A large iceberg is shown floating in the ocean. The top part of the iceberg, which is visible above the water surface, is relatively small and jagged. The much larger part of the iceberg is submerged below the surface, illustrating the concept of hidden or 'below the surface' information. The water is a deep blue color, and the sky is a lighter blue.

Understanding
Ankylosing Spondylitis (AS)
Disease Activity in Adults...
ABOVE and
BELOW the Surface

A Planning Guide to
Help You Work With
Your Healthcare Team
About Your Disease
Management

The information contained in this educational resource is intended to reinforce and supplement information you receive from your healthcare team. It is not a substitute for medical advice from your physician. If you have questions about the information you read in this educational resource, please discuss them with your healthcare provider.

This has been produced as a patient education resource by Pfizer Inc.

How to Use This Planning Guide

The Iceberg



Consider the popular phrase, the *tip of the iceberg*. This means that only part of an iceberg is visible above the surface of the water, yet below the surface lies a much larger piece of the iceberg that cannot be seen.¹ It's a commonly used image to help explain situations where what you see doesn't tell the full story.

The iceberg is a metaphor to explain what's happening in your body when you're living with **ankylosing spondylitis (AS)**, a type of **arthritis** that causes inflammation in certain parts of the spine.²

The iceberg is a useful image because the signs and symptoms of AS—back pain and stiffness—are just the tip of the iceberg.² AS is marked by chronic inflammation in various parts of the body³; inflammation is what's occurring—and which can't be seen—under the AS iceberg.

This educational resource will help you:

- 1 Define AS and describe the common signs and symptoms of AS
- 2 Understand the potential causes of AS including the genetic causes associated with the disease and the environmental factors that may trigger it
- 3 Describe how AS can affect your quality of life—including the associated emotional challenges that may affect patients and their caregivers—and the importance of regularly communicating with your healthcare team about your disease management
- 4 Explain other medical conditions that may occur with AS
- 5 Identify available disease management options for AS while understanding the core goals of AS management—namely, *to relieve individual symptoms, such as pain and stiffness*, with the goal of preventing disease progression²

Support for Disease Management Decision-Making

This brochure is a different type of patient resource because it is designed to support *disease management decision-making*—the process of working with your healthcare team to set treatment strategies and goals focused on your medical needs.⁴

The medical content in this brochure is more in-depth than traditional patient education materials. That is by design. Each section explains important clinical concepts and raises key topics you may want to discuss with your healthcare team.

If you're a patient, these new insights about AS may help you develop and manage an action plan for your condition through improved communication and shared decision-making with your doctor. If you're a caregiver, the information in this brochure may help you understand and support a patient in need.

This guide includes medical terms you may have never seen before. **Bolded** terms throughout each section are defined in the glossary on page 15.

Disease Management Takeaway

Gaining new insights about AS may help empower you to support your own disease management plan.⁵ Empowerment means gaining control over your medical well-being and acting on the medical topics and concerns that a patient or caregiver defines as important.⁶ Being empowered also involves partnering with your healthcare team—your rheumatologist, dermatologist, primary care physician, nurse practitioner, physician assistant, pharmacist, etc—to design a disease management plan for you or for a person under your care.



A Tip From the AS Iceberg

Patients should seek out as much medically accurate information as possible about AS—including clinical insights found in this brochure—to support their disease management through enhanced communication and shared decision-making between the patient, doctor, and the healthcare team.

Need-to-Know Information About Ankylosing Spondylitis

1 AS: A Chronic Inflammatory Disease

This section will begin with understanding the key facts about AS. For each section, you can mark down your questions and concerns when discussing your medical condition and treatment plan with your healthcare team.



“
I have AS, which causes pain in my lower back and other joints. It was really rather mild for many years, but it's been getting worse.
”

AS: A Chronic Inflammatory Disease Marked by Back Pain and Stiffness

AS is a chronic inflammatory disease.⁸ It's not known what causes it, but a combination of genetic and environmental factors may make a person more likely to develop AS.³



A family history of AS, a person's sex, and having certain other existing diseases (eg, psoriasis) may be factors as well.²

Let's look at the family history aspect of AS from a scientific perspective.



AS may run in your family because there are certain genes thought to cause the condition.³ These genes spark complex cellular activity in your body.⁹ This, in turn, contributes to the underlying inflammation in the body. Remember: inflammation is what's occurring underneath the surface of the AS iceberg.

AS may affect people differently.¹⁰



Among men, AS has been shown to cause greater spinal dysfunction and is more commonly associated with other inflammatory conditions like uveitis, a form of eye inflammation.¹⁰



Among women, AS may be present at the same time as other conditions, such as psoriasis, peripheral arthritis, and inflammatory bowel disease.¹¹



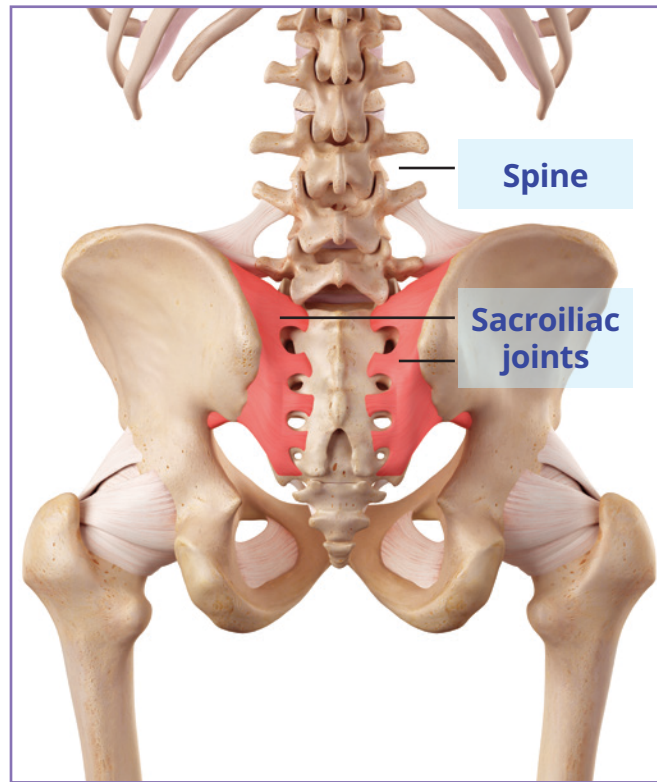
Among people of different races, Blacks experience more severe AS compared with either Latinxs or Whites.¹²



A Tip From the AS Iceberg

Inflammation in the spine is known as spondylitis.¹³ Spondylitis may cause the formation and fusion (or binding) of new bone in the spine, a condition called ankylosing ... explaining the name ankylosing spondylitis.^{3,14} In very serious cases if left untreated, the bones in the spine may fuse completely, causing a condition known as "bamboo spine."¹⁵

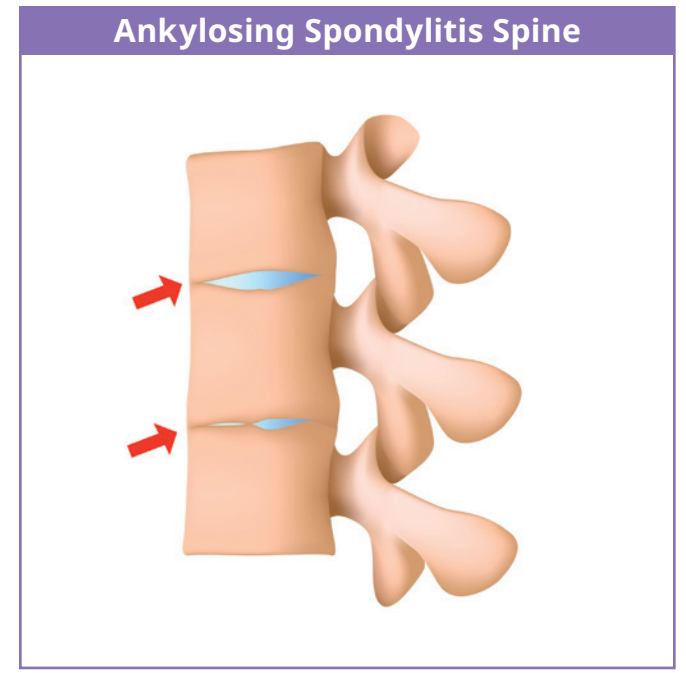
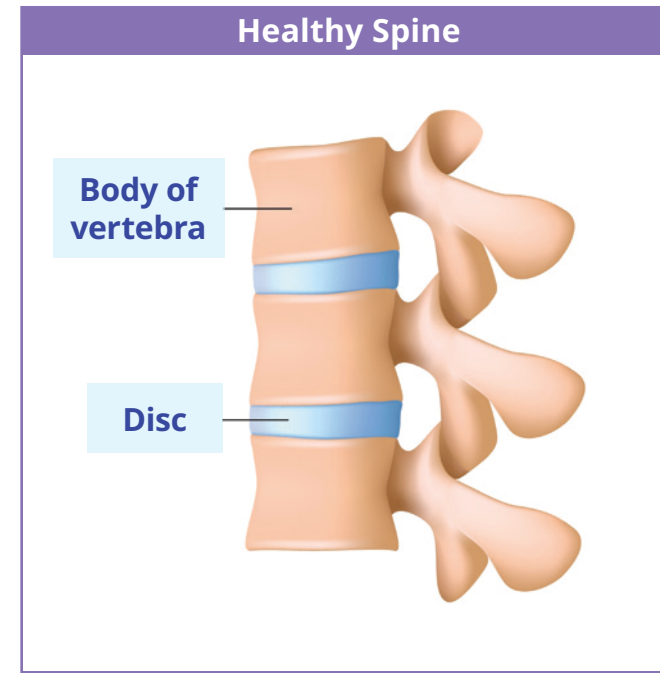
Signs and Symptoms of AS



AS affects certain parts of the spine and the **sacroiliac** joints.³

People with AS may have pain in their lower back and/or hips, and over time, may develop stiffness due to inflammation.² This can lead to challenges with physical function and difficulties performing daily physical activities.¹¹

“ I love to cook, but I am unable to stand upright on my feet for more than 5 to 10 minutes, due to AS.”



- In severe cases, new bone may form in the spine, called ankylosis³
- When sections of the spine grow together, it leads to a stiff spine that is difficult to bend^{2,3}

Many people with AS have periodic back pain and stiffness.² But others have severe, recurring back pain and stiffness. It has been shown that people with AS tend to have back pain that lasts more than 3 months, with symptoms beginning before age 45.¹⁶

People with AS—whether it’s mild or severe—may have times when their symptoms are worse, called flares.² Other times, when their symptoms improve, their condition is considered to be in remission. More specifically, a patient with AS is said to be in remission when they have low levels of disease activity and inflammation—and when the joint stiffness and pain caused by AS are having little effect on one’s physical activities.¹⁷

Note your personal questions/concerns to discuss with your healthcare team:

Disease Management Takeaway

Back pain and stiffness are main symptoms of AS.³ For some patients, these symptoms are mild and come and go, but for others, back pain and stiffness can be severe and persistent.² When AS is advanced, sections of the spine can fuse, making it hard to bend the back.³ This represents a significant disease burden for patients.

2 How AS Differs From Other Types of Arthritis

AS is a type of arthritis called **spondyloarthritis (SpA)**. SpA includes 2 broad categories of diseases: axial SpA (axSpA), which mainly affects the spine, and peripheral SpA, which affects other joints and tendons as well.^{18,19} There are 2 subtypes of axSpA: **nonradiographic axial spondyloarthritis (nr-axSpA)** and **radiographic axial spondyloarthritis (r-axSpA)**, known as AS.¹⁸

The categories of SpA are shown in the table below.

SpA: Categories and Conditions^{18,20}

Axial SpA (axSpA)	Peripheral SpA
Nonradiographic axSpA (nr-axSpA) Back pain, but spinal and joint damage can't be seen on an X-ray (nonradiographic) ^{18,20}	Reactive arthritis Inflammation triggered by an infection in the intestine or urinary tract ^{18,19}
Radiographic axSpA (r-axSpA) AS AS is grouped in this category because the spinal and joint damage characteristics of the disease can be seen on an X-ray ^{18,20}	Enteropathic arthritis Inflammation of the intestine, along with the spine and/or joints ²⁰
	Psoriatic arthritis Psoriasis plus pain and swelling in the small joints of the hands and feet ^{18,20}
	Undifferentiated SpA SpA that doesn't fit into any specific category ^{18,20}

Patients with nr-axSpA may develop AS.²¹ One 2015 study showed that as many as 26% of patients with nr-axSpA may progress to AS after a 15-year period.²¹ Disease progression occurs for different reasons. For example, in this research, one factor attributed to disease progression was the presence, in blood tests, of elevated levels of **C-reactive protein** and **HLA-B27 proteins** among the study participants.²¹



A Tip From the AS Iceberg

Because underlying inflammation is always present in your body when you have AS—that is, it is occurring below the surface of the AS iceberg—it's important to always adhere to your disease management plan as directed by your healthcare provider.²²



Because back pain is common, and diagnosing AS can be challenging, evaluation for AS should be performed by a rheumatologist.^{16,23}

A physical exam, a family history, X-rays and, in some cases a **magnetic resonance imaging (MRI)**, and blood work are used to diagnose this disease.³ AS is monitored with regular visits to a rheumatologist, who can detect and treat complications.

It can be challenging for a healthcare provider to diagnose AS because it develops slowly and there is currently no single test for AS.^{15,24} This can lead to a delayed diagnosis, which may cause patients to have long-term pain, stiffness, and problems with mobility.²⁴ In severe cases, patients may have irreversible new bone formation in the spine, loss of spinal function, and reduced quality of life.²⁴

Diagnosing back pain involves distinguishing between mechanical pain and inflammatory pain. Mechanical pain results from a physical change to the back or its component parts (eg, the spine and discs, muscles, and nerves).²⁵ Inflammatory pain occurs when there are immune system irregularities; AS or radiographic axSpA is considered inflammatory pain caused by inflammatory arthritis.²⁵

Disease Management Takeaway

There are several different types of SpA, and this may delay getting a correct diagnosis.^{3,18} Be sure to visit your rheumatologist regularly to monitor your condition and to share any questions or concerns you may have.

Note your personal questions/concerns to discuss with your healthcare team:

3 AS and Its Potential Impact on Quality of Life



AS is a form of arthritis.²

The severe pain and stiffness due to inflammation and decreased physical function are characteristics of AS, and they may have a profound effect on patients' quality of life.^{3,26} Physical and emotional challenges may negatively affect patients' sense of well-being.²⁶

For example, a US study involving 294 people with AS found that feelings of helplessness and depression were cited in self-reported disease activity by the study participants.²⁷ Another research effort, which involved 110 patients in the United Kingdom, showed that anxiety and depression were directly associated with AS disease activity and functional impairment.^{27,28}

If you are experiencing any of these difficulties, please consult with your doctor.

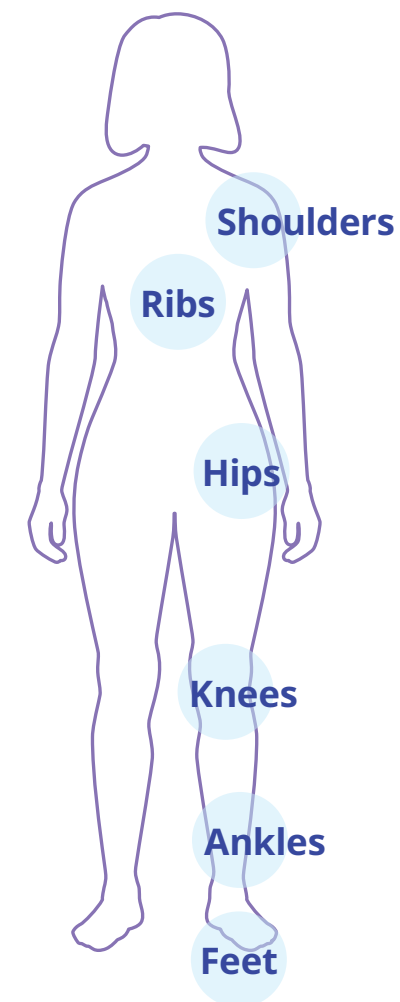
Disease Management Takeaway

You should share your concerns about potential lifestyle challenges associated with AS with your rheumatologist, primary care physician, or other healthcare providers.²⁶ They may help you cope with disease-related challenges that may be interfering with daily activities.

4 AS and the Potential Development of Other Medical Conditions—Known as Comorbidities

If you have AS, you may develop other health conditions known as **comorbidities**, which may be physical or psychological in nature.²⁶

AS may develop in other areas of the body causing pain and stiffness. These include²:



Note your personal questions/concerns to discuss with your healthcare team:

Physical Comorbidities: Examples

There are additional physical complications that may occur with AS.^{14,22,29-33}

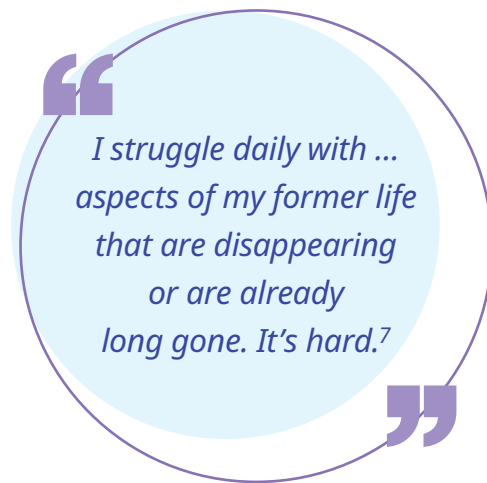
Complication	Definition	Area(s) affected
Enthesitis ^{14,22}	Inflammation of the entheses, where joint capsules, ligaments, or tendons attach to bone	<ul style="list-style-type: none"> • Back • Pelvic bones • Sacroiliac joints • Chest • Heels
Inflammatory bowel disease ^{22,29}	Two conditions—Crohn’s disease and ulcerative colitis—that cause chronic inflammation of the gastrointestinal (GI) tract	<ul style="list-style-type: none"> • Any part of the GI tract
Psoriatic arthritis (PsA) ^{30,31}	A type of arthritis that may affect the skin and joints	<ul style="list-style-type: none"> • Elbows • Knees • Scalp • Nails • Joints
Uveitis ^{22,32,33}	Inflammation of the eye, causing redness, pain, light sensitivity, and skewed vision	<ul style="list-style-type: none"> • The middle layer of the eye

Mental Health Comorbidities: Examples

Disease activity and the loss of mobility may lead to the following mental health comorbidities²⁶:

- Anxiety
- Depression
- Sleep disorders

If you are experiencing any of these difficulties, please consult with your healthcare provider.



Disease Management Takeaway Comorbidities are common among patients with AS.^{24,26} But every patient’s situation is different. It’s important to work closely with your healthcare provider to monitor your AS symptoms and overall health.

5 The Goals of AS Medical Care and Available Disease Management Options

There is no cure for AS.³ Core goals of disease management include reducing symptoms, managing pain, and slowing disease progression.

Pharmacologic and nonpharmacologic approaches may be used in managing AS.^{22,34} Medications used in managing AS may include^{22,34-37}:

- Nonsteroidal anti-inflammatory drugs^{22,34,36}
- **Glucocorticoids**, a type of steroid, reduces inflammation and turns down the activity of the immune system^{38,39}
- **Disease-modifying antirheumatic drugs (DMARDs)**, designed to relieve AS symptoms and help inhibit joint damage,^{22,34,36,37} and **bdMARDs (“biologic” DMARDs)**, genetically engineered proteins, which target parts of the immune system that cause inflammation³⁵
- **Biologics**, such as tumor necrosis factor inhibitors, and interleukin-17 **antagonists**, block certain cellular responses driving AS inflammatory activity^{22,34,36}
- **JAK (Janus kinase) inhibitors** are believed to decrease your body’s production of specific enzymes associated with inflammation^{40,41}

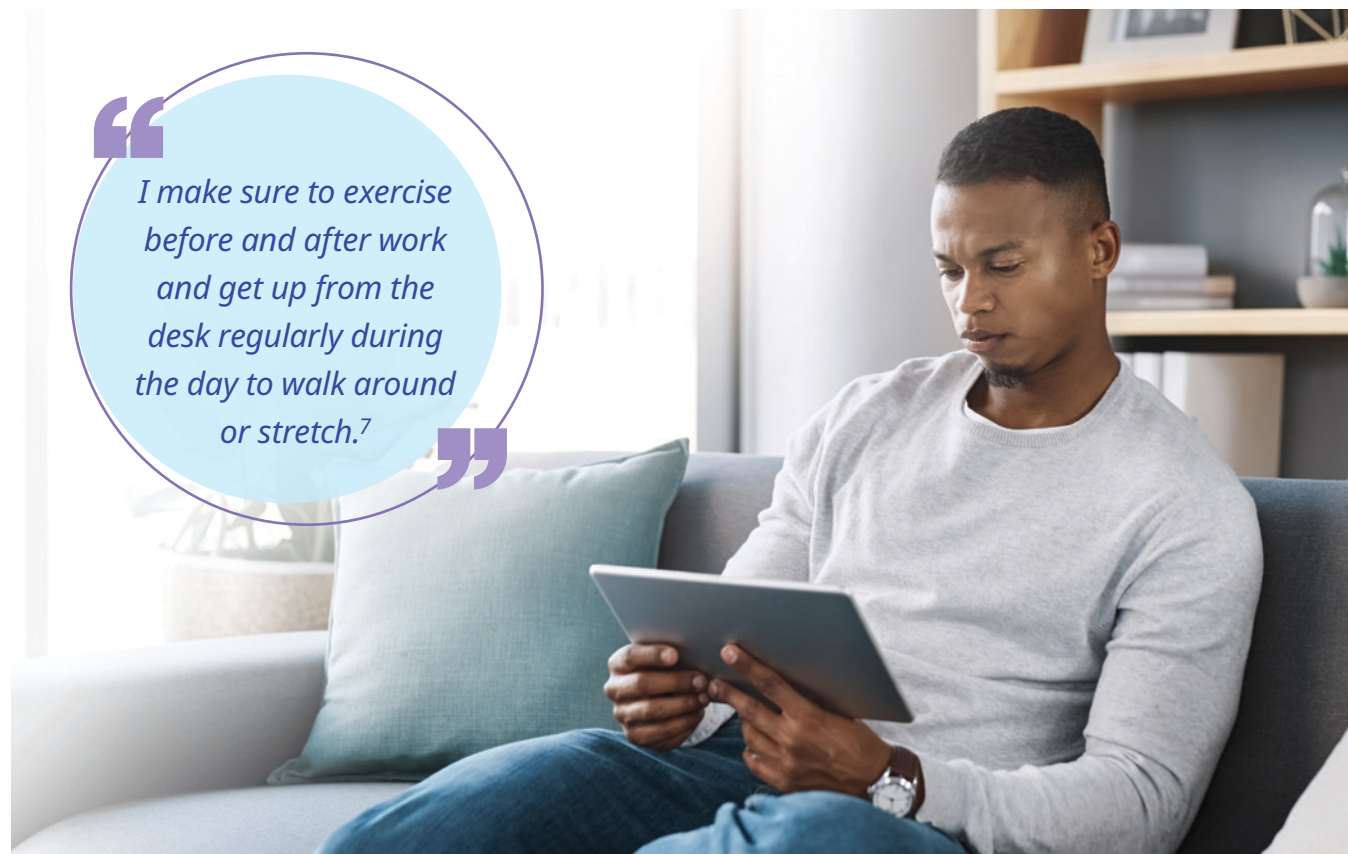
Nonpharmacologic treatment options include³⁴:

- Physical therapy and rehabilitation
- Exercise
- Emotional support (eg, in the form of patient education, and/or involvement in associations or patient peer groups focused on the challenges of living with AS)

Disease Management Takeaway It’s important to understand how medications and physical therapy work together to support AS disease management. Medications help decrease the underlying inflammation that accompanies AS.^{22,36} Physical therapy and other such measures may help to enhance mobility of the spine and improve posture.²

Note your personal questions/concerns to discuss with your healthcare team:

Resources for People With AS



The following organizations provide educational resources on AS and other forms of arthritis:

Spondylitis Association of America
www.spondylitis.org

Arthritis Foundation
www.arthritis.org/diseases/ankylosing-spondylitis

National Institutes of Health
www.niams.nih.gov/health-topics/ankylosing-spondylitis

CreakyJoints – Global Healthy Living Organization
www.creakyjoints.org

Glossary of Key Terms

Ankylosis	A bony fusion of the ligaments in the spine and, occasionally, other joints. ¹⁴ This may occur in a person with very severe AS due to inflammation over many years.
Antagonist	A substance that halts the action or changes the effect of another substance. ⁴²
Arthritis	Joint pain or joint disease, with symptoms that include swelling, pain, stiffness, and reduced mobility. ⁴³
Biologics (bDMARDs)	Genetically engineered proteins, which act on immune system activity that causes inflammation. ³⁵
C-reactive protein (CRP)	A protein that, when detected in a blood test, marks the presence and intensity level of inflammation in the body. ⁴⁴
DMARDs	Abbreviation for disease-modifying antirheumatic drugs, which are designed to relieve AS symptoms and joint damage. ³⁷
Glucocorticoid	Another name for steroids, this medicine reduces inflammation and turns down the activity of the immune system. ^{38,39}
HLA-B27	A gene that is present in most people diagnosed with AS. ^{21,45}
Inflammatory bowel disease	Conditions, such as Crohn’s disease and ulcerative colitis, characterized by chronic inflammation of the gastrointestinal tract. ²⁹
JAK inhibitor	A medicine that is believed to work by decreasing your body’s production of specific enzymes associated with inflammation. ^{40,41}
MRI	Magnetic resonance imaging; a procedure that uses magnetism, radio waves, and a computer to create pictures of areas inside the body. ^{46,47}
Psoriatic arthritis	A type of arthritis that may affect the skin and joints. Psoriatic arthritis tends to affect men and women the same way, and typically occurs after age 30. ⁴⁸
Sacroiliac joints	The joints that connect the spine to the pelvis. ⁴⁹
Spondyloarthritis	An umbrella term for inflammatory diseases that can affect the back, pelvis, neck, and some larger joints, as well as internal organs, like the intestines and eyes. ³⁷



Preparing for Your Next Appointment With Your Healthcare Provider

Your next appointment:

Healthcare provider: _____

Date: _____

Arrival Time: _____

Location (In-office or telehealth visit): _____



A Tip From the AS Iceberg

AS is a complex condition marked by a range of symptoms.²² That's why different healthcare providers—rheumatologists, dermatologists, primary care physicians, physical therapists, nurses, pharmacists, and other healthcare providers—may be needed to provide medical care.²



List any other questions or concerns you would like to discuss with your healthcare provider (rheumatologist, dermatologist, primary care physician, nurse practitioner, physician assistant, or pharmacist) during your next visit:

Common AS Signs and Symptoms^{22,24,50}

Lower back pain

Stiffness

Decreased physical
function

Fatigue

Structural Manifestations of Underlying Inflammation^{14,24,50}

New bone formation in the axial skeleton

Loss of spinal function and mobility

Joint damage

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