

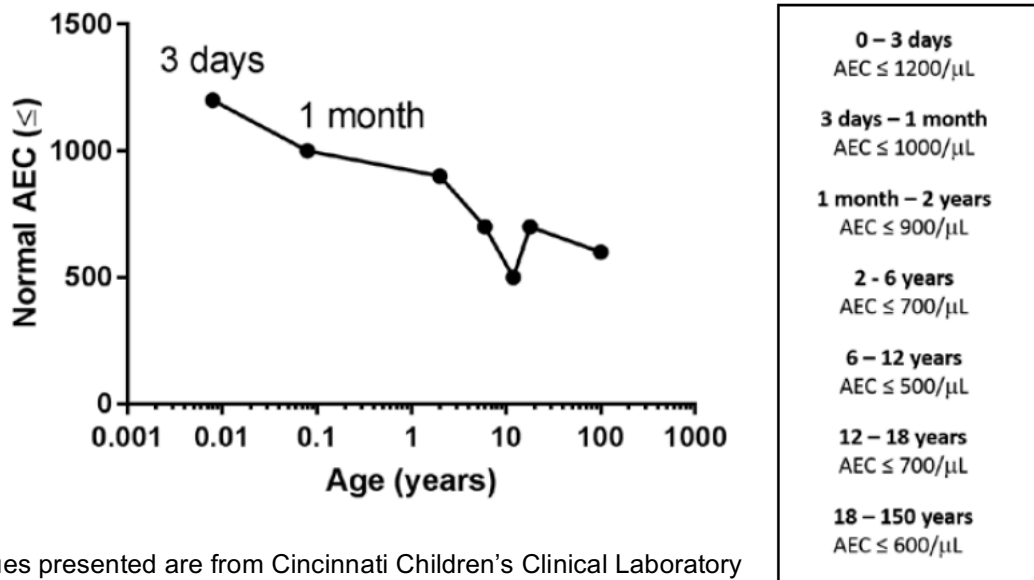
Eosinophilia

Eosinophils are a normal cellular component of the blood and of certain tissues, including the spleen, lymph nodes and thymus and the submucosal areas of the gastrointestinal, respiratory and genitourinary tracts. Eosinophilic disorders occur when eosinophils are found in above-normal amounts, called 'eosinophilia', in various parts of the body. When the body wants to attack a substance, such as an allergy-triggering food or airborne allergen or a parasite, eosinophils respond by moving into the area and releasing a variety of toxins. However, when the body produces too many eosinophils, they can cause chronic inflammation resulting in tissue damage.

How Many Eosinophils is Too Many?

What are "normal" or "above-normal" amounts of eosinophils? There are not published, established guidelines to answer this question, and the amount will vary by location in the body; however, we know from our Clinical Laboratory here at Cincinnati Children's that the maximum absolute eosinophil count (AEC) in the peripheral blood varies by age, with it being higher in younger children.

Maximum Absolute Eosinophil Count (AEC) in Peripheral Blood



Values presented are from Cincinnati Children's Clinical Laboratory

What Could Too Many Eosinophils Be From?

There are many disorders in which eosinophils have been found to be elevated in the blood or in different tissues. General categories of disease, each with examples of those that have increased levels of eosinophils, are presented herein and range from allergic disorders to endocrine disorders. These are differential diagnoses for a patient with eosinophilia.

Allergic Disorders

Allergic disorders are classically characterized by the presence of eosinophils. Allergic rhinoconjunctivitis (hay fever) has increased levels of eosinophils in the nasal mucosa. Asthma, after an exacerbation, shows increased numbers of eosinophils in the lung and blood. Atopic dermatitis (aka, eczema) has increased levels of eosinophils in the skin and peripheral blood. Eosinophilic gastrointestinal disorders have increased levels of eosinophils in portions of the gastrointestinal tract (esophagus, stomach, small intestine, large intestine, or multiple segments).

Drug Reactions

Any drug / medicine (prescription, non-prescription, supplements) has the potential to cause a reaction. Some of these reactions are allergic in nature, and eosinophils might be elevated in blood or in tissues where the drug is concentrated.

Connective Tissue and Inflammatory Disorders

Connective tissue and inflammatory disorders, including eosinophilic granulomatosis with polyangiitis (EGPA, formerly known as Churg-Strauss syndrome), rheumatoid arthritis, sarcoidosis and inflammatory bowel disease, can have increased eosinophil levels.

Infectious Diseases

Parasitic infections, fungal infections and some other types of infections are associated with increased numbers of eosinophils. Below are presented different types of infection and specific infectious organisms or conditions.

- Helminth (especially tissue-invasive)
- Ectoparasite (scabies, myiasis)
- Fungi (especially coccidiomycosis and ABPA)

Eosinophilia is rarely associated with infections by protozoa (except for *Sarcocystis* and *Isospora belli*) or by bacteria (except for resolving scarlet fever and tuberculosis [TB]) or by viruses (except for advanced HIV).

Blood, Neoplasm and Myeloproliferative Disorders

Hematologic, neoplasm and myeloproliferative disorders with increased levels of eosinophils include hypereosinophilic syndrome, leukemias (myelogenous and lymphocytic), lymphomas (especially Hodgkin lymphoma, cutaneous T cell lymphoma [CTCL] and other T cell lymphomas), tumors (e.g., adenocarcinoma of the bowel, lung, ovary or other solid organ), myeloproliferative neoplasms (e.g., *PDGFRA*-, *PDGFRB*- or *FGFR1*-associated), systemic mastocytosis and atheroembolic disease (e.g., cholesterol embolism syndrome).

Immunologic Disorders and Reactions

Immunodeficiency (especially *DOCK8* deficiency, *STAT3* deficiency [e.g., hyper-IgE syndrome] and Omenn syndrome), thymomas, and transplant rejections are only a few types of immunologic conditions with increased numbers of eosinophils.

Endocrine Disorders

Hypoadrenalism has been associated with increases in the levels of eosinophils in the blood.

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