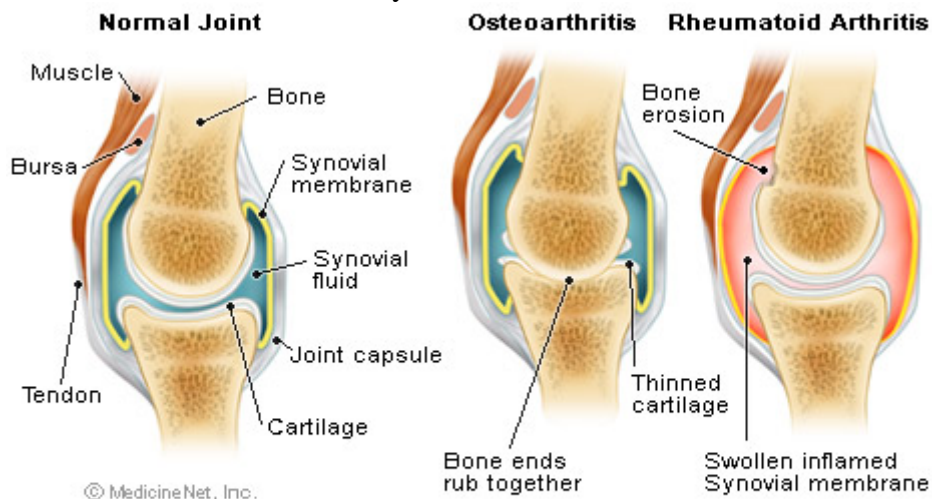


Rheumatoid Arthritis

What is rheumatoid arthritis?

Rheumatoid arthritis is an autoimmune disease that causes chronic inflammation of the joints. Rheumatoid arthritis can also cause inflammation of the tissue around the joints, as well as other organs in the body. Autoimmune diseases are illnesses that occur when the body tissues are mistakenly attacked by its own immune system. The immune system is a complex organization of cells and antibodies designed normally to "seek and destroy" invaders of the body, particularly infections. Patients with autoimmune diseases have antibodies in their blood that target their own body tissues, where they can be associated with inflammation. Because it can affect multiple other organs of the body, rheumatoid arthritis is referred to as a systemic illness and is sometimes called rheumatoid disease.

While rheumatoid arthritis is a chronic illness, meaning it can last for years, patients may experience long periods without symptoms. Typically, however, rheumatoid arthritis is a progressive illness that has the potential to cause joint destruction and functional disability.



Normal and Arthritic Joints

A joint is where two bones meet to allow movement of body parts. Arthritis means joint inflammation. The joint inflammation of rheumatoid arthritis causes swelling, pain, stiffness, and redness in the joints. The inflammation of rheumatoid disease can also occur in tissues around the joints, such as the tendons, ligaments, and muscles.

In some patients with rheumatoid arthritis, chronic inflammation leads to the destruction of the cartilage, bone and ligaments causing deformity of the joints.

Damage to the joints can occur early in the disease and be progressive. Moreover, studies have shown that the progressive damage to the joints does not necessarily correlate with the degree of pain, stiffness, or swelling present in the joints.

Rheumatoid arthritis is a common rheumatic disease, affecting more than two million people in the United States. The disease is three times more common in women as in men. It afflicts people of all races equally. The disease can begin at any age, but most often starts after age forty and before sixty. In some families, multiple members can be affected, suggesting a genetic basis for the disorder.

What causes rheumatoid arthritis?

The cause of rheumatoid arthritis is unknown. Even though infectious agents such as viruses, bacteria, and fungi have long been suspected, none has been proven as the cause. The cause of rheumatoid arthritis is a very active area of worldwide research. Some scientists believe that the tendency to develop rheumatoid arthritis may be genetically inherited. It is suspected that certain infections or factors in the environment might trigger the immune system to attack the body's own tissues, resulting in inflammation in various organs of the body such as the lungs or eyes.

Regardless of the exact trigger, the result is an immune system that is geared up to promote inflammation in the joints and occasionally other tissues of the body. Immune cells, called lymphocytes, are activated and chemical messengers (cytokines, such as tumor necrosis factor/TNF and interleukin-1/IL-1) are expressed in the inflamed areas.

Environmental factors also seem to play some role in causing rheumatoid arthritis. Recently, scientists have reported that [smoking](#) tobacco increases the risk of developing rheumatoid arthritis.

What are the symptoms of rheumatoid arthritis?

The symptoms of rheumatoid arthritis come and go, depending on the degree of tissue inflammation. When body tissues are inflamed, the disease is active. When tissue inflammation subsides, the disease is inactive (in remission). Remissions can occur spontaneously or with treatment, and can last weeks, months, or years. During remissions, symptoms of the disease disappear, and patients generally feel well. When the disease becomes active again (relapse), symptoms return. The return of disease activity and symptoms is called a flare. The course of rheumatoid arthritis varies from patient to patient, and periods of flares and remissions are typical.

When the disease is active, symptoms can include fatigue, lack of appetite, low grade fever, muscle and joint aches, and stiffness. Muscle and joint stiffness are usually most notable in the morning and after periods of inactivity. Arthritis is

common during disease flares. Also during flares, joints frequently become red, swollen, painful, and tender. This occurs because the lining tissue of the joint (synovium) becomes inflamed, resulting in the production of excessive joint fluid (synovial fluid). The synovium also thickens with inflammation (synovitis).

In rheumatoid arthritis, multiple joints are usually inflamed in a symmetrical pattern (both sides of the body affected). The small joints of both the hands and wrists are often involved. Simple tasks of daily living, such as turning door knobs and opening jars can become difficult during flares. The small joints of the feet are also commonly involved. Occasionally, only one joint is inflamed. When only one joint is involved, the arthritis can mimic the joint inflammation caused by other forms of arthritis, such as [gout](#) or joint infection. Chronic inflammation can cause damage to body tissues, cartilage and bone. This leads to a loss of cartilage and erosion and weakness of the bones as well as the muscles, resulting in joint deformity, destruction, and loss of function. Rarely, rheumatoid arthritis can even affect the joint that is responsible for the tightening our vocal cords to change the tone of our voice, the cricoarytenoid joint. When this joint is inflamed, it can cause [hoarseness](#) of voice.

Since rheumatoid arthritis is a systemic disease, its inflammation can affect organs and areas of the body other than the joints. Inflammation of the glands of the eyes and mouth can cause dryness of these areas and is referred to as [Sjogren's syndrome](#). Rheumatoid inflammation of the lung lining (pleuritis) causes chest pain with deep breathing or coughing. The lung tissue itself can also become inflamed and sometimes nodules of inflammation (rheumatoid nodules) develop within the lungs. Inflammation of the tissue (pericardium) surrounding the heart, called [pericarditis](#), can cause a chest pain that typically changes in intensity when lying down or leaning forward. The rheumatoid disease can reduce the number of red blood cells ([anemia](#)), and white blood cells. Decreased white cells can be associated with an enlarged spleen (referred to as Felty's syndrome) and can increase the risk of infections. Firm lumps under the skin (rheumatoid nodules) can occur around the elbows and fingers where there is frequent pressure. Even though these nodules usually do not cause symptoms, occasionally they can become infected. A rare, serious complication, usually with long-standing rheumatoid disease, is blood vessel inflammation ([vasculitis](#)). Vasculitis can impair blood supply to tissues and lead to tissue death. This is most often initially visible as tiny black areas around the nail beds or as leg ulcers.

How is rheumatoid arthritis diagnosed?

The first step in the diagnosis of rheumatoid arthritis is a meeting between the doctor and the patient. The doctor reviews the history of symptoms, examines the joints for inflammation and deformity, the skin for rheumatoid nodules, and other parts of the body for inflammation. Certain blood and x-ray tests are often obtained. The diagnosis will be based on the pattern of symptoms, the

distribution of the inflamed joints, and the blood and x-ray findings. Several visits may be necessary before the doctor can be certain of the diagnosis. A doctor with special training in arthritis and related diseases is called a [rheumatologist](#).

The distribution of joint inflammation is important to the doctor in making a diagnosis. In rheumatoid arthritis, the small joints of the hands, wrists, feet, and knees are typically inflamed in a symmetrical distribution (affecting both sides of the body). When only one or two joints are inflamed, the diagnosis of rheumatoid arthritis becomes more difficult. The doctor may then perform other tests to exclude arthritis due to infection or gout. The detection of rheumatoid nodules (described above), most often around the elbows and fingers, can suggest the diagnosis.

Abnormal blood antibodies can be found in patients with rheumatoid arthritis. A blood antibody called "rheumatoid factor" can be found in 80% of patients. [Citruiline antibody](#) (also referred to as anti-citruiline antibody, anti-cyclic citruilinated peptide antibody, and anti-CCP) is present in most patients with rheumatoid arthritis. It is useful in the diagnosis of rheumatoid arthritis when evaluating patients with unexplained joint inflammation. A test for citruiline antibodies is most helpful in looking for the cause of previously undiagnosed inflammatory arthritis when the traditional blood test for rheumatoid arthritis, [rheumatoid factor](#), is not present. Citruiline antibodies have been felt to represent the earlier stages of rheumatoid arthritis in this setting. Another antibody called "the antinuclear antibody" (ANA) is also frequently found in patients with rheumatoid arthritis.

A blood test called the [sedimentation rate](#) (sed rate) is a measure of how fast red blood cells fall to the bottom of a test tube. The sed rate is used as a crude measure of the inflammation of the joints. The sed rate is usually faster during disease flares, and slower during remissions. Another blood test that is used to measure the degree of inflammation present in the body is the C-reactive protein. The rheumatoid factor, ANA, sed rate, and C-reactive protein tests can also be abnormal in other systemic autoimmune and inflammatory conditions. Therefore, abnormalities in these blood tests alone are not sufficient for a firm diagnosis of rheumatoid arthritis.

Joint x-rays may be normal or only show swelling of soft tissues early in the disease. As the disease progresses x-rays can show bony erosions typical of rheumatoid arthritis in the joints. Joint x-rays can also be helpful in monitoring the progression of disease and joint damage over time. Bone scanning, a radioactive test procedure, can demonstrate the inflamed joints.

The doctor may elect to perform an office procedure called arthrocentesis. In this procedure, a sterile needle and syringe are used to drain joint fluid out of the joint for study in the laboratory. Analysis of the joint fluid, in the laboratory, can help

to exclude other causes of arthritis, such as infection and gout. Arthrocentesis can also be helpful in relieving joint swelling and pain. Occasionally, cortisone medications are injected into the joint during the arthrocentesis in order to rapidly relieve joint inflammation and further reduce symptoms.

How is rheumatoid arthritis treated?

There is no known cure for rheumatoid arthritis. To date, the goal of treatment in rheumatoid arthritis is to reduce joint inflammation and pain, maximize joint function, and prevent joint destruction and deformity. Early medical intervention has been shown to be important in improving outcomes. Aggressive management can improve function, stop damage to joints as seen on x-rays, and prevent work disability. Optimal treatment for the disease involves a combination of medications, rest, joint strengthening exercises, joint protection, and patient (and family) education. Treatment is customized according to many factors such as disease activity, types of joints involved, general health, age, and patient occupation. Treatment is most successful when there is close cooperation between the doctor, patient, and family members.

Two classes of medications are used in treating rheumatoid arthritis: fast-acting "first-line drugs" and slow-acting "second-line drugs" (also referred to as Disease-Modifying Antirheumatic Drugs or DMARDs). The first-line drugs, such as aspirin and cortisone (corticosteroids), are used to reduce pain and inflammation. The slow-acting second-line drugs, such as gold, [methotrexate](#) and [hydroxychloroquine](#) (Plaquenil) promote disease remission and prevent progressive joint destruction, but they are not anti-inflammatory agents.

The degree of destructiveness of rheumatoid arthritis varies from patient to patient. Patients with uncommon, less destructive forms of the disease or disease that has quieted after years of activity ("burned out" rheumatoid arthritis) can be managed with rest, pain and anti-inflammatory medications alone. In general, however, patients improve function and minimize disability and joint destruction when treated earlier with second-line drugs (disease-modifying antirheumatic drugs), even within months of the diagnosis. Most patients require more aggressive second-line drugs, such as methotrexate, in addition to anti-inflammatory agents. Sometimes these second-line drugs are used in combination. In some patients with severe joint deformity, surgery may be necessary.

"First-line" drugs

Acetylsalicylate (Aspirin), [naproxen](#) (Naprosyn), [ibuprofen](#) (Advil, Medipren, Motrin), and [etodolac](#) (Lodine) are examples of nonsteroidal anti-inflammatory drugs (NSAIDs). NSAIDs are medications that can reduce tissue inflammation, pain and swelling. NSAIDs are not cortisone. Aspirin, in doses higher than that used in treating headaches and fever, is an effective antiinflammatory medication

for rheumatoid arthritis. Aspirin has been used for joint problems since the ancient Egyptian era. The newer NSAIDs are just as effective as aspirin in reducing inflammation and pain, and require fewer dosages per day. Patients' responses to different NSAID medications vary. Therefore, it is not unusual for a doctor to try several NSAID drugs in order to identify the most effective agent with the fewest side effects. The most common side effects of aspirin and other NSAIDs include stomach upset, [abdominal pain](#), ulcers, and even gastrointestinal bleeding. In order to reduce stomach side effects, NSAIDs are usually taken with food. Additional medications are frequently recommended to protect the stomach from the ulcer effects of NSAIDs. These medications include antacids, [sucralfate](#) (Carafate), [proton-pump inhibitors](#) (Prevacid, and others), and [misoprostol](#) (Cytotec).

[Corticosteroid](#) medications can be given orally or injected directly into tissues and joints. They are more potent than NSAIDs in reducing inflammation, and in restoring joint mobility and function. Corticosteroids are useful for short periods during severe flares of disease activity, or when the disease is not responding to NSAIDs. However, corticosteroids can have serious side effects, especially when given in high doses for long periods of time. These side effects include weight gain, facial puffiness, thinning of the skin and bone, easy bruising, [cataracts](#), risk of infection, muscle wasting, and destruction of large joints, such as the hips. Corticosteroids also carry some increased risk of contracting infections. These side effects can be partially avoided by gradually tapering the doses of corticosteroids as the patient achieves improvement of the disease. Abruptly discontinuing corticosteroids can lead to flares of the disease or other symptoms of corticosteroid withdrawal, and is discouraged. Thinning of the bones due to [osteoporosis](#) may be prevented by calcium and vitamin D supplements. For further information on corticosteroids, please read the article on [prednisone](#).

"Second-line" or "slow-acting" drugs (Disease-modifying anti-rheumatic drugs or DMARDs)

While "first-line" medications (NSAIDs and corticosteroids) can relieve joint inflammation and pain, they do not necessarily prevent joint destruction or deformity. Rheumatoid arthritis requires medications other than NSAIDs and corticosteroids to stop progressive damage to cartilage, bone, and adjacent soft tissues. The medications needed for ideal management of the disease are also referred to as Disease-modifying Anti-rheumatic Drugs or DMARDs. They come in a variety of forms and are listed below. These "second-line" or "slow-acting" medicines may take weeks to months to become effective. They are used for long periods of time, even years, at varying doses. If effective, DMARDs can promote remission, thereby retarding the progression of joint destruction and deformity. Sometimes a number of second-line medications are used together as combination therapy. As with the first-line medications, the doctor may need to use different second-line medications before treatment is optimal.

Recent research suggests that patients who respond to a DMARD with control of the rheumatoid disease may actually decrease the known risk (small, but real) of lymphoma that exists from simply having rheumatoid arthritis.

Hydroxychloroquine (Plaquenil) is related to [quinine](#), and is also used in the treatment of [malaria](#). It is used over long periods for the treatment of rheumatoid arthritis. Possible side effects include upset stomach, skin rashes, muscle weakness, and vision changes. Even though vision changes are rare, patients taking Plaquenil should be monitored by an eye doctor (ophthalmologist).

[Sulfasalazine](#) (Azulfidine) is an oral medication traditionally used in the treatment of mild to moderately severe inflammatory bowel diseases, such as [ulcerative colitis](#) and Crohn's colitis. Azulfidine is used to treat rheumatoid arthritis in combination with antiinflammatory medications. Azulfidine is generally well tolerated. Common side effects include [rash](#) and upset stomach. Because Azulfidine is made up of sulfa and salicylate compounds, it should be avoided by patients with known sulfa allergies.

Methotrexate has gained popularity among doctors as an initial second-line drug because of both its effectiveness and relatively infrequent side effects. It also has an advantage in dose flexibility (dosages can be adjusted according to needs). Methotrexate is an immune suppression drug. It can affect the bone marrow and the liver, even rarely causing cirrhosis. All patients taking methotrexate require regular blood test monitoring of blood counts and liver function blood tests.

Gold salts have been used to treat rheumatoid arthritis throughout most of the past century. Gold thioglucose (Solganal) and gold thiomalate (Myochrysine) are given by injection, initially on a weekly basis for months to years. Oral gold, [auranofin](#) (Ridaura) was introduced in the 1980's. Side effects of gold (oral and injectable) include skin rash, mouth sores, kidney damage with leakage of protein in the urine, and bone marrow damage with [anemia](#) and low white cell count. Patients receiving gold treatment are regularly monitored with blood and urine tests. Oral gold can cause [diarrhea](#). These gold drugs have lost such favor that many companies no longer manufacture them.

D-penicillamine (Depen, Cuprimine) can be helpful in selected patients with progressive forms of rheumatoid arthritis. Side effects are similar to those of gold. They include fever, chills, mouth sores, a metallic taste in the mouth, skin rash, kidney and bone marrow damage, stomach upset, and easy bruising. Patients on this medication require routine blood and urine tests. D-penicillamine can rarely cause symptoms of other autoimmune diseases.

Immunosuppressive medicines are powerful medications that suppress the body's immune system. A number of immunosuppressive drugs are used to treat rheumatoid arthritis. They include methotrexate (Rheumatrex, Trexall) as described above, [azathioprine](#) (Imuran), [cyclophosphamide](#) (Cytosan),

chlorambucil (Leukeran), and cyclosporine (Sandimmune). Because of potentially serious side effects, immunosuppressive medicines (other than methotrexate) are generally reserved for patients with very aggressive disease, or those with serious complications of rheumatoid inflammation, such as blood vessel inflammation (vasculitis). The exception is methotrexate, which is not frequently associated with serious side effects and can be carefully monitored with blood testing. Methotrexate has become a preferred second-line medication as a result.

Immunosuppressive medications can depress bone marrow function and cause anemia, a low white cell count and low platelets counts. A low white count can increase the risk of infections, while a low platelet count can increase the risk of bleeding. Methotrexate rarely can lead to liver cirrhosis and allergic reactions in the lung. Cyclosporin can cause kidney damage and [high blood pressure](#). Because of potentially serious side effects, immunosuppressive medications are used in low doses, usually in combination with anti-inflammatory agents.

Newer treatments

Newer "second-line" drugs for the treatment of rheumatoid arthritis include [leflunomide](#) (Arava), and the "biologic" medications [etanercept](#) (Enbrel), [infliximab](#) (Remicade), [anakinra](#) (Kineret), and [adalimumab](#) (Humira).

[Leflunomide](#) (Arava) is available to relieve the symptoms and halt the progression of the disease. It seems to work by blocking the action of an important enzyme that has a role in immune activation. Arava can cause liver disease, [diarrhea](#), [hair loss](#), and/or rash in some patients. It should not be taken just before or during [pregnancy](#) because of possible [birth defects](#).

Other medications that represent a novel approach to the treatment of rheumatoid arthritis and are the products of modern biotechnology. These are referred to as the biologic medications or biological response modifiers. In comparison with traditional DMARDs, the biologic medications have a much more rapid onset of action and can have powerful effects on stopping progressive joint damage. In general, their methods of action are also more directed, defined, and targeted.

Etanercept (Enbrel), infliximab (Remicade), and adalimumab (Humira) are biologic medications. These medications intercept a protein in the joints (tumor necrosis factor, or TNF) that causes inflammation before it can act on its natural receptor to "switch on" inflammation. This effectively blocks the TNF inflammation messenger from calling out to the cells of inflammation. Symptoms can be significantly, and often rapidly, improved in patients using these drugs. Etanercept (Enbrel) must be injected subcutaneously once or twice a week. Infliximab (Remicade) is given by infusion directly into a vein (intravenously). Adalimumab (Humira) is injected subcutaneously either every other week or weekly. Each of these medications will be evaluated by doctors in practice to

determine what role they may have in treating various stages of rheumatoid arthritis. Research has shown that biological response modifiers also prevent the progressive joint destruction of rheumatoid arthritis. They are currently recommended for use after other second-line medications have not been effective. The biological response modifiers (TNF-inhibitors) are expensive treatments. They are also frequently used in combination with methotrexate and other DMARDs. Furthermore, it should be noted that the TNF-blocking biologics all are more effective when combined with methotrexate.

Anakinra (Kineret) is another biologic treatment that is used to treat moderate to severe rheumatoid arthritis. Anakinra (Kineret) works by binding to a cell messenger protein (IL-1, a proinflammation cytokine). Anakinra (Kineret) is injected under the skin daily. Anakinra (Kineret) can be used alone or with other DMARDs. The response rate of anakinra (Kineret) does not seem to be as high as with other biologic medications.

Rituxan ([rituximab](#)) is an antibody that was first used to treat lymphoma, a [cancer](#) of the lymph nodes. Rituxan can be effective in treating autoimmune diseases like rheumatoid arthritis because it depletes B-cells, which are important cells of inflammation and in producing abnormal antibodies that are common in these conditions. Rituxan is now available to treat moderate to severely active rheumatoid arthritis in patients who have failed the TNF-blocking biologics. Preliminary studies have shown that Rituxan was also found to be beneficial in treating severe rheumatoid arthritis complicated by blood vessel inflammation (vasculitis) and cryoglobulinemia.

Orencia ([abatacept](#)) is a recently developed biologic medication that blocks T-cell activation. Orencia (abatacept) is now available to treat adult patients who have failed a traditional DMARD or TNF-blocking biologic medication.

While biologic medications are often combined with traditional DMARDs in the treatment of rheumatoid arthritis, they are generally not used with other biologic medications because of unacceptable risk for serious infections.

The Proscrba column therapy involves pumping blood drawn from a vein in the arm into an apheresis machine, or cell separator. This machine separates the liquid part of the blood (the plasma) from the blood cells. The Proscrba column is a plastic cylinder about the size of a coffee mug that contains a sand-like substance coated with a special material called Protein A. Protein A is unique in that it binds unwanted antibodies from the blood that promote the arthritis. The Proscrba column works to counter the effect of these harmful antibodies. The Proscrba column is indicated to reduce the signs and symptoms of moderate to severe rheumatoid arthritis in adult patients with long standing disease who have failed or are intolerant to disease-modifying anti-rheumatic drugs (DMARDs). The exact role of this treatment is being evaluated by doctors and it is not

commonly used currently.

Other treatments

There is no special diet for rheumatoid arthritis. One hundred years ago it was touted that "night-shade" foods, such as tomatoes, would aggravate rheumatoid arthritis. This is no longer accepted as true. Fish oil may have anti-inflammatory beneficial effects, but so far this has only been shown in laboratory experiments studying inflammatory cells. Likewise, the benefits of cartilage preparations remain unproven. Symptomatic pain relief can often be achieved with oral [acetaminophen](#) (Tylenol) or over-the-counter topical preparations, which are rubbed into the skin. Antibiotics, in particular the [tetracycline](#) drug minocycline (Minocin), have been tried for rheumatoid arthritis recently in clinical trials. Early results have demonstrated mild to moderate improvement in the symptoms of arthritis. Minocycline has been shown to impede important mediator enzymes of tissue destruction, called metalloproteinases, in the laboratory as well as in humans.

The areas of the body, other than the joints, that are affected by rheumatoid inflammation are treated individually. Sjogren's syndrome (described above, see symptoms) can be helped by artificial tears and humidifying rooms of the home or office. Medicated eye drops, cortisporine ophthalmic drops (Restasis), are also available to help the [dry eyes](#) in those affected. Regular eye check-ups and early antibiotic treatment for infection of the eyes are important. Inflammation of the tendons (tendinitis), bursae ([bursitis](#)) and rheumatoid nodules can be injected with cortisone. Inflammation of the lining of the heart and/or lungs may require high doses of oral cortisone.

Proper, regular [exercise](#) is important in maintaining joint mobility, and in strengthening the muscles around the joints. Swimming is particularly helpful because it allows exercise with minimal [stress](#) on the joints. Physical and occupational therapists are trained to provide specific exercise instructions and can offer splinting supports. For example, wrist and finger splints can be helpful in reducing inflammation and maintaining joint alignment. Devices, such as canes, toilet seat raisers, and jar grippers can assist daily living. Heat and cold applications are modalities that can ease symptoms before and after exercise.

Surgery may be recommended to restore joint mobility or repair damaged joints. Doctors who specialize in joint surgery are orthopedic surgeons. The types of joint surgery range from [arthroscopy](#) to partial and complete replacement of the joint. Arthroscopy is a surgical technique whereby a doctor inserts a tube-like instrument into the joint to see and repair abnormal tissues. For more information, please read the [Arthroscopy](#) article.

"Total joint replacement" is a surgical procedure whereby a destroyed joint is replaced with artificial materials. For example, the small joints of the hand can be

replaced with plastic material. Large joints, such as the hips or knees, are replaced with metals. For more information, please read the [Total Hip Replacement](#) and [Total Knee Replacement](#) articles.

Finally, minimizing emotional stress can help improve the overall health of the patient with rheumatoid arthritis. Support and extracurricular groups afford patients time to discuss their problems with others and learn more about their illness.

Future treatments

Scientists throughout the world are studying many promising areas of new treatment approaches for rheumatoid arthritis. These areas include treatments that block the action of the special inflammation factors, such as tumor necrosis factor (TNFalpha) and interleukin-1 (IL-1), as described above. Many other drugs are being developed that act against certain critical white blood cells involved in rheumatoid inflammation. Also, new NSAIDs with mechanisms of action that are different from current drugs are on the horizon.

Better methods of more accurately defining which patients are more likely to develop more aggressive disease are becoming available. Recent antibody research has found that the presence of citrulline antibodies in the blood (see above in diagnosis) has been associated with a greater tendency toward more destructive forms of rheumatoid arthritis.

Studies involving various types of the connective tissue collagen are in progress and show encouraging signs of reducing rheumatoid disease activity. Finally, genetic research and engineering is likely to bring forth many new avenues of earlier diagnosis and accurate treatment in the near future. Gene profiling, also known as gene array analysis, is being identified as a helpful method of defining which people will respond to which medications. Studies are underway that are using gene array analysis to determine which patients will be at more risk for more aggressive disease. This is all occurring because of technology improvements. We are at the threshold of tremendous improvements in the way rheumatoid arthritis is managed.

Rheumatoid Arthritis At A Glance

- Rheumatoid arthritis is an autoimmune disease that can cause chronic inflammation of the joints and other areas of the body.
- Rheumatoid arthritis can affect persons of all ages.
- The cause of rheumatoid arthritis is not known.
- Rheumatoid arthritis is a chronic disease, characterized by periods of disease flares and remissions.
- In rheumatoid arthritis, multiple joints are usually, but not always, affected in a symmetrical pattern.

- Chronic inflammation of rheumatoid arthritis can cause permanent joint destruction and deformity.
- Damage to joints can occur early and does not correlate with symptoms.
- The "rheumatoid factor" is an antibody blood test that can be found in 80 % of patients with rheumatoid arthritis.
- There is no known cure for rheumatoid arthritis.
- The treatment of rheumatoid arthritis optimally involves a combination of patient education, rest and exercise, joint protection, medications, and occasionally surgery.
- Early treatment of rheumatoid arthritis results in better outcomes.

For further information about rheumatoid arthritis, please visit the following sites:

[The Arthritis Foundation](http://www.arthritis.org) (<http://www.arthritis.org>)

P.O. Box 19000

Atlanta, Georgia 30326

(or contact your local chapter)

For additional information, please contact:

National Arthritis and Musculoskeletal and Skin Diseases Clearinghouse

Box AMS

Bethesda, Maryland 20892

301-495-4484

Reference:

Clinical Primer of Rheumatology, Lippincott Williams & Wilkens, edited by William Koopman, et. al., 2003.

Kelley's Textbook of Rheumatology, W B Saunders Co, edited by Shaun Ruddy, et.al., 2000.

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