Rabies Antibody, Serology

Background: Usually transmitted by bite of bates or exposure such as open wounds or inhalation of aerosols of bat urine. Vaccination available for high risk individuals such as vegetarians. Immunoglobulins available.

Sampling: Animal: Punch biopsy from the neck with many hair follicles, snap freeze, ship at -70°C to reference lab. Ideally, animal brain, frozen -70° C. Follow instructions from reference lab. Domestic animals suspected of rabies should be kept for 10 days, survival makes rabies unlikely.

Human: Cerebrospinal fluid, serum, saliva, brain biopsy, nuchal skin.

Information: www.Cdc.gov/ncidod/dvrd/rabies

To asses immune status: 2 mL serum

Reference Interval: Rabies Antibody Immunity > 0.5 IE/mL

Renin Activity, Plasma

Relate information:
Aldosterone, Serum or Plasma
Aldosterone, Urine
Potassium, Serum or Plasma
Potassium, Urine
Sodium (Na), Serum
Sodium (Na), Urine

Background: Conversion of angiotensinogen to angiotensin I is catalyzed by renin. Angiotensin I is further cut by a "converting enzyme" to angiotensin II, which stimulates the secretion of aldosterone and is an active vasopressor. To test plasma renin activity is useful in the diagnosis of hyperaldosteronism known to be two major types:

1) primary hyperaldosteronism (Conn Syndrome) in which aldosterone is autonomously produced by an adrenal adenoma. Usually renin is low and does not increase in response to stimuli such as volume depletion, hyponatremia or upright posture.
2) secondary hyperaldosteronism as a response to cardiac failure, cirrhosis, renovascular hypertension, renin secreting tumors, forced diuresis, vomiting with usually high renin activity.

Sampling: There is a circadian variation with a morning maximum and late afternoon minimum. Sampling has to be standardized, best in the morning and upright position, both to be recorded to the laboratory.

A 5ml specimen should be drawn into a pre chilled EDTA or heparin tube and kept on ice to be transported immediately to the laboratory or plasma has to be separated in a 4°C pre-chilled centrifuge and to be frozen immediately. No freeze-thaw cycles.

To test for primary hyperaldosteronism: Sample first specimen at 8 am for renin activity after 30 min in an upright position before placing patient on low sodium diet for 3-6 days and sample second specimen under exact same conditions. To give a maximal stimulation, in addition a diuretic can be administered before the second sampling. There may be in some patients with

Conn syndrome an increase in renin activity. Interpretation only validated by concurrent serum aldosterone levels.

Reference Interval:	3-19 pg/ml	unstimulated
	5-40 pg/ml	stimulated

Respiratory Syncytial Virus, Serology

Synonyms: RSV

Background: As the most common viral agent causing respiratory infections in children, up to 50% of infants have experienced an infection with fever, wheezing cough, rhinorrhea.

Since young infants have maternal IgG antibodies, false positive results are possible, a fourfold increase of IgG antibodies can only detected in 50% of the children younger than 6 month.

Sampling: 1 mL of serum when patient develops signs of infection and 10 to 30 days later a second sample is required.

Reference Interval:	IgG antibody	negative	< 20 RE/mL
	IgA antibody	negative	< 0.7 COI
		borderline	0.7-1.0 COI
		positive	> 1.0 COI

Reticulocyte Count

Related Information: Erythropoietin (EPO), Serum
Blood Count, Complete

Background: Monitoring response to anemia therapy. Marker for success of marrow engraftment after transplantation. Marker of early response to immunosuppression during therapy of aplastic anemias.

In transfused patients, dilution my decrease reticulocyte counts. False high counts may occur due to intracellular parasites, large platelets, drug therapies, erythropoietic protoporphyria, cold agglutinins.

Sampling: 1 mL EDTA blood

Reference Interval:

Adults	0.5-1.5%
at birth	1.6-8.3% , mean 5.3% falling to adult level by the end of week two.
Absolute count:	10-80 x 10^9 /L
	Reticulocytes > 100 x 10^9 /L indicates increased erythropoiesis.

Corrected reticulocyte count for anemic patients:

Reticulocyte Index = reticulocytes (%) x patients Hct / normal Hct

Rheumatoid Factor, Serum or Body Fluid

Related information: Antinuclear antibodies
C-Reactive Protein, Serum
Cryoglobulin, Qualitative, Serum or Plasma
HLA-B27
Immunoglobulin M (IgM)

Synonyms: RF

Background: RF is in most of the cases an IgM class antibody, occasionally of IgG, IgA, or IgE classes, reacting with the Fc region of other immunoglobulins, often of the IgG class and form immune complexes mediating in high concentrations tissue injury.

Up to 85% of patients clinically diagnosed with rheumatoid arthritis (RA) have positive RF. However, 3% of the general population has low levels of RF, in the group of 65 years and older up to 20% have increased levels. As little as 5% of RF positive individuals will develop RA and the risk correlates with RF values. High values are also associated with prevalence of subcutaneous nodules, necrotizing vasculitis, and poorer long term prognosis. Positive RF in joint fluid may be an early indicator before serum RF increases.

Specificity for RA is low but increases with high values and repeated positive tests. High levels of RF are also present in most of patients with Sjoegren syndrome and essential mixed cryoglobulinemia. Low values are predominant in connective tissue diseases, in chronic and inflammatory disorders such as infective endocarditis, tuberculosis, liver diseases, sarcoidosis, idiopathic pulmonary fibrosis, and hematologic diseases. They may be associated with hypergammaglobulinemia.

Sensitivity of RF is also not high, 35% of patients with RF have negative RF test results. In children with juvenile RA, only 30% have elevated RF levels.

Usually, negative for RF are patients with Reiter's syndrome, ankylosing spondylitis, psoriasis.

For disease and therapeutic monitoring, RF is not the appropriate parameter, C Reactive Protein and Sedimentation rates are more useful.

Sampling: 1 mL serum

Reference Interval: < 14 IU/mL

Riboflavin see Vitamin B2, Serum

Ribonucleoprotein U1-snRNP Antibody

Related Information: Smith (SM) Antibody
SS-A/Ro and SS-B/La Antibodies

Background: The U1-snRNP antibody binds to U1-snRNP which is a ribonucleoprotein assembled of protein A, protein C and other proteins complexed with a small nuclear RNA fragment (see also Smith (SM) Antibody).

The U1-snRNP antibody is defining mixed connective tissue disease (MCTD), which is an overlap syndrome of systemic lupus erythematosus (SLE), scleroderma, polymyositis, arthritis, arthralgia, esophageal dysmotility, Raynaud phenomena, but rare renal involvement. Rheuma factor (RF) is positive in 50% of the patients.

High levels of U1-snRNP antibodies are highly suggestive for MCTD particularly if anti-DNA antibodies (Antibodies, dsDNA and Antibodies, ssDNA), Smith (SM) Antibody, and histone antibodies are absent. However low levels of U1-snRNP antibody are found in SLE, scleroderma and other diseases.

Sampling: 1 mL serum

Reference Interval: Negative: <10 U/mL

Rickettsiosis see Coxiella burnetii, Serology

RNP-U1 see Ribonucleoprotein U1-snRNP Antibody

Rota Virus, Serology

Related Information: Helminths, Feces, Microscopy
Enterohemorrhagic E.coli (EHEC), (E.coli O157)
Enteropathogenic E.coli (EPEC)
Rota Virus, Direct Detection
Shigella, Culture and Serology

Background: Human rotavirus is the most common cause of severe diarrhea in infants 6 month to 3 years of age, transmitted as a highly contagious agent via the fecal-oral route and occurs predominantly in winter. Group A is as common in developing as well as in industrialized countries, group B primarily in China, group C occurs more sporadically. Incubation period is 1-2 days with abrupt onset, accompanied by vomiting, fever, diarrhea, abdominal pain and lasts usually 5-8 days and is rarely fatal, although it may be complicated by serve dehydration. Other causes to consider are adeno-calici-astro-corona-norwalk- or norwalklike-viruses.

Sampling: 2 mL serum, sampling at onset of disease and 1-2 weeks later.

Reference Interval: Negative: Children titer < 1:10
Adult titer < 1:40

Rota Virus, Direct Detection

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Background: Please see: Rota Virus, Serology

As a limitation of direct Rotar virus detection (EIA) false positive results in healthy neonates occur, however in symptomatic individuals the results are reliable.

Sampling: Approx. 2 g stool

Reference Interval: Report on antigen detection: negative

Rubella, Serology

Background: Due to a wide use of mumps-measles-rubella immunization in children in western countries, the incidence has fallen since 1994 and is targeted by the CDC to be eradicated. However, several outbreaks have been reported in populations not immunized. The infection is characterized by a macular exanthema, lymphadenopathy, pharyngitis, conjunctivitis, the incubation period is 2-3 weeks and subclinical infections are common.

Pregnancy: Pregnant women who become infected with rubella have a high risk to transmit the virus via the placenta to infect the fetus. Infection of the fetus may cause fetal death, premature delivery, severe congenital defects such as deafness and congenital heart disease. Excretion of rubella in intrauterine infected neonates lasts for month in nasopharyngeal secretions and urine after birth. Rubella vaccination is therefore strongly recommended in women in childbearing age and being not pregnant at time of receiving the vaccination.

Since IgM antibodies do not cross the placenta, IgM antibody in the child suggests rubella infection, whereas a single positive IgG antibody titre may be due to maternal transfer of IgG via the placenta.

Sampling: 1 mL of serum is needed for the acute, first serologic sample and for a second, convalescent sample after 2-3 weeks. Rise in titer more than three fold suggests rubella infection or vaccination.

Reference Interval:

HAH method:	negative:	titer < 1:8 immunity absent
	borderline:	titer 1:16 immunity questionable
	positive:	titer > 1:16 immunity present

Immunoglobulin classes:

Positive IgG indicates immunity, positive IgM indicates either infection or recent vaccination.

IgG antibody	negative:	< 10 IU/mL, immunity absent
IgM antibody	negative:	< 15 AU/mL
	borderline:	15-25 AU/m
	positive:	>25 AU/mL