The Aging Urinary System

kidneys show lots of atrophy in old age
  ✍ from ages 25 to 85; number of nephrons declines by 30 – 40%
  ✍ up to 1/3rd of remaining glomeruli become atherosclerotic, bloodless and nonfunctional

kidneys of 90 yr old man are 20 – 40% smaller than those of a 30 yr old and receive only half as much blood

proportionately less efficient at clearing wastes
  ✍ while renal function remains adequate there is little reserve capacity

reduced renal function is a significant factor in overmedication of the aged
  ✍ drug doses often have to be reduced

water balance is more difficult
  ✍ kidneys become less responsive to ADH and sense of thirst is blunted

voiding and bladder control become problematic:
  ~80% of men over 80 are affected by benign prostatic hyperplasia that compresses the urethra
    ✍ reduces force of urine stream
    ✍ makes it harder to empty bladder
older women become increasingly subject to incontinence
    ± esp if pelvic wall muscles have been weakened by pregnancy and childbearing

incontinence can also result from senescence of sympathetic NS
Disorders of Urinary System

Acute or Chronic Renal Failure
(or renal insufficiency)

most serious disorder of urinary system

nephrons can regenerate and restore kidney function after short-term injuries or individual nephrons can enlarge to compensate

‡ a person can survive with as little as 1/3rd of one kidney

when 75% are lost the remaining cannot maintain homeostasis

result is azotemia and acidosis

may also lead to anemia

Cystitis (=bladder infection)

most are ascending infections‡ move up urethra from outside

especially common in women

if untreated bacteria can spread up ureters to cause pyelitis or infection of pelvis

if infection reaches renal cortex and nephrons = pyelonephritis

kidney infections can also result from invasion by blood borne pathogens (=descending infection)

Kidney Stones

=Renal Calculus is a hard granule of calcium, phosphate, uric acid and protein
form in renal pelvis

usually small enough to pass into urine flow

sometimes are up to several centimeters and block pelvis or ureter

leads to destruction of nephrons as pressure builds in kidney

a large, jagged stone passing down ureter can stimulate strong contractions that can be excruciatingly painful

can also damage ureter and cause hematuria

causes:

- hypercalcemia
- dehydration
- pH imbalances
- frequent UTI’s
- enlarged prostate causing urine retention