



RHEUMATOLOGY NURSE NEWSLETTER

EDUCATIONAL PLANNING COMMITTEE

Kori Anne Dewing, MN, ARNP
Nurse Practitioner
Virginia Mason Medical Center
Seattle, Washington

Jacqueline Fritz, RN, MSN, CNS
Medical Advancement Center
Critical Care and Rheumatology
Specialist
Cypress, California

Nicole M. Furfaro, MSN, ARNP
Nurse Practitioner
Rheumatology and Internal Medicine
Seattle Rheumatology Associates
Seattle, Washington

Joyce M. Kortan, RN
Clinic Nurse Manager
Arthritis and Rheumatology
Consultants, P.A.
Edina, Minnesota

Vicky Ruffing, RN
Nurse Manager
Johns Hopkins Arthritis Center
Johns Hopkins University
Baltimore, Maryland

LEARNING OBJECTIVES

- Review the clinical presentation of ankylosing spondylitis (AS), focusing on common symptoms and disease course
- List at least three common quantitative tests of spinal mobility and implement appropriate tests into clinical practice
- Explain the rationale behind recently-published treatment guidelines for the management of AS, and identify areas that may improve overall outcomes for your patients
- Discuss the impact of common extraarticular manifestations common among patients with AS that occur as a result of chronic inflammation

WHAT'S INSIDE

- Who gets ankylosing spondylitis (AS) and why do they get it?
- How does AS present clinically? How is it diagnosed?
- What tests should I be using to document and monitor my patient's chest and spinal mobility?
- How is AS best managed?
- Are TNF inhibitors appropriate for all of my patients? What are some of the side effects I need to warn my patients about?

RHEUMATOLOGY NURSE IS ONLINE!

Visit www.iche.edu and click on **Enduring Materials** to access a PDF of this newsletter and take the post-test electronically!

ACCREDITATION STATEMENT

The Institute for Continuing Healthcare Education is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity offers 1.5 contact hours to participating nurses. This credit may be applied toward licensure requirements in those states that recognize American Nurses Credentialing Center's Commission on Accreditation (ANCC-COA) accredited providers.

Accreditation applies solely to educational activities and does not imply approval or endorsement of any commercial product by the ANCC-COA.

The Institute for Continuing Healthcare Education is approved by the California Board of Registered Nursing, Provider Number 13313. The Institute for Continuing Healthcare Education approves this activity for 1.8 contact hours.

Jacqueline Fritz, RN, MSN, CNS, is the nurse planner for this activity.

DISCLOSURE

It is the policy of the Institute for Continuing Healthcare Education (the Institute) that the education presented within Institute-provided, CME-certified activities be unbiased and based upon scientific evidence. To help participants make judgments about the presence of bias, the Institute provides information that planners, teachers, authors, developers, and activity managers have disclosed about financial relationships they have with commercial entities that produce or market products or services related to the content of this educational activity. Any relationships that an individual may have with commercial entities have been disclosed and reviewed, and any potential conflicts have been resolved.

Relationships are abbreviated as follows: E, Educational planning committee; G, Grant/research support recipient; A, Advisor/review panel member; C, Consultant; S, Stock shareholder; SB, Speaker bureau; H, Honoraria; O, Other.

Kori Anne Dewing, MN, ARNP, has disclosed that she does not have any relevant financial relationships specific to the subject matter of the content of the activity.

Jacqueline Fritz, RN, MSN, CNS, has disclosed the following relevant financial relationships that have occurred within the past 12 months: Roche, Novartis, Genentech, Inc., Pfizer/SB.

Nicole M. Furfaro, MSN, ARNP, has disclosed the following relevant financial relationships that have occurred within the past 12 months: Genentech/C, SB; Bristol-Myers Squibb/SB.

Joyce M. Kortan, RN, has disclosed the following relevant financial relationships that have occurred within the past 12 months: UCB/A, SB; Centocor/A, H; Hoffman-La Roche Ltd./A; American College of Rheumatology/H; Genentech, Inc., Novartis/H, SB; Amgen/SB; Wyeth/SB; Bristol-Myers Squibb/SB.

Vicky Ruffing, RN, has disclosed that she does not have any relevant financial relationships specific to the subject matter of the content of the activity.

CONTENT FREELANCER

Anne Jacobson, MPH, Medical Writer, has disclosed that she does not have any relevant financial relationships specific to the subject matter of the content of the activity.

CONTENT PEER REVIEWER

This newsletter was reviewed by Deanna Harris, RN, BSN. Ms. Harris has disclosed that she does not have any relevant financial relationships specific to the subject matter of the content included in this educational activity.

ACTIVITY DEVELOPMENT & MANAGEMENT TEAM

Cathy Pagano, CCMEP; Sandra Davidson; Christine M. O'Leary, PharmD, BCPS; Karen Thomas, CCMEP; Scott Kober, CCMEP; and Courtney Cohen are employees of the Institute for Continuing Healthcare Education and are collectively responsible for the planning, development, and management of this CME activity. These individuals have disclosed that they have had no relevant financial relationship specific to the subject matter of this activity that have occurred within the past 12 months. Shunda R. Irons-Brown, PhD, MBA, also an employee of the Institute, has disclosed the following relationships: Merck & Co./S; Bristol-Myers Squibb, GlaxoSmithKline/O.

OFF-LABEL/ INVESTIGATIONAL USE DISCLOSURE

There are no off-label and/or investigational uses discussed within the literature of this enduring activity.

ANKYLOSING SPONDYLITIS: PATHOPHYSIOLOGY, TREATMENT, AND PATIENT MANAGEMENT

Ankylosing spondylitis (AS) is a progressive and potentially disabling inflammatory condition named because of the appearance of patients with advanced disease, who often appear with crooked (“ankylos”) vertebra (“spondylos”). Although generally considered a disease of the spine, AS also adversely affects the hips, shoulders, and peripheral joints, as well as organ systems throughout the body.

The management of AS is evolving, as new disease criteria, measures of disease activity, and treatment guidelines lead to a new standard of care.¹⁻³ Decisions to initiate or modify treatment are typically based on disease activity, which is measured by a mix of objective clinical measures and patient self-reports.

PATHOPHYSIOLOGY

The pathogenesis of AS is poorly understood. As in rheumatoid arthritis (RA), the first few pathological steps in AS involve inflammation and erosive bone destruction (Table 1). However, AS progresses to include new bone formation, eventually leading to the fusion of joints and vertebrae. The development of bony growths, usually originating from ligaments, is the hallmark pathologic feature of AS.

CLINICAL PRESENTATION

According to current estimates, AS affects at least 500,000 patients in the United States.^{4,5} Men are 5 times more likely than women to develop AS, and among all patients, the peak age of onset is between 20 and 30 years of age.⁴

Patients with AS typically present with complaints of back pain. Distinguishing inflammatory back pain from mechanical back pain can be a challenge, and may

TABLE 1 FEATURES OF RA vs. AS ^{12, 29}		
	RHEUMATOID ARTHRITIS	ANKYLOSING SPONDYLITIS
AFFECTED JOINTS	Small peripheral joints	Sacroiliac joints, neck
MORNING STIFFNESS	>30 min	<30 min
CLASSIC DEFORMITIES	Swan neck, ulnar deviation, wrist subluxation, boutonniere's deformity	Neck hyperextension, kyphosis (hunchback), spinal fusion
DISEASE PROGRESSION	Inflammation → erosive bone destruction	Inflammation → erosive bone destruction → new bone formation
ESR	Increased	Increased in 50–70% of patients
RHEUMATOID FACTOR	Positive in 70% of patients	Unknown
IMAGING	Juxtaarticular osteoporosis, erosions	Lumbar vertebrae squaring, sacroiliitis, bamboo spine
NSAID RESPONSE	Usually some relief	Variable
TREATMENT	Exercise, NSAIDs, DMARDs, biologic therapies	Exercise, NSAIDs, biologic therapies

delay the diagnosis of AS in some patients. Unlike mechanical back pain, inflammatory back pain improves with exercise, worsens with rest, and responds to treatment with nonsteroidal antiinflammatory drugs (NSAIDs). Although patients with mechanical back pain may find some relief from NSAID therapy, NSAIDs alter the underlying pathology only in those with inflammatory pain.

Other symptoms of AS include hip and shoulder pain, buttock pain (indicative of sacroiliitis), limited chest expansion, and peripheral arthritis. Patients may also experience enthesitis, or inflammation of the region where tendons and ligaments attach to bone. Enthesitis may manifest as pain and tenderness at the heel, sternum, or other enthesal sites. Although these symptoms may be suggestive of AS, they are not specific for this type of spondyloarthropathy. Diagnosis of AS requires a thorough patient history, clinical evaluation, laboratory testing, and imaging studies.

The clinical course of AS is variable, although disease flare is common. In a study of 134 patients with AS, approximately 70% reported having a disease flare during any given week.⁶ The majority of these were minor flares, described as “pain or swelling localized to one area with fatigue and stiffness.” Only 12% of patients reported major flares, defined as “generalized pain, hot burning joints, muscle spasm, fever, sweating, extreme fatigue, and stiffness.” Major flares lasted for an average of 2.4 weeks, and nearly all (92%) were preceded by and followed by minor flares, suggesting consistently higher levels of disease activity.⁶ Therefore, while minor flares appear to be common in AS, the presence of major flares may be helpful in identifying patients with more severe and active disease.



WHAT IS THE LIKELIHOOD THAT THIS DISEASE WILL BE PASSED ON TO MY CHILDREN?

Although the specific cause of AS is unknown, genetics appear to play a role in the development of this condition. Most people who have AS carry the HLA-B27 gene. Having that gene doesn't mean that a patient will definitely develop AS, but it may make them more susceptible to its development. To date, 23 different subtypes of HLA-B27 have been described. Some subtypes are more closely associated with spondyloarthropathies in certain populations. However, HLA-B27 isn't the determining factor behind the development of AS, as fewer than 5% of HLA-B27-positive patients ever develop a seronegative spondyloarthropathy.¹

A 2007 study of patients living in Iceland demonstrated a significant clustering of AS among multiple generations of family members. First-degree relatives of patients with AS had a significantly higher relative risk of developing AS (94), while second- and third-degree relatives also had high relative risks (25 and 3.5, respectively).²

— Nicole Furfaro, MSN, ARNP

REFERENCES

1. Klippel, J, Crofford, L, Stone, J, Weyand, C. Primer on the Rheumatic Diseases, 12th Ed. Arthritis Foundation; Atlanta, GA: 2001.
2. Thjodleifsson B, Geirsson AJ, Björnsson S, Bjarnason I. A common genetic background for inflammatory bowel disease and ankylosing spondylitis: a genealogic study in Iceland. *Arthritis Rheum.* 2007;56(8):2633-2639.



IS THIS A PERMANENT CONDITION? WILL IT EVER GO AWAY?

Ankylosing spondylitis (AS) is a chronic inflammatory condition; by definition, this means that it is likely a lifelong disease. However, the course of the condition can be variable. AS may be limited and never result in spinal ankylosis, or it may become disabling with significant functional limitations and pain. Unfortunately, there is no "crystal ball" laboratory test or prognostic tool that allows healthcare providers to reliably predict who will develop more significant disease, though it is common for patients with AS to experience periods of flares and remission of varying severity.¹

— Kori Dewing, MN, ARNP

REFERENCE

1. Imboden J, Hellmann D, Stone J. *Current Rheumatology Diagnosis and Treatment*, 2nd ed. New York, NY; McGraw-Hill: 2007.

PHYSICAL EVALUATION

Patients with AS may lose chest and spinal mobility over time. Documenting chest and back range of motion provides a baseline against which a patient's progress can be measured.^{7,8} Common quantitative tests of spinal mobility are outlined below. Some centers may choose to perform variations of these measures (eg, the original vs. the modified Schöber test). As long as they are performed in a consistent manner, these tests will provide a valuable index of disease progression.

MODIFIED SCHÖBER TEST | Decreased flexibility in the lower back is a clinical feature of AS. With the patient standing erect, the skin is marked with a pen at the lumbosacral joint line. A second mark is made 5 cm down from the lumbosacral joint, and a third mark is made 10 cm up from the lumbosacral joint. The patient bends forward as if to touch his or her toes, and the distance between the upper and lower marks is measured. Bending over should increase the distance between the marks, but the magnitude of this increase is modest in patients with limited range of motion. An increase of 5 cm between the upper and lower marks is considered normal, whereas an increase of <5 cm indicates decreased spinal mobility.⁹ The original Schöber test involved just 2 markers and was less reproducible than the 3-mark modified Schöber test.¹⁰

OCCIPUT-TO-WALL DISTANCE | The patient places his or her heels and back against the wall and attempts to touch the back of the head to the wall while keeping the chin level. The distance between the wall and the tragus (the prominent soft tissue bump just in front of the ear canal) is measured. The shorter distance of two tries should be recorded. This measurement is also called the tragus-to-wall distance. Increasing occiput-to-wall distance indicates a loss of lumbar and cervical flexibility and progressive spinal kyphosis (hunchback).⁹

CHEST EXPANSION | This measurement is taken at the level of the 4th intercostal space, or just below the breasts in female patients. Standing with hands on head, the

patient exerts maximum forced expiration, followed by maximal inspiration. The difference between measurements taken at maximum expiration and maximum inspiration should be 7 cm or more; a recording of <3 cm is abnormal. The best of 3 efforts should be recorded.^{9,11}

FINGERTIPS-TO-FLOOR DISTANCE | With knees straight, the patient bends forward as if to touch the floor. At the point of fullest flexion, the distance between the fingertips and the floor is measured and recorded.

INTERMALEOLAR DISTANCE | This test measures abduction of the hips and is typically performed with the patient lying down. Keeping the knees straight and the legs in contact with a resting surface, the patient is asked to separate the legs as far as possible while the toes point upward. Alternatively, the patient can stand and separate the legs as far as possible. The distance between the medial malleoli is measured and recorded.⁹

LABORATORY FINDINGS

No single laboratory test can either confirm or rule out the presence of AS, although several tests can aid in the differential diagnosis of patients with suspected spondyloarthropathy (Figure 4). Acute phase reactants, including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), are elevated in only 50% to 70% of patients with AS.¹²

The human leucocyte antigen (HLA)-B27 gene is seen in approximately 95% of Caucasian patients with AS, and therefore its presence is suggestive of AS. However, HLA-B27 occurs with less frequency in AS patients of African and Asian descent, and is also present in many persons without AS.¹² Therefore, although HLA-B27 appears to be a prerequisite to the development of AS in many patients, its presence alone is not sufficient for patients to develop the disease.¹³ A negative test for HLA-B27, however, makes the diagnosis of AS less likely in a patient with inflammatory back pain.¹⁴

Several immune-related genes appear to be down-regulated — not completely silenced, but turned down significantly — in patients with AS.¹⁵ These “hushed” genes indicate a genetic basis for the immunosuppression observed in AS patients.¹⁵ Additional research on the genetics of AS may prove useful in the diagnosis and treatment of AS. For example, another genetic test could join HLA-B27 testing to improve the diagnosis of patients with AS or to predict which treatment is most likely to induce a clinical response.

IMAGING STUDIES

Patients with AS have characteristic radiographic findings that are relevant for diagnosis and monitoring. The hallmark radiographic changes occur in the sacroiliac (SI) joints, where the pelvis meets the spine. Common findings include sacroiliitis, joint erosions, and joint effacement. The main limitation of conventional radiography is that it may not show obvious pathologic changes, even in

patients with longstanding AS. Ten years after diagnosis, only 40% of patients with AS show radiographic evidence of sacroiliitis.¹⁶ Compared with plain film radiographs, magnetic resonance imaging (MRI) can detect inflammation in the SI joints much earlier.¹⁷ Therefore, MRI is now being incorporated into diagnostic algorithms for AS.¹⁸

Another characteristic radiographic finding emerges in patients with advanced disease, when the vertebra become fused. Over time, ossification of the spinal discs causes the vertebra to fuse across the disc spaces, forming a long bony column referred to as “bamboo spine.”¹²

DIAGNOSIS OF AS

The diagnosis of AS is made on the basis of suggestive clinical features, including evidence of sacroiliitis according to conventional radiography or MRI (Figure 1). Establishing the presence of inflammatory back pain is the first step toward confirming a diagnosis of AS. True inflammatory back pain must include 4 of the following 5 features:⁹

- Age at onset <40 years
- Back pain >3 months
- Insidious onset
- Morning stiffness
- Improvement with exercise

FIGURE 1
DIAGNOSTIC ALGORITHM FOR ANKYLOSING SPONDYLITIS

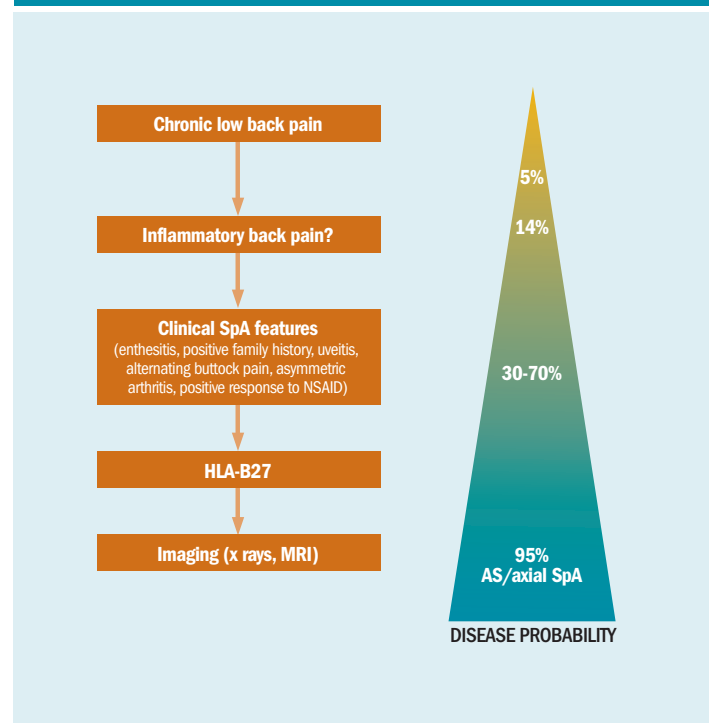


FIGURE 2 | ASAS CLASSIFICATION CRITERIA FOR AXIAL SPONDYLOARTHRITIS (EARLY ANKYLOSING SPONDYLITIS)

(in patients with back pain ≥ 3 months and age at onset < 45 years)

Sacroiliitis on imaging* plus ≥ 1 SpA feature**	OR	HLA-B27* plus ≥ 2 other SpA features**
<p>*Sacroiliitis on imaging:</p> <ul style="list-style-type: none"> - Active (acute) inflammation on MRI highly suggestive of sacroiliitis associated with SpA <p>OR</p> <ul style="list-style-type: none"> - Definite radiographic sacroiliitis according to modified New York criteria 		<p>**SpA features:</p> <ul style="list-style-type: none"> - Inflammatory back pain - Arthritis - Enthesitis (heel) - Uveitis - Dactylitis - Psoriasis - Crohn's disease/ulcerative colitis - Good response to NSAIDs - Family history for SpA - HLA-B27 - Elevated CRP

Source: Rudwaleit M, van der Heijde D, Landewe R, et al. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. *Ann Rheum Dis.* 2009;68:777-783.

In 2009, the Ankylosing Spondylitis Assessment Study group (ASAS) published new classification criteria for early AS, or axial spondyloarthritis (SpA) (Figure 2).^{1,19} In prior classification systems, radiographic evidence of sacroiliitis was necessary to establish a diagnosis of AS. Conventional radiography can show the consequences of inflammation (ie, structural damage), but not the inflammation itself. By comparison, MRI detects active inflammation often years before the appearance of radiographic sacroiliitis.¹⁸ The updated ASAS classification system now includes MRI as an option for identifying sacroiliitis. With these new criteria, rheumatologists can intervene earlier in the disease process, when there is evidence of inflammation on MRI, rather than waiting for the appearance of radiographic changes.¹⁸

The new ASAS classification system only applies to patients with confirmed inflammatory back pain. Diagnostic criteria for axial SpA can be met in 2 ways: sacroiliitis on imaging plus at least one other disease feature, or HLA-B27 positivity plus at least 2 other disease features.¹

DISEASE MONITORING

Rheumatology nurses and other healthcare providers can choose from several assessment tools designed for monitoring disease activity in the AS population. Many of these incorporate a numbering scale (NRS), in which the patient is asked to rate a specific feature of his disease on a scale from 0 to 10, moving from the least (0) to the most (10) severe. Some tools include merely 1 or 2 questions focused on specific symptoms, while others contain multiple questions related to disease activity level, disability level, or spinal mobility.

Some questions include the option of using a visual analog scale (VAS), usually a 100 mm horizontal line that is labeled on either

FIGURE 3 | THE BATH ANKYLOSING SPONDYLITIS DISEASE ACTIVITY INDEX (BASDAI)

Please tick the box which represents your answer. All questions refer to last week (ie ☒).

FATIGUE

1. How would you describe the overall level of fatigue/tiredness you have experienced?

NONE										VERY SEVERE									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

SPINAL PAIN

2. How would you describe the overall level of AS neck, back, or hip pain you have had?

NONE										VERY SEVERE									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

PERIPHERAL ARTHRITIS

3. How would you describe the overall level of pain/swelling in joints other than neck, back, or hips you have had?

NONE										VERY SEVERE									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

ENTHESITIS

4. How would you describe the overall level of discomfort you have had from any areas tender to touch or pressure?

NONE										VERY SEVERE									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

INTENSITY OF MORNING STIFFNESS

5. How would you describe the overall level of morning stiffness you have had from the time you wake up?

NONE										VERY SEVERE									
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

DURATION OF MORNING STIFFNESS

6. How long does your morning stiffness last from the time you wake up?

0 h			1h				2 or more h												
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

$$\text{BASDAI} = Q1 + Q2 + Q3 + Q4 + (Q5+Q6/2)$$

5

Source: The Assessment of SpondyloArthritis international Society (ASAS) handbook: a guide to assess spondyloarthritis. *Ann Rheum Dis.* 2009;68(suppl 2):23.

end, such as “none” (0 mm) and “worst possible” (100 mm), to describe extremes of pain, stiffness, or other symptoms. Patients are asked to place a mark along the VAS line to indicate the intensity of their symptoms. The ASAS has stated a preference for the NRS over the VAS to simplify the use of the more comprehensive assessment tools, which involve compiling and averaging responses from multiple questions.⁹

PATIENT GLOBAL ASSESSMENT | A simple, one-question tool that can be used alone, but is also used as part of composite measures such as the ASAS clinical response. Patients are asked, “How active was your spondylitis on average during the last week?” Responses range from not active (0) to very active (10).⁹



IS THERE ANYTHING I SHOULD WORRY ABOUT IF I WANT TO GET PREGNANT?

Published data indicates that AS does not negatively affect fertility or outcomes related to pregnancy. Unlike in many patients with rheumatoid arthritis, symptoms do not appear to improve during pregnancy in patients with AS;¹ consequently, counseling patients on medications that are safe to take during pregnancy should occur before conception. Disease flares following births are common in patients with AS — in one study by Østensen et al, approximately 60% of patients with AS reported a disease flare within six months postpartum.²

— Joyce Kortan, RN

REFERENCES

1. Østensen M, Fuhrer L, Mathieu R, Seitz M, Villiger PM. A prospective study of pregnant patients with rheumatoid arthritis and ankylosing spondylitis using validated clinical instruments. *Ann Rheum Dis*. 2004;63(10):1212-1217.
2. Østensen M, Østensen H. Ankylosing spondylitis—the female aspect. *J Rheumatol*. 1998;25(1):120-124.

SPINAL PAIN | The ASAS recommends assessing spinal pain with 2 questions that ask the patient to describe the severity of pain experienced on average during the past week, from no pain (0) to most severe pain (10):⁹

- How much pain of your spine due to AS do you have?
- How much pain of your spine due to AS do you have at night?

BATH AS DISEASE ACTIVITY INDEX (BASDAI) | Named for Bath, England, where it was initially developed, the BASDAI consists of 6 questions that explore the 5 major symptoms of AS: fatigue, spinal pain, joint pain or swelling, enthesitis (areas of localized tenderness), and morning stiffness (Figure 3). To calculate the BASDAI score, the two morning stiffness scores are first averaged, resulting in a single stiffness score. This is then averaged with the remaining 4 symptom scores, resulting in a BASDAI score ranging from 0 to 10. Patients with BASDAI scores ≥ 4 are considered to have uncontrolled disease activity.⁹

BATH AS FUNCTIONAL INDEX (BASFI) | The BASFI asks patients to rank 10 activities from “easy” (0) to “impossible” (10). The first 8 questions describe potential functional limitations related to disease course, while the final 2 questions evaluate the patient’s ability to cope with these limitations in everyday life. The final BASFI score, which ranges from 0 to 10, is calculated as the average of the 10 scores assigned to each the following items:

1. Putting on your socks or tights without help or aids (eg, sock aids)
2. Bending forward from the waist to pick up a pen from the floor without an aid
3. Reaching up to a high shelf without help or aids (eg, helping hand)
4. Getting out of an armless dining room chair without using your hands or any other help
5. Getting off the floor without any help from lying on your back
6. Standing unsupported for 10 minutes without discomfort
7. Climbing 12–15 steps without using a handrail or walking aid (one foot on each step)
8. Looking over your shoulder without turning your body
9. Doing physically demanding activities (eg, physiotherapy exercises, gardening, or sports)
10. Doing a full day’s activities whether it be at home or work

ASAS DISEASE ACTIVITY SCORE (ASDAS)

Efforts are underway to overhaul the current system for evaluating disease activity in AS.^{20,21} Currently under development by the ASAS, the ASDAS is a new scoring system that builds on earlier scoring systems to provide a more sensitive tool for measuring disease activity.² Recent validation studies show that the ASDAS outperforms the BASDAI in detecting changes in disease activity in response to anti-tumor necrosis factor (TNF) therapy.²² The ASDAS score is calculated with a computer-based algorithm that assigns a different weight to each of the following measures:

- Spinal pain (BASDAI question 2)
- Peripheral pain/swelling (BASDAI question 3)
- Duration of morning stiffness (BASDAI question 6)
- Patient global assessment
- CRP

MEASURES OF TREATMENT RESPONSE

The BASFI, BASDI, and other disease activity measures are also used to assess treatment response. The ASAS20 is the most common measure of response in clinical trials.²³ It is defined as an improvement of $\geq 20\%$ and absolute improvement of ≥ 10 units (on a scale of 0–100) in at least 3 of 4 disease domains:

- Patient global assessment
- Pain
- Function (BASFI)
- Inflammation (BASDI)

Additional measures of clinical response reflect improvements of $\geq 50\%$ (ASAS50) and $\geq 70\%$ (ASAS70) in these parameters. For any definition of clinical response, if only 3 domains are improved, there must be no deterioration in the fourth domain. Deterioration is defined as a change for the worse of $\geq 20\%$ and ≥ 10 units (on a scale of 0–100). An ASAS partial response is defined as an absolute value of < 20 (on a scale of 0–100) in each of the 4 disease domains.

MANAGEMENT OF AS

Disease monitoring includes taking a thorough patient history, physical examination, laboratory tests, and imaging, which are all based on a core set of measurements recommended by ASAS. The frequency of monitoring should be based on current symptoms, severity of disease activity, and treatment plan.

For patients with AS, the goals of therapy are to relieve symptoms, restore function, prevent joint damage, prevent spinal fusion and complications of spinal disease, and minimize extraarticular manifestations. Earlier in 2010, the European League Against Rheumatism (EULAR) and ASAS published new recommendations for the treatment of AS. The updated guidelines describe the roles of nonpharmacologic approaches, pharmacologic therapy, and surgery in the comprehensive management of patients with AS (Table 2).³

NONPHARMACOLOGIC TREATMENT

Exercise is an essential tool for improving and maintaining range of motion of the spine, preserving function, and relieving symptoms. All AS patients should be instructed on proper posture. Patients should also be encouraged to perform home exercises, including daily stretching and water exercises if possible. Physical therapy may benefit select patients with AS.²⁴

The importance of exercise should be reinforced repeatedly as part of a comprehensive management strategy. Although patients with AS generally recognize the importance of exercise as a feature of disease management, the majority do not report participating in exercise on a regular basis.²⁵ Patient education materials on useful exercises in AS are readily available from sources such as the National Ankylosing Spondylitis Society (www.nass.co.uk/public/exercises.htm).

TABLE 2
2010 ASAS/EULAR RECOMMENDATIONS FOR THE MANAGEMENT OF AS³

TREATMENT	RECOMMENDATIONS
Nonpharmacologic treatment	<ul style="list-style-type: none"> • Patient education • Exercise
NSAIDs	<ul style="list-style-type: none"> • First-line treatment for pain and stiffness • Continuous treatment for active, symptomatic disease • Consider CV and GI risks
Analgesics	<ul style="list-style-type: none"> • Treatment of residual pain if other recommendations fail, are contraindicated, or poorly tolerated
Corticosteroids	<ul style="list-style-type: none"> • Local injection for musculoskeletal inflammation • Systemic therapy not effective for axial disease
DMARDs	<ul style="list-style-type: none"> • No benefits on axial symptoms • Sulfasalazine can be considered for peripheral arthritis
Biologic therapy	<ul style="list-style-type: none"> • Anti-TNF therapy for persistently high disease activity • No obligation to use DMARDs before or during anti-TNF therapy • No differences among agents on axial and articular/enthesal manifestations • Differences between agents in GI efficacy in patients with IBD • Switching to second TNF inhibitor potentially effective in patients who lose response to first agent • No evidence supporting biological therapies other than TNF inhibitors in AS
Surgery	<ul style="list-style-type: none"> • Total hip arthroplasty in patients with refractory pain/disability and radiographic evidence of structural damage, regardless of age • Spinal corrective osteotomy in patients with severe, disabling deformity

PHARMACOLOGIC THERAPY

NSAIDS

NSAIDs are the foundation of treatment of all symptomatic patients with AS.²⁶ Up to 80% of AS patients report substantial symptom relief with NSAID therapy.²⁷ Furthermore, some evidence suggests that continuous (vs. on-demand) NSAID therapy may stall the progression of radiographic damage in patients with AS,²⁸ perhaps through inhibitory effects on osteoblasts.²⁹

Patients with inflammatory back pain are more likely than those with mechanical back pain to experience a reduction in pain and stiffness with NSAID therapy. Therefore, a therapeutic trial of anti-inflammatory NSAIDs may be helpful in confirming the diagnosis of AS.

NSAIDs increase the risk of gastrointestinal (GI) bleeding, but this can be offset by the use of gastroprotective agents such as proton-pump inhibitors. Selective COX-2 inhibitors are as effective as conventional NSAIDs in managing the symptoms of AS and have a lower risk of serious GI events.^{30,31} However, COX-2 inhibitors may be associated with cardiovascular toxicity, and this concern has limited their use to patients with an increased risk for GI bleeding. For patients with AS, the choice of NSAID or COX-2 inhibitor should be made according to the GI and cardiovascular risk profile of each patient.²⁶

DMARDS

In contrast to patients with other autoimmune conditions, including RA, patients with AS do not respond well to conventional disease-modifying anti-inflammatory drugs (DMARDs) and corticosteroids.²⁶ DMARDs, including sulfasalazine, are not effective for the axial manifestations of AS, but may have a limited role in patients with peripheral arthritis. Local corticosteroids may be an option for sites of acute musculoskeletal inflammation, but systemic corticosteroids are not effective against axial disease.³

ANTI-TNF THERAPY

Treatment with TNF inhibitors can significantly improve function in patients with AS, even after prolonged disease activity of >10 years.³² Four anti-TNF agents — infliximab, etanercept, adalimumab, and golimumab — are currently approved for the treatment of AS in the United States.³³⁻³⁶ Certolizumab pegol, a fifth TNF inhibitor that is approved for the treatment of RA, is being evaluated in AS in a phase III study.^{37,38} Concomitant use of DMARDs such as methotrexate is not required during treatment with TNF inhibitors, and may increase the risk of adverse events without improving response.³

TNF inhibitor therapy may not be appropriate for all patients with AS. Several patient and disease features are predictors of a good response to anti-TNF therapy.³⁹⁻⁴¹ These include:

- Younger age
- Shorter disease duration
- Good functional ability
- Presence of HLA-B27
- Elevated acute phase reactants (eg, ESR and CRP)
- No prior anti-TNF therapy

Different options for TNF inhibition appear to be equally effective for AS patients with axial and articular/enthesal disease manifestations.³ In a 2007 meta-analysis of the three TNF inhibitors available at the time, approximately 80% of patients with AS responded to treatment with adalimumab, etanercept, or infliximab.⁴² In addition, half of all patients had at least a 50% improvement in symptoms. The majority of these patients had rapid responses that were apparent within 6 weeks of therapy.⁴²

Studies of the individual TNF inhibitors show consistent efficacy, with approximately 60% of patients achieving a clinical response to anti-TNF therapy within 12 weeks of therapy. For patients who do not respond to or do not tolerate one TNF inhibitor, switching to another anti-TNF agent can be an effective strategy for achieving a clinical response.⁴³ Responses to anti-TNF therapy are durable, lasting at least 2–5 years.^{44,45} However, despite significant and sustained improvements in inflammation and function, anti-TNF therapy has not been shown to slow the progression of radiographic damage in patients with AS.⁴⁶⁻⁴⁸

TNF inhibitor trials primarily use ASAS20 clinical response ($\geq 20\%$ reduction in signs and symptoms of AS) as the primary efficacy endpoint. Some trials also evaluated ASAS40 and ASAS70 responses.

INFLIXIMAB | Infliximab (5 mg/kg) is administered by intravenous infusion over 2 hours at weeks 0, 2, and 6, and every 6 weeks thereafter for adult patients with AS.³³ In the Ankylosing Spondylitis Study for the Evaluation of Recombinant Infliximab Therapy (AS-SERT), 61% of patients in the infliximab group achieved a clinical response compared with 19% of patients in the placebo group.⁴⁹ Infliximab also provided a 2.5-point additional improvement in the BASDAI score and a 1.7-point additional improvement in the BASFI score compared with placebo.⁴⁹ Other studies have shown additional benefits of treatment



WHAT EXERCISES OR STRETCHES SHOULD I BE DOING?

While there is no definitive guidance on specific exercises that are most helpful in patients with AS, it is important that patients do some form of stretching, posture improvement exercises, and strength training most days of the week. The goal of exercise is to preserve function by preventing postural deformities, preserving spinal flexibility, improving muscle strength/stamina, and reducing overall levels of pain.¹

Potential exercises include:

- Deep breathing
- Gentle yoga
- Stationary bike/cycling
- Tai chi
- Swimming
- Side bends
- Standing against a wall trying to touch the wall with your shoulders and buttocks simultaneously (without straining)
- Gentle back stretches

Input from a physical therapist may be helpful and necessary depending upon how advanced a patient's disease is when initiating an exercise program.

— Joyce Kortan, RN

REFERENCE

1. Elyan M, Khan MA. Does physical therapy still have a place in the treatment of ankylosing spondylitis? *Curr Opin Rheumatol.* 2008;20:282-286.



CAN I STILL PLAY CONTACT SPORTS (FOOTBALL, BASKETBALL, HOCKEY, ETC.) OR IS THAT LIKELY TO MAKE THINGS WORSE?

The cornerstone of therapy for all AS patients includes physical therapy and exercise, but decisions to pursue more vigorous physical activity such as contact sports should be made after consultation with a patient's healthcare provider and physical therapist. Mild disease activity may allow patients to play contact sports, but they should only do so under strict supervision. As disease activity progresses, ankylosis of the joints and osteoporosis may make patients more vulnerable to spinal injuries when subjected to trauma.¹

The Spondylitis Web Info For Teens (SWIFT) is a useful Web site for teenage patients to visit for information and support.² Based upon anecdotal feedback posted on that Web site, many teenage patients with AS express severe pain for several days after participating in contact sports, although evidence of this is scarce in the published literature.

—Joyce Kortan, RN

REFERENCES

1. Thumbikant P, Hariharan RP, Ravichandran G, McClelland MR, Mathew KM. Spinal cord injury in patients with ankylosing spondylitis. *Spine*. 2007;32(26):2989-2995.
2. Spondylitis Web Info For Teens. teens.spondylitis.org/index.html. Accessed August 30, 2010.

with infliximab, such as improved quality of life in patients with AS.⁵⁰ Infliximab was also effective in reversing the symptoms of cauda equina syndrome, a severe neurologic impairment and an uncommon complication of AS.⁵¹

ETANERCEPT | Etanercept (50 mg) is administered once weekly by subcutaneous injection.³⁴ In the pivotal trial of etanercept in AS, 60% of patients achieved an ASAS20 clinical response within 12 weeks of treatment with etanercept. Furthermore, 45% of patients achieved an ASAS50 response, and 25% reached an ASAS70 response.⁵² According to MRI, treatment with etanercept also decreased spinal inflammation, which worsened in the placebo group. Injection-site reactions were the only adverse event that occurred with more frequency in the etanercept group than in the placebo group.⁵² A long-term follow-up analysis showed that the benefits of etanercept were sustained for up to 2 years of continuous therapy.⁵³ Etanercept has also been shown to reduce the rates of uveitis compared with placebo in patients with AS.⁵⁴

ADALIMUMAB | Adalimumab is a humanized anti-TNF monoclonal antibody that is administered every other week via subcu-

taneous injection (40 mg).³⁵ The durable efficacy of adalimumab in AS was demonstrated in the placebo-controlled Adalimumab Trial Evaluating Long-term Efficacy and Safety for AS (ATLAS) study.⁴⁴ Within the adalimumab group, nearly two-thirds of patients (64.5%) achieved a ASAS20 response, and half (50.6%) also achieved a ASAS40 response. One-third of patients (33.5%) sustained at least partial remission for up to 2 years. Long-term treatment was well-tolerated in the ATLAS study. Among 311 patients who received at least 1 dose of adalimumab, 6 patients (1.9%) developed a serious infection, and 1 patient (0.3%) had an adalimumab-related hypersensitivity reaction.⁴⁴

GOLIMUMAB | Golimumab is a human anti-TNF alpha monoclonal antibody and the first once-monthly agent approved for the treatment of active AS. In the pivotal golimumab trial, approximately 60% of patients achieved an ASAS20 response to monthly golimumab after 14 weeks of therapy.⁵⁵ Golimumab has also been shown to improve specific complications of AS, including sleep disturbance.⁵⁶ Golimumab (50 mg) is administered by subcutaneous injection once per month.³⁶

SURGERY

Surgical interventions may be beneficial in some patients with AS. For patients with refractory pain or disability and radiologic evidence of structural damage, total hip replacement surgery may be appropriate, regardless of patient age. For AS patients with severe and disabling deformities, corrective spinal osteotomy may restore some function. Acute vertebral fractures should be managed in consultation with a spinal surgeon.³

The chronic inflammation associated with AS can also lead to extraarticular manifestations that affect all systems of the body. According to the 2010 EULAR/ASAS guidelines for the management AS, extraarticular manifestations of AS should be managed in collaboration with other specialists.³

EXTRAARTICULAR MANIFESTATIONS

UVEITIS | Anterior uveitis is the most common extraarticular manifestation of AS, occurring in up to 40% of patients.⁵⁷ Indeed, as the first sign of AS for some patients, the appearance of uveitis should alert providers to the possibility of AS. Uveitis usually presents as acute pain in one eye, blurred vision, and sensitivity to light. Patients with suspected uveitis should be referred to an ophthalmologist to verify the diagnosis and begin treatment with local steroids and atropine. With proper treatment, acute uveitis resolves within approximately 6 weeks. Recurrence of uveitis is common, but with proper treatment, it is not associated with permanent visual impairment.⁵⁸

GASTROINTESTINAL MANIFESTATIONS | Patients with AS are susceptible to a variety of GI complications. Asymptomatic inflammatory bowel disease (IBD) can be detected by colonoscopy in up to 60% of patients with AS.⁵⁹ Though this rarely progresses to symptomatic IBD, clinicians should be aware of this elevated risk. Patients with AS are almost four times more likely to develop peptic ulcers than non-AS patients (OR, 3.63).⁶⁰ Liver disease is also more common among AS patients (OR, 1.93).⁶⁰

PULMONARY MANIFESTATIONS | Lung involvement in AS is often related to altered chest mechanics. Fusion of the costovertebral joints and ankylosis of the thoracic spine can lead to chest wall restriction, adversely affecting ventilation.⁶¹ AS is also associated with a type of pulmonary fibrosis called apical fibrobullous disease. This disorder may result from reduced ventilation in the upper lobes of the chest, altered mechanical stress in the lung apices, or repeated pulmonary infections. Other pulmonary complications include spontaneous pneumothorax, pulmonary superinfections, and obstructive sleep apnea, which may exacerbate fatigue among patients with AS. To date, no treatments appear to alter the course of apical fibrobullous disease. Therefore, management of respiratory manifestations is mainly related to treating superinfections with antifungal or antibacterial agents.⁶¹

Given their increased risk for a variety of respiratory problems, smoking cessation is particularly important for AS patients who smoke. Compared with nonsmoking AS patients, AS patients who smoke have significantly worse BASDAI and BASFI scores, and perform significantly worse on lung function tests.⁶² Encouraging smoking cessation may improve long-term function outcome in AS patients who smoke.⁶³

CARDIOVASCULAR DISEASE | Chronic inflammation, a pathological feature of AS, is also a risk factor for the development and progression of atherosclerosis. Patients with AS have a 3-fold increase in the risk of myocardial infarction (OR, 3.1) and ischemic heart disease (OR, 2.74) compared with non-AS patients.^{60,64} Other cardiovascular complications occurring more frequently among AS patients include cardiac arrhythmias (OR, 1.82), hyperlipidemia (OR, 1.46), and heart failure (OR, 1.42). Therefore, cardiovascular risk assessment and management are important steps in the comprehensive care of the AS patient.

NEUROLOGICAL INVOLVEMENT | Patients with advanced AS may experience spinal cord or spinal nerve compression, leading to a range of neurological symptoms. Due to its altered biomechanical properties, the ankylosed spine also has an increased risk of fracture. In a study of AS patients hospitalized for spinal fractures, 67% had neurological deficits at the time of admission. Spinal fracture was also associated with a high mortality rate, approaching 18% within the first 3 months after injury.⁶⁵

CANCER | Patients with AS do not appear to be more susceptible to cancer compared with non-AS populations.⁶⁶ However, there is some concern that anti-TNF therapy can mask the signs of metastatic disease, delaying diagnosis. A recent case report describing an AS patient with an undiagnosed malignancy that progressed during anti-TNF therapy, resulting in a lethal hepatic rupture, underscores this concern.⁶⁷



WILL MY DISEASE MAKE ME MORE SUSCEPTIBLE FOR CARDIAC CONDITIONS DOWN THE ROAD?

Cardiac involvement is a common extraskeletal manifestation of ankylosing spondylitis (AS). Aortitis, aortic valve disease (which leads to aortic insufficiency), conduction abnormalities, and left ventricular dysfunction are the most common related cardiac manifestations. Echocardiogram and EKG studies are frequently ordered to diagnose and monitor cardiac involvement. As disease severity increases and duration of disease lengthens, there is a rise in prevalence of both aortic incompetence and conduction abnormalities in patients with AS.^{1,2}

Similar to rheumatoid arthritis, evidence suggests that patients with AS have increased cardiovascular morbidity and mortality compared to the normal population.³ In addition to cardiac manifestations, the increased morbidity and mortality rates may also be due to endothelial dysfunction and atherosclerosis related to systemic inflammation.⁴

It is therefore vital to aggressively manage hyperlipidemia, hypertension, and other risk factors for cardiovascular disease in patients with AS.²

— Kori Dewing, MN, ARNP

REFERENCES

1. Lautermann D, Braun J. Ankylosing spondylitis — cardiac manifestations. *Clin Exp Rheumatol*. 2002;20(suppl 28):S11-S15.
2. Goodson NJ, Solomon DH. The cardiovascular manifestations of rheumatic diseases. *Curr Opin Rheumatol*. 2006;18:135-140.
3. Peters MJ, van der Horst-Bruinsma IE, Dijkmans BA, Nurmohammed MT. Cardiovascular risk profile of patients with spondyloarthropathies, particularly ankylosing spondylitis and psoriatic arthritis. *Semin Arthritis Rheum*. 2004;34:585-592.
4. Azevedo VF, Pecoits-Filho R. Atherosclerosis and endothelial dysfunction in patients with ankylosing spondylitis. *Rheumatol Int*. 2010;30(11):1411-1416.

REFERENCES

1. Rudwaleit M, van der Heijde D, Landewe R, et al. The development of Assessment of SpondyloArthritis international Society classification criteria for axial spondyloarthritis (part II): validation and final selection. *Ann Rheum Dis.* 2009;68:777-783.
2. van der Heijde D, Lie E, Kvien TK, et al. ASDAS, a highly discriminatory ASAS-endorsed disease activity score in patients with ankylosing spondylitis. *Ann Rheum Dis.* 2009;68:1811-1818.
3. EULAR/ASAS guidelines on the management of ankylosing spondylitis. Presented at the European League Against Rheumatism Annual Congress; June 16-19, 2010; Rome, Italy. [in press].
4. Spondylitis Association of America. About ankylosing spondylitis. Available at www.spondylitis.org/about/ankylosing_spondylitis.aspx. Accessed September 1, 2010.
5. Gabriel SE, Michaud K. Epidemiological studies in incidence, prevalence, mortality, and comorbidity of the rheumatic diseases. *Arthritis Res Ther.* 2009;11:229.
6. Cooksey R, Brophy S, Gavenor MB, Brooks CJ, Burrows CL, Siebert S. Frequency and characteristics of disease flares in ankylosing spondylitis. *Rheumatology.* 2010;49:929-932.
7. Gladman DD, Inman RD, Cook RJ, et al. International spondyloarthritis interobserver reliability exercise—the INSPIRE study: I. Assessment of spinal measures. *J Rheumatol.* 2007;34:1733-1739.
8. Chandran V, O'Shea FD, Schentag CT, Inman RD, Gladman DD. Relationship between spinal mobility and radiographic damage in ankylosing spondylitis and psoriatic spondylitis: a comparative analysis. *J Rheumatol.* 2007;34:2463-2465.
9. The Assessment of SpondyloArthritis international Society (ASAS) handbook: a guide to assess spondyloarthritis. *Ann Rheum Dis.* 2009;68(suppl 2):23.
10. Davis JC, Jr., Gladman DD. Spinal mobility measures in spondyloarthritis: application of the OMERACT filter. *J Rheumatol.* 2007;34:666-670.
11. American College of Rheumatology (ACR) Image Bank. Available at images.rheumatology.org. Accessed September 1, 2010.
12. Sieper J, Braun J, Rudwaleit M, Boonen A, Zink A. Ankylosing spondylitis: an overview. *Ann Rheum Dis.* 2002;61(suppl 3):iii8-18.
13. Laval SH, Timms A, Edwards S, et al. Whole-genome screening in ankylosing spondylitis: evidence of non-MHC genetic-susceptibility loci. *Am J Hum Genet.* 2001;68:918-926.
14. Brown MA. Human leucocyte antigen-B27 and ankylosing spondylitis. *Intern Med J.* 2007;37:739-740.
15. Duan R, Leo P, Bradbury L, Brown MA, Thomas G. Gene expression profiling reveals a downregulation in immune-associated genes in patients with AS. *Ann Rheum Dis.* 2010;69:1724-1729.
16. Huerta-Sil G, Casasola-Vargas JC, Londono JD, et al. Low grade radiographic sacroiliitis as prognostic factor in patients with undifferentiated spondyloarthritis fulfilling diagnostic criteria for ankylosing spondylitis throughout follow up. *Ann Rheum Dis.* 2006;65:642-646.
17. Klausner A, Bollow M, Calin A, et al. Workshop report: clinical diagnosis and imaging of sacroiliitis. Innsbruck, Austria, October 9, 2003. *J Rheumatol.* 2004;31:2041-2047.
18. Rudwaleit M, Jurik AG, Herrmann K-GA, et al. Defining active sacroiliitis on magnetic resonance imaging (MRI) for classification of axial spondyloarthritis: a consensual approach by the ASAS/OMERACT MRI group. *Ann Rheum Dis.* 2009;68:1520-1527.
19. Bennett AN, Marzo-Ortega H, Emery P, McGonagle D. Diagnosing axial spondyloarthritis. The new Assessment in SpondyloArthritis international Society criteria: MRI entering centre stage. *Ann Rheum Dis.* 2009;68:765-767.
20. Lukas C, Landewe R, Sieper J, et al. Development of an ASAS-endorsed disease activity score (ASDAS) in patients with ankylosing spondylitis. *Ann Rheum Dis.* 2009;68:18-24.
21. Boers M. Just released from the ASAS factory! First steps towards a disease activity score for ankylosing spondylitis. *Ann Rheum Dis.* 2009;68:1-2.
22. Pedersen SJ, Sørensen IJ, Herrmann K-GA, et al. Responsiveness of the Ankylosing Spondylitis Disease Activity Score (ASDAS) and clinical and MRI measures of disease activity in a 1-year follow-up study of patients with axial spondyloarthritis treated with tumour necrosis factor α inhibitors. *Ann Rheum Dis.* 2010;69:1065-1071.
23. Anderson JJ, Baron G, van der Heijde D, Felson DT, Dougados M. Ankylosing spondylitis assessment group preliminary definition of short-term improvement in ankylosing spondylitis. *Arthritis Rheum.* 2001;44:1876-1886.
24. Elyan M, Khan MA. Does physical therapy still have a place in the treatment of ankylosing spondylitis? *Curr Opin Rheumatol.* 2008;20:282-286.
25. Passalent LA, Soever LJ, O'Shea FD, Inman RD. Exercise in ankylosing spondylitis: discrepancies between recommendations and reality. *J Rheumatol.* 2010;37:835-841.
26. Zochling J, van der Heijde D, Burgos-Vargas R, et al. ASAS/EULAR recommendations for the management of ankylosing spondylitis. *Ann Rheum Dis.* 2006;65:442-452.
27. Song IH, Poddubny DA, Rudwaleit M, Sieper J. Benefits and risks of ankylosing spondylitis treatment with nonsteroidal antiinflammatory drugs. *Arthritis Rheum.* 2008;58:929-938.
28. Wanders A, Heijde D, Landewe R, et al. Nonsteroidal antiinflammatory drugs reduce radiographic progression in patients with ankylosing spondylitis: a randomized clinical trial. *Arthritis Rheum.* 2005;52:1756-1765.
29. Sieper J, Appel H, Braun J, Rudwaleit M. Critical appraisal of assessment of structural damage in ankylosing spondylitis: Implications for treatment outcomes. *Arthritis & Rheumatism.* 2008;58:649-656.
30. van der Heijde D, Baraf HS, Ramos-Remus C, et al. Evaluation of the efficacy of etoricoxib in ankylosing spondylitis: results of a fifty-two-week, randomized, controlled study. *Arthritis Rheum.* 2005;52:1205-1215.
31. Barkhuizen A, Steinfeld S, Robbins J, West C, Coombs J, Zwillich S. Celecoxib is efficacious and well tolerated in treating signs and symptoms of ankylosing spondylitis. *J Rheumatol.* 2006;33:1805-1812.
32. Sieper J, Appel H, Braun J, Rudwaleit M. Critical appraisal of assessment of structural damage in ankylosing spondylitis: implications for treatment outcomes. *Arthritis Rheum.* 2008;58:649-656.
33. Remicade (infliximab) [prescribing information]. Horsham, PA: Centocor Ortho Biotech Inc; 2010.
34. Enbrel (etanercept) [prescribing information]. Thousand Oaks, CA: Immunex Corporation; 2010.
35. Humira (adalimumab) [prescribing information]. Abbott Park, IL: Abbott Laboratories; 2010.
36. Simponi (golimumab) [prescribing information]. Horsham, PA: Centocor Ortho Biotech Inc; 2010.
37. Cimzia (certolizumab pegol) [prescribing information]. Brussels, Belgium: UCB, Inc; 2009.
38. Clinicaltrials.gov. Phase III Trial of Certolizumab Pegol in Subjects With Active Axial Spondyloarthritis (NCT01087762). Available at clinicaltrials.gov/ct2/show/NCT01087762. Accessed September 7, 2010.
39. Rudwaleit M, Listing J, Brandt J, Braun J, Sieper J. Prediction of a major clinical response (BASDAI 50) to tumour necrosis factor alpha blockers in ankylosing spondylitis. *Ann Rheum Dis.* 2004;63:665-670.
40. Lord PA, Farragher TM, Lunt M, Watson KD, Symmons DP, Hyrich KL. Predictors of response to anti-TNF therapy in ankylosing spondylitis: results from the British Society for Rheumatology Biologics Register. *Rheumatology (Oxford).* 2010;49:563-570.
41. Rudwaleit M, Claudepierre P, Wordsworth P, et al. Effectiveness, safety, and predictors of good clinical response in 1250 patients treated with adalimumab for active ankylosing spondylitis. *J Rheumatol.* 2009;36:801-808.
42. McLeod C, Bagust A, Boland A, et al. Adalimumab, etanercept and infliximab for the treatment of ankylosing spondylitis: a systematic review and economic evaluation. *Health Technol Assess.* 2007;11:1-158, iii-iv.
43. Cantini F, Niccoli L, Benucci M, et al. Switching from infliximab to once-weekly administration of 50 mg etanercept in resistant or intolerant patients with ankylosing spondylitis: results of a fifty-four-week study. *Arthritis Rheum.* 2006;55:812-816.
44. van der Heijde D, Schiff MH, Sieper J, et al. Adalimumab effectiveness for the treatment of ankylosing spondylitis is maintained for up to 2 years: long-term results from the ATLAS trial. *Ann Rheum Dis.* 2009;68:922-929.
45. Braun J, Baraliakos X, Listing J, et al. Persistent clinical efficacy and safety of anti-tumour necrosis factor alpha therapy with infliximab in patients with ankylosing spondylitis over 5 years: evidence for different types of response. *Ann Rheum Dis.* 2008;67:340-345.
46. van der Heijde D, Landewe R, Einstein S, et al. Radiographic progression of ankylosing spondylitis after up to two years of treatment with etanercept. *Arthritis Rheum.* 2008;58:1324-1331.
47. van der Heijde D, Landewe R, Baraliakos X, et al. Radiographic findings following two years of infliximab therapy in patients with ankylosing spondylitis. *Arthritis Rheum.* 2008;58:3063-3070.
48. van der Heijde D, Salonen D, Weissman BN, et al. Assessment of radiographic progression in the spines of patients with ankylosing spondylitis treated with adalimumab for up to 2 years. *Arthritis Res Ther.* 2009;11:R127.
49. van der Heijde D, Dijkman B, Geusens P, et al. Efficacy and safety of infliximab in patients with ankylosing spondylitis: results of a randomized, placebo-controlled trial (ASSERT). *Arthritis Rheum.* 2005;52:582-591.
50. Han C, Smolen JS, Kavanaugh A, et al. The impact of infliximab treatment on quality of life in patients with inflammatory rheumatic diseases. *Arthritis Res Ther.* 2007;9:R103.
51. Comec D, Devauchelle Pensec V, Joulin SJ, Saraux A. Dramatic efficacy of infliximab in cauda equina syndrome complicating ankylosing spondylitis. *Arthritis Rheum.* 2009;60:1657-1660.
52. Davis JC, Jr., Van Der Heijde D, Braun J, et al. Recombinant human tumour necrosis factor receptor (etanercept) for treating ankylosing spondylitis: a randomized, controlled trial. *Arthritis Rheum.* 2003;48:3230-3236.
53. Davis JC, Jr., van der Heijde DM, Braun J, et al. Efficacy and safety of up to 192 weeks of etanercept therapy in patients with ankylosing spondylitis. *Ann Rheum Dis.* 2008;67:346-352.
54. Sieper J, Koenig A, Baumgartner S, et al. Analysis of uveitis rates across all etanercept ankylosing spondylitis clinical trials. *Ann Rheum Dis.* 2010;69:226-229.
55. Inman RD, Davis JC, Jr., Heijde D, et al. Efficacy and safety of golimumab in patients with ankylosing spondylitis: results of a randomized, double-blind, placebo-controlled, phase III trial. *Arthritis Rheum.* 2008;58:3402-3412.
56. Deodhar A, Braun J, Inman RD, et al. Golimumab reduces sleep disturbance in patients with active ankylosing spondylitis: Results from a randomized, placebo-controlled trial. *Arthritis Care Res (Hoboken).* 2010;62(9):1266-1271.
57. Zeboulon N, Dougados M, Gossec L. Prevalence and characteristics of uveitis in the spondyloarthropathies: a systematic literature review. *Ann Rheum Dis.* 2008;67:955-959.
58. Tay-Kearney ML, Schwam BL, Lowder C, et al. Clinical features and associated systemic diseases of HLA-B27 uveitis. *Am J Ophthalmol.* 1996;121:47-56.
59. Leirisalo-Repo M, Turunen U, Stenman S, Helenius P, Seppala K. High frequency of silent inflammatory bowel disease in spondyloarthropathy. *Arthritis Rheum.* 1994;37:23-31.
60. Kang J-H, Chen Y-H, Lin H-C. Comorbidity profiles among patients with ankylosing spondylitis: a nationwide population-based study. *Ann Rheum Dis.* 2010;69:1165-1168.
61. Kanathur N, Lee-Chiong T. Pulmonary manifestations of ankylosing spondylitis. *Clin Chest Med.* 2010;31:547-554.
62. Kaan U, Ferda O. Evaluation of clinical activity and functional impairment in smokers with ankylosing spondylitis. *Rheumatol Int.* 2005;25:357-360.
63. Doran MF, Brophy S, MacKay K, Taylor G, Calin A. Predictors of longterm outcome in ankylosing spondylitis. *J Rheumatol.* 2003;30:316-320.
64. Peters MJL, Visman I, Nielen MMJ, et al. Ankylosing spondylitis: a risk factor for myocardial infarction? *Ann Rheum Dis.* 2010;69:579-581.
65. Westerveld LA, Verlaan JJ, Onor FC. Spinal fractures in patients with ankylosing spondylitis: a systematic review of the literature on treatment, neurological status and complications. *Eur Spine J.* 2009;18:145-156.
66. Feltelius N, Ekholm A, Blomqvist P. Cancer incidence among patients with ankylosing spondylitis in Sweden 1965-95: a population based cohort study. *Ann Rheum Dis.* 2003;62:1185-1188.
67. Ahn IE, Ju JH, Kang KY, Park SH, Kim HY. The silent progression of metastatic malignancy during the treatment with soluble tumor necrosis factor receptor. *Clin Rheumatol.* 2010;29:225-227.

ACTIVITY LEARNING ASSESSMENT REQUEST FOR CREDIT & EVALUATION FORM

ACTIVITY INSTRUCTIONS & CRITERIA FOR SUCCESS

Continuing Nursing Education contact hours are offered to all activity participants. To successfully complete this activity and obtain a Certificate of Contact Hours awarded, the learner is required to read the entire newsletter, complete the post-test, and complete the activity evaluation form. Learners are required to correctly answer 70% of the learning assessment questions. Statements of Credit will be forwarded via email within 4 to 6 weeks. All forms must be received by October 15, 2012, to be eligible for credit.

1. Please fax both sides of this evaluation to ICHE at (215) 592-9085, *OR*
2. Please complete the evaluation online by going to www.iche.edu and clicking on **Enduring Materials**.

NAME _____

DEGREE/CERTIFICATION _____

ACTIVITY POST-TEST QUESTIONS | Please circle the letter that matches the correct response to each question below

1. How do common features of ankylosing spondylitis (AS) differ from common features of rheumatoid arthritis (RA)?
 - a. Patients with AS usually have morning stiffness of at least 30 minutes, while patients with RA usually have morning stiffness of less than 30 minutes
 - b. NSAIDs usually provide some relief to patients with AS, while the relief is variable in patients with RA
 - c. AS typically affects the sacroiliac joints and the neck, while RA typically affects small peripheral joints
 - d. All of the above
2. Which of the following disease modifying antirheumatic drugs (DMARDs) is least efficacious in patients with AS?
 - a. Methotrexate
 - b. Etanercept
 - c. Infliximab
 - d. Golimumab
3. Your new patient, PT, is 31 years old. He presents with back pain of insidious onset that he has noticed for approximately 5 months. He states that he has daily morning stiffness of approximately 15 minutes and that his pain does not improve with exercise. According to the Ankylosing Spondylitis Assessment Study (ASAS), should you conclude that his back pain is inflammatory in nature?
 - a. Yes
 - b. No
4. Which is the only laboratory test that can definitely confirm or rule out the presence of AS?
 - a. HLA-B27
 - b. Erythrocyte sedimentation rate
 - c. C-reactive protein
 - d. None of the above
5. Which of the following patients with AS would be most likely to respond to the use of anti-TNF therapy?
 - a. A 45-year-old patient naïve to anti-TNF therapy with disease duration of 15 years
 - b. An 18-year-old patient with good functional ability, elevated ESR levels, presence of the HLA-B27 gene, and disease duration of 3 months
 - c. A 16-year-old patient with normal acute phase reactant levels who does not have the HLA-B27 gene
 - d. A 38-year-old patient with presence of the HLA-B27 gene, poor functional ability, and prior history of anti-TNF failure
6. According to clinical trials, approximately how much does the use of TNF inhibitors slow the progression of radiographic damage in patients with AS?
 - a. 10%
 - b. 20%
 - c. 50%
 - d. TNF inhibitors do not slow the progression of radiographic damage in patients with AS
7. TRUE OR FALSE: According to data from clinical trials, the majority of patients with AS participate in exercise on a regular basis.
 - a. True
 - b. False
8. What is the most common extraarticular manifestation of AS?
 - a. Apical fibrobullous disease
 - b. Uveitis
 - c. Symptomatic inflammatory bowel disease
 - d. Obstructive sleep apnea
9. TJ, a longstanding patient of yours, just completed his most recent BASDAI survey. His scores are as follows – Fatigue: 5, Spinal Pain: 4, Peripheral Arthritis: 9, Enthesitis: 8, Intensity of Morning Stiffness: 3, Duration of Morning Stiffness: 5. What is his BASDAI score?
 - a. 5.2
 - b. 5.6
 - c. 6.0
 - d. 6.4
10. Approximately what percentage of individuals with inflammatory back pain will be diagnosed with AS?
 - a. 2%
 - b. 14%
 - c. 35%
 - d. 75%

The learning objectives designed for this activity (listed below), can help me strive toward:	NOTHING AT THIS TIME	REINFORCEMENT OF CURRENT PRACTICES	MODERATE IMPROVEMENT	SIGNIFICANT IMPROVEMENT
Review the clinical presentation of ankylosing spondylitis (AS), focusing on common symptoms and disease course	1	2	3	4
List at least three common quantitative tests of spinal mobility and implement appropriate tests into clinical practice	1	2	3	4
Explain the rationale behind recently-published treatment guidelines for the management of AS, and identify areas that may improve overall outcomes for your patients	1	2	3	4
Discuss the impact of common extraarticular manifestations common among patients with AS that occur as a result of chronic inflammation	1	2	3	4

Please indicate the extent of your agreement with the following statements:	STRONGLY DISAGREE		NOT SURE		STRONGLY AGREE	
1. The information presented in this newsletter was pertinent to my professional needs	1	2	3	4	5	6
2. The content of this newsletter contributes valuable information that will assist me in improving patient outcomes	1	2	3	4	5	6
3. Based on my experience, I would recommend future newsletters to my colleagues	1	2	3	4	5	6
4. Were you able to locate information about faculty disclosure at the beginning of the newsletter?	YES			NO		
5. Did you perceive any bias or commercial influence in the newsletter? If so, your help in identifying it is appreciated: _____	YES			NO		

6. Which, if any, disease monitoring tools do you commonly use in your patients with AS? BASDAI BASFI ASAS None Other _____

7. How would you rate your ability to diagnose and manage patients with AS? Excellent Good Average Poor

8. The following is the primary barrier to implementing change at my facility:
- a. Lack of knowledge regarding evidence-based strategies
 - b. Misperceptions of or negative attitudes about research and evidence-based care
 - c. Demanding patient workloads
 - d. Fears about practicing differently from peers

For purposes of certification, please complete the following information. Please note that the Institute will not forward or sell your name to any lists. **PLEASE PRINT CLEARLY.**

Number of credits claimed _____ (Maximum credits 1.5 ANCC-COA contact hours/1.8 California Board of Nursing contact hours)

First Name _____ Middle Initial _____ Last Name _____

Confirm certification types here RN NP CNS CRNA CNM LPN Other _____

Your certificate will be emailed to the address you list below.

Title/Position (if applicable) _____

Affiliation (University or Hospital) _____

Preferred Address _____

City _____ State _____ Zip _____

Preferred Telephone _____ Preferred Fax _____ E-Mail Address _____

I certify that I have participated in the above-named continuing-education activity.

Signature _____ Date _____

We are interested in adding to our base of faculty and educational development. To help us better plan for education in this area, and to invite you to participate in future educational development, we may contact you for your expertise. If you opt NOT to be contacted, please check here: _____

UNRAVELING THE COMPLEXITIES OF SOCIAL SECURITY DISABILITY INSURANCE

BY VICKY RUFFING, RN

Mrs. Smith stands before me. Her hands are permanently gnarled. She wears bedroom slippers because her first metatarsophalangeal joints are so subluxed she cannot get her feet into shoes. She has had both knees and both hips replaced. She uses a walker. It doesn't take a healthcare professional to see that she is clearly disabled.

*"I just received another letter," she tells me.
"I was denied disability by Social Security again."*

We've all been there. It is a heartbreaking experience. Understanding the process by which the Social Security Administration (SSA) makes decisions about submitted claims could take hundreds of pages, but when we have patients in front of us who need our help, sometimes it is the simplest of choices we make that make the biggest difference.

Let's start by briefly looking at the system. The duties of the SSA and their field offices include assisting individuals filing for Social Security Benefits, making decisions about nonmedical issues, and dictating Disability Determination Services policy. When a person (disabled or not) applies for services, they fall into one of two classes – Social Security Disability Income (SSDI) or Social Security Income (SSI).

The SSA depends on the Disability Determination Service to collect medical, functional, and vocational evidence in order to help their officials make disability decisions. The SSA defines disability as "The inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than 12 months."¹

To determine disability, a sequential evaluation process is undertaken. If "no" is answered to any of the following questions—except the first one for which a "yes" response would end the evaluation—the process stops there and does not continue:

1. *Is the claimant engaging in substantial gainful activity (SGA)?*
2. *Is the impairment(s) severe?*
3. *Does the impairment(s) meet/equal listings?*
4. *Does the impairment(s) preclude the ability to perform past relevant work?*
5. *Does the impairment preclude the ability to perform other work?*

SGA is a bit of a murky area as the definition of "substantial" work is vague. Certainly, our patients would need to have, at the very least, severely cut back their work hours to be considered for disability, although there is no threshold for how many or few hours are considered to be "substantial."¹

Severity of impairment and impairment listings for autoimmune disorders are outlined in Chapter 14 of the Social Security Blue Book.² In order to prove that an immune system disorder is disabling, applications must include a medical history, a report of physical examination, any laboratory findings, imaging (if applicable), and sustained constitutional signs or symptoms. Constitutional symptoms should include items such as severe fatigue, fever, malaise, or involuntary weight loss.

Because the individual on the other end is only going to be reading a form and not physically seeing a patient, it is vital that we thoroughly and accurately "paint a picture" within the application showing the true state of our patient.

When determining whether impairment precludes an individual's to perform prior relevant (or other, unrelated) work, a patient's clear functional level must be described. Functional level can be demonstrated through independence, or lack thereof, performing activities of daily living. Pain present with or without activity, along with limitations caused by pain, should be described in detail. For example, "Standing more than five minutes causes extreme knee and hip pain" is a good, descriptive, and specific phrase that helps to tell the patient's story. Report any inflammation of major peripheral joints, difficulty with ambulation, difficulty with fine and gross movements, joint pain, swelling and/or tenderness. Comorbidities and their severity should also be reported.

Based on my experience, either of these scenarios would likely be classified by DDS as an "extreme limitation:"

- Mrs. Smith has persistent inflammation of her right ankle (a major peripheral weight-bearing joint) resulting in the inability to ambulate effectively
- Mr. Jones has extreme deformities in both hands (each upper extremity) resulting in the inability to perform fine and gross movements effectively

Remember that limitations must be expected to last greater than 12 months, and be sure to include a prognosis.

Social Security values the opinion of treating sources; however, this must be in the form of a medical opinion and not a statement regarding whether you or a physician believes that his/her patient is unable to work or is "disabled." The DDS is not obligated to accept your opinion unless it is consistent with all the evidence in file, including both the objective findings and symptoms.

Letters used to support patients in their claim should cite alleged symptoms and any symptom-related limitations and restrictions. Include a summary of the disease history with details of any prior treatment that has failed. Presenting a general time frame is acceptable; exact dates are not necessary.

Remember to include any self-reported measurements in your documentation. If your patients have completed an MHAQ, RAPID, or other disease activity measure, send along a copy. If you have joint counts, global health assessments, or pain scale results, send those as well. In our practice, we measure decreased range of motion, as applicable, but we do not measure grip strength or range of motion on all joints. If we get a form asking for those measures, we cross it out and write "not tested" or, depending on the case, "may cause unnecessary discomfort."

Spending some time learning about the criteria used for determining disability will benefit both you and your patients. Keeping links to the Web sites in the references below can be a handy tool to help quickly answer some of the more important questions and minimize those frustrating and argumentative phone calls and letters that so often ping-pong back and forth.

REFERENCES

1. Social Security Online. 2010 Red Book. www.socialsecurity.gov/redbook/2010/overview-disability.htm. Accessed August 30, 2010.
2. Social Security Online. 2010 Blue Book. www.ssa.gov/disability/professionals/bluebook/index.htm. Accessed August 30, 2010.



NEED MORE RHEUMATOLOGY FOCUSED EDUCATION?

Go to www.osteomatters.com
for CE-certified activities focused
on the management of patients
with osteoporosis.

The Institute for Continuing Healthcare Education plans and implements continuing medical education activities that are fair, balanced, evidence-based, evaluated for bias, and in the best interest of the public.

COMMERCIAL SUPPORT

Supported by educational grants from **Genentech, Inc., Biogen Idec, Bristol-Myers Squibb, and UCB.**

GENERAL DISCLOSURE AND COPYRIGHT STATEMENT

The opinions expressed in this publication are those of the participating faculty and not those of the Institute for Continuing Healthcare Education (the Institute), Genentech, Inc., Biogen Idec Inc., Bristol-Myers Squibb, UCB, or any manufacturers of products mentioned herein.

This information is provided for general medical education purposes only and is not meant to substitute for the independent medical judgment of a healthcare professional regarding diagnostic and treatment options of a specific patient's medical condition. In no event will the Institute be responsible for any decision made or action taken based upon the information provided in this activity.

Participants are encouraged to consult the package insert for all products for updated information and changes regarding indications, dosages, and contraindications. This recommendation is particularly important for new or infrequently used products.