein self-protein to the immune system. The alternative hypothesis is that the immune system encounters bacterial hsp65, which induces a crossreactive response to hsp60 due to the highly conserved nature of this protein across different species.

**Methods:**In order to test our hypotheses, we have immunized C57BL/6

mice biweekly with 10 micrograms of either mouse hsp60 or bacterial hsp65 with or without incomplete Freund's adjuvant (IFA). We have then monitored the development of anti-hsp60 and anti-hsp65 in the sera of the immunized mice by enzyme-linked immunoassay following each immunization.

#### Results Obtained and Conclusion:

High titers of anti-hsp65 were detected in mice immunized with hsp65 and IFA after the first immunization, and in mice immunized with hsp65 alone after two immunizations. In contrast, no antibody response to either hsp60 or hsp65 was observed in mice immunized with hsp60 even following the fourth immunization. However, high titers of anti-hsp60 antibodies were observed in some of the mice immunized with hsp65 and IFA after only two immunizations. These data suggest that autologous hsp are not immunogenic even when introduced at high concentration, but that bacterial hsp is able to induce a response to self-hsp in mice immunized with hsp65. We propose that bacterial infection, through molecular mimicry, could trigger a break in tolerance to self-hsp, leading to the production of anti-hsp60 autoantibodies and the eventual endothelial injury and thrombosis in SLE patients.

## 99

**BIOMARKERS DIFFERENTIATE PRE-RADIOGRAPHIC AND RADIOGRAPHIC SYMPTOMATIC KNEE OSTEOARTHRITIS FROM SYMPTOMATIC CONTROLS: RESULTS OF A POPULATION-BASED STUDY USING MRI** Jolanda Cibere, Hongbin Zhang, Anona Thorne, A Robin Poole, Tatiana Lobanok, Jacek Kopec, Joel Singer, Hubert Wong, Sherry Trithart, Victoria Combes, Ali Guermazi, Charles Peterfy, Savvakis Nicolaou, Peter Munk, John M Esdaile (Arthritis Research Centre of Canada, Vancouver, BC, University of British Columbia, Vancouver, BC, McGill University, Montreal, QC, Synarc Inc., San Francisco, California)

**Objective:** To determine the association of cartilage biomarkers with pre-radiographic and radiographic symptomatic knee OA compared to symptomatic normal controls.

**Methods:** Subjects, 40-79 years, with knee pain were assembled, stratified by age decade and gender, in a cross-sectional population-based study and evaluated clinically, with MRI, xray, serum and urine biomarkers (Ibex). MR cartilage (MRC) defects (score 0-4) and xrays (Kellgren-Lawrence [KL] grade 0-4) were read blinded. Subjects were classified as No OA (NOA) (KL<2, MRC=0), pre-radiographic OA (PROA) (KL<2, MRC>0) or radiographic OA (ROA) (KL>1, MRC>0). Serum was analyzed for type II collagen degradation (C2C), type I and II collagen degradation (C1,2C), type II procollagen synthesis (CPII), aggrecan epitope 846 (846) and ratios of C1,2C/C2C, C1,2C\*/CPII/C2C, C2C/CPII and C2C/846. Urine was analyzed for C2C and C1,2C. Multicategory logistic regression (adjusted for age, sex, BMI) was used to evaluate the association of OA category (using NOA as the reference group) with each log transformed biomarker, incorporating stratum sampling weights.

**Results Obtained and Conclusion:** Of 201 Caucasians, 9% had NOA, 54% PROA and 37% ROA. None of the biomarkers distinguished PROA from ROA. However, the risk of ROA compared to NOA was significantly reduced for CPII (per 0.35 unit increase) (OR 0.72, 95%CI 0.54-0.96), and increased for C2C/CPII (per 0.29 unit increase) (OR 1.42, 95%CI 1.03-1.96). For both ROA and PROA compared to NOA, urine C2C (per 0.35 unit increase) (OR 1.63, 95%CI 1.05-2.53; and OR 1.60, 95%CI 1.06-2.42, respectively) and urine C1,2C (per 0.64 unit increase) (OR 1.63, 95%CI 1.06-2.50 and OR 1.62, 95%CI 1.09-2.40, respectively) were increased significantly.

**Brief Conclusion:** In this population-based study, biomarkers did not differentiate between MRI-defined PROA and ROA. However, serum and urine type II collagen synthesis and degradation markers were significantly associated with ROA and urine degradation markers were associated with PROA.

## 100

**RELIABILITY AND STANDARDIZATION OF THE HIP EXAMINATION IN OSTEOARTHRITIS** Jolanda Cibere, Anona Thorne, Nicholas Bellamy, Andrew Chalmers, Nelson Greidanus, Nizar Mahomed, Sherry Trithart, Victoria Combes, Kamran Shojania, Jacek Kopec, John M Esdaile (Arthritis Research Centre of Canada, Vancouver, BC, University of British Columbia, Vancouver, BC, University of Queensland, Brisbane,

Queensland, Australia, University of Toronto, Toronto, Ontario)

**Objective:** To evaluate the benefit of standardization on the reliability of the physical examination of the hip by rheumatologists and orthopedic surgeons.

**Methods:** Six subjects with mild to severe hip osteoarthritis (OA) were examined by 6 examiners (4 rheumatologists, 2 orthopedic surgeons) experienced in the assessment of hip OA using a 6x6 Latin square design. Subjects were examined, followed by a standardization meeting and, a day later, by post-standardization examinations. 33 hip examination maneuvers were evaluated, including range of motion, pain, tenderness, muscle strength, leg length and gait. The order of examinations was randomized for each examiner. For dichotomous signs, agreement was calculated as the prevalence-adjusted bias-adjusted kappa (PABAK). Ordinal and continuous variables were analyzed by ANOVA, using the proportion of variance due to rheumatologists to calculate a reliability coefficient (Rc).

**Results Obtained and Conclusion:** Subjects' mean age was 61 years (range 49-65), mean BMI was 24 (range 21-30), mean WOMAC pain on walking was 52 mm (range 21-81mm). 23/33 (70%) hip examinations were reliable after standardization. Two new items resulted from the standardization meeting. The pre-/post-standardization reliability for select hip examinations using PABAK were as follows: Gait 0.06/0.52; pain on internal rotation 0.60/0.52; pain on external rotation 0.24/0.72; pain on flexion 0.46/0.82; Patrick test for hip pain 0.78/0.80; Thomas test 0.60/0.88; Trendelenburg test 0.36/0.06. The pre-/post-standardization reliability for select hip examinations using Rc were as follows: hip flexion strength 0.83/0.95; hip abduction strength 0.90/0.86; hip adduction strength 0.87/0.86; ROM internal rotation (supine) 0.87/0.94; ROM external rotation (supine) 0.87/0.80.

**Brief Conclusion:** Moderate to very good agreement was present for many hip examinations prior to standardization. Improved reliability was achieved after standardization for many but not all hip assessments. This will be important for improved outcome studies of early hip OA.

## 101

**SYNOVIAL MMP EXPRESSION IN UNTREATED EARLY RA PATIENTS: DISTINCT SUBSETS BASED ON SYNOVIAL MMP1 AND MMP3 MRNA LEVELS.** Ramandip Singh, Daniela Stroescu, Hani S El-Gabalawy, Carol A Hitchon, Guoping Ma, Keng Wong, Andrea Craig (University of Manitoba, Winnipeg, Manitoba)

**Objective:** MMP-1 and MMP-3 are key proteases that mediate articular damage in RA. High systemic and synovial levels of these MMPs are associated with radiographic damage in early RA. We aimed to investigate if expression of these MMPs in the synovium reflects the clinical disease phenotype in early arthritis.

**Methods:** Synovial biopsies were obtained using a Parker-Pearson needle from 15 joints in 13 patients with early arthritis prior to initiation of DMARDs. Synovial MMP1 and MMP3 mRNA levels were measured and related to protein expression levels by immunohistology. Serum MMP1 and MMP3 levels were measured by ELISA. Joint counts, ESR, CRP values were evaluated at baseline and in follow-up. The number of DMARDs used in treatment of the arthritis was also examined and compared.

**Results Obtained and Conclusion:** There was a strong correlation between MMP1 and MMP3 mRNA levels, and both were highly associated with cellular expression of the proteins in the synovial lining layer. Based on these levels, the biopsy samples fell into two distinct non-overlapping groups: high MMP mRNA (n=7) and low MMP mRNA (n=6). There was a 35-fold and 11-fold difference in MMP1 and MMP3 mRNA levels, respectively. Weak correlation between serum MMP1 and MMP3 levels was noted. There were no statistically significant differences in baseline CRP (high/low; 30.4 vs. 33.4), ESR (60 vs. 34), swollen (7 vs. 11), and tender joints (6 vs. 12). At 6-12 months follow-up, there were no statistically significant differences between the groups in CRP, ESR, and joint counts. Furthermore, there was comparable use of DMARDs in the two groups. Follow up radiographic data will be available at a later date.

**Brief Conclusion:** The synovium of untreated early RA patients fell into 2 distinct groups based on the level of MMP1 and MMP3 mRNA detectable in the tissue. Despite dramatic differences, these groups could not be distinguished based on early clinical features such as joint counts, CRP, ESR at baseline or follow-up. The clinical significance of such distinct differences in synovial MMP levels is unclear. We are currently examining the biological basis of these differences.

## 102

**RECENT CORTICOSTEROID USE AND RECENT DISEASE ACTIVITY: ARE THEY INDEPENDENT DETERMINANTS OF CORONARY HEART DISEASE RISK FACTORS IN SYSTEMIC LUPUS ERYTHEMATOSUS?** Igor Karp, Michal Abrahamowicz, Paul Fortin, Louise Pilote, Carolyn Neville, Christian A Pineau, John Esdaile (Division of Clinical Epidemiology, Montreal General Hospital, Montreal, Quebec, Canada, Department of Epidemiology and Biostatistics, Faculty of Medicine, McGill University, Montreal, Quebec, Canada, Division of Rheumatology, University Health Network, Toronto Western Hospital; Division of Outcomes and Population Health, University Health Network, Toronto Western Hospital, Toronto, Ontario, Canada, Division of Internal Medicine, Montreal General Hospital, Montreal, Quebec, Canada, Division of Clinical Epidemiology, Montreal General Hospital, Montreal, Quebec, Canada, Department of Medicine, McGill University, Montreal, Quebec, Canada; McGill University Health Centre Lupus Clinic, Montreal, Quebec, Canada, Arthritis Research Centre of Canada and Division of Rheumatology, University of British Columbia, Vancouver, BC, Canada)

**Objective:** Systemic lupus erythematosus (SLE) is characterized by a markedly elevated risk for coronary heart disease (CHD), the exact pathogenesis of which is unknown. In particular, the causal roles of corticosteroid therapy and SLE disease activity and whether their putative effects are mediated through conventional risk factors remain unclear.

**Methods:** Data abstracted retrospectively from the charts at 11,359 available clinic visits for 310 SLE patients were used to investigate the associations of (i) recent corticosteroid dose and (ii) recent Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) score, with each of eight CHD risk factors (total serum cholesterol, HDL-cholesterol, LDL-cholesterol, Apolipoprotein B, triglycerides, systolic blood pressure (SBP), body mass index (BMI), and blood glucose), as well as the aggregate estimate of two-year CHD risk. Separate multivariable hierarchical linear regression models estimated the mutually adjusted effects of average daily corticosteroid dose and average SLEDAI score within past year on the current level of each risk factor while adjusting for age, sex, cumulative damage score, disease duration, and, where appropriate, use of relevant medications.

**Results Obtained and Conclusion:** Higher past-year corticosteroid dose was independently associated with significantly higher overall two-year CHD risk and higher levels of all eight individual risk factors. Higher past-year lupus disease activity level was independently associated with higher overall two-year CHD risk and lower HDL-cholesterol and higher values of SBP, Apolipoprotein B, triglycerides, and blood glucose.

**Brief Conclusion:** In SLE, both recent use of corticosteroids and recent lupus activity are independently associated with higher values of several well-recognized CHD risk factors and overall two-year CHD risk.

## 103

**ANTIBODIES TO CYCLICAL CITRULLINATED PEPTIDE (CCP) ARE ASSOCIATED WITH LOWER SERUM OSTEOPROTEGERIN (OPG) IN EARLY INFLAMMATORY ARTHRITIS** Adarshdip Brar, Micheal Sargent, Keng Wong, Nadia El-Gabalawy, Charles Bernstein, Hani El-Gabalawy, Carol Hitchon (University of Manitoba, Winnipeg, Manitoba)

**Objective:** Osteoclastogenesis and osteoblastogenesis are closely linked in bone turnover and probably also to the development of erosions. Receptor activator of nuclear factor  $\kappa$ B ligand (RANKL) and its decoy receptor osteoprotegerin (OPG) are important regulators of osteoclastogenesis and are upregulated by inflammatory cytokines through prostaglandin E2 production. Inhibition of cyclo-oxygenase 2 (COX2) interferes with osteoblastogenesis. We sought to determine whether serum OPG and RANKL levels differed in patients with early inflammatory arthritis (EIA) who have autoantibodies predictive of early erosions and whether these levels were influenced by the inhibition of COX2.

**Methods:** Patients with EIA of  $\leq 12$  months duration ( $n = 98$ ) rheumatoid arthritis (RA) 48%; undifferentiated arthritis (UA) 52%) were assessed for clinical disease activity (swollen and tender joint counts, acute phase response (ESR, CRP), DAS28-CRP3), and RA autoantibodies (rheumatoid factor (RF), anti-cyclical citrullinated peptide (CCP)). NSAID use (COX-2 selective vs. non-selective vs. no NSAID) at initial clinic visit was recorded. Serum OPG, RANKL and CCP were measured using ELISA. Results are recorded as mean (SD).

**Results Obtained and Conclusion:** Results and conclusion: RA and UA patients had similar serum levels of OPG (575(312) vs 462(354) pg/ml;

p=ns) and RANKL (323(1006) vs. 596(2984) pg/ml p=ns). CCP + ve ( $n=19$ ) patients had lower OPG than CCP -ve ( $n=24$ ) patients (551(279) pg/ml vs. 707 (378)  $p < 0.05$ ) but similar RANKL levels (323 (1006) vs 167(518) pg/ml p=ns). OPG and RANKL levels were positively correlated ( $R=0.2$   $p < 0.05$ ). OPG and RANKL did not correlate with CCP or RF titer, joints counts, ESR, CRP nor DAS28. OPG and RANKL levels did not differ between NSAID users and non-users however, among users, the OPG/RANKL ratio was higher in non-selective COX2 users compared to selective COX2 users (10(7) vs 6.4(4.1)  $p < 0.05$ ).

**Brief conclusion:** Altered OPG/RANKL pathways affecting osteoclast activity may contribute to the erosive potential seen in CCP + ve early arthritis. This finding needs to be corroborated with a larger study and radiographic outcomes.

## 104

**INCIDENCE OF OSTEOARTHRITIS IN BRITISH COLUMBIA, CANADA, 1995-2001** Jacek A. Kopec, Mushfiqu Rahman, Christel Le Petit, Jean-Marie Berthelot, Jaafar Aghajanian, Eric C. Sayre, Jolanda Cibere, Aslam H. Anis, Elizabeth M. Badley (University of British Columbia, Arthritis Research Centre of Canada, Statistics Canada, University of Toronto)

**Objective:** The number of persons affected by osteoarthritis (OA) in Canada and other industrialized societies is likely to rise due to population aging. However, there have been no published studies of the trends in OA incidence over time. The purpose of our study was to describe changes in age-standardized and age-specific incidence of OA in males and females during the period 1995/6 - 2000/1 in British Columbia (BC), Canada.

**Methods:** We have used data on all visits to health professionals and hospital admissions covered by the Medical Services Plan of BC (population of about 4 million) for the fiscal years 1995/6 through 2000/1. OA was defined as at least one visit to a health professional or one hospital separation with ICD-9 code 715. Incidence rate was estimated as number of new cases during a given year divided by the BC population for that year. A 4-year run-in period was applied to eliminate prevalent cases, with an additional adjustment for prevalence bias. Rates were standardized to the 1998 BC population.

**Results Obtained and Conclusion:** Age-standardized incidence rates of OA increased between 1995/6 and 2000/1 by 3.5% in men (from 10.5 to 10.9 per 1000) and by 8% in women (from 14.1 to 15.3 per 1000). In both men and women, the rates increased primarily in persons 60 years of age and older, with little change in the younger age groups. These data suggest that factors other than age have contributed to a recent rise in the incidence of OA. A limitation of the study is a relatively short period of observation. Comparisons with other studies are not available at the present time.

**Brief Conclusion:** If the observed trends continue, the burden of OA over the next 1-2 decades will be larger than predicted on the basis of changes in population age structure.

## 105

**DEMOGRAPHICS AND CO-MORBIDITY IN EARLY ARTHRITIS: COMPARISON OF A CLINICAL REGISTRY SAMPLE WITH A POPULATION-BASED SAMPLE** Sasha Bernatsky, the McGill Early Arthritis Research Group, Debbie Feldman, Murray Baron (McGill University, Faculty of Medicine, University of Montreal, Jewish General Hospital)

**Objective:** Clinical patient registries may not capture the entire spectrum of the population of interest; potential differences of importance include demographic make-up and co-morbidity. Our objective was to compare demographics and co-morbidity in two samples of patients with newly diagnosed inflammatory arthritis, one from a clinical patient registry, and one from the corresponding provincial administrative database.

**Methods:** The first sample of 130 patients was drawn from the McGill Early Arthritis Registry, which consecutively enrolls patients referred with new-onset inflammatory arthritis. Data on co-morbidity was collected using standardized questionnaires. The population-based sample was obtained from the Régie d'Assurance Maladie du Québec (RAMQ) administrative database, where new cases of RA in 2000 were defined according to ICD-9 codes from billing activity. Co-morbidity in this sample was also assessed using ICD-9 codes. The two populations were compared in terms of demographics and co-morbidity.

**Results Obtained and Conclusion:** In the arthritis registry sample, the sub-



jects were primarily female (72.5 %, 95% Confidence Interval [CI] 63.9, 79.8), as was true for the population-based sample (65.8% female, 95% CI 65.0, 66.6). The age distribution was also similar in the arthritis registry (mean 55.9 years, standard deviation (SD) 15.0, median 55 years) and the population sample (mean 57.1 years, SD 17.1, median 57 years). Regarding co-morbidity, the prevalence of cardiac disease, hypertension, diabetes, and cancer was similar, although the prevalence of hypercholesterolemia as reported by the clinical sample was lower than the prevalence documented in the population-based sample.

**Brief Conclusion:** These preliminary results suggest that the sample from the arthritis registry was similar to the sample from the provincial administrative database, in terms of demographics and co-morbidity. However, caution is needed regarding the interpretation of these results, given the different means whereby early arthritis was defined in the two samples, as well as the fact that different methods of co-morbidity ascertainment were used for the two groups. Further work is in progress to explore the extent to which clinical patient registries reflect the actual population of interest.

## 106

**EMPLOYMENT AND ARTHRITIS: MAKING IT WORK!** Diane Lacaille, Margaret White, Pam Rogers, Monique Gignac, Catherine Backman, Daniel Pratt, John Esdaile (University of British Columbia, Vancouver, BC Canada, Arthritis Research Centre of Canada, Vancouver BC Canada, Arthritis Research Centre of Canada, BC Canada, University Health Network, Toronto, ON, Canada, University of British Columbia, Vancouver, BC Canada)

**Objective:** Work disability (WD) is a common outcome of RA and other inflammatory arthritis (IA). We have developed and pilot tested a program to help people with IA deal with the difficulties they encounter at work because of their arthritis and to prevent WD.

**Methods:** The program was developed to modify the risk factors known to increase the risk of WD in arthritis and to enhance self-management of the problems that people with IA encounter at work, as identified in initial focus groups. It consists of 5 weekly group sessions, take-home material, and an individual assessment with an occupational therapist (OT) for an ergonomic assessment of their work and with a vocational rehabilitation counselor (VRC). We report on the process and outcome evaluations up to 3 months.

**Results Obtained and Conclusion:** Our sample includes 19 employed women with IA (RA:17, PA:1, SLE:1; mean (SD) age: 50(7.9) yrs; median disease duration: 8.5 yrs). The OT and VRC visits resulted in recommendations for change in 100% and 61%, respectively. At 3 mos, changes were implemented in 65% and 56%, respectively. 94% reported the program had changed the way they managed their work and arthritis. 81% stated the program increased their confidence at requesting job accommodations; and 53% had taken steps towards making a request. Improvements were seen in perceived self-efficacy at work (0-10 scale): mean (SD) pre, post & 3 mos = 6.6(2.0), 7.2(1.6) & 7.4(1.7), resp.; self-rated work productivity (0-10 scale): 7.2(2.4), 8.1(1.8) & 8.0(1.8), resp.; measures of limitations at work: Work Limitation Questionnaire (6.4(5.2), 6.3(4.7) & 5.5(5.1) resp.), Work Instability Scale (10.3(5.2), 8.7(6.4) & 8.0 (6.6), resp), Work Productivity and Activity Impairment Questionnaire (44.2%(23.6), 41.8%(27.4) & 34.7%(29.6), resp.) & Endicott Work Productivity Scale (30(24.1), 23(15.5), 20(16.7), resp.). Differences were not statistically significant due to small N. No difference was seen in amount of work missed.

**Brief Conclusion:** Our program resulted in people making changes to adapt their work to their arthritis, in improved self-confidence in ability to manage problems at work because of arthritis, as well as improved self-rated productivity and small reduction in limitations at work. Further testing in a RCT is needed.

## 107

**PREDICTORS OF OSTEOPOROSIS DIAGNOSIS AMONG PATIENTS WITH FRAGILITY HIP FRACTURE** Derek Haaland, Dana Cohen, Courtney Kennedy, Jonathan Adachi, Nadir Khalidi, Alexandra Papaioannou (McMaster University, Hamilton, Ontario)

**Objective:** To examine osteoporosis diagnosis/treatment rates and predictors in patients admitted with a fragility hip fracture.

**Methods:** We conducted a retrospective chart review of all patients aged 50 and over admitted to two Hamilton, Ontario, hospitals from March 2003

through to May 2004 with a fragility hip fracture. Among patients with no documented osteoporosis and surviving until discharge, the rate of new osteoporosis diagnosis ("osteoporosis" noted/osteoporosis treatment initiated) was determined. Hypothesized predictors of diagnosis (demographic, clinical, radiographic and hospital-stay-related variables) were examined in univariate analyses using chi-square and Mantel-Haenszel odds ratio (OR) tests, with new osteoporosis diagnosis as the dependent variable. Significant predictors in univariate analyses were entered into backward logistic regression analyses for 1) patients discharged directly from orthopaedics and 2) patients transferred to a rehabilitation or geriatrics unit (rehab/geriatrics) prior to discharge.

**Results Obtained and Conclusion:** 253 (74.0%) patients were previously undiagnosed, and 228 (90.1%) of these survived to discharge. 74 (32.5%) of these patients had rehab/geriatrics stays. 62 (27.2%) had fracture history. 22 (9.6%) and 9 (3.9%) took calcium and vitamin D, respectively. In univariate analyses, rehab/geriatrics stay strongly predicted osteoporosis diagnosis (74.3% diagnosed versus 18.8% in the non rehab/geriatrics group; OR=12.5; p<0.001). Other significant univariate predictors were admission from community (versus longterm care; OR=9.53; p<0.001), discharge to community (OR=3.42; p<0.001), no documented cognitive impairment (OR=2.4; p=0.0025), female sex (OR=1.8; p=0.036), orthopaedic stay length (p=0.0025) and documented osteopenia (p=0.049). Multivariate regression of the non rehab/geriatrics group revealed female sex, stay length and discharge to community remaining as significant predictors of osteoporosis diagnosis (p<0.05).

**Brief Conclusion:** Osteoporosis remains largely undiagnosed among patients admitted with fragility hip fracture. Rehab/geriatrics stay strongly predicted diagnosis. Among patients discharged directly from orthopaedics, males (9.8% diagnosed) and nursing-home residents (16.0% diagnosed) were particularly underdiagnosed. Great opportunity exists for improving post-fracture osteoporosis diagnosis/treatment, especially among patients discharged directly from acute care.

## 108

**RELIABILITY OF EXERCISE TESTING PARAMETERS IN CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS (JIA)** Davinder Singh-Grewal, Samantha Stephens, Oded Bar-Or, Joseph Beyene, Bonnie Cameron, Ronald Laxer, Claire Leblanc, Rayfel Schneider, Jane Schneiderman-Walker, Hiran Selvadurai, Earl Silverman, Lynn Spiegel, Virginia Wright, Brain Feldman (The Hospital for Sick Children, Toronto, ON, Children's Exercise and Nutrition Centre, Hamilton, ON, Children's Hospital of Eastern Ontario, Ottawa, ON, The Children's Hospital at Westmead, Sydney, N.S.W., Bloorview Macmillan Children's Centre, Toronto, ON)

**Objective:** To determine the reliability of exercise testing in children with JIA.

**Methods:** Children with JIA aged 8-16 years and recruited in the PEAK study undertook two exercise tests 2-4 weeks apart. Testing included (1) sub-maximal oxygen uptake - 5min treadmill test at 3.0km/hr (VO2submax), (2) peak VO2 - incremental treadmill test to volatile fatigue (VO2peak) and (3) peak anaerobic power - modified Wingate. Test and re-test reliability was assessed using intra-class correlation (ICC) and Bland and Altman plots used to determine limits of agreement (LOA). An ICC of 0.61-0.8 indicates substantial and >0.8 almost perfect agreement.

**Results Obtained and Conclusion:** 70 patients (female n=57) were studied. Mean age was 11.3 years (8-16; SD=2.7), 36 had polyarticular, 18 oligoarticular, 5 systemic, 5 psoriatic, and 6 enthesitis related JIA. Mean active joint count 2.2 (0-28 joints; SD=5.0). Mean height 147cm (121.5-176.8; SD=13.6), weight 46kg (22-94kg; SD=16.2kg) and body fat 23.3% (8-51.2%; SD=8.4%).

**Exercise Testing Results**

Parameter; Test1 mean (SD); Test2 mean (SD); Difference in means; ICC; LOA

VO2submax (L/min); 0.50 (0.14); 0.48 (0.12); - 0.02; 0.82; ± 0.16

VO2submax (ml/kg/min); 11.6 (1.9); 11.1 (1.9); - 0.50; 0.60; ± 3.4

VO2peak (L/min); 1.5 (0.5); 1.5 (0.5); 0.02; 0.91; ± 0.44

VO2peak (ml/kg/min); 34.1 (7.0); 34.7 (7.8); 0.62; 0.72; ± 11.1

Power 30sec (W); 214 (119); 235 (119); 21.0; 0.94; ± 9

Power 30sec (W. Kg-1); 4.5 (1.9); 5.0 (1.9); 0.55; 0.85; ± 2.1

**Brief Conclusion:** These results suggest almost perfect agreement of exercise testing in absolute terms for VO2submax, VO2peak, and peak anaero-

bic power. When defined in relative terms, the strength of agreement for VO<sub>2</sub>submax was moderate while peak anaerobic power and VO<sub>2</sub>peak was almost perfect. These Results suggest that exercise testing in children with JIA is consistent and reliable.

## 109

**THE EFFECTS OF VIGOROUS EXERCISE TRAINING ON MOTOR FUNCTION AND FUNCTIONAL FITNESS IN CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS (JIA)** Davinder Singh-Grewal, Samantha Stephens, Oded Bar-Or, Joseph Beyene<sup>1</sup>, Bonnie Cameron<sup>1</sup>, Ronald Laxer<sup>1</sup>, Claire Leblanc<sup>3</sup>, Rayfel Schneider<sup>1</sup>, Jane Schneiderman-Walker<sup>1</sup>, Hiran Selvadurai<sup>4</sup>, Earl Silverman<sup>1</sup>, Lynn Spiegel<sup>1</sup>, Virginia Wright<sup>5</sup>, Brian Feldman<sup>1</sup> (The Hospital for Sick Children, Toronto, ON, Children's Exercise and Nutrition Centre, Hamilton, ON, Children's Hospital of Eastern Ontario, Ottawa, ON, The Children's Hospital at Westmead, Sydney, N.S.W., Australia, Bloorview Macmillan Children's Centre, Toronto, ON)

**Objective:** A randomized, controlled, single blinded study to assess the effect of a 12 week formal aerobic exercise training program on motor function in children with JIA.

**Methods:** Children aged 8-16 years, with JIA were recruited. Those with significant cardiac, pulmonary or metabolic, or severe hip disease, those engaged in >3 hours/week of extra-curricular activity and those unable to cooperate with testing or training were excluded.

Subjects were randomized into either an intensive aerobic and anaerobic exercise program or the attention placebo (gentle relaxation based on Qigong). Both groups undertook weekly, supervised classes and twice weekly home sessions.

Subjects underwent habituation, baseline and post-training testing - (1) metabolic efficiency of locomotion (VO<sub>2</sub>submax) on a treadmill at 1.5, 3km/hr and most comfortable speed, (2) maximal aerobic capacity (VO<sub>2</sub>max) - incremental task on a treadmill with progressive increase in incline and speed to volitional fatigue and (3) peak anaerobic power - all out cycling task (modified Wingate). Questionnaires of physical function attended were Child Health Assessment Questionnaire (CHAQ), Quality of Life (QOL), Activity Scale for Kids (ASK) and Habitual Activity Estimation Scale (HAES).

**Sample size** to show a 10% difference in the VO<sub>2</sub>submax (a=0.05; B=0.20; drop out 12.5%) was 80.

VO<sub>2</sub>submax is the primary outcome and the change observed in the groups will be compared using repeated measures ANOVA. Potential confounders will be examined using ANCOVA.

**Results Obtained and Conclusion:** 80 patients (female n=57) were recruited. Ten dropped out (5 after commencing the program). Mean age was 11.3 years (8-16; SD=2.7), 36 had polyarticular, 18 oligoarticular, 5 systemic, 5 psoriatic, and 6 etesitis related JIA. Mean joint count was 2.2 (0-28; SD=5.0, height 147cm (121.5-176.8; SD=13.6), weight 46kg (22-94kg; SD=16.2kg) and body fat 23.3% (8-51.2%; SD=8.4%). Baseline VO<sub>2</sub>submax was 11.1ml/kg/min (SD=1.9), VO<sub>2</sub>max 34.7ml/kg/min (SD=7.8) and peak anaerobic power 50 W/kg.

**Brief Conclusion:** Two patients had not completed at the time of writing. Final results will be reported.

## 110

**RELIABILITY OF FUNCTIONAL ACTIVITY QUESTIONNAIRES IN CHILDREN WITH JUVENILE IDIOPATHIC ARTHRITIS (JIA)** Davinder Singh-Grewal, Samantha Stephens, Oded Bar-Or, Joseph Beyene, Bonnie Cameron, Ronald Laxer, Claire Leblanc, Rayfel Schneider, Jane Schneiderman-Walker, Hiran Selvadurai, Earl Silverman, Lynn Spiegel, Virginia Wright, Brian Feldman (The Hospital for Sick Children, Toronto, ON, Children's Exercise and Nutrition Centre, Hamilton, ON, Children's Hospital of Eastern Ontario, Ottawa, ON, The Children's Hospital of Westmead, Sydney, N.S.W., Australia, 5Bloorview Macmillan Children's Centre, Toronto, ON, Canada)

**Objective:** To determine the reliability of functional activity questionnaires in children with JIA.

**Methods:** Children with JIA of any subtype, aged 8-16 years and recruited in the Physical Exercise and Activity in Kid (PEAK) Study filled in three different functional activity questionnaires during a study visit 2-4 weeks apart prior to commencement of the PEAK exercise program. The ques-

tionnaires included (1) the Childhood Assessment Questionnaire (CHAQ) (2) the Revised Activity Scale for Kids (ASK) and (3) the Habitual Activity Estimation Scale (HAES). Test and re-test reliability was assessed using intra-class correlation (ICC) and Bland and Altman plots were used to determine limits of agreement (LOA). An ICC of 0.61-0.8 was considered to indicate substantial and >0.8 almost perfect agreement.

**Results Obtained and Conclusion:** Data were available for 70 patients (female n=57) studied from 2003-2005. Mean age was 11.3 years (8-16; SD 2.7), 36 had polyarticular JIA, 18 oligoarticular, 5 systemic, 5 psoriatic, and 6 had etesitis related JIA. Mean active joint count 2.2 (0-28 joints; SD 5.0). Mean height was 147cm (121.5-176.8; SD 13.6), weight 45kg (23-93kg; SD 15.7kg).

**Results for Functional Activity Questionnaires**

**Parameter; Test1 mean (SD); Test 2 mean (SD); Difference in means (%); ICC; LOA**

CHAQ; 0.33 (0.48); 0.29 (0.44); - 0.05; 0.82; ±0.5

Revised Ask; 0.07 (0.52); 0.03 (0.47); - 0.04; 0.91; ±0.6

HAES weekday; 6.0 (2.0); 6.8 (2.5); 0.77; 0.15; ±0.6

HAES weekend; 6.6 (2.8); 6.9 (3.0); 0.26; 0.34; ±0.6

**Brief Conclusion:** These data suggest almost perfect reliability of the CHAQ and Ask questionnaires, while the HAES weekday and weekend questionnaire indicated slight and fair reliability, respectively. Based on this investigation, the CHAQ and Revised ASK both demonstrated high reliability in determining functional activity, however, the HAES may not be reliable in characterizing physical activity levels in children with JIA.

## 111

**WAIT TIMES FOR LIKELY INFLAMMATORY ARTHRITIS PATIENTS IN AN EARLY ARTHRITIS CLINIC** Susanna Tam, Ieva Fraser, Elizabeth Badley, Wendy Young, Peter C. Coyte (University of Toronto, Toronto, ON, Southlake Regional Health Center, Newmarket, ON)

**Objective:** An Early Arthritis Clinic (EAC) was developed using a skilled Occupational Therapist (OT) in rheumatology to assess likely inflammatory patients referred to two community rheumatologists' offices. This study reports on a determination of the wait times for likely inflammatory arthritis patients seen in this EAC compared with provincial reports.

**Methods:** One-hundred forty-nine of the 227 patients referred for assessment in the EAC agreed to release their chart information for this study. In this EAC, an experienced rheumatology OT pre-screened the patients and arranged for appropriate diagnostic tests. Afterwards the patient saw the rheumatologist for diagnosis and treatment. Wait times were measured as the interval between the referral receipt date by the rheumatologists' offices and the dates to when the patient was assessed by the therapist and then the rheumatologist.

**Results Obtained and Conclusion:** The wait time distribution had wide variations. Some patients waited as little as 2 days to see the OT and 7 days to see the rheumatologists other patients waited 95 days and 158 days respectively. Fifty percent of the patients waited up to 3 weeks to see the OT and 5 weeks to see the rheumatologist. The reported provincial average wait times in this region was 2.8 weeks. Patients in the upper 25% quartile who waited more than 54 days to when the rheumatologist occurred randomly throughout the year with 57% due to patient cancellations.

**Brief Conclusion:** On initial analysis the EAC process did not appear to improve wait times. However, this study does not account for the time to initiate treatment. In conventional care settings this may not be until the second or third rheumatological appointment after the completion of diagnostic assessments and tests. Patients in this EAC process have undergone these procedures for the rheumatologist to make a diagnosis. Therefore using a therapist as an intermediate agent may improve the flow of patients to be seen by rheumatologists especially in regions where rheumatologist services are scarce. Further research is needed to determine if wait times for treatment differs in patients pre-screened by a therapist before seeing a rheumatologist and those seen in the rheumatologists' offices directly.

## 112

**A RANDOMIZED, DOUBLE-BLIND, CROSSOVER COMPARISON OF THE EFFICACY AND SAFETY OF ORAL CONTROLLED RELEASE TRAMADOL AND PLACEBO IN PATIENTS WITH PAINFUL OSTEOARTHRITIS** Andre Beaulieu, MD, Denis Callaghan, MD, William O'Mahony, MD, Carter Thorne, MD, John Sibley, MD, John

Bartlett, MD, Richard Knight, MD, Gunnar Kraag, MD, Ronald Akhras, MD, John Eisenhoffer, MD, Paula Piraino, Ph.D, Zoltan Harsanyi, MBA, Andrew C. Darke, Ph.D (Centre de Rhumatologie St-Louis, Ste-Foy, PQ, Hamilton, ON, Corunna Medical Research Centre, ON, The Arthritis Program Research Group Inc., Newmarket, ON, Royal University Hospital, Saskatoon, SK, London Road Diagnostic and Medical Centre, Sarnia, ON, Ultra-Med Inc., Pointe-Claire, PQ, The Ottawa Hospital, Ottawa, ON, Centre Medicaire Acadie, Montreal, PQ, Purdue Pharma, Pickering, ON)

Objective: Patients with moderate or greater osteoarthritis pain, were evaluated for efficacy, safety and quality of life while receiving CR tramadol (Zytram XL®) or placebo.

Methods: Patients underwent washout from all analgesics 2-7 days before randomization to 150 mg daily of CR tramadol or placebo, and titrated to effect and tolerability weekly to 200, 300, or to a maximum of 400 mg daily. After 4 weeks of treatment patients were crossed-over to the alternative treatment for an additional 4 weeks. Acetaminophen, 325-650 mg q4-6h prn was provided as rescue.

Results Obtained and Conclusion: 100 patients were randomized and 77 were evaluable for efficacy (36 men, 41 women, mean age 59.4±9.6 years). CR tramadol resulted in significantly lower ( $p=0.0009$ ) mean daily pain ( $37.4\pm23.9$  vs.  $45.1\pm24.3$ ; VAS). WOMAC subscale scores for pain ( $189.0\pm105.0$  vs  $230.0\pm115.4$ ;  $p=0.0001$ ), and physical function ( $632.4\pm361.3$  vs  $727.4\pm383.4$ ;  $p=0.0205$ ) were also significantly better with CR tramadol than to placebo, although stiffness was not ( $p=0.4093$ ). The total Pain and Disability ( $22.8\pm14.5$  vs.  $27.2\pm14.8$ ;  $p=0.0004$ ), and overall Pain and Sleep ( $104.7\pm98.0$  vs  $141.0\pm108.2$ ;  $p=0.0005$ ) scores were significantly lower for CR tramadol. SF-36 scores were also significantly better during CR tramadol treatment for the Pain Index ( $38.8\pm10.8$  vs  $35.6\pm9.0$ ;  $p=0.0100$ ), General Health Perception ( $46.5\pm11.2$  vs  $44.4\pm11.6$ ;  $p=0.0262$ ), Vitality ( $43.1\pm13.2$  vs  $40.2\pm13.7$ ;  $p=0.0255$ ), and Overall Physical Component score ( $40.8\pm8.9$  vs.  $37.8\pm7.7$ ;  $p=0.0002$ ). 55.8% of patients preferred CR tramadol treatment ( $p=0.0005$ ) compared to 20.8 % and 23.4% of patients that chose placebo or had no preference.

Brief Conclusion: CR tramadol is effective for the management of painful osteoarthritis.

## 113

TREATMENT OF AMYLOID A (AA) AMYLOIDOSIS: RESULTS FROM A 2-YEAR, DOUBLE-BLINDED, RANDOMIZED, PLACEBO-CONTROLLED, INTERNATIONAL TRIAL WITH 1,3-PROPANEDISULFONATE (1,3-PDS; NC-503; FIBRILEXTM), A SELECTIVE ANTI-AMYLOID COMPOUND. Peter D. Gorevic,

Irena Butrimiene, Evgeny L. Nasonov, Laura M. Dember, Richard Briand, Denis Garceau, Wendy Hauck, Henri A. Ménard, on behalf of the Fibrillex Amyloidosis Treatment (FAST) group. (Mount Sinai Medical Center, New York, NY, USA, VU Institute of Experimental and Clinical Medicine, Vilnius, Lithuania, Institute of Rheumatology, Russian Academy of Medical Sciences, Moscow, Russian Federation, Boston University, Boston, MA, USA, Neurochem Inc., Laval, QC, Canada, McGill University Health Center, Montreal, QC, Canada.)

Objective: AA amyloidosis is a rare but serious late complication of patients with chronic inflammatory conditions. We report the results of the first, large, therapeutic trial involving a novel, oral, anti-AA amyloid compound (1,3-PDS) in this patient population.

Methods: Adults with biopsy-confirmed AA amyloidosis and renal involvement, were randomized 1:1 to either placebo or 1,3-PDS for 24 months. The primary outcome was a composite assessment of renal function and death to classify disease as worsened (= 50% reduction in CrCl, or doubling of SCr, or progressed to dialysis, or died during the study), improved (= 50% increase in CrCl and none of the parameters of worsened disease), or stable, relative to baseline.

Results Obtained and Conclusion: 183 patients from 27 centers were enrolled. Rheumatoid arthritis (49%), familial Mediterranean fever (20%) and, ankylosing spondylitis (12%) were prominent. At baseline, nephrotic syndrome was present in 40% of patients, proteinuria = 1 g/day in 79%, CrCl <30 mL/min/1.73 m<sup>2</sup> in 16%, mean serum CRP levels were  $18\pm20$  mg/L (range: 0.2-110); mean SAA levels were  $40\pm63$  mg/L (range: 0.8-424). Baseline characteristics were not different between treatment groups. Cox proportional hazards regression analysis of the ITT population showed

that 1,3-PDS was associated with a 42% reduction in risk of renal deterioration or death (95% C.I. 37-93%,  $p=0.025$ ). The mean annual rate of change in CrCl (mL/min/1.73 m<sup>2</sup>/year) was -10.9 in the 1,3-PDS group vs -15.6 in the placebo group ( $p=0.025$ ). 1,3-PDS also delayed the mean time to a 50% decrease in CrCl by 4.4 months ( $p=0.029$ ), and delayed the mean time to progression to dialysis by 5.3 months ( $p=0.18$ ). The incidence of serious or non-serious adverse events was similar between treatment groups (36 % vs 42%, 98% vs 93%, respectively); the number of deaths was also similar (5 each).

Brief Conclusion: 1,3-PDS demonstrated clinically meaningful beneficial effects on preventing the progression of renal disease and a safety profile similar to placebo.

## 114

METHOTREXATE DECREASES THE PRODUCTION OF CITRULLINATED ANTIGEN IN VITRO: A POSSIBLE EXPLANATION FOR ITS SINGULAR IN VIVO THERAPEUTIC USEFULNESS IN RHEUMATOID ARTHRITIS. M. LORA, , Z.J. ZHOU, H.A. MENARD. (Division of Rheumatology McGill University Health Center)

Objective: Auto-antibody to the Sa auto-antigen [citrullinated (cit-) vimentin] is of specific diagnostic and, of high prognostic value in Rheumatoid Arthritis (RA). Methotrexate (MTX) is the most useful single treatment for RA. We sought a biological relationship between those two clinical observations.

Methods: Cell cultures rich in cit-proteins and Sa antigen as detected by western blot (WB) using rabbit and rheumatoid serum respectively, are treated with MTX with and without folic acid protection. The peptidyl-larginine deiminase isoenzymes (PADIs) involved in each cell line are identified by reverse transcriptase-polymerase chain reaction (RT-PCR). PADI2 protein is identified by WB and removed from the extracts by immunoprecipitation (IP). PADI activity is tested by WB on native vimentin.

Results Obtained and Conclusion: Of several cell lines tested, two present the desired citrullination status: UMR106 and ECV304. At increasing but still therapeutic range concentrations for RA, MTX inhibits the production of total cit-proteins and cit-antigens in the former but not in the latter. That inhibition is folic acid preventable. Several PADIs are present in ECV304 but UMR106 has only PADI 2. PADI 2 protein is present but inactive in extracts of MTX treated cells. When removed from those extracts by IP, the washed immunoprecipitate contains active PADI 2 capable of reconstituting the Sa antigen from vimentin.

Brief Conclusion: In vitro, MTX has a dose-dependent differential effect on protein citrullination depending on the cell type and that may be related to the PADI isoenzyme content. In the case of UMR 106, there seems to be a PADI 2 inhibitor generated during MTX treatment.

## 115

LOW BONE MINERAL DENSITY (BMD) IN PEDIATRIC SYSTEMIC LUPUS ERYTHEMATOSUS (SLE): PREVALENCE AND ETIOLOGY Sandrine Compeyrot-Lacassagne, Pascal N. Tyrrell, Eshetu Atenafu, David Gilday, Derek Stephens, Earl D. Silverman (Division of pediatric rheumatology, the Hospital for Sick Children, Toronto, Canada, Population health science, the Hospital for Sick Children, Toronto, Canada, Diagnostic imaging, the Hospital for Sick Children, Toronto, Canada)

Objective: SLE is a multi-organ autoimmune disease. 15-20% of Lupus patients presents before the age of 16. Our objectives were to determine the prevalence of low BMD and to correlate disease variables to BMD in patients with pediatric SLE.

Methods: The retrospective review of a cohort of 173 patients followed at Sickkids with pediatric SLE between 1990 and 2003 identified 72 patients who had a dual-energy X-absorptiometry done with mean disease duration of 3.24 years. We analyzed BMDs at lumbar spine (Ls) as z-scores were available. Osteopenia was defined as BMDs < -1 and osteoporosis as BMDs < -2.5. Data for disease activity (SLEDAI, ECLAM, SLEDAI area under the curve), quality of life (CHAQ), disease damage (SLICC), sex, ethnicity, BMI, age at diagnosis, age, CS therapy (cumulative dose of CS, duration of CS treatment), requirement and duration of other therapies (NSAID, Methotrexate, MMF, Azathioprine, Cyclophosphamide, Cyclosporine and Hydroxychloroquine), clinical features, vertebral fractures and puberty status were collected at the time of the DEXA.



**Results Obtained and Conclusion:** 31 patients (43%) had a BMDs < -1 and 16 (22%) a BMDs < -2.5. In univariate analysis, BMDs < -1 was significantly correlated with age, disease duration, CS duration, cumulative dose of CS, azathioprine requirement, cyclophosphamide requirement, lupus nephritis and presence of damage. Two additional variables were associated with BMD < -2.5 (MMF requirement and class III-IV nephritis). Multivariate analysis for BMDs < -1 indicated cumulative dose of CS and age as independent predictors. Similarly for BMD < -2.5, lupus nephritis and disease duration were identified as independent predictors.

Abnormal BMD is a common and early complication of pediatric SLE correlated with CS requirement and disease severity. Lupus nephritis appears to be a predictor of severe outcome.

**Brief Conclusion:** Our study confirms the role of CS and points out the role of cumulative disease activity in the occurrence of abnormal BMD. Therefore patients with the most aggressive diseases are at high risk of developing low BMD.

## 116

**PATIENT-REPORTED SIDE EFFECTS OF LOCAL CORTICOSTEROID INJECTIONS: A PROSPECTIVE COHORT STUDY** Jean Gillies, Charles Ratzlaff, Lauren Swann, Ewan Goligher (University of British Columbia, Vancouver, BC)

**Objective:** Local corticosteroid (CS) injections are commonly used to treat musculoskeletal problems. There are no standard protocols for joint and soft tissue injections. We employ a protocol involving a series of three CS injections given at 2-week intervals. The objective of this study is to describe the side effect experience of patients receiving local triamcinolone acetonide injections in our tertiary referral rheumatology clinic.

**Methods:** Consecutive patients attending our clinic for CS injection were asked to participate in the study. Participants completed a 14-day side effect log book that tracked the most common side effects described in the literature: facial flushing, local swelling, redness, bruising, increased pain, elevated blood glucose (diabetics only) and menstrual irregularity. Side effects not listed in the log book were also recorded. Age and gender were documented.

**Results Obtained and Conclusion:** A total of 307 injections were administered to 84 subjects. The mean age of the subjects was 54.1 years (SD 14.4 years). After the first injection, the most common side effects were: increased pain (49%), facial flushing (31%) and bruising (31%). Twenty-six percent reported no side effects. The mean duration of the side effects were: bruising (6.4 days), facial flushing (3.6 days) and increased pain (3.2 days). There were no statistically significant changes in the side effect frequency between the 1st injection and subsequent injections. The likelihood of experiencing a given side effect were no different for men and women. All side effects reported were transient. There were no reports of post-injection infection, skin atrophy/depigmentation, tendon/fascia rupture, or aseptic necrosis.

Patient-reported side effects of CS injections can easily be monitored in the clinic setting allowing treatment modification. The risk of side effects does not increase with subsequent injections.

**Brief Conclusion:** Patients receiving local corticosteroid injections have a risk of experiencing minor side effects of limited duration. In this study, corticosteroid injections have been shown to be safe and effective for repeated use. Patients should be informed about the risks and probable duration of side effects that they may experience after local corticosteroid injections.

## 117

**RECOGNIZING OSTEOPOROSIS AND ITS CONSEQUENCES IN QUEBEC (ROCQ): THE CARE GAP FOLLOWING A FRAGILITY FRACTURE** Jacques P. Brown, Louis Bessette, Michèle Beaulieu, Mirela Baranci, Sonia Jean, Shawn K. Davison, Louis-Georges Ste-Marie (Laval University, Ste-Foy, Quebec, Merck Frosst Canada, Montreal, Quebec, Sanofi-Aventis Pharma, Montreal, Quebec, University of Montreal, Montreal, Quebec)

**Objective:** The objective of this analysis is to evaluate the diagnostic and treatment rates of osteoporosis six months following a fragility fracture in women 50 years and over participating in a patient health-management programme (ROCQ).

**Methods:** Seventeen centers in three socio-sanitary regions in the Province

of Quebec (Canada) are participating in the ROCQ programme. At phase 1, women with fractures are recruited during their visit to a cast or outpatient clinic and later contacted by phone to answer a short questionnaire to identify the specific circumstances of their fracture. During the first phone contact, there is no reference about the possible association between their fracture and osteoporosis, and no investigation or intervention is proposed. Six months after the fracture event, women are contacted for a second time by phone (phase 2) to determine the diagnostic (informed of osteoporosis and/or BMD measurement with diagnosis of osteoporosis) and treatment (bisphosphonates, raloxifene, nasal calcitonin or teriparatide) rates of osteoporosis.

**Results Obtained and Conclusion:** After 22 months, 1,774 women (mean age: 65.8 years) completed phase 1. A total of 1,456 (82%) sustained a fragility fracture and 318 (18%) sustained a traumatic fracture. The ratio of fragility: traumatic fractures increased with age. Eighty-one out of 468 women (17%) with fragility fracture who completed the questionnaire at phase 2 were already on treatment for osteoporosis at the time of their fracture. Of those who were not prescribed an osteoporosis treatment at phase 1, 18% initiated pharmacological therapy within the six-month period following their fracture. At phase 2, 27% of participants either received a diagnosis of osteoporosis or were on treatment despite that 73% of these women consulted a physician (other than an orthopaedic surgeon) during the six to eight months between phases 1 and 2.

**Brief Conclusion:** In ROCQ, 82% of fractures were considered related to osteoporosis, higher than previously reported (70% over age 45). Despite the availability of adequate diagnostic modalities and effective treatments for osteoporosis, there is a substantial care gap in the management of this disease. The proportion of fragility fractures is higher than expected and the management of osteoporosis is not optimal.

## 118

**FREQUENCY OF ASSESSMENT FOR CARDIAC RISK FACTORS IN RHEUMATOID ARTHRITIS PATIENTS** S. Zareen Ahmad, Mary J. Bell, Alexander Kiss (University of Toronto)

**Objective:** There is increasing awareness that patients with rheumatoid arthritis have excess cardiovascular morbidity and mortality. In addition, they are known to have higher rates of dyslipidemia than the general population. For these reasons, detection and treatment of cardiac risk factors should be priorities in the management of patients with rheumatoid arthritis. The purpose of this study was to assess the frequency with which lipids are measured in

rheumatoid arthritis patients in a university-based rheumatology practice. In addition, we assessed the frequency with which other cardiovascular risk factors were addressed in our sample. Framingham risk scores were also calculated for rheumatoid arthritis patients identified in the study. These allowed us to compare our patients' risks of cardiovascular disease to those of the general population.

**Methods:** Charts belonging to 94 rheumatoid arthritis patients were reviewed. All subjects were from the practice of a single rheumatologist. All males with rheumatoid arthritis were included, while females were randomly chosen for inclusion. Data collected from the charts included demographic information, history of cardiovascular disease and known history of cardiovascular risk factors. Information was also collected concerning the physician's response to detection of cardiovascular risk factors in these patients. The data were analyzed using appropriate descriptive statistics and Framingham risk scores were calculated.

**Results Obtained and Conclusion:** With the exception of glucose measurements, specific documentation of cardiovascular risk factors was frequently missing in these charts. HDL and LDL values were documented on the charts only 36% of the time. 50% of the time these tests had been ordered by the rheumatologist. Females were assessed for cardiovascular risk factors less frequently than men, although younger mean age of the females may have been at least partially responsible for this observation.

**Brief Conclusion:** Screening of rheumatoid arthritis patients for dyslipidemia and other cardiac risk factors was sub-optimal in our sample. Increased emphasis on the detection of cardiac risk factors is needed in this practice, with particular attention to female patients with rheumatoid arthritis.

## 119

**ANALYSIS OF UNFOLDED PROTEIN RESPONSE FOLLOWING INFECTION OF B27-POSITIVE TARGET CELLS WITH ARTHRITOGENIC BACTERIA** Kyoung-Sun Na, Tae-Hwan Kim, Robert D. Inman (Toronto Western Hospital, Hanyang University, Toronto Western Hospital)  
Objective: The mechanism by which the HLA-B27 contributes to the pathogenesis of spondyloarthritis is unknown. Recent studies have suggested that HLA-B27 is prone to misfold in the endoplasmic reticulum and that this misfolding of HLA-B27 heavy chains might induce the unfolded protein response (UPR), which in turn could influence an inflammatory response. Since HLA-B27 is associated with the development of reactive arthritis following certain types of infection, it is important to address whether the host: pathogen interactions could influence the B27-related UPR. To investigate this question, we have examined the expression of the UPR-inducible genes, BiP and CHOP, after infection of HLA-B27-expressing cells with arthritogenic bacteria.

Methods: The target cells used were C1R cells (a human B cell line) transfected with HLA-B27, HLA-B7, HLA-A2 or pSV2neo vector alone. Target cells were infected with either *Salmonella typhimurium* or *Chlamydia trachomatis* elementary bodies. Semiquantitative RT-PCR was performed to compare the relative expression of BiP and CHOP among the various transfected cells.

Results Obtained and Conclusion: Expression of BiP and CHOP was increased in cells following infection with *Salmonella typhimurium*. However, we found no significant differences between cells expressing HLA B27 and those expressing control class I alleles. *Chlamydia* infection did not upregulate BiP or CHOP expression in target cells.

Brief Conclusion: Using transfected cells, B27-related abnormalities in UPR were not reflected in these *in vitro* host: pathogen interactions. The role of B27 in conferring susceptibility to ReA remains unresolved and requires further clinical and *in vivo* analysis.

## 120

**COMPARISON OF PATIENT-PHYSICIAN PERCEPTIONS OF DISEASE ACTIVITY IN PSORIATIC ARTHRITIS (PSA)** Catherine Schentag, Dafna Gladman (Toronto Western Hospital, Toronto, Ontario)

Objective: To determine the amount of agreement between patient and physician ratings of disease activity in PsA and to identify factors that influence how these ratings are made.

Methods: Consecutive patients attending a PsA clinic were asked to rate their disease activity (DA) on a 10cm VAS, and complete the modified Fatigue Severity Scale, HAQ and SF-36. All patients were assessed clinically according to a standardized PsA protocol by a rheumatologist, who also rated the patient's disease activity. Chance corrected agreement between patient-physician ratings was measured by the intraclass correlation coefficient (ICC). DA ratings of the patients and physicians were separately correlated with patient symptoms, health status and disease characteristics using Pearson correlation.

Results Obtained and Conclusion: The study comprised 244 patients, 57% male, mean age 52 years, and disease duration 17 years. Compared to physicians, patients rated DA as more severe. The mean DA rating was 3.6 for patients and 2.3 for physicians ( $p < 0.0001$ ). Chance corrected agreement was poor; the ICC was 0.31. Correlations between DA ratings with disease characteristics for patients and physicians respectively, were: pain (0.81 vs 0.49), stiffness (0.72 vs 0.54), fatigue (0.62 vs 0.33), active joint count (0.49 vs 0.57), swollen joint count (0.32 vs 0.49), clinically damaged joint count (0.16 vs 0.13), psoriasis activity and severity index (0.09 vs 0.16), patient self-report of psoriasis severity (0.49 vs 0.27), HAQ (0.65 vs 0.50) and the physical component summary score for the SF-36 (0.71 vs 0.51). The disease characteristics that seemed to influence how these ratings were made thus appeared to be different for patients and physicians. For patients, the severity of symptoms such as pain, stiffness and fatigue were the most important, while for physicians it was the active joint count.

Brief Conclusion: There was poor agreement between patient-physician ratings of disease activity suggesting patients and physicians have different perceptions of disease activity in PsA. While patient ratings focused on pain, those of physicians were on the number of actively inflamed joints.

## 121

**TIME-DEPENDENT ANALYSES OF LIPID ABNORMALITIES AS RISK FACTORS FOR RENAL DETERIORATION IN SYSTEMIC LUPUS ERYTHEMATOSUS**

Annaliese Tisseverasinghe, Raja Bobba, Jiandong Su, Paul Corey, Murray Urowitz, Dafna D Gladman, Paul R Fortin.

Objective: To determine whether and which plasma lipids, adjusted for temporal variations, are associated with subsequent renal deterioration (RD) in individuals with systemic lupus erythematosus (SLE).

Patients and Methods: In a prospectively-followed cohort of 1060 SLE patients, the outcome RD (serum creatinine (sCr) above 200  $\mu\text{mol/l}$ , doubling, 20% increase from an abnormal value, or elevation from normal to abnormal range, for at least 6 months) was modelled using separate Cox Proportional-Hazard regressions for each of five main predictor variables: serum total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and TC/HDL-C ratio. Covariates in each model resulted from stepwise selection of demographical variables, disease duration, renal indices, cardiovascular risks, lupus disease indices, and medications. All predictor variables were time-dependent.

Results: During a mean 8.8(0-31) year follow-up, 93(9%) experienced RD. Compared to the outcome-free group, patients with RD had higher mean serum TC (5.8+/-1.7 versus 5.1+/-1.4  $\mu\text{mol/l}$ ;  $P < 0.0001$ ), TG (2.5+/-1.3 versus 1.7+/-1.1  $\mu\text{mol/l}$ ;  $P < 0.0001$ ), LDL-C (3.2+/-1.4 versus 2.8+/-1.0  $\mu\text{mol/l}$ ;  $P < 0.05$ ), and TC/HDL-C ratio (4.1+/-1.0 versus 3.6+/-1.3;  $P < 0.0005$ ), but comparable HDL-C (1.4+/-0.5 versus 1.5+/-0.5  $\mu\text{mol/l}$ ;  $P = 0.64$ ). In the multivariate model using TC as main predictor variable, TC remained associated with RD (standardized HR 1.24; 95% CI 1.05-1.47), as did sCr (1.14; 1.12-1.17), hypertension (7.09; 3.77-13.33), SLICC/ACR DI (1.19; 1.02-1.38), proteinuria (1.10; 1.00-1.21), extra-renal SLEDAI (1.36; 1.07-1.72), and prednisone dose (1.27; 1.00-1.59). Similarly, TG was predictive of RD (1.34; 1.04-1.73), in a model retaining sCr (1.18; 1.13-1.21) and hypertension (6.31; 1.79-22.3). The larger number of measurements available for TC compared to TG likely explains the disparity in number of covariates between these models. Results were inconclusive respecting impact of LDL-C, TC/HDL-C ratio, and HDL-C on RD.

Conclusions: Total cholesterol and triglyceride are associated with development of RD in this SLE cohort. This is a novel finding in the SLE population, and the first time that time-dependent analyses have been used to investigate the effect of dyslipidemia on RD.

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**EVALUATION OF A MULTIDISCIPLINARY FIBROMYALGIA EDUCATION PROGRAM BASED ON PATIENTS' EXPECTATIONS, QUESTIONS AND SATISFACTION** Danielle Skeith, Kathy Cotton, Lois Flakstad, Paul Davis (University of Alberta)

Objective: Patient education programs are a valuable clinical resource for patients with fibromyalgia. The objective of this study was to evaluate the expectations and satisfaction of 60 patients enrolled in a University of Alberta Hospital three-day fibromyalgia education program.

Methods: A session evaluation questionnaire as well as a custom designed satisfaction survey were utilized to measure patient satisfaction. Agreement and Likert scoring systems were used to analyze results from the questionnaires.

Results Obtained and Conclusion: Every mean score was greater or equal to 2.9 out of 5. Statistical improvement of FIQ scores were observed during analysis of pre and post program mean scores, 67.5-59.1 ( $P < 0.002$ ).

Brief Conclusion: Overall results demonstrated that patients were satisfied with the fibromyalgia education program but a number of inclusions and modifications to the program were suggested by patients to optimize their self-management of this difficult condition.

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