外科常見併發症

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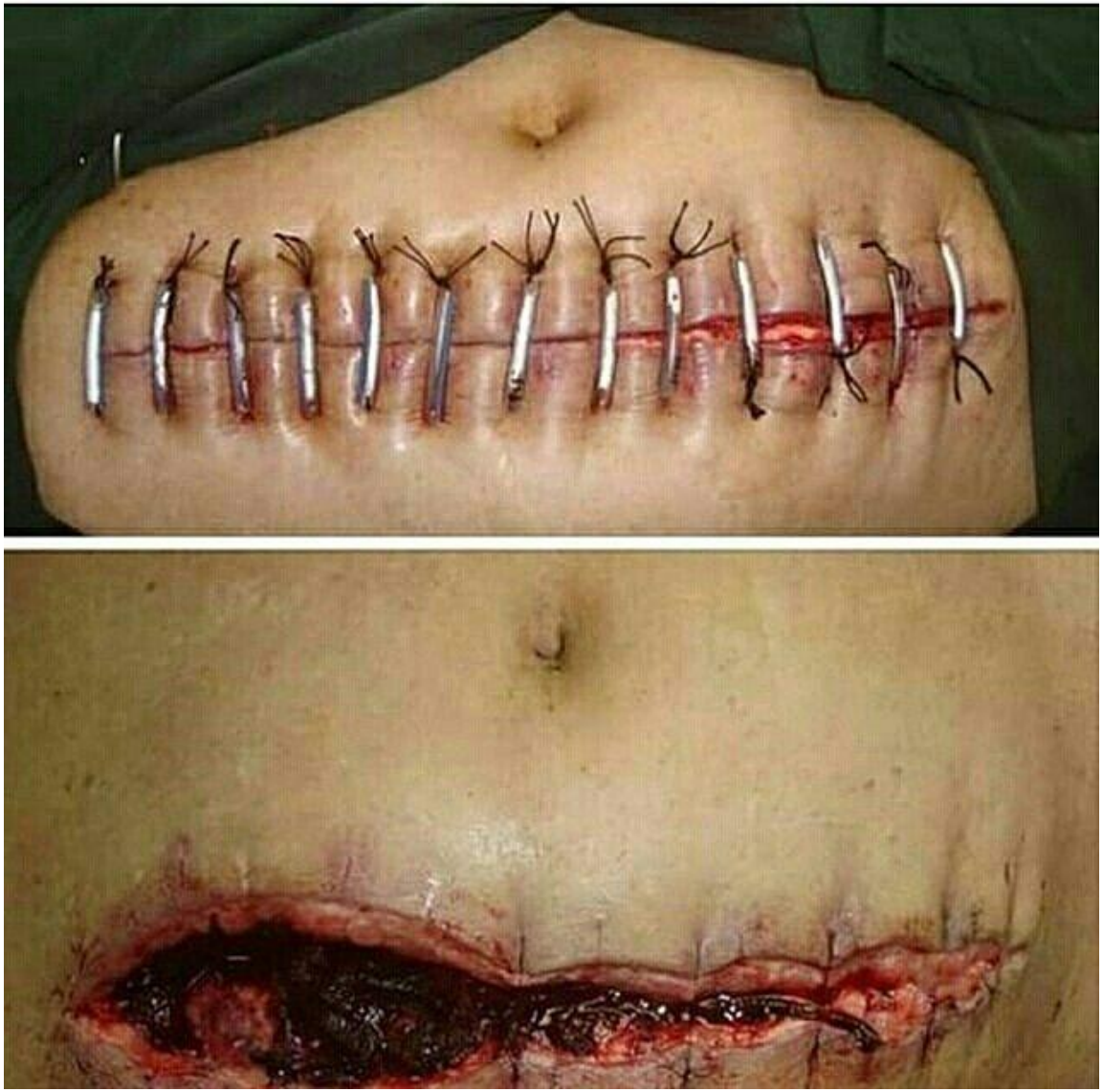
Classification

- Wound
- Thermal regulation
- Postoperative fever
- Pulmonary
- Cardiac
- Gastrointestinal
- Metabolic
- Neurological

Wound Complications

- Dehiscence
- Seroma
- Hematoma
- Infection

Dehiscence



What do you do?

- Wrap in moist (with normal saline) dressing and call your chief.

hematoma

- Abnormal collection of blood
- **Presentation**: discoloration of the wound edges (purple/blue), blood leaking through sutures
- Etiology: imperfect hemostasis

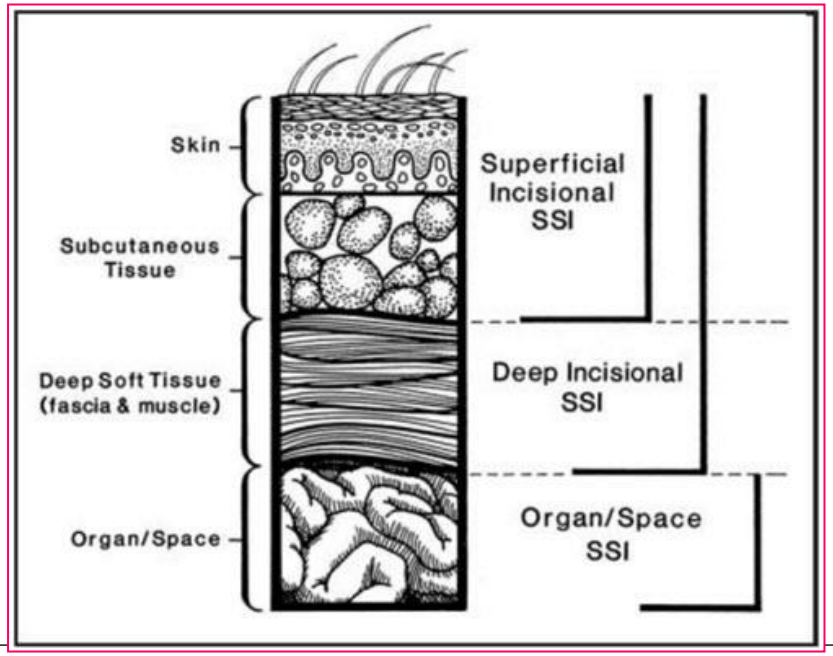
- **What is the biggest concern with retained hematoma in the wound?**
  - Potential for infection

hematoma

- You are called by the nurse about a patient who has just undergone a **thyroidectomy** with report of the patient having **difficulty breathing and desaturations**?

Wound Infection

- **Superficial Site Infection (SSI)**
  - Superficial
  - Deep (involving the fascia/muscle)
  - Presentation: erythema, tenderness, drainage



Wound Infection

- **Organ Space**
  - Occurring 4-6 days postop
  - Presentation: SIRS symptoms

Seroma

Seroma

- Collection of liquefied fat, serum and lymphatic fluid under the incision
- Benign
- No erythema or tenderness
- **Associated procedures**: mastectomy, axillary and groin dissection
- Treatment: evacuation, pack, suction drains

Complications of Thermal Regulation

- Hypothermia
- Malignant hyperthermia

Hypothermia

- Drop in temp by 2° C
- Temp below 35 ° C → coagulopathy, platelet dysfunction
- Risks:
  - 3x risk increase of cardiac events,
  - 3x risk increase of SSI,
  - increase risk of blood loss and transfusion requirement

Malignant hyperthermia

- Autosomal dominant, rare
- **Presentation**: fever, tachycardia, rigidity, cyanosis
- **Treatment**: Dantrolene 1 to 2 mg/kg → 10 mg/kg total until symptoms

Postoperative Fever

- **What is the number #1 culprit of fever POD #1?**

- **Atelectasis**
- **Management**: IS (incentive spirometry), early ambulation

Postoperative Fever

- Infections – pod 5
- UTI – pod 3
- DVT, PE – pod 7-10
- Abscess – pod 5-7
- Drug - anytime

Postoperative Fever

- **Work-up > 48h**:
- Blood cultures
- UA/urine culture
- CXR
- Sputum culture
- …then Treat the Fever

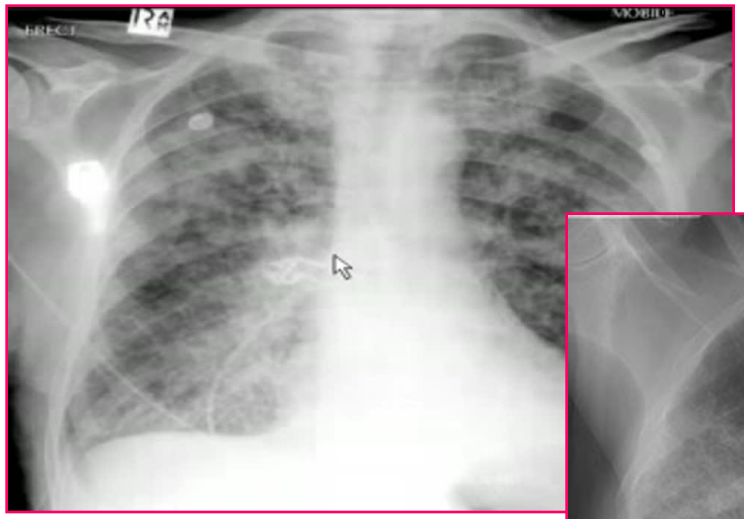
Pulmonary complications

- **Atelectasis** – peripheral alveolar collapse due to shallow tidal breaths, MC cause of fever within 48h

- **Aspiration pneumonitis** – only requires 0.3 ml per kilogram of body weight (20 to 25 ml in adults)

Pulmonary complications

- **Nosocomial pneumonia**
- **Pulmonary edema** – CHF, ARDS
- **Pulmonary embolus** – 1/5 are fatal, greatest management = prevention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Cardiac Complications

- **Hypertension**
  - Post op HTN due to inadequate pain control, fluid overload, failure to give anti-HTN meds.
  - Hypertension can cause aneurysm rupture, CVA, MI

Cardiac Complications

- **Ischemia/Infarction**
  - Leading cause of death in any surgical patient
  - Key to treatment = prevention
  - First steps: MONA

Cardiac Complications

- **Arrhythmias**
  - 30 seconds of abnormal cardiac activity
  - Key to treatment = correct underlying medical condition, electrolyte replacement (Mg > 2, K > 4)
  - Arrhythmias can occur from electrolyte abnormalities, meds, stress, endocrine abnormalities, and underlying cardiac disease

Cardiac Complications

- **Arrhythmias**

- Atrial fibrillation is the most common arrhythmia and occurs between postoperative days 3 to 5 in high-risk patients. This is typically when patients begin to mobilize their interstitial fluid into the vascular fluid space.
- rate control is more important than rhythm control for atrial fibrillation.

Renal Complications

- **Urinary retention**
- Inability to evacuate urine-filled bladder after 6 hours
  - 250-300 mL urine → catheterization
  - >500 mL trigger foley replacement

Renal Complications

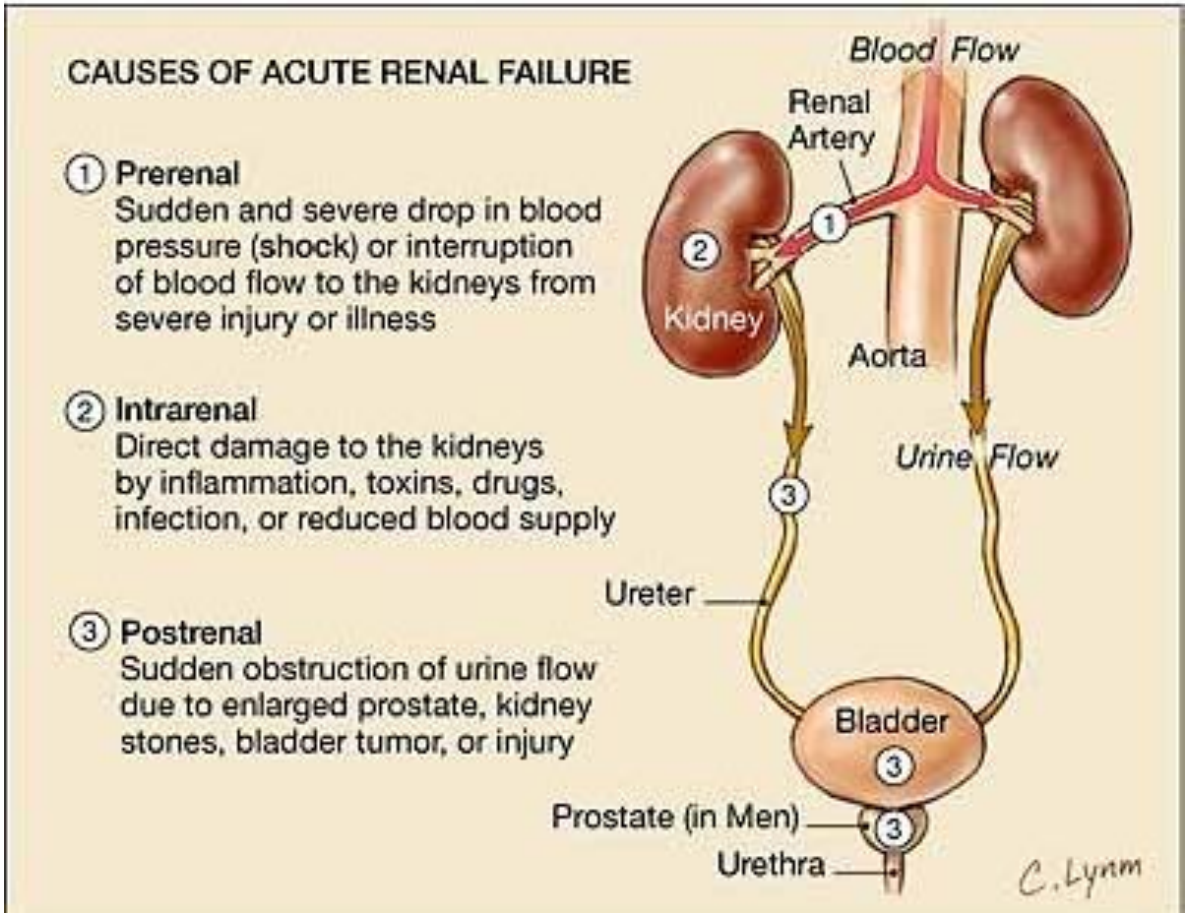
- **Acute renal failure**
  - Oliguria < 0.5 cc/kg/hr
  - Pre-renal (FeNa < 1)
  - Intrinsic (FeNa > 1)
  - Post-renal (FeNa > 1)

Renal Complications

- Pre-renal – from impaired renal perfusion usually hypovolemia
- Intrinsic – actual injury to the nephrons, glomeruli, or tubules, think toxins
- Post – renal – obstruction, eg ligation of ureter

Renal Complications

Acute renal failure



Gastrointestinal Complications

- Postoperative ileus
- GI bleeding
- Pseudomembranous colitis
- Ischemic colitis
- Anastomotic leak
- **Enterocutaneous fistula**

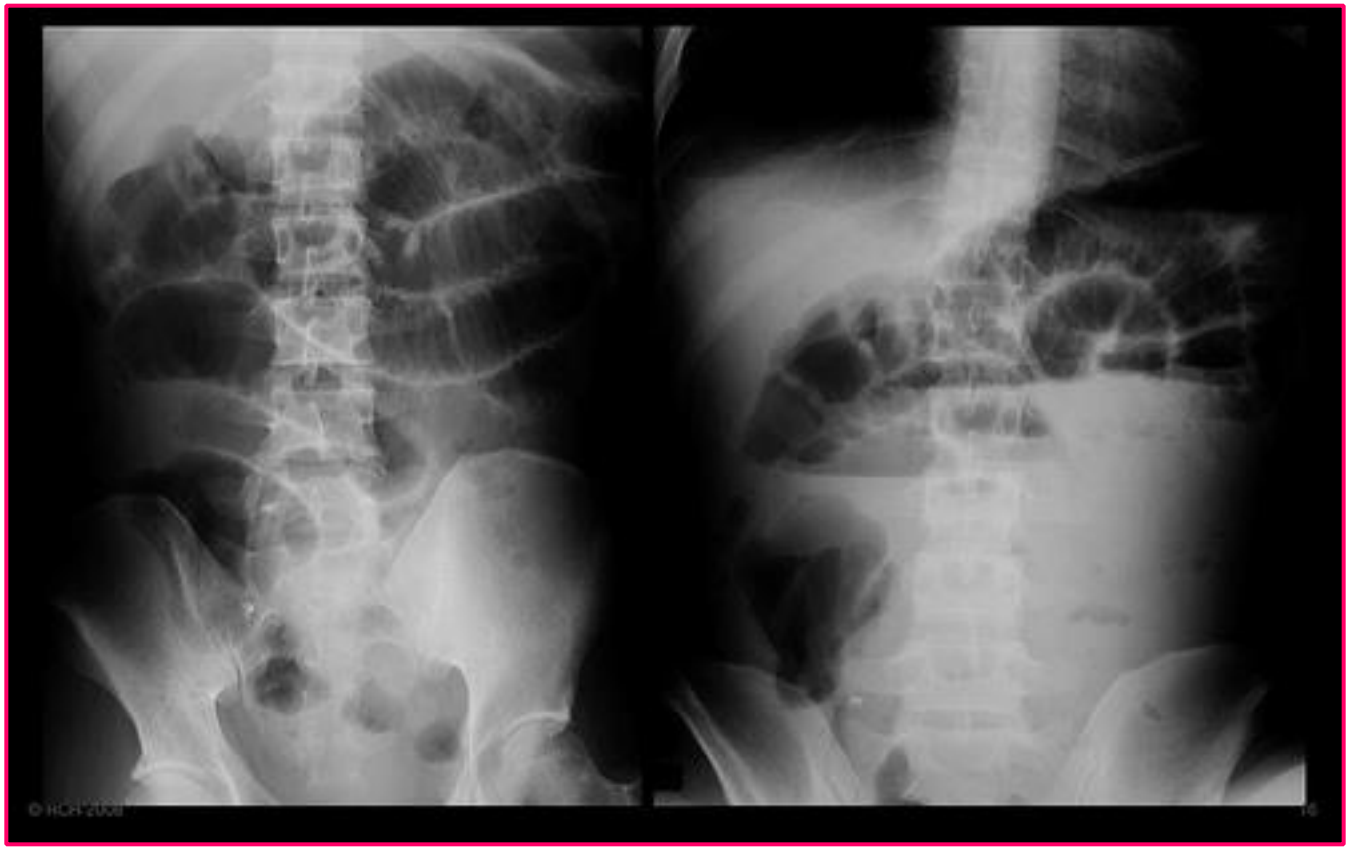
Postoperative ileus

Postoperative ileus

- Lack of function without evidence of obstruction
- Prolonged by extensive operation/manipulation, SB injury, narcotic use, abscess and pancreatitis
- Must be distinguished from SBO

- **Imaging**: KUB flat/upright
- **Diagnosis**: dilation throughout with air in colon and rectum
- **VS.**
- SBO – air fluid levels, no colonic or rectal air

Small bowel obstruction



Gastrointestinal Complications

- **GI Bleeding**
- From any source → get detailed history, place NG tube
- Etiology: Cushing's ulcer (less common with PPI use)

Gastrointestinal Complications

- Anastomotic bowel leak:
  - 5-7 days POD, usually associated with peritoneal Irritation

Gastrointestinal Complications

- **Pseudomembranous colitis**
- Superinfection with C difficile due to alteration in normal flora
- Toxic colitis is a surgical EMERGENCY (mortality 20-30%)
  - Hypotension, shock

共筆專用表: 偽膜性結腸炎治療

the New England Journal of Stupid

困難梭狀桿菌 (Clostridium difficle) 是一種革藍氏陽性厭氧菌，會導致腹瀉 (CDAD)、甚至是結腸炎 (colitis)，請看治療建議…

1. **輕中度首選 Metronidazole**
   重度首選 Vancomyicn PO

3. **嚴重且有併發症的替代藥**
   可考慮Tigecycline

ORGANISM	ANTIBIOTIC	DOSE	ALTERNATIVES
C. difficile (mild-to-moderate)	Metronidazole	500 mg PO tid × 10-14 days	Vancomycin, 125 mg PO qid × 10-14 days
C. difficile (severe)	Vancomycin	125 mg PO qid × 10-14 days	Fidaxomicin, 200 mg PO bid × 10 days
C. difficile (severe complicated or fulminant)	Vancomycin + Metronidazole	500 mg PO qid × 10-14 days 500 mg IV tid × 10-14 days	Tigecycline, 50 mg IV bid × 10-21 days in place of metronidazole Additional vancomycin via rectal retention enema, 500 mg in 100 mL normal saline q6h if complete ileus present Colectomy or ileostomy
C. difficile (first recurrence)	Same as primary infection based on severity of disease		Fidaxomicin, 200 mg PO bid × 10 days Fecal transplant
C. difficile (>one recurrence)	Vancomycin taper	125 mg PO qid × 10 days, then 125 mg PO bid × 7 days, then 125 mg PO qd × 7d, then 125 mg PO qod or q3d × 14-28 days, then stop	Vancomycin, 125 mg PO qid × 10 days, followed by rifaximin, 400 mg PO bid × 14 days Fidaxomicin, 200 mg PO bid × 10 days Fecal transplant

2. **嚴重且有併發症首選**
   Vancomycin + Metronidazole

4. **如果腸絞痛或無法口服可考慮**
   Vancomycin ENEMA (灌腸)

資料來源: Mandell, Douglas, and Bennetts Principles and Practice of Infectious Diseases, 8e

Metabolic complications

- **Hyper/Hypothyroidism**

- **SIADH**
- inappropriate antidiuretic hormone secretion
- Continue ADH secretion despite hyponatremia
- Neurosurgical procedures, trauma stroke, drugs (ACEI, NSAIDs)

Metabolic complications

Finding	SIADH	DI
Urine Output	Less than 200 mls x 2hrs	Greater than 250 mls x 2hrs
Serum Sodium	Below 135 mEq/L	Above 135 mEq/L
Urine Sodium	Below 25-30 mEq/L	Decreased
Urine Osmolality	Above 900 mOsm/kg	Below 400 mOsm/kg
Plasma Osmolality	Below 275 mOsm/L	Above 295 mOsm/L
Blood Pressure	Normotension	Hypotension
Fluid Status	No Dehydration	Dehydration
Neuro Symptoms	Confusion, delirium, coma with low Na	Seizures, coma

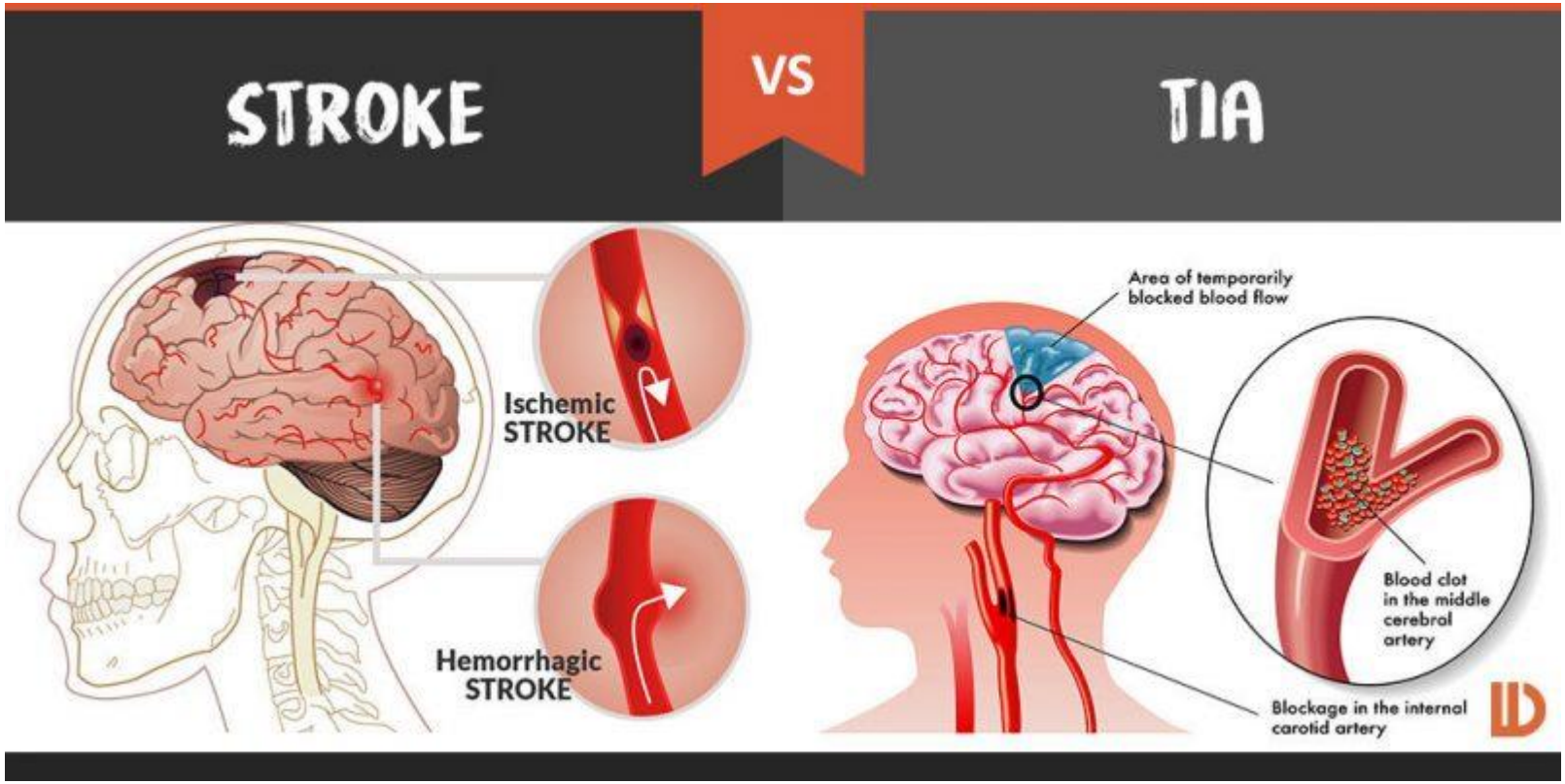
Neurologic Complications

- Beware the drugs that you will be subscribing
- Delirium, dementia, psychosis

Clinical feature	Delirium	Dementia	Exacerbation of psychosis
Onset	acute	slow	acute
Circadian course	fluctuating	stable	stable
Level of consciousness	affected	spared	spared
Attention	impaired	impaired	may be impaired
Cognition	impaired	impaired	may be impaired
Hallucinations	usually visual	often absent	usually auditory
Delusions	poorly systematized	often absent	sustained and systematized
Psychomotor activity	increased or reduced	often normal	variable
Involuntary movements	Asterixis, myoclonus, tremor	absent	absent
EEG	abnormal	abnormal	Usually normal

Neurologic Complications

- Seizure disorders
- Stroke and TIA



Neurologic Complications

- Stroke:
  - Stroke is defined as an abrupt onset of focal neurologic deficit that lasts at least 24 hours and is presumed to be of vascular origin caused by ischemia
    - **Ischemic** : sudden Ischemia: thrombus, emboli; 88%
      - Cerebral Atherosclerosis but 30% unknown etiology
    - Hemorrhagic : gradual ischemia 12%
- Transient ischemia attacks
  - Focal ischemic neurologic deficits lasting less than 24 hours but usually less than 30 minutes

Thanks for your listening!!