Overview of Rheumatoid Arthritis

Rheumatoid arthritis (RA) is a chronic (long-lasting) inflammatory disease that mostly affects joints. RA causes pain, swelling, stiffness, and loss of function in joints. It is an autoimmune disorder because the immune system attacks the healthy joint tissues. Normally, the immune system helps protect the body from infection and disease.

Additional features of rheumatoid arthritis can include the following.

- It affects the lining of the joints, which damages the tissue that covers the ends of the bones in a joint.
- RA occurs in a symmetrical pattern, meaning that if one knee or hand has the condition, the other hand or knee does, too.
- It affects the joints in the wrist, hands, feet, spine, knees, and jaw.
- RA may cause fatigue, occasional fevers, and a loss of appetite.
- RA may cause medical problems outside of the joints, in areas such as the heart, lungs, blood, nerves, eyes, and skin.

Fortunately, current treatments can help people with the disease to lead productive lives.

What happens in rheumatoid arthritis?

Doctors do not know why the immune system attacks joint tissues. However, they do know that when a series of events occurs, rheumatoid arthritis can develop. This series of events includes:

- A combination of genes and exposure to environmental factors starts the development of RA.
- The immune system may be activated years before symptoms appear.
- The start of the autoimmune process may happen in other areas of the body, but the impact of the immune malfunction settles in the joints.
- Immune cells cause inflammation in the inner lining of the joint, called the synovium.
- This inflammation becomes chronic, and the synovium thickens due to an increase of cells, production of proteins, and other factors in the joint, which can lead to pain, redness, and warmth.
- As RA progresses, the thickened and inflamed synovium pushes further into the joint and destroys the cartilage and bone within the joint.
As the joint capsule stretches, the forces cause changes within the joint structure. The surrounding muscles, ligaments, and tendons that support and stabilize the joint become weak over time and do not work as well. This can lead to more pain and joint damage, and problems using the affected joint.

Who Gets Rheumatoid Arthritis?

You are more likely to get rheumatoid arthritis if you have certain risk factors. These include:

- **Age.** The disease can happen at any age; however, the risk for developing rheumatoid arthritis increases with age. Children and younger teenagers may be diagnosed with juvenile idiopathic arthritis, a condition related to rheumatoid arthritis.
- **Sex.** Rheumatoid arthritis is more common among women than men. About two to three times as many women as men have the disease. Researchers think that the female hormone estrogen may play a role in the development of the disease for some women.
- **Family history and genetics.** If a family member has RA, you may be more likely to develop the disease.
- **Smoking.** Research shows that people who smoke over a long period of time are at an increased risk of getting rheumatoid arthritis. For people who continue to smoke, the disease may be more severe.
- **Obesity.** Some research shows that being obese may increase your risk for the disease as well as limit how much the disease can be improved.
- **Periodontitis.** Gum disease may be associated with the risk of RA.

Symptoms of Rheumatoid Arthritis

Common symptoms of rheumatoid arthritis include:

- Joint pain at rest and when moving, along with tenderness, swelling, and warmth of the joint.
- Joint stiffness that lasts longer than 30 minutes, typically after waking in the morning or after resting for a long period of time.
- Fatigue – feeling unusually tired or having low energy.
- Occasional low-grade fever.
- Loss of appetite.

Rheumatoid arthritis can happen in any joint; however, it is more common in the wrist, hands, and feet. The symptoms usually happen on both sides of the body, in a symmetrical pattern. For example, if you have RA in the right hand, you likely also have it in the left hand.
RA affects people differently. In some people, RA starts with mild or moderate inflammation affecting just a few joints. However, if it is not treated or the treatments are not working, RA can worsen and affect more joints. This can lead to more damage and disability. At times, RA symptoms worsen in “flares” due to a trigger such as stress, too much activity, or suddenly stopping medications.

The goal of treatment is to control the disease so it is in remission or near remission, with no signs or symptoms of the disease.

Rheumatoid arthritis can cause other medical problems, such as:

- Rheumatoid nodules that are firm lumps just below the skin.
- Anemia due to low blood cell counts.
- Neck pain and dry eyes and mouth.
- Rarely, inflammation of the blood vessels, the lining of the lungs, or the sac enclosing the heart.

**Causes of Rheumatoid Arthritis**

Researchers do not know what causes the immune system to turn against the body’s joints and other tissues. Studies show that a combination of the following factors may lead to the disease:

- **Genes.** Certain genes that affect how the immune system works may lead to rheumatoid arthritis. However, some people who have these genes never develop the disease. This suggests that genes are not the only factor in the development of RA. In addition, more than one gene may determine who gets the disease and how severe it will become.
- **Environment.** Researchers continue to study how environmental factors may trigger rheumatoid arthritis in people who have specific genes that also increase their risk. In addition, some factors such as bacteria, viruses, and gum disease may play a role in the development of RA.
- **Sex hormones.** Researchers think that sex hormones may play a role in the development of rheumatoid arthritis when genetic and environmental factors also are involved. Studies show:
  - Women are more likely than men to develop rheumatoid arthritis.
  - The disease may improve during pregnancy and flare after pregnancy.

**Diagnosis of Rheumatoid Arthritis**

Doctors diagnose RA by:

- Taking a medical history.
Performing an exam.
Ordering laboratory tests.
Ordering imaging studies, such as x-rays or ultrasound.

It can be difficult to diagnose rheumatoid arthritis when it is in the early stages because:

- The disease develops over time, and only a few symptoms may be present in the early stages.
- There is no single test for the disease.
- Symptoms differ from person to person.
- Symptoms can be similar to those of other types of arthritis and joint conditions.

As a result, doctors use a variety of tools to diagnose the disease and to rule out other conditions.

Medical History
Remember to let your doctor know:

- About your symptoms, when and how they started, and how they have changed over time.
- What limitations in activities you may have, such as difficulty with work, leisure, or activities around the house.
- About your other medical problems.
- If you have any family members with similar symptoms or if any family members have rheumatoid arthritis.
- What medications you take.

Answers to these questions can help your doctor make a diagnosis and understand the impact the disease has on your life.

Physical Examination
The doctor usually performs a physical exam that may include:

- Examining your joints.
- Watching how you walk, bend, and carry out activities of daily living.
- Looking for a rash on your skin.
- Listening to your chest for signs of inflammation in the lungs.

Laboratory Tests
Lab tests may help to diagnose rheumatoid arthritis. Some common tests include:
Rheumatoid factor (RF). This blood test checks for RF, an antibody that many people with rheumatoid arthritis can eventually have in their blood. An antibody is a special protein made by the immune system that normally helps fight invaders in the body. Not all people with RA test positive for RF; some people test positive for RF but never develop the disease; and some people test positive but have another disease. However, doctors can use this test, along with other test results and evaluations, to diagnose rheumatoid arthritis.

- **Anti-cyclic citrullinated peptide antibody (anti-CCP).** This blood test checks for anti-CCP antibodies, which appear in many people with rheumatoid arthritis. In addition, anti-CCP can appear before RA symptoms develop, which can help doctors diagnose the disease early. This test’s results, along with the results from RF blood tests, are very useful in confirming a rheumatoid arthritis diagnosis.

- **Complete blood count.** This blood test measures different blood cell counts and can help diagnose anemia, which is common in people with RA.

- **Erythrocyte sedimentation rate (often called the sed rate).** This test measures inflammation in the body.

- **C-reactive protein.** This is another common test for inflammation that can help diagnose rheumatoid arthritis and monitor disease activity and response to treatments.

**Imaging Tests**

To check for joint damage, doctors may use imaging tests such as:

- **X-rays** help check for RA; however, they are not useful in the early stages of rheumatoid arthritis, before joint damage occurs. Doctors may use x-rays to monitor the progression of the disease or to rule out other causes for the joint pain.
- **Magnetic resonance imaging (MRI) and ultrasound** may help diagnose rheumatoid arthritis in the early stages of the disease. In addition, these imaging tests can help evaluate the amount of damage in the joints and the severity of the disease.

**Treatment of Rheumatoid Arthritis**

Treatment of rheumatoid arthritis continues to improve, which can give many people relief from symptoms, improving their quality of life. Doctors may use the following options to treat RA:

- **Medications.**
- **Surgery.**
- **Routine monitoring and ongoing care.**
- **Complementary therapies.**
Your doctor may recommend a combination of treatments, which may change over time based on your symptoms and the severity of your disease. No matter which treatment plan your doctor recommends, the goals are to help:

- Relieve pain.
- Decrease inflammation and swelling.
- Prevent, slow, or stop joint and organ damage.
- Improve your ability to participate in daily activities.

Rheumatoid arthritis may start causing joint damage during the first year or two that a person has the disease, so early diagnosis and treatment are very important.

Medications

Most people who have RA take medications. Studies show that early treatment with combinations of medications, instead of one medication alone, may be more effective in decreasing or preventing joint damage.

Many of the medications that doctors prescribe to treat RA help decrease inflammation and pain, and slow or stop joint damage. They may include:

- Anti-inflammatory medications to provide pain relief and lower inflammation.
- Corticosteroids that can help decrease inflammation, provide some pain relief, and slow joint damage. Because they are potent drugs, your doctor will prescribe the lowest dose possible to achieve the desired benefit.
- Disease-modifying antirheumatic drugs (DMARDs) that can help to slow or change the progression of the disease.
- Biologic response modifiers if your disease is more severe. These medications target specific immune messages and interrupt the signal, helping to decrease or stop inflammation.
- Janus kinase (JAK) inhibitors, which send messages to specific cells to stop inflammation from inside the cell.

Surgery

Your doctor may recommend surgery if you have permanent damage or pain that limits your ability to perform day-to-day activities. Surgery is not for everyone. You and your doctor can discuss the options and choose what is right for you.

Your doctor will consider the following before recommending surgery:

- Your overall health.
- The condition of the affected joint or tendon.
• The risks and benefits of the surgery.

Types of surgery may include joint repairs and joint replacements. Read more in our Joint Replacement Surgery Health Topic.

Routine Monitoring and Ongoing Care

Regular medical care is important because your doctor can:

• Monitor how the disease is progressing.
• Determine how well the medications are working.
• Talk to you about any side effects from the medications.
• Adjust your treatment as needed.

Monitoring typically includes regular visits to the doctor. It also may include blood and urine tests, and x-rays. Having rheumatoid arthritis increases your risk of developing osteoporosis, particularly if you take corticosteroids. Osteoporosis is a bone disease that causes the bones to weaken and easily break. Talk to your doctor about your risk for the disease and the potential benefits of calcium and vitamin D supplements or other osteoporosis treatments.

Who Treats Rheumatoid Arthritis?

Diagnosing and treating rheumatoid arthritis requires a team effort involving you and several types of health care professionals. These may include:

• Rheumatologists, who specialize in arthritis and other diseases of the bones, joints, and muscles.
• Primary care providers, such as internists, who specialize in the diagnosis and medical treatment of adults.
• Orthopaedists, who specialize in the treatment of and surgery for bone and joint diseases or injuries.
• Physical therapists, who help to improve joint function.
• Occupational therapists, who teach ways to protect joints, minimize pain, perform activities of daily living, and conserve energy.
• Dietitians, who teach ways to eat a good diet to improve health and maintain a healthy weight.
• Nurse educators, who specialize in helping people understand their overall condition and set up their treatment plans.
• Mental health professionals, who help people cope with difficulties.

Living With Rheumatoid Arthritis
Research shows that people who take part in their own care report less pain and make fewer doctor visits. They also enjoy a better quality of life.

Self-care can help you play a role in managing your RA and improving your health. You can:

- Learn about rheumatoid arthritis and its treatments.
- Use exercises and relaxation techniques to reduce your pain and keeping you active.
- Communicate well with your health care team so you can have more control over your disease.
- Reach out for support to help cope with the physical emotional, and mental effects of rheumatoid arthritis.

Participating in your care can help build confidence in your ability to perform day-to-day activities, allowing you to lead a full, active, and independent life.

Lifestyle Changes

Certain activities can help improve your ability to function on your own and maintain a positive outlook.

- **Rest and exercise.** Balance your rest and exercise, with more rest when your RA is active and more exercise when it is not. Rest helps to decrease active joint inflammation, pain, and fatigue. In general, shorter rest breaks every now and then are more helpful than long times spent in bed. Exercise is important for maintaining healthy and strong muscles, preserving joint mobility, and maintaining flexibility. Exercise can help:
  - Improve your sleep.
  - Decrease pain.
  - Keep a positive attitude.
  - Maintain a healthy weight.

Doctors usually recommend low-impact exercises, such as water exercise programs. Talk to your health care providers before beginning any exercise program.

- **Joint care.** Some people find wearing a splint for a short time around a painful joint reduces pain and swelling. People use splints mostly on wrists and hands, but also on ankles and feet. Talk to your doctor or a physical or occupational therapist before wearing a splint. Other ways you can protect your joints include:
  - Using self-help devices, such as items with a large grip, zipper pullers, or long-handled shoehorns.
○ Using tools or devices that help with activities of daily living, such as an adaptive toothbrush or silverware.
○ Using devices to help you get on and off chairs, toilet seats, and beds.
○ Choosing activities that put less stress on your joints, such as limiting the use of the stairs or taking rest periods when walking longer distances.
○ Maintaining a healthy weight to help lower the stress on your joints.

• **Monitoring of symptoms.** It is important to monitor your symptoms for any changes or the development of new symptoms. Understanding your symptoms and how they may change can help you and your doctor manage your pain when you have a flare.

• **Stress management.** The emotions you may feel because of RA – fear, anger, and frustration, along with any pain, physical limitations, and the unpredictable nature of flares – can increase your stress level. Although there is no evidence that stress plays a role in causing rheumatoid arthritis, it can make living with the disease more difficult. Stress also may affect the amount of pain you feel. Ways to cope with stress can include:
  ○ Regular rest periods.
  ○ Relaxation techniques such as deep breathing, meditating, or listening to quiet sounds or music.
  ○ Movement exercise programs, such as yoga and tai chi.

• **Mental health management.** Living with RA can be hard and isolating. If you feel alone, anxious, or depressed about having the disease, talk to your doctor, an RA support social worker, or mental health professional. Keep the lines of communication open. Talk to family and friends about your RA to help them understand the disease. You may find it helpful to join an online or community support group.

• **Healthy diet.** A healthy and nutritious diet that includes a balance of calories, protein, and calcium is important for maintaining overall health. Talk to your doctor about drinking alcoholic beverages because they may interact with the medications you take for rheumatoid arthritis.

Before making any changes to your diet or activity, talk to your doctor.

**Research Progress Related to Rheumatoid Arthritis**
Over the last several decades, research has greatly increased our understanding of the immune system, genetics, and biology. This research is now showing results in several areas important to rheumatoid arthritis. Scientists are thinking about RA in exciting ways that were not possible years ago.

Genetics

NIAMS-supported researchers have identified several genetic factors that may make some people more likely to develop rheumatoid arthritis, as well as factors that affect disease severity. Scientists have learned that dozens of genes determine whether a person develops rheumatoid arthritis and how severe the disease will become. Researchers are studying these findings to help identify new treatment approaches for the disease.

Researchers are also investigating the potential connection between health, disease, and the human microbiome, which are microorganisms that inhabit the human body, such as the intestines and the mouth. One study found that the presence of a specific type of gut bacteria correlated with rheumatoid arthritis in newly diagnosed, untreated people. Another study has found that bacteria in the mouth can contribute to the autoimmune RA process, indicating that good dental hygiene is important. More work is being done to understand how bacteria interacts with the immune system in the disease.

The Disease Process

NIAMS intramural researchers are studying the natural history of rheumatoid arthritis in children and adults to understand how the disease progresses and affects patient symptoms and functional status.

Investigators are also exploring whether patients with rheumatoid arthritis in remission while taking tumor necrosis factor-alpha (TNF-) inhibitors can remain in remission after tapering the dose of these medications. Most studies so far suggest that taking them away completely leads to flares. However, researchers are studying and identifying what factors predict who will relapse when treatments are reduced.

Scientists are continuing to understand what happens at the molecular level in rheumatoid arthritis and are working to develop tests that could help diagnose RA earlier and identify patients who would benefit most from specific treatments.

Joint inflammation. NIAMS-funded researchers have determined that joint inflammation can continue in rheumatoid arthritis even after clinical symptoms have eased. This finding may help doctors determine when a patient is truly in remission and can safely stop treatment.
New Therapies
To date, there is still no cure for RA. Researchers continue to identify turned on genes and molecules that contribute to the development and worsening of rheumatoid arthritis and thus are potential targets for new treatments. The path between identifying the molecule and developing a drug that targets it is long and difficult. Fortunately, several new medications for RA have emerged over the past 20 years that substantially reduce symptoms and damage in rheumatoid arthritis. However, over time, medications may stop working for some people, creating a need for new advanced therapies. Researchers continue to identify more candidate drugs, with hopes that these will have fewer side effects or will cure more patients.

National Institutes of Health Accelerating Medicines Partnership. The NIAMS and the National Institute of Allergy and Infectious Diseases are leading the Accelerating Medicines Partnership in Rheumatoid Arthritis and Systemic Lupus Erythematosus (AMP RA/SLE). The AMP RA/SLE consortium is a unique public-private partnership that was created to find new ways to identify and validate promising biological targets for diagnostics and drug development.

For More Info

U.S. Food and Drug Administration
Toll free: 888-INFO-FDA (888-463-6332)
Website: https://www.fda.gov

Drugs@FDA at https://www.accessdata.fda.gov/scripts/cder/daf/. Drugs@FDA is a searchable catalog of FDA-approved drug products.

Centers for Disease Control and Prevention, National Center for Health Statistics
Website: https://www.cdc.gov/nchs

National Institute of Allergy and Infectious Diseases
Website: https://www.niaid.nih.gov

National Center for Complementary and Integrative Health
Website: https://nccih.nih.gov

American Academy of Orthopaedic Surgeons
Website: https://www.aaos.org

American College of Rheumatology
Website: https://www.rheumatology.org

Arthritis Foundation
If you need more information about available resources in your language or other languages, please visit our webpages below or contact the NIAMS Information Clearinghouse at NIAMSInfo@mail.nih.gov.

- Asian Language Health Information
- Spanish Language Health Information