

Autoimmunity takes many forms. There are also many treatments for it. Treatment depends on the type of disease, how severe it is, and its symptoms. Generally, treatments have one of three goals:

Relieving symptoms—If your symptoms bother you, your doctor may suggest treatments that give some relief. Relieving symptoms may be as simple as taking a drug for pain relief. It may also be as involved as having surgery.

Preserving organ function—When autoimmune diseases threaten organs, treatment may be needed to prevent damage. Such treatments may include drugs to control an inflamed kidney in people with lupus. Insulin injections can regulate blood sugar in people with diabetes. These treatments don't stop the disease. But they can save organ function. They can also help people live with disease complications.

Targeting disease mechanisms—Some drugs may also be used to target how the disease works. In other words, they can suppress the immune system. These drugs include cyclophosphamide (Cytoxan*) and cyclosporine (Neoral and Sandimmune). The same immune-suppressing drug may be used for many diseases.

Physicians most often help patients manage the consequences of inflammation caused by the autoimmune disease. For example, in people with Type 1 diabetes, physicians prescribe insulin to control blood sugar levels so that elevated blood sugar will not damage the kidneys, eyes, blood vessels, and nerves. However, the goal of scientific research is to prevent inflammation from causing destruction of the insulin-producing cells of the pancreas, which are necessary to control blood sugars. In some diseases such as lupus or rheumatoid arthritis, medication can occasionally slow or stop the immune system's destruction of the kidneys or joints. These drugs include corticosteroids (prednisone), methotrexate, cyclophosphamide, azathioprine, and cyclosporin. Unfortunately, these medications also suppress the ability of the immune system to fight infection and have other potentially serious side effects. ♦

Case Study

A six-year-old Caucasian female presented to the emergency room with episodes of abdominal pain and occasional fever. The symptoms had been occurring over several days. Approximately one year earlier, she had gone to the ER with the same complaints. Nothing unusual was noted at that time.

Laboratory Work:

The CBC revealed a hemoglobin of 10.0 g/dl, a WBC of 169.6×10^3 , and a platelet count of 545,000. The manual differential showed 54 segmented neutrophils, 19 bands, 13 lymphocytes, 4 monocytes, 2 eosinophil, 1 basophil, 5 metamyelocyte, and 1 promyelocyte. Calcium and AST were increased on the metabolic panel. The urinalysis contained 2+ leukocyte esterase.

The patient was referred to a pediatric oncologist for a bone marrow aspirate. In conjunction with the bone marrow aspirate, flow cytometry and cytogenetic studies were obtained. The Philadelphia chromosome translocation abnormality was revealed upon chromosomal analysis of the bone marrow. The abnormality is an indication of Chronic Myelocytic Leukemia (CML). Approximately 90% of CML patients will have the Philadelphia chromosome. A FISH (fluorescent in situ hybridization) study was performed and 95.8% of 500 nuclei had fusion of the BCR and ABL signals. Fusion of these two genes leads to the leukemogenic process. CML is predominantly found in adults. It is very rare in children.

Treatment:

Typically, Interferon and Cytarabine are used to treat CML patients. However, this patient was given Gleevec, a new gene-targeting drug. Gleevec is a tyrosine-kinase activity inhibitor that slows white blood cell growth. It was approved for pediatric use five days prior to the patient's diagnosis of CML. In early June, the patient was started on Gleevec. After one week of treatment, her white blood cell count was down to 10.8×10^3 . She is also scheduled to have a bone marrow transplant. ♦

Client Service Spotlight



Michelle Friesen has been an employee of Avera Sacred Heart Hospital for 7 years. She is a medical technologist (ASCP) from Menno, SD. She received her bachelor's degree in Clinical Laboratory Science from SDSU and completed her internship at Sioux Valley Hospital. She and her husband Lee have two children: Seth, age 5, and Aidan, age 2. Their pets include 2 cats (on a regular basis) and whatever her boys bring home...frogs, snakes, worms, butterflies, etc.!

Michelle enjoys listening to books on tape during her 45 minute commute to ASHH, going for walks, decorating birthday cakes, and "researching" on the internet. Her favorite aspect of lab work is the challenge of keeping up with the constantly changing instrumentation and methodology. She also works for a temp agency (Lewis and Clark Health Education and Services) in Yankton. Michelle appreciates the exposure she receives when working in different laboratory environments and gains new perspectives on laboratory practices and instrumentation



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Medicare Increases Reimbursement To Physicians

When the Centers for Medicare and Medicaid Services issued its final ruling for the physician fee schedule for 2003, CMS director Tom Scully stated that the CMS believed the formula used to calculate the amounts was flawed. The CMS explained that it did not have the authority to use actual, after-the-fact data to revise the estimates used for calculating the sustainable growth rates for fiscal years 1998 and 1999 for the purpose of deciding future updates. However, the CMS lacks the power to change the statutory formula. On February 13, 2003 Congress passed the Consolidated Appropriations Resolution 2003 (CAR) which allowed the CMS to make an adjustment to the SGR's of FY 1998 and FY 1999. After CAR, the CMS revised the SGR for 1998 to 3.2% (an increase of 1.7%) and for 1999 to 4.2% (an increase of 4.5%). The revisions were then used to recalculate updates. A second final ruling was issued February 28, 2003 which stated that the conversion factor for 2003 was to increase 1.4% rather than decrease 4.4%. The CF dollar value changed from \$34.59 to \$36.79. Reimbursement for an office visit went from a uniform national amount of \$47.76 to \$51.13, and for a screening mammogram to increase to \$82.77 from \$77.30. The new physician fee schedule will apply to services used from March 1 to December 31, 2003.

Sources: www.ama-assn.org • www.rbrvs.com • www.cap.org • www.cms.hhs.gov ♦

Medicare Reimbursement 101

Have you ever wondered how the federal government comes up with the dollar amounts for Medicare reimbursed services? Since January 1, 1992 Medicare has paid for physician services under section 1848 of the Social Security Act, which is entitled "Payment for Physician Services". Section 1848 is the foundation for reimbursement calculations and is composed of three major elements: a physician fee schedule, a sustainable growth rate (SGR), and limits on amounts that non-participating providers can charge beneficiaries.

Medicare uses the physician fee schedule to pay for more than 7,000 services. Under the formula provided in section 1848 (b) (1) the payment amount for each service is the product of three factors:

1. a nationally uniform relative value index (RVU)
2. a geographic adjustment factor (GAF)
3. a nationally uniform conversion factor (CF)

Section 1848 requires that payments made under the physician fee schedule be based on a national RVU. Each individual service has a total RVU value based on the sum of these three measurable resources:

1. RVU for physician work
2. RVU for practice expenses
3. RVU for malpractice expenses

New Tests Available Through ALN

Platelet Function Analyzer - Avera McKennan

The traditional bleeding time is operator dependent, poorly reproducible and can potentially cause scarring. The test has questionable sensitivity to platelet defects and poor correlation to bleeding tendency. The PFA-100 platelet function analyzer is an automated system that uses the agonists collagen/epinephrine and collagen/ADP to stimulate platelet aggregation. The instrument measures the time required for a formed platelet plug to block a microscopic aperture (closure time). This measurement indicates platelet adhesion and aggregation in the sample.

The PFA-100 has been shown to detect disorders in primary hemostasis and platelet function. The closure time is prolonged by thrombocytopenia, low hematocrit, anti-platelet drugs, and acquired platelet defects.

The total of these three expenditures make up the national uniform RVU for a service. However, this is a "mythical" value, no one receives the uniform national average amount. Each reimbursable service is assigned geographical practice cost indices (GPCI's). GPCI's reflect the *local* relative value costs of each of the three RVU's.

The final variable in the Medicare formula is the nationally uniform conversion factor (CF). The function of CF's in the formula is to translate the resources used in providing a service into a tangible dollar amount. CF's are required by law to be updated annually.

And now, finally, the actual Medicare formula used to calculate a CPT code amount:

$ \begin{array}{r} \text{physician work RVU} \times \text{physician work GPCI} \\ + \\ \text{practice expense RVU} \times \text{practice expense GPCI} \\ + \\ \text{malpractice expense RVU} \times \text{malpractice expense GPCI} \\ \hline = \text{total RVU} \\ \times \\ \text{CF} \\ \hline = \$ \text{ payment} \quad \blacklozenge \end{array} $

The specimen is whole blood collected in 3.2% buffered Na citrate. The specimen is stored at room temperature and the test must be performed within 4 hours of collection. Agitation of the specimen must be avoided to prevent activation of platelets prematurely.

High sensitivity C-reactive Proteins

The American Heart Association and the Centers for Disease Control report that the results of hs-CRP should be reported in milligrams per liter, with concentrations of <1.0mg/L defined as high risk; 1.0-3.0 mg/L as average risk; and >3.0 mg/L defined as high risk. People in the high risk category have about a two fold increase in relative risk for cardiovascular disease than those in the low risk group. Hs-CRP testing in combination with lipid testing has been reported to provide predictive information for future cardiac events. The specimen of choice is serum. ♦

Autoimmune Diseases

No one knows why the immune system treats some body parts like germs. It is known that you can't catch autoimmune diseases from another person. Most scientists think that our genes and things in the environment are involved. If you have a certain gene or combination of genes, you may be at higher risk for autoimmune disease. But you won't get the disease until something around you turns on your immune system. This may include the sun, infections, drugs, or, in some women, pregnancy.

Autoimmune diseases are often chronic, requiring lifelong care and monitoring, even when the person may look or feel well. Currently, few autoimmune diseases can be cured or made to "disappear" with treatment. However, many people with these diseases can live normal lives when they receive appropriate medical care.

Autoimmunity can affect almost any organ or body system. The exact problem one has with autoimmunity (or its diseases) depends on which tissues are targeted. If the skin is the target, you may have skin rashes, blisters, or color changes. If it's the thyroid gland, you may be tired, gain weight, be more sensitive to cold, and have muscle aches. If it's the joints, you may have joint pain, stiffness, and loss of function. In many people, the first symptoms are fatigue, muscle aches, and low fever.

Because autoimmune diseases can affect almost any organ or system of the body, one way to group them is by the body system(s) they attack. The following is a list (not inclusive) of body systems and the autoimmune diseases that can affect them.

Blood & Blood Vessels

- Autoimmune hemolytic anemia
- Pernicious anemia
- Polyarteritis nodosa
- Systemic lupus erythematosus
- Wegener's granulomatosis

Digestive Tract (including the mouth)

- Autoimmune hepatitis
- Behçet's disease
- Crohn's disease
- Primary biliary cirrhosis
- Scleroderma
- Ulcerative colitis

Eyes

- Sjögren's syndrome
- Type 1 diabetes mellitus
- Uveitis

Glands

- Graves' disease
- Thyroiditis
- Type 1 diabetes mellitus

Heart

- Myocarditis
- Rheumatic fever
- Scleroderma
- Systemic lupus erythematosus

Joints

- Ankylosing spondylitis
- Rheumatoid arthritis
- Systemic lupus erythematosus

Kidneys

- Glomerulonephritis
- Systemic lupus erythematosus
- Type 1 diabetes mellitus

Lungs

- Rheumatoid arthritis
- Sarcoidosis
- Scleroderma
- Systemic lupus erythematosus

Muscles

- Dermatomyositis
- Myasthenia gravis
- Polymyositis

Nerves & Brain

- Guillain-Barré syndrome
- Multiple sclerosis
- Systemic lupus erythematosus

Skin

- Alopecia areata
- Pemphigus/pemphigoid
- Psoriasis
- Scleroderma
- Systemic lupus erythematosus
- Vitiligo

Chronic Fatigue syndrome and fibromyalgia are also considered autoimmune diseases.

Autoimmune diseases often don't show a clear pattern of symptoms at first. So diagnosing them can be hard. But with time, a diagnosis can usually be made by using: Medical history, Physical exam, and Medical tests.

No one test will show that you have an autoimmune disease. But doctors may find clues in a blood sample and there are numerous tests that can be helpful if finding these clues. An example would be people with lupus or rheumatoid arthritis often have certain autoantibodies in their blood. Autoantibodies are blood proteins formed against the body's own parts.

FANA, fluorescent antinuclear antibody, is used to help diagnose systemic lupus erythematosus (SLE) and drug-induced lupus, but may also be positive in cases of scleroderma, Sjögren's syndrome, Raynaud's disease, juvenile chronic arthritis, rheumatoid arthritis, antiphospholipid antibody syndrome, autoimmune hepatitis, and many other autoimmune and non-autoimmune diseases. For this reason, SLE, which is commonly known as lupus, can be tricky to diagnose correctly. Because the ANA test result may be positive in a number of these other diseases, additional testing can help to establish a diagnosis of SLE. More specific subsets of the general ANA test are used to help pinpoint the specific autoimmune disease; these tests include anti-dsDNA, anti-Sm, Sjögren's syndrome antigen (SSA, SSB); Scl-70 antibodies; anti-centromere; anti-histone; anti-RNP

Not all people with these diseases have these autoantibodies. And some people without autoimmune disease do have them. So blood tests alone may not always help. But if a person has disease symptoms and autoantibodies, the doctor can be sure of a diagnosis.