Benign Leukocytoses

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Benign Leukocytoses

- Neutrophilia
- Lymphocytosis
- Basophilia
- Monocytosis
- Eosinophilia
Neutrophilia

- Neutrophils fight infection, participate in inflammatory responses
- Bone marrow
  - Most neutrophils live here
  - All stages of maturation
- Blood
  - Only 5% of all neutrophils are here
  - Normally only segmented neutrophils
  - Half are marginated
Types of Neutrophilia

- Mature (lots of segmented neutrophils)
- Immature (lots of immature neutrophils)
Mature neutrophilia
Immature neutrophilia
Causes of Mature Neutrophilia

- Infection (bacterial)
- Inflammation
- Physiologic things
  - Stress
  - Hormones
Toxic Changes

- Seen only in infection!
- Toxic granulation, Döhle bodies, cytoplasmic vacuolization
- Scariest: cytoplasmic vacuolization
Normal neutrophil (top left)  Neutrophil with toxic granulation
Promyelocyte
Döhle bodies
Cytoplasmic vacuolization
Causes of Immature Neutrophilia

- Infection (bacterial)
- Inflammation
- Severe anemia
- Something filling up the marrow
Three Forms of Immature Neutrophilia

• Left shift
<table>
<thead>
<tr>
<th>blast</th>
<th>promyelocyte</th>
<th>myelocyte</th>
<th>metamyelocyte</th>
<th>band</th>
<th>segmented neutrophil</th>
</tr>
</thead>
</table>
Left shift
Three Forms of Immature Neutrophilia

- Left shift
- Leukemoid reaction
Three Forms of Immature Neutrophilia

- Left shift
- Leukemoid reaction
- Leukoerythroblastastic reaction
Leukoerythroblastic reaction
Three Forms of Immature Neutrophilia

- Left shift
- Leukemoid reaction
- Leukoerythroblastic reaction
  - Due to something malignant
  - Due to something benign
Lymphocytes fight infection, participate in immunologic responses

Normal lymphocyte count
- Varies a lot with age!
- Bigger normal range in infants

Normal immunophenotype in blood
- T cells: 80%
- B cells: 15%
- NK cells: 5%
Types of Lymphocytosis

- Mature (lots of mature lymphocytes)
- Reactive (lots of funny-looking lymphocytes)
Mature lymphocytosis
Reactive lymphocytosis
Causes of Mature Lymphocytosis

- Infectious lymphocytosis
- Bordetella pertussis
- Transient stress
Causes of Reactive Lymphocytosis

- Infectious mononucleosis
- Pediatric viral infections
- Viral hepatitis
- Immune disorders
Downey cells
Other Benign Leukocytoses

- Basophilia
  - CML
  - CML
  - CML
Basophilia
Other Benign Leukocytoses

- Basophilia
- Eosinophilia
  - Drugs
  - Asthma
  - Skin diseases
  - Parasites
Eosinophilia
Other Benign Leukocytoses

- Basophilia
- Eosinophilia
- Monocytosis
  - Infection
  - Autoimmune disease
  - Malignancy