**Eosinophils**

**Interpretive Summary**

**Description:** Eosinophils are white blood cells that are specialized to combat parasites and other infectious diseases. They are also involved in allergic responses.

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**Decreased Eosinophils**

**Common Causes**

- Normal (some reference intervals include zero)
- Corticosteroid-induced
  - Cushing's disease
  - Exogenous glucocorticoids

**Uncommon Causes**

- Epinephrine-induced
- Decreased bone marrow production
- Peripheral destruction by immune or other mechanisms

**Related Findings**

- Corticosteroid-induced
  - Neutrophilia, lymphopenia, monocytosis, eosinopenia, possible thrombocytosis
  - Increased ALP, possible mild increases in GGT, ALT, cholesterol, and glucose
  - Supportive endocrine testing (abnormal urine cortisol: creatinine ratio, ACTH stimulation test, and/or low dose dexamethasone suppression tests)

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**Increased Eosinophils**

**Common Causes**

- Parasitic infections: ectoparasites and endoparasites
- Allergic/Hypersensitivity responses
  - Asthma
  - Eosinophilic granuloma complex
  - Allergic dermatitis/atopy
  - Food allergies
  - Eosinophilic gastroenteritis
  - Allergic rhinitis/sinusitis

**Uncommon Causes**

- Infectious: viral, bacterial, fungal, protozoal
- Neoplasia
  - Mast cell neoplasia
  - Lymphoma
  - Carcinoma
  - Thymoma
  - Eosinophilic leukemia
- Endocrine
  - Addison's disease
  - Hyperthyroidism
- Idiopathic conditions
  - Masticatory or extraocular muscle myositis (dogs)
  - Panosteitis (dogs)
  - Eosinophilic bronchopneumopathy (dogs)

Related Findings

- Parasitic infections
  - Positive skin scrapings for ectoparasites
  - Positive fecal tests (fecal ova & parasites, Baermann test, or fecal sedimentation) for parasite eggs or larvae
  - Positive heartworm testing (serology for antigen or antibody, microfilaria testing)
- Hypersensitivity responses
  - Asthma
    - Bronchial pattern on thoracic radiographs
    - Eosinophilic and neutrophilic inflammation found on transtracheal or endotracheal wash
  - Eosinophilic granuloma complex
    - Histopathology supportive of eosinophilic granuloma complex
  - Allergic dermatitis/atopy
    - Abnormalities on skin allergy testing
    - Histopathology supportive of allergic dermatitis
  - Food allergies/eosinophilic gastroenteritis
    - Gastrointestinal biopsies showing eosinophilic inflammation
    - Gastric and/or intestinal wall thickening found on abdominal ultrasound
    - Abnormal serum folate and cobalamin
  - Allergic rhinitis/sinusitis
    - Lymphoplasmacytic or eosinophilic inflammation on nasal biopsies

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Additional Information

**Physiology**

- Eosinophil granules stain variably eosinophilic (pink) depending on the species, and their shape is species specific.
  - The granules are large, round, and uniform in the horse, and rod-shaped and less bright in the cat.
  - Dogs can have varying numbers and sizes of granules.
  - The granules contain lysozymes and other substances that are important to their protective function.
- Eosinophils are active in killing of helminths and also in the regulation of mast cells.
- Eosinophils are most commonly found in the skin, lung, gastrointestinal tract and endometrium

**Diagnostic Methodology**

- The absolute eosinophil count is calculated by multiplying eosinophil percentage (relative eosinophil count) by the total white blood cell count.

**References**


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