

# Neutrophilia

ANC (PMN cells + bands) > 7 x 10<sup>9</sup>/L  
(in peripheral blood)

## Reactive

**Orderly** ↑ in neutrophils:  
PMNs > bands > metamyelocytes

## Neoplastic

**Disorderly** ↑ in neutrophils:  
All cells along neutrophil maturation process are seen  
in .abnormal ratios

### Infectious

→ Usually Bacterial  
→ Can be generalized, localized, pyrogenic, abscess-forming  
→ Sometimes viral

### Inflammatory (necrosis)

→ Cardiac infarct, ischemic trauma, vasculitis  
→ Solid tumors (necrosis): cancer outgrowing blood supply

### Metabolic

→ uremia  
→ acidosis  
→ gout  
→ poisoning  
→ eclampsia

### Medications

(stress-related)  
→ Steroids  
→ Epinephrine  
→ lithium

## Chronic:

### Myeloproliferative Dx

1 main myeloid cell line ↑, with slight ↑ses in other myeloid cell lines

**Chronic Myelogenous Leukemia (CML)**  
→ mutation at very initial pluripotent hematopoietic stem cell, ↑ WBCs  
→ ↑ basophils  
→ ↑ metamyelocyte + myelocyte "bulge" (> bands)  
→ Splenomegaly  
→ ↑ plts

### Polycythemia Vera (PV)

→ High Hematocrit  
→ EPO low or normal  
→ Pruritis post bath  
→ Headaches

### Chronic Myelomonocytic Leukemia

→ High monocytes, as well as high neutrophils  
→ RARE!!

### Acute Myeloid Leukemia (AML)

→ Mutation in initial *myeloid blast stem cell*.  
→ WBC diff: high Blasts. High neutrophils initially!  
→ *Late stages*: Pancytopenia due to marrow infiltration (bleeding, fatigue, infection) – neutropenia!

Viral-induced coughs usually **non-productive**

**PJP coughs = non-productive**

Bacterial-induced coughs produce phlegm!!!

# Neutropenia

ANC (PMN cells + bands) < 1.5 x 10<sup>9</sup>/L  
(in peripheral blood)

## Isolated Neutropenia

**Idiopathic**  
→ Chronic benign neutropenia

**Congenital**  
→ Cyclic Neutropenia

### ↓ Production (marrow)

→ "Anti-" medications:  
Anti-inflammatories  
Antibiotics  
Anti-thyroids  
Anti-hypertensives  
Anti-stroke  
Anti-psychotic  
Anti-convulsants  
Anti-rheumatic  
Anti-neoplastic  
→ Viral infections:  
EBV, CMV, HIV, flu, childhood viruses  
(measles, mumps, rubella)

### ↑ Consumption

→ Septicemia:  
infection by gram + and - bacteria and fungi:  
• *Staph. aureus* – skin  
• Coagulase negative *Staph* (MRSA) – IV sites/lines  
• Gram negatives – gut and urinary tract  
• Fungi (2: *candida* – mouth, liver, etc; *aspergillus*)  
→ If febrile, medical emergency!!!

### ↑ Destruction

→ Autoimmune:  
lupus, rheumatoid arthritis  
→ Allo-immune:  
mom to fetus, transfusion-induced

## Neutrophils and other myeloid cell lines decreased

### ↓ Production

#### Marrow infiltration

→ acute leukemia (AML, ALL) blast infiltration  
→ myeloma  
→ metastatic cancer  
→ myelodysplasia

#### Marrow Aplasia

→ Idiopathic  
→ Drugs  
→ autoimmune or alloimmune destruction  
→ severe infection or sepsis/bacteremia  
(*anemia of chronic illness*)

### Sequestration

→ Splenomegaly

#### Medications

(most common cause of adult neutropenia)  
→ Anti-\_\_\_ medications  
→ Chemotherapy, radiation → Marrow Aplasia