budget impact model, employing a third-party payer perspective, with a two-year time horizon was developed. Population demographics were used to calculate the number of AR eligible patients to receive treatment with biologic therapies. Current and forecasted hypothetical market share sizes were applied for selected biologic products for this indication. Two scenarios were stated: without golimumab IV – with golimumab IV. Annual dose frequency was based on labeled dosing for each indication as stated in product´s prescribing information. Pricing inputs for all biologics were based on public listed prices of CESFAR as of 01/01/2015. IV administration costs were obtained from interviews with private payers. **RESULTS:** In a population of 2098 eligible patients for treatment with biological products: the total annual cost of treatment and total cost per patient per year were similar for both scenarios across the two years' time horizon with a tendency which favored the adoption of golimumab IV (Year 1: -1,20%), which increased in the second year (Year 2: -2.23%) for a total cost of treatment and total cost per patient over 2 years of -1,71%. **CONCLUSIONS:** Addition of golimumab IV in local formularies in Chile is budget favorable and does not impact negatively the annual health care budget of a payer while adding another therapeutic option for patients.

PMS5
IMPACT OF FINANCIAL INCENTIVES ON ACCESS TO SERVICES AND QUALITY OF CARE
Ghali N
Laval University, Quebec City, QC, Canada
OBJECTIVES: The waiting time is used to assess the level of access to health services. Waiting times that exceed the medically reasonable time has consequences not only on the quality of services, but also leads to unnecessary costs. Financial incentives to institutions has been explored in several experiments and gave encouraging results concerning the evolution of wait times. It is in this context that our study falls. Indeed, we seek to measure the impact of financial incentives, especially activity based funding experience, on waiting times and length of stay for surgeries. **METHODS:** Our data sample consists of two groups: treatment group (Quebec) and control group (British Columbia). We use a Mixed Proportional Hazard (MPH) model with difference in difference approach to estimate the hazard to move from a waiting state to a surgery state and from impatient state to discharge state. **RESULTS:** We demonstrate that each additional 1M$ of funding decreased the waiting time by 9.8 days for knee replacements and 5 days for hip replacements. On the other hand, length of stay decreased by 1.14 and 1.18 days for knee and hip surgeries, respectively. **CONCLUSIONS:** Surgery Access Program, analyzed in this text, has helped to reduce waiting time for knee and hip surgeries and also to decrease the length of stay for hospitalizations following these surgeries. The increase in surgical production encouraged hospitals to discharge patients more quickly, as long as this medical act does not decline the patient's health by more than a critical level. The length of stay reflects a dimension of quality but can't be considered as an outcome indicator. Improving waiting times and shortening lengths of stay while treating a larger volume, is certainly an improvement in the productivity of an hospital. However, we must ensure that this progress doesn't lead to a deterioration of the quality of services.

PMS6
ANKYLOSING SPONDYLITIS TREATMENT AND FOLLOW-UP COSTS IN COLOMBIA
Alarcon C[1], Arango C[1], Bautista A[1], Caicedo T[2], Guzman C[1], Jaimes D[1], Londoño D[3], Martinez JB[1], Marquez J[1], Rodriguez D[3], Salazar MS[3], Taborda A[4]
[1]*Clinical Rheumatologist, Bogota, Colombia,* [2]*Clinical Rheumatologist, Pasto, Colombia,* [3]*Integralis, Bogota, Colombia,* [4]*Independent, Bogota, Colombia*
OBJECTIVES: to estimate the cost of Ankylosing spondylitis (AS) in Colombia. Background: AS is part of a group of pathologies of the spine called Spondyloarthropathies, characterized by low frequency but with a severe disability, and high requirements of medical resources and costs **METHODS:** A structured survey was answered by seven rheumatologists in the country, in order to determine patterns of medication usage, management of adverse events, monitoring practice and follow-up of patients with AS in a year. Valuation of health resources and procedures were based on national standard tariffs (ISS 2001 + 30% and SOAT 2014). Medication prices were obtained from SISMED and price regulation official documents. Costs are reported in local currency (COP) **RESULTS:** Average annual cost of NSAIDs COP 105,509 pesos (range: COP 5,219.5 to 151,986). Second line DMARDs cost range between COP 3,104.33 and 4,307,000. Biologic antiTNF annual cost fluctuates towards COP 28.661.464 and 30.264.000. Monitoring and follow up costs range between COP 3.741.018 and 6.445.367. High uncertainty in expected adverse events costs between COP 6.558 to 3.382.456 per year. **CONCLUSIONS:** The AS is a disease represents a high economic burden for health system in Colombia.

PMS7
COSTO-UTILIDAD DE UN ESQUEMA INICIAL DE TRATAMIENTO CON TOFACITINIB COMPARADO CON TERAPIA BIOLOGICA ANTI-TNF EN PACIENTES ADULTOS CON ARTRITIS REUMATOIDE QUE HAN PRESENTADO RESPUESTA INADECUADA A METOTREXATO EN VENEZUELA
Rosselli D[1], Rueda JD[2], Andrade AJ[3], Prieto VA[4]
[1]*Pontificia Universidade Javeriana, Bogotá, Colombia,* [2]*Pontificia Universidad Javeriana, Facultad de Medicina, Bogotá, DC, Colombia,* [3]*Pfizer Venezuela, Caracas, Venezuela,* [4]*Pfizer SAS, Bogota, Colombia*
OBJECTIVOS: Estimar la costo-utilidad de un esquema inicial de tratamiento con tofacitinib comparado con la terapia biológica anti-TNF en pacientes adultos con artritis reumatoide (AR) que han presentado respuesta inadecuada a metotrexato en Venezuela desde la perspectiva del pagador público. Tofacitinib se encuentra en proceso de aprobación por parte de las autoridades sanitarias. **METODOLOGÍAS:** Se realizó la adaptación de un modelo de microsimulación a nivel de paciente en Excel. Se compararon esquemas de tratamiento iniciando con adalimumab, etanercept, infliximab o tofacitinib. Cada alternativa de tratamiento se combinó con metotrexato. Se consideraron horizontes temporales de uno, cinco, diez años y toda la vida del paciente. La unidad de resultado fueron años de vida ajustados por calidad (AVAC). El puntaje inicial del HAQ (Health Assessment Questionnaire) como respuesta clínica de corto y largo plazo se tomó de la literatura y se realizaron comparaciones indirectas. Los costos (expresados en bolívares venezolanos de 2014, Bs.) fueron obtenidos de fuentes oficiales y manuales tarifarios. Para el caso de tofacitinib se asumió paridad de precio con etanercept. La tasa de descuento, 5% para costos y desenlaces. **RESULTADOS:** Para el horizonte temporal de toda la vida del paciente, los costos totales esperados fueron: adalimumab Bs. 2.248.884; etanercept Bs. 1.998.582; infliximab Bs 2.283.026 y tofacitinib Bs. 1.909.658. Los resultados en términos de AVAC fueron: adalimumab 10,4767; etanercept 10,6700; infliximab 10,7172 y tofacitinib 10,9100. **CONCLUSIONES:** Bajo los supuestos del modelo, el esquema de tratamiento que inicia con tofacitinib es una alternativa costo-ahorradora comparado con los esquemas que inician con adalimumab e infliximab en todos los horizontes temporales considerados. Comparado con el esquema que inicia con etanercept es una alternativa costo-efectiva en los horizontes de 5 y 10 años y costo-ahorradora en los horizontes de 1 año y toda la vida del paciente.

PMS8
ANÁLISIS DE COSTO EFECTIVIDAD Y COSTO UTILIDAD DE RITUXIMAB COMO TRATAMIENTO EN PACIENTES CON ARTRITIS REUMATOIDE, ANTE EL FALLO O INTOLERANCIA EN PRIMERA LÍNEA DE UN ANTI-TNF, EN EL CONTEXTO VENEZOLANO
Romero M[1], Huerfano LM[2], Acero G[1]
[1]*Salutia Foundation, Bogotá, Colombia,* [2]*Salutia Foundation - Research center in economy, management and health technologies., Bogota, Colombia*
OBJECTIVOS: analizar la relación de costo--efectividad y costo-utilidad del uso de rituximab frente a un segundo Anti-TNF y abatacept para el manejo de pacientes con artritis reumatoide que no respondieron a la terapia en primera línea con un AntiTNF. **METODOLOGÍAS:** a través de un modelo de cadenas de Markov, que simuló la actividad de la enfermedad basado en la escala DAS28, se evaluó la efectividad de rituximab mediante los desenlaces años de vida con baja actividad de la enfermedad y años de vida ajustados por calidad de vida; la utilidad fue tomada de un estudio realizado en Colombia. Los costos se obtuvieron de bases de datos del Ministerio de Salud venezolano y de los manuales tarifarios en bolívares fuertes. Se realizó un análisis de sensibilidad univariado para el precio y un análisis probabilístico tipo Montecarlo. **RESULTADOS:** para un paciente en promedio y en un horizonte temporal de cinco años, rituximab mostró la mayor efectividad tanto desde los años de vida ajustados por calidad como por los años con enfermedad controlada (2,68 y 2,73) frente a los Anti-TNF (2,23 y 2,13). Al analizar las razones de costo efectividad, aplicando una tasa de descuento del 5% anual, rituximab mostró dominancia frente a abatacept ($47.361,06) y costo-efectividad frente a los demás. En todas las iteraciones del análisis de sensibilidad se mantuvo la costo-efectividad de rituximab. **CONCLUSIONES:** desde la perspectiva del sistema de salud venezolano el uso de rituximab es una opción dominante en el tratamiento de pacientes con artritis reumatoide en segunda línea frente a un nuevo Anti-TNF para las condiciones del caso analizado.

PMS9
ANÁLISIS DE MINIMIZACIÓN DE COSTOS DE TOFACITINIB EN EL TRATAMIENTO DE PACIENTES CON ARTRITIS REUMATOIDE QUE HAN PRESENTADO RESPUESTA INADECUADA A METOTREXATO EN COLOMBIA
Vargas-Valencia J[1], Prieto VA[2]
[1]*Econopharma Consulting, Mexico, Mexico,* [2]*Pfizer SAS, Bogota, Colombia*
OBJECTIVOS: Estimar desde la perspectiva del sistema de salud colombiano el costo anual de tratamiento con tofacitinib comparado con los fármacos anti-reumáticos modificadores de la enfermedad (FARMEs) – biológicos disponibles en el plan de beneficios. **METODOLOGÍAS:** Un análisis de comparaciones indirectas, usando un método bayesiano, mostró que tofacitinib es una alternativa de similar efectividad y seguridad a la de los (FARMEs) – biológicos. Se realizó una minimización de costos. Los comparadores fueron: abatacept (750 mg cada 4 semanas), adalimumab (40 mg subcutáneo cada 2 semanas), certolizumab (400 mg cada 4 semanas), etanercept (50 mg semanal), golimumab (50 mg cada 4 semanas), infliximab (3 mg/kg semana 0, 2, 6 y cada 8 semanas), rituximab (1000 mg los días 0 y 15; se asumió reinfusión cada 6 meses - 1000 mg), tocilizumab (8 mg/kg al mes) y tofacitinib (5 mg dos veces al día). Para el estudio se siguieron las recomendaciones de la Guía Colombia para el manejo de Artritis Reumatoide. Se asumió un peso promedio de 70 kg. El horizonte temporal fue 1 año. Se incluyeron solo costos médicos directos. Los costos sin descuento, se expresaron en pesos colombianos de 2014. Los precios de los medicamentos se tomaron de la base de datos oficial (SISMED, reporte enero- junio de 2014) y el costo de administración de tarifarios nacionales. **RESULTADOS:** Los costos anuales para cada alternativa fueron: abatacept ($28.180.394), adalimumab ($25.477.144), certolizumab ($25.013.784), etanercept ($27.421.267), golimumab ($29.868.384), infliximab ($ 24.256.886), rituximab ($ 21.336.056), tocilizumab ($ 26.681.634) y tofacitinib ($ 23.020.381). El costo promedio anual de las alternativas disponibles en el plan de beneficios fue $26.159.779. **CONCLUSIONES:** El costo anual de tratamiento con tofacitinib, es un 12% inferior con respecto al costo promedio de tratamiento anual de las alternativas disponibles en plan de beneficios, lo que representa un ahorro promedio de $3.159.385 por paciente.

MUSCULAR-SKELETAL DISORDERS – Patient-Reported Outcomes & Patient Preference Studies

PMS10
APRESENTAÇÃO DO PROGRAMA DESFECHOS DE UM HOSPITAL PRIVADO DE SÃO PAULO, BRASIL
Bizutti CC, Escobosa DM, Marques FR
Hospital Israelita Albert Einstein, São Paulo, Brazil

OBJETIVOS: O programa Desfechos caracteriza-se como um centro de coleta de dados que tem como principal objetivo mensurar o desfecho clínico e qualidade de vida periódica de pacientes pós alta hospitalar. O programa trabalha em conjunto com os Programas Integrados na disponibilização de informações com foco nos indicadores de resultado. Este trabalho irá apresentar o Programa Desfechos e os dados coletados (jan/2011-jan/2015), em diversos períodos de seguimento pós alta hospitalar. **MÉTODOS:** Estudo transversal, retrospectivo, a partir da análise quantitativa dos dados. Neste estudo foram realizadas ligações telefônicas utilizando o instrumento EQ-5D para medir qualidade de vida. O método utilizado foi o Time Trade-Off (TTO). O estudo foi realizado no Hospital Israelita Albert Einstein (HIAE), um hospital geral, privado, de alta complexidade. **RESULTADOS:** Realizamos 16.479 ligações telefônicas e obtivemos 10.985 (67%) de contatos com sucesso. Na coleta dos dados de qualidade de vida, os pacientes apresentaram a média de TTO: 0,546 antes do procedimento ou alta hospitalar e após 6 meses, apresentou TTO:0,814. No follow up coletamos 268 (9%) informações de óbitos. Os principais motivos de censuras foram: insucesso após 4 tentativas (30%); dados cadastrais desatualizados (1%) e recusas (2%). **CONCLUSÕES:** É essencial que as organizações de saúde avaliem de maneira eficaz os desfechos clínicos e estado funcional de seus pacientes após alta hospitalar. Desta maneira será possível avaliar a qualidade da assistência prestada, identificar as reais necessidades de seus pacientes e assim, melhorar a utilização dos recursos e sistemas de saúde.

PMS11

SUBJECT RECOMMENDATIONS FOR IMPROVING THEIR COMPLIANCE AND ENGAGEMENT IN COMPLETING DAILY ELECTRONIC DIARIES IN OSTEOARTHRITIS CLINICAL TRIALS

Khurana L[1], Gary ST[1], Otero A[1], Evans C[2], Hall C[1], Dallabrida S[1]
[1]*PHT Corporation, Boston, MA, USA,* [2]*Endpoint Outcomes, Boston, MA, USA*

OBJECTIVES: Clinical trials for osteoarthritis (OA) are increasingly using electronic methods to collect patient-reported outcomes (ePRO). As use of this technology increases, it is important to consider patient preference in questionnaire design. The purpose of this study was to determine optimal use/compliance for subjects completing daily ePRO diaries on handheld devices. **METHODS:** 104 subjects with OA were surveyed in the US. Subjects were asked to assume that they were using a handheld electronic device to complete questionnaires in a clinical trial. Subjects were given examples and asked about their preferences for improving their compliance and engagement in the technology. **RESULTS:** Subjects were 37 to 90 years old and 58% female. 62% reported that they would like to see a "thank you" screen at the end of each questionnaire. 78% thought it would be helpful or necessary to regularly receive a graph to track and monitor their symptoms. 92% preferred to see their progress as they completed a questionnaire. 70% of subjects said they would like the first screen of the questionnaire on the device, summarizing questionnaire length/estimated completion time. Subjects were asked if being informed by the device that their compliance was below expectations would motivate them to complete a daily questionnaire. The majority of subjects (76-80%) indicated that this information would motivate them, 13-15% indicated this would have no impact on their motivation, and less than 9% indicated such messaging would be discouraging. **CONCLUSIONS:** Subjects with OA were motivated by knowing their compliance in completing a daily questionnaire. Specifically, subjects preferred a diary screen summarizing questionnaire length/completion time, tracking their progress through a questionnaire, and "thank you" messages upon questionnaire completion. Subjects were interested in tracking and monitoring their health status. Investigators should consider including these design elements for use with ePRO assessments in clinical trials.

PMS12

EVALUACION SOBRE MEDICAMENTOS Y ACTOS MEDICOS CUBIERTOS FINANCIERAMENTE POR RESOLUCION JUDICIAL- FNR

Gómez L, Scarpitta C, Rey N, Rotondaro A, Saona G, Balarini R
Fondo Nacional de Recursos, Montevideo, Uruguay

Fondo Nacional de Recursos (FNR) creado por ley para asegurar el acceso de toda la población a un conjunto de prestaciones médicas de alta especialización e impacto económico. Basándose en la calidad, asegura la viabilidad económica de sus prestaciones. Adquiere especial relevancia el seguimiento de la situación de los pacientes que han recibido financiación del FNR para la realización de actos médicos o medicamentos fuera del listado de cobertura priorizada a su cargo, como consecuencia de una sentencia judicial que impone al FNR dicha prestación.**OBJECTIVOS:** Analizar coberturas adjudicadas judicialmente. Determinar si corresponden a cobertura no priorizada. Verificar el cumplimiento de las sentencias de condena; el tiempo transcurrido entre la adjudicación y la cobertura; y la sobrevida de los mismos. **METODOLOGÍAS:** Estudio descriptivo a través de encuesta telefónica a los pacientes con cobertura judicialmente determinada, entre 2007- 2014. Sin criterios de exclusión. **RESULTADOS:** En el período se cubrieron 56 solicitudes, 5% no ubicados. 93% sector privado, 95% Medicamentos: Interferón Beta 35,7% (n= 20), Sorafenib 27.5% (21), Bevacizumab y Temozolamida 5.4% (3). Patologías Esclerosis Múltiple y Hepatocarcinoma 35.7% (20), tumores SNC 7.1% (4). La sobrevida de los pacientes fue de 70%. La mortalidad en Hepatocarcinomas fue 94.1% y la sobrevida de 8 meses. En los pacientes con EM fue de 4.34 años, no fallecidos. **CONCLUSIONES:** La totalidad de las solicitudes se encontraban fuera de la normativa del FNR, no contempladas por el FTM ni PIAS. La cobertura fue inmediata a la sentencia, cumpliendo los aspectos técnicos y médicos. Entrevistados mostraron interés y disponibilidad a participar en estudios de estas características. La experiencia demostró la pertinencia de incluir seguimiento periódico a pacientes cubiertos judicialmente.

PMS13

QUALITY OF LIFE IN PATIENTS AFTER TOTAL HIP REPLACEMENT

Bielik J, Javorkova E, Banarova P, Melus V
Trencin University, Trencin, Slovak Republic

OBJECTIVES: The current prevalence of Total Hip Replacement (THR) in adult patients in Slovakia ranges in about 5 200 cases per year with expenditures about 10.545.600 €. The THR has a great impact on the quality of life (QoL) and the physical ability too. Till now in the Slovak Republic was not realised the study like this one. **METHODS:** 118 patients, 59 men and 59 women, with THR were studied. The average age was 62,24 y., the average duration of illness was 7,75 y. and the average waiting time to surgery was 0,73 y. QoL and the taking care about himself (TCaH) was evaluated after THR on the numeric scale from 0 to 10 (0 for the worst, 10 for the best) and pain (0 for the best, 10 for the worst) by patients themselves **RESULTS:** QoL has increased from 4,24 to 6,30 after THR. The ability to take care about himself has decreased from 6,38 to 3,45 after THR. Pain has decreased from 7,85 to 3,32 after THR, and after spa stay from 3,04 to 2,03. The loss of money in productive age patients was 216,63 €. The score of physical health by SF 36 questionnaire was 50,94 points and score of mental health was 65,41 points, the average score was 57,98 points. 35 patients from 45 patients were able to come back to work after THR. **CONCLUSIONS:** THR has a great impact on QoL, pain and on the TCaH too. There was not statistical difference between men and women in all evaluated parameters. The early/earlier made THR could have an important influence on better QoL and pain development. There is a good correlation between results from numeric scale and SF 36.

MUSCULAR-SKELETAL DISORDERS – Health Care Use & Policy Studies

PMS14

CARACTERIZACIÓN DE PACIENTES CON ENFERMEDAD OSTEOARTICULAR DESDE LA PERSPECTIVA DEL ASEGURAMIENTO EN COLOMBIA

Romero M[1], Celis S[2], Molina G[2], Alzate P[3]
[1]*Salutia Foundation, Bogotá, Colombia,* [2]*Salutia Foundation - Research center in economy, management and health technologies., Bogota, Colombia,* [3]*Salutia Foundation, Bogota, Colombia*

OBJECTIVOS: analizar el comportamiento de pacientes con enfermedad crónica osteoarticular afiliados a una aseguradora colombiana. **METODOLOGÍAS:** a partir de la información de usos y consumos de una aseguradora colombiana para el año 2013, se identificaron todos los pacientes que habían sido atendidos al menos tres veces por servicios ambulatorios o con un egreso hospitalario con diagnósticos asociados a esta enfermedad, que incluyen diferentes tipos de artritis y osteoartrosis, y que fueron identificados de acuerdo con los códigos de diagnóstico. Los pacientes fueron analizados en función de sus variables demográficas, uso de servicios, costos y comorbilidades. **RESULTADOS:** se estimó una prevalencia del 3,75% de enfermedad osteoarticular sobre la población total con una edad promedio de 50,2 años, siendo el 58,93% mujeres. Los pacientes tienen un costo promedio anual en servicios con cargo al plan obligatorio de salud de $1.369.493,20 pesos colombianos, que en total por la carga de pacientes significa el 12,28% del costo total para el asegurador. El 19,39% de estos presenta comorbilidades, siendo diabetes, enfermedad cardiovascular y enfermedades digestivas crónicas las más frecuentes. Además, se estimó que el costo promedio aumenta 1,5 veces a medida que se asocia una comorbilidad adicional. **CONCLUSIONES:** el grupo de riesgo por enfermedad osteoarticular se convierte en un grupo de interés para la gestión del aseguramiento, en especial por la cantidad de pacientes identificados, lo que genera una alta carga de enfermedad. En este caso, esta carga se presenta especialmente en mujeres adultas, y sus costos se potencian con comorbilidades, lo cual hace más importante el control y gestión de la progresión.

PMS15

PATTERNS OF CARE WITH BIOLOGICAL DRUGS FOR ANKYLOSING SPONDYLITIS: REAL-WORLD DATA FROM THE PRIVATE HEALTHCARE MARKET IN BRAZIL

Medina P, Rodrigues N, Goes L, Pegoretti B, Bottoni A, Moraes Z
Evidencias - Kantar Health, Campinas, Brazil

OBJECTIVES: Ankylosing spondylitis (AS) is a progressive, incurable rheumatologic disease with worldwide prevalence of 0.1-0.5%. Since January 2012, the Brazilian Agency for Supplementary Healthcare (ANS-Agência Nacional de Saúde Suplementar) declared the coverage of intravenous biological drugs (BD) mandatory for patients with AS, rheumatoid arthritis, psoriatic arthritis and Crohn's disease in the private healthcare system (PHS). This study presents real-word data on the patterns-of-care for AS in Brazilian PHS. **METHODS:** We retrieved all requests of BD for patients with AS submitted between January/2012-January/2015 on Evidências-Kantar Health private market administrative claims database. After patient de-identification, data on diagnosis, type of drug, and line-of-treatment were collected. **RESULTS:** BD was requested for 46 patients, 16 males (34.8%) and 30 females (65.2%), mean age of 43.7 years. Drugs requested were: infliximab (39.1%), adalimumab (21.7%), golimumab (19.6%), etanercept (17.4%) and rituximab (2.2%). Most patients (73.9%) were on first-line treatment with BD, 23.9% on second and 2.2% on third-line. Reasons for change in medication were: unsatisfactory response (75%) and adverse events (25%). Based on available information, diagnosis of AS couldn't be confirmed for all patients. For 52.2% AS was the most likely diagnosis, other possible diagnoses were: primary sacroiliitis (17.4%), degenerative spine disease (4.3%), unspecific lumbar pain (4.3%), enteropathic arthritis (4.3%), Reiter's syndrome (2.2%) and seronegative arthropathy (2.2%). In 13% of the cases, lack of information precluded diagnosis. In 4 of 16 cases in which AS was not the most likely diagnosis, patients were already on 2nd or 3rdline treatments due to unsatisfactory response. **CONCLUSIONS:** Choice of BD followed international guidelines for AS. However, almost half the patients could not have diagnosis of AS confirmed, even tough some were already on 2nd or 3rd line therapy with BD. PHS must emphasize the correct use of diagnostic criteria before patients are put on unnecessary treatment with BD.

PMS16

RACIAL DISPARITIES IN TOTAL ANKLE ARTHROPLASTY UTILIZATION AND OUTCOMES

Singh Ja, Ramachandran R
Uab School Of Medicine, Birmingham, Al, USA