

# HYPERCALCEMIA

## I. ELEVATED PTH

### A. Primary

1. Sporadic
  - PTH adenoma
  - PTH hyperplasia
  - PTH carcinoma
2. Hereditary
  - MEN 1
  - MEN 2
  - Isolated adult hyperparathyroidism
  - Familial hypocalciuric hypercalcemia
3. Ectopic

### B. Secondary (Do not cause $\uparrow$ Ca<sup>++</sup>)

1. Renal failure
2. Osteomalacia
3. Pseudohyperparathyroidism
4. Malabsorption

### C. Tertiary

### D. Other

1. Lithium
2. Recovery from acute renal failure

## II. MALIGNANCY

### A. Local osteolysis

1. Multiple myeloma
2. Lymphoma
3. Some breast cancers
4. Prostate cancer

### B. Humoral

1. Vit. D-like substance
  - B-cell Lymphoma
  - Hodgkin's disease
2. PTH-related peptide mediated
  - a. Squamous and epidermoid carcinomas
    - Pharynx
    - Larynx
    - Lung
    - Esophagus
    - Cervix
    - Vulva
    - Skin

## III. VITAMIN D EXCESS

1. Vit. D intoxication
2. Granulomatous diseases
  - Sarcoid
  - TB, Leprosy
  - Fungi (Histoplasmosis)
3. Idiopathic hypercalcemia of infancy

## IV. INCREASED BONE TURNOVER

1. Hyperthyroidism
2. Immobilization w/ Paget's disease
3. Thiazides
4. Vit. A intoxication

## V. ENDOCRINE

1. Hyperthyroidism
2. Adrenal insufficiency
3. VIP-oma syndrome

## VI. ASSOCIATED WITH RENAL FAILURE

1. Severe 2<sup>o</sup> hyperparathyroidism
  - Aluminum
  - Milk-alkali syndrome

## VII. OTHER

1. Estrogens and anti-estrogens
2. Serum protein abnormalities

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2. PTH-related peptide mediated (con't)
    - b. Common
      - Breast CA
      - Ovarian CA
      - Bladder and kidney CA
    - c. Uncommon
      - T-cell lymphoma
      - HTLV 1 - associated leukemia
      - Pheochromocytoma
      - Islet cell neoplasms of pancreas