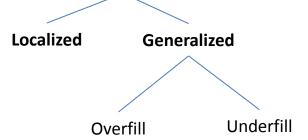
Edema

Excess fluid accumulation in the Extracellular/interstitial spaces

Pitting Edema

Usually due to intravascular issues; lymphatics unblocked, so pressing on edema pushes fluid into lymph vessels; temporary lymphatic drinage causes pitting.



2 basic pathophysiological mechanisms behind edema:

- Fluid leakage out of capillaries into surrounding interstitium. (more common)
- 2. Failure of lymphatics to return fluid from interstitium back to blood. *(rarer)*

Non-pitting Edema

Lymphedema:

Lymphatic drainage is blocked, so pressing on the edema doesn't cause fluid there to be drained into lymph, so usually no pitting.

Lymph node obstruction, alteration, or removal (tumors, mastectomies, surgeries, infections, congenital defects)

Blocked lymphatic vessels

Lymphatics are physically unable to drain fluid from the interstitum

Lymphatics can't remove plasma proteins that leaked-out into ISF, so oncotic pressure of interstitium 个

Buildup of fluid at site of tissues

Myxedema:

Tissue is deposited under the skin; "edema" is not just fluid, so doesn't leave pits

Grave's disease

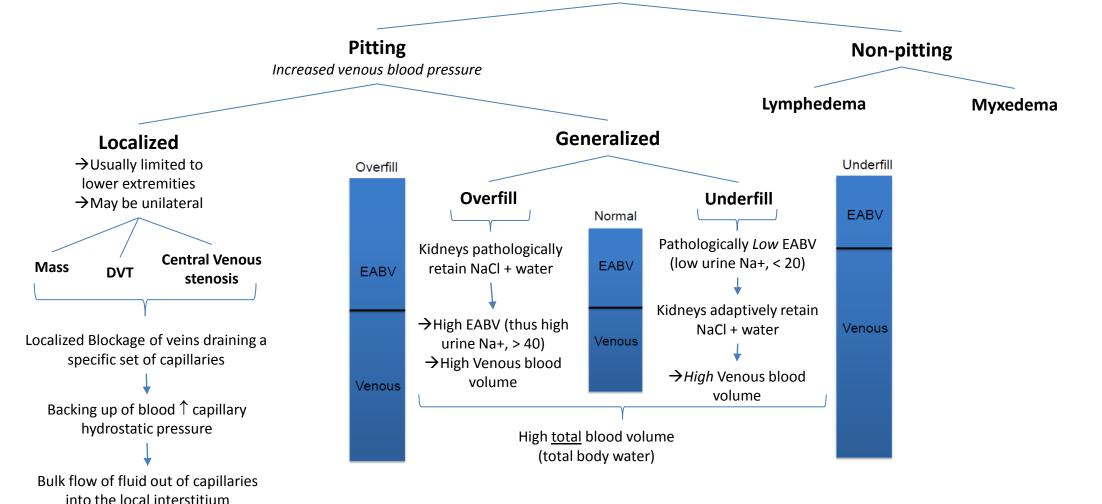
Infiltrative dermopathy

Edema

(bilateral purple orange-peels on shins)

(localized edema)

Edema: Excess fluid accumulation in the Extracellular/interstitial spaces



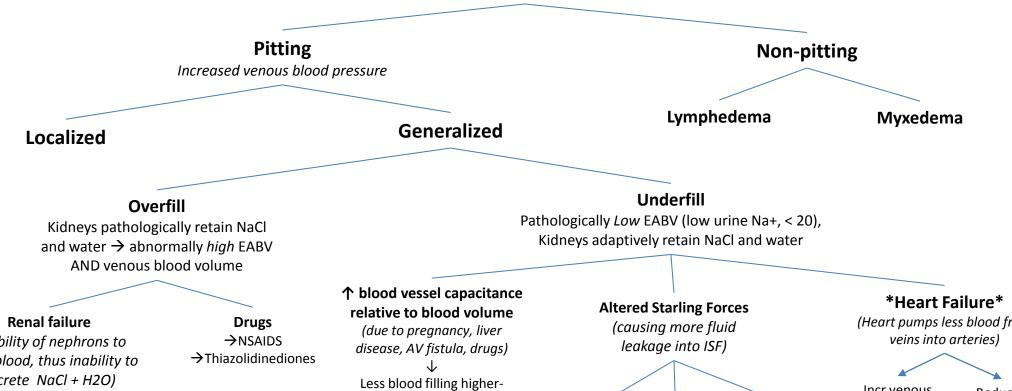
Note:

- Arteries "autoregulate" the bloodflow into the capillaries with pre-capillary sphincters, keeping capillary hydrostatic pressures constant (arterial hypertension doesn't cause edema).
- The venous system has no autoregulation, so high venous blood volume/pressure can back up into the capillaries and increase hydrostatic pressure, causing edema.

Abbreviations:

EABV = effective arterial blood volume RAAS = renin-angiotensin-aldosterone system

Edema: Excess fluid accumulation in the Extracellular/interstitial spaces



(inability of nephrons to filter blood, thus inability to excrete NaCl + H2O)

→ Acute renal failure

→ Chronic renal failure

→ Nephrotic syndrome in the setting of renal failure (NaCl retention becomes primary cause of edema)

capacitance vessels, ↓ EABV

个 Capillary hydrostatic pressure

→ Right Heart failure → Constrictive pericarditis → pericardial effusion

个 Capillary Permeability (usually in sick/ICU

patients) →Burns, alleries, trauma, sepsis, ARDS → Idiopathic edema →refeeding edema

↓ capillary oncotic pressure

(low serum albumin) → ↓ plasma protein synthesis (liver cirrhosis, malnutrition → ↑ plasma protein loss (i.e.

nephrotic syndromes)

(Heart pumps less blood from

Incr venous Reduced pressure arterial BP and **EABV** Incr capillary hydrostatic Activation of pressure **RAAS** Incr bulk flow Kidneys retain of fluid out of more salt + capillaries water

Buildup of fluid in tissues all around the body (generalized effect, more in gravitydependent regions)