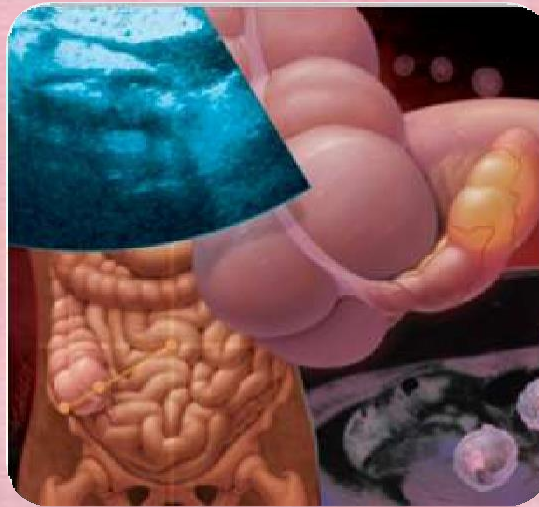


# APPENDISITIS AKUT



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# Permasalahan: Contoh Kasus

- ❑ ♀ 20 thn dtg ke IGD, nyeri perut kanan bawah, diberi analgetik spasmolitik o/ dokter, keluhan berkurang, Px pulang.
- ❑ Hari ke-2 nyeri hebat seluruh perut, panas badan tinggi, tanda2 peritonitis.
- ❑ Menjalani operasi laparotomi appendektomi ⇒ DO: abses 200cc, fibrin interloop usus, perforasi appendiks di 1/3 tengah, fecolit di 1/3 proksimal





Para dokter sering mempergunakan  
**obat-obatan yg tidak diketahui cara bekerjanya,**  
untuk **penyakit yg tidak diketahuinya,** dan ditujukan  
kepada **pasien yg sama sekali tidak dikenalnya.**



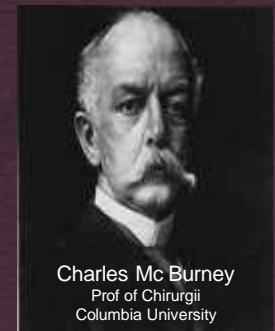
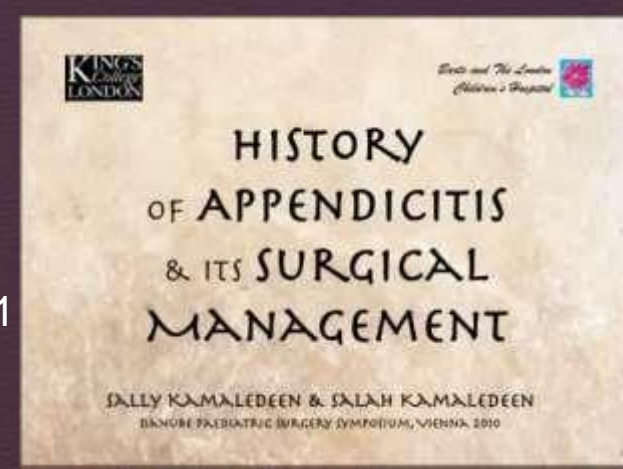
*Voltaire*



# SEJARAH



- **1736**, Claudius Amyand ⇒ Op appendix & hernia pd ♂ 11
- **1824**, Louyer-Villermay ⇒ 2 kasus otopsi
- **1827**, Francois Melier ⇒ 7 kasus otopsi
- **1839**, Bright & Addison ⇒ Gx appendicitis "*Elements of practical medicine*"
- **1848**, Hancock ⇒ insisi drainase
- **1886**, Kronlein ⇒ Appendectomy pertama
- **1889**, Charles McBurney ⇒ Early Laparotomy, publikasi: "*New York Medical Journal*"
- **1894**, Charles McBurney ⇒ Insisi McBurney's
- **1982**, Semm ⇒ Laparoscopic Appendectomy



Charles Mc Burney  
Prof of Chirurgii  
Columbia University



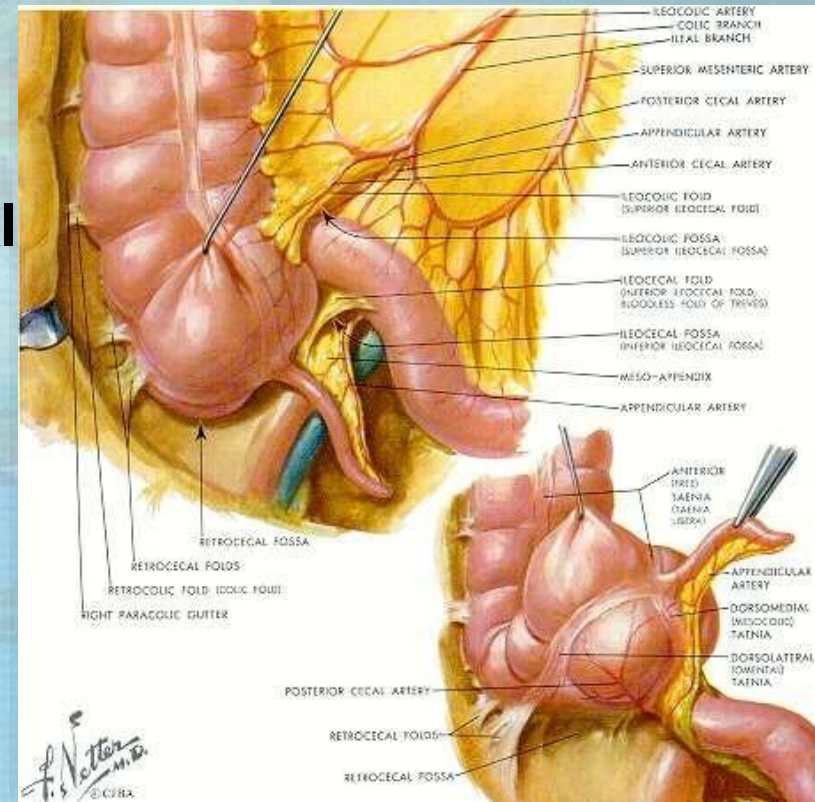
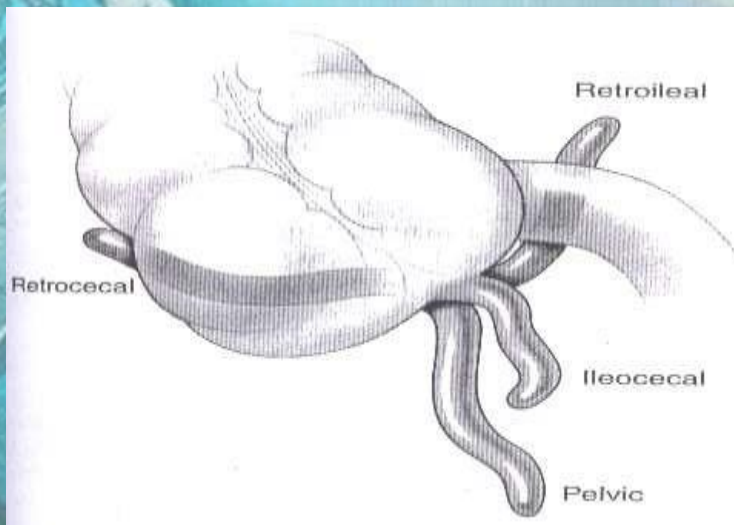
# APPENDICITIS AKUT



- Definisi ⇒ **Inflamasi akut apendiks vermiformis**
- Insidens di US ⇒ **7% populasi**
- Insidens tertinggi ⇒ **dekade II - III**
- Patologi:
  - **Obstruksi o/ fekalith / appendicolith (35%)**
  - **Hiperplasia limfoid (65%)**
- Klinis ⇒ **nyeri RLQ, distensi abd, nausea-vomiting, febris, peritonitis**

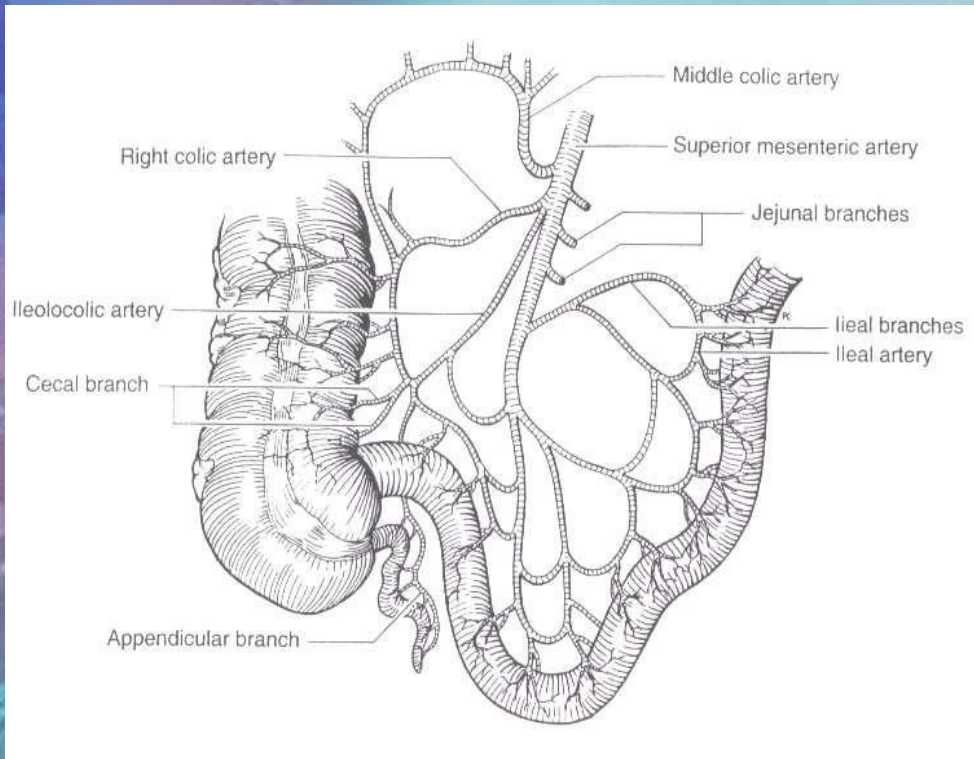
# ANATOMI

- Embriologi ⇒ minggu ke-8
- Bagian dari sekum
- Organ rudimenter, dangkal & tipis
- Panjang ⇒ 2,5 - 25 cm ; rata2 ⇒ 5cm
- Lokasi ⇒ pertemuan 3 taenia coli
- Letak ⇒ ante/retrocecal, retroileal pelvic, ileocecal

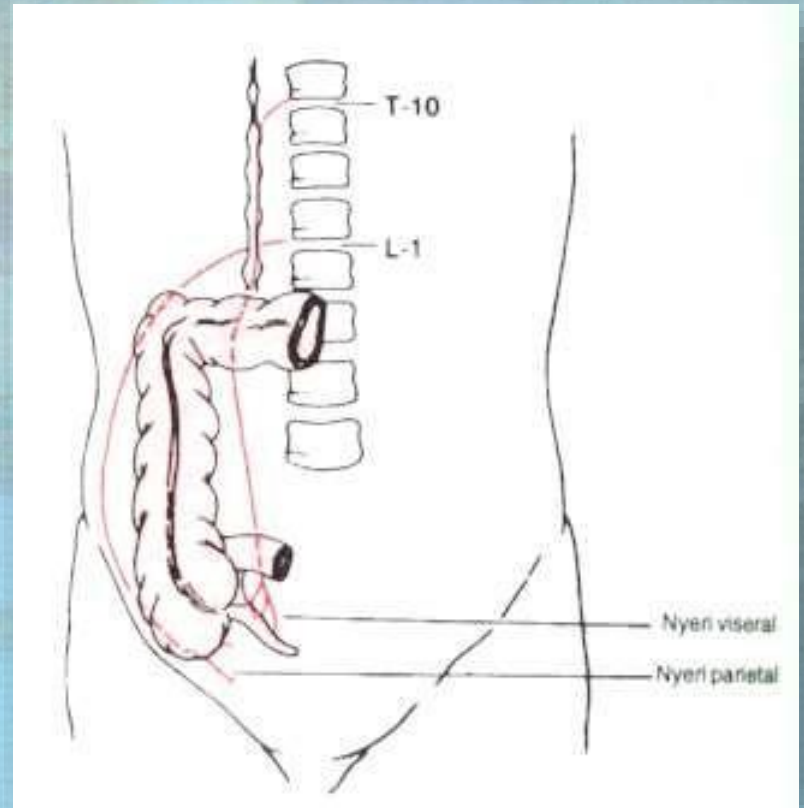




# ALIRAN DARAH APENDIKS

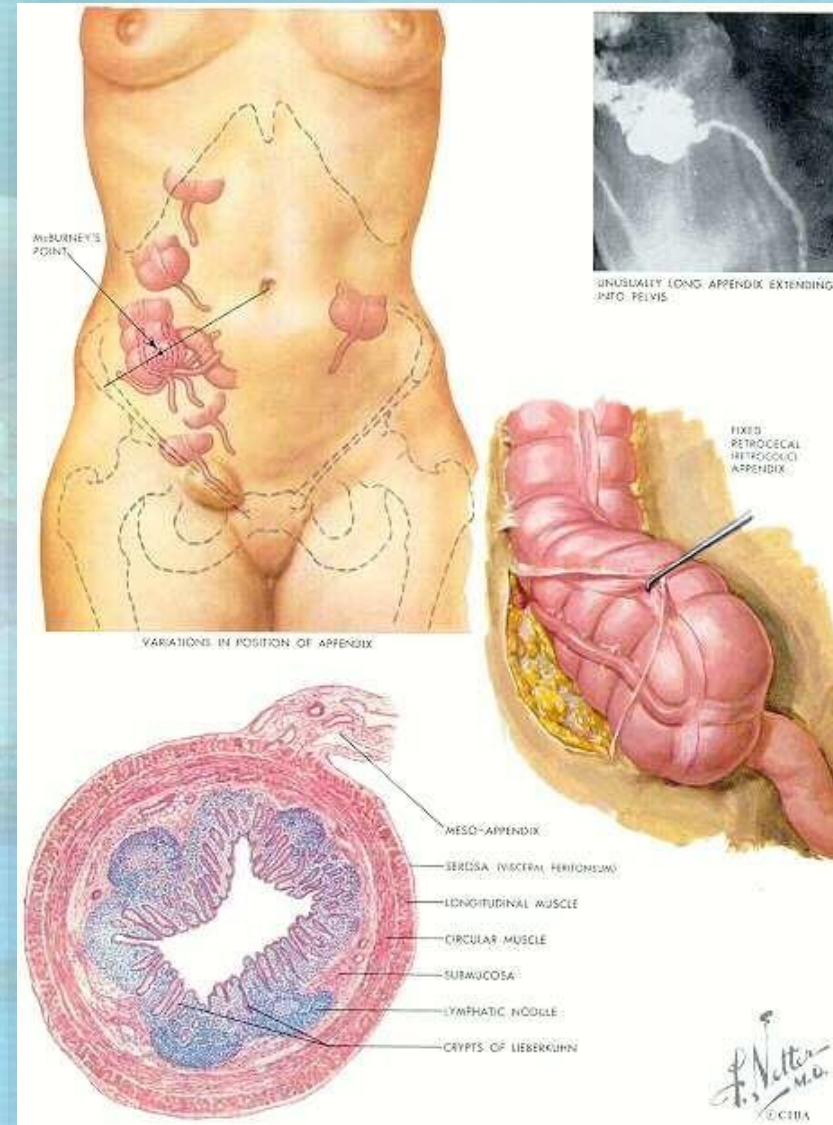


# PERSYARAFAN APENDIKS



# FISIOLOGI

- Organ Immunologi  $\Rightarrow$  IgA  $\Rightarrow$  **GALT**  
(gut associated lymphoid tissue)
- Arah & posisi  $\Rightarrow$  sgt bervariasi
- Lapisan  $\Rightarrow$  = usus lain





# PATOFISIOLOGI



**Initiation of inflammation**  
possibly by faecolith, or enlarged lymphnodes, or adhesion obstruction

Acute inflammation of mucosa

Extension of inflammation across appendiceal wall

Involvement of serosa by inflammation

Spread of peritonitis to adjacent structures (depends on the position of appendix) → local peritonitis

Gangrene of the appendix wall

**PERFORATION**

Attempts at walling off perforation by omentum & adjacent bowel

Inadequate containment leading to spreading peritonitis

Intense & extensive walling off reaction

**Peri-appendicular phlegmone / infiltrat**

**Peri-appendicular abscess**

**Poorly localised colicky central abdominal pain (visceral pain)**

Continuous central abdominal pain often associated with nausea & vomiting (due to autonomic stimulation)

- Localization of symptoms & signs as parietal peritoneum becomes involved (somatic innervation): tenderness, rebound tenderness, muscle rigidity, in the right iliac fossa.
- Moderate fever, facial flush & tachycardia
- Leucocytosis, mainly neutrophils

Tenderness extends to whole abdomen with increasing rigidity and more pronounced systemic features of sepsis: fever, dehydration, organ dysfunctions

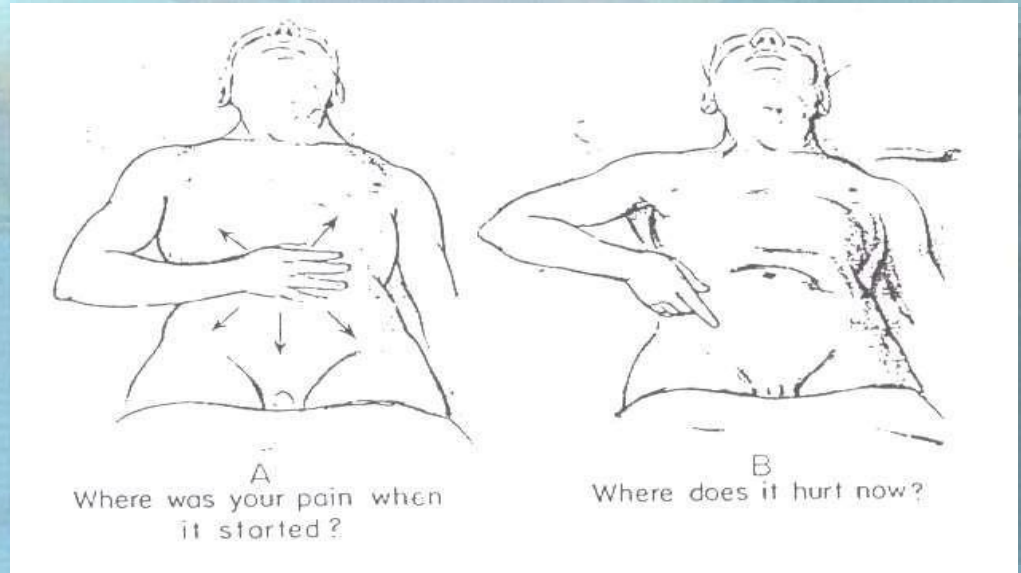
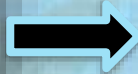
Formation of appendicular mass with gradual recovery

Fluctuant appendicular mass, & intermittent fever



# GEJALA KLINIS

- Mula  $\Rightarrow$  nyeri ulu hati, anoreksia, nausea, vomiting
- Nyeri kemudian berpindah ke abdomen kanan bawah (RLQ)  $\Rightarrow$  ***Ligart's sign***
- Makin lama nyeri makin  $\uparrow$  (terlokalisir)  $\Rightarrow$  bertambah nyeri pada pergerakan, berjalan, atau batuk




# PEMERIKSAAN FISIK



- Suhu tubuh sedikit  $\uparrow$  /subfebris (bila tanpa perforasi)
- Peristalsis normal / sedikit  $\downarrow$
- RLQ  $\Rightarrow$  nyeri tekan (+), nyeri lepas (+)
- Peritonitis:
  1. Lokal  $\Rightarrow$  NT (+) RLQ, defans muscular (+) **RLQ**
  2. Difus  $\Rightarrow$  NT (+) & DM (+) seluruh abdomen
- DRE/RT  $\Rightarrow$  nyeri tekan jam 10-11  $\Rightarrow$  **appendicitis**  
bila nyeri seluruh lingkaran  $\Rightarrow$  **peritonitis**



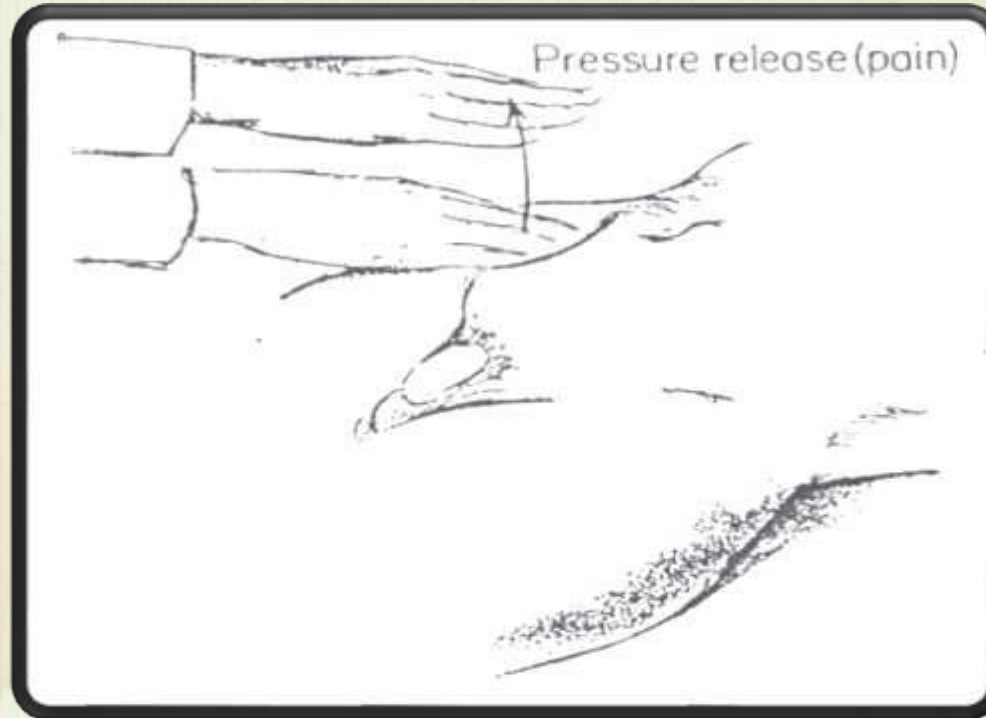
# Nyeri rangsangan peritoneum tidak langsung

- 
1. **Mc Burney Pain Sign** ⇨ nyeri tekan daerah Mc Burney
  2. **Rovsing Sign** ⇨ nyeri RLQ saat abdomen kontra Mc Burney ditekan
  3. **Blumberg Sign (Rebound Fenomena)** ⇨ nyeri saat tekanan pd kontra Mc Burney dilepaskan
  4. **Psoas Sign** ⇨ nyeri saat otot psoas mayor ditegangkan dgn cara:
    - a. Aktif (ekstremitas inferior Dx posisi ekstensi/lurus ⇨ Px diminta u/ memfleksikan ekstremitas tsb mll hip joint)
    - b. Pasif (Px posisi LLD & ekstremitas inferior Dx posisi lurus ⇨ pemeriksa mengekstensikan ekstremitas tsb mll hip joint ke arah belakang)
  4. **Obturator Sign** ⇨ nyeri saat otot obturator ditegangkan dgn cara memfleksikan femur Dx mll hip joint & di endorotasikan
  5. **Tenhorn Sign** ⇨ testis Dx ditarik --- Px merasa nyeri di RLQ
  6. **Ligart Sign** ⇨ nyeri berpindah dari epigastrium ke RLQ
  7. **Dunphy Sign** ⇨ nyeri RLQ saat batuk



# PEMERIKSAAN FISIK

## *McBurney Sign*



- Nyeri tekan = *tenderness*
- Nyeri lepas = *rebound tenderness*
- Defans muskuler = *muscular guarding*

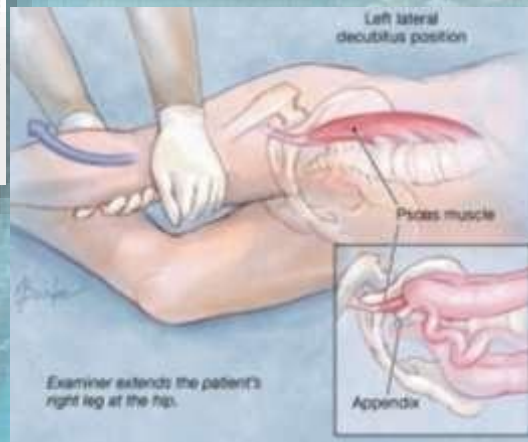
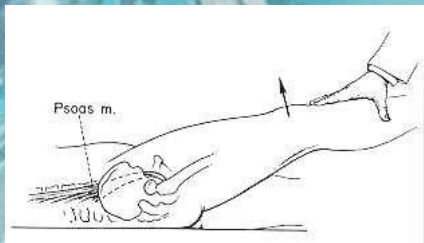
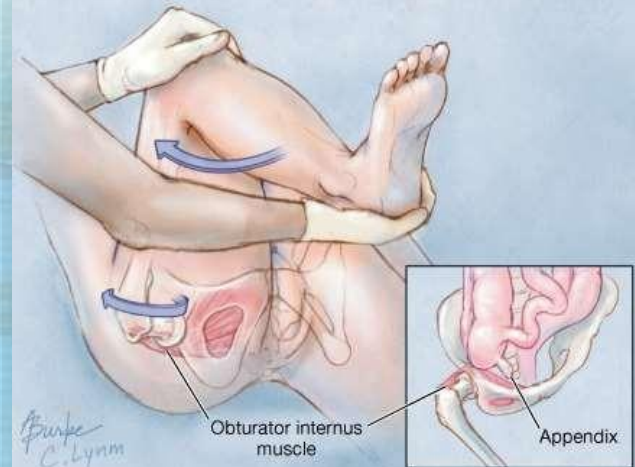


# PEMERIKSAAN FISIK

- Rovsing's sign
- Obturator sign
- Psoas sign

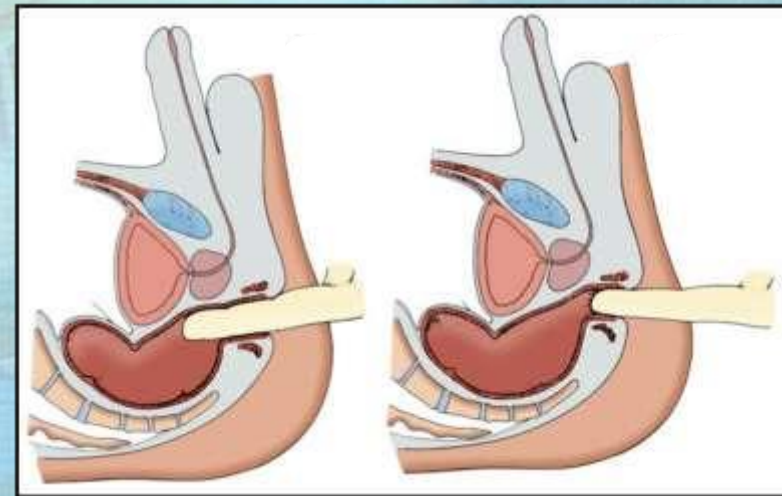
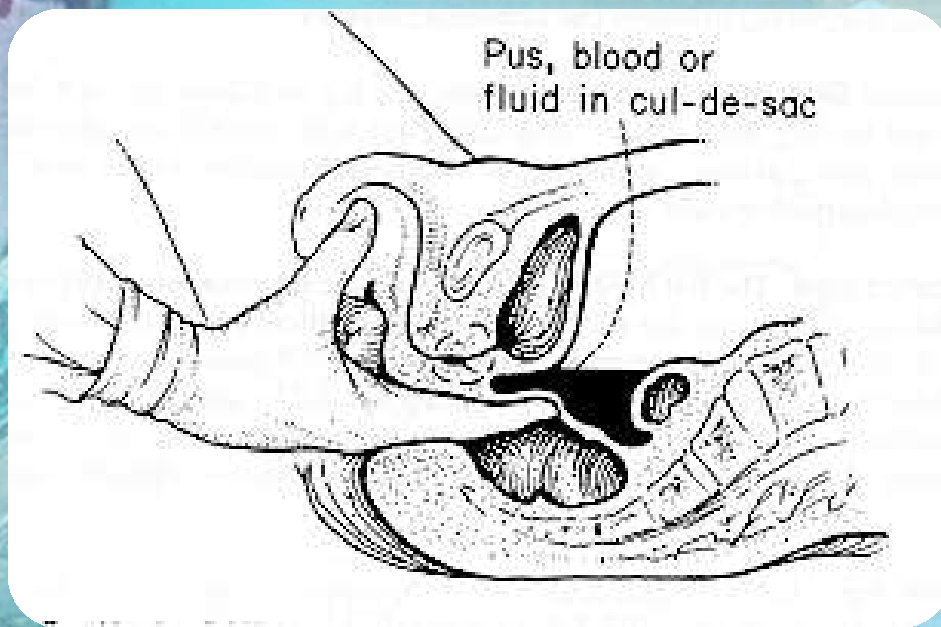


With the patient in the supine position, the examiner passively flexes the right hip and knee. The leg is gently pulled laterally while maintaining position of the knee, causing internal rotation at the hip.



# PEMERIKSAAN FISIK

- Colok dubur (RT / D R E ) ⇒ jangan terlewatkan!!!





# LABORATORIUM

- Leukosit  $\Rightarrow$  10.000 -18.000/mm<sup>3</sup>, tetapi bisa normal
- 75% pasien  $\Rightarrow$  Diff count dominan neutrofil
- Urine normal  $\Rightarrow$  kecuali letak apendiks retrosekal  
/  
pelvik: eritrosit/leukosit urine (+)



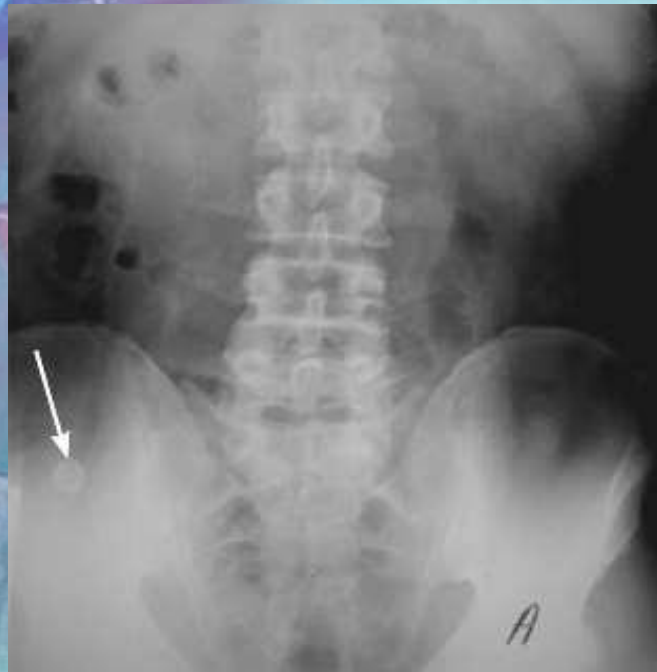
# PEMERIKSAAN PENUNJANG



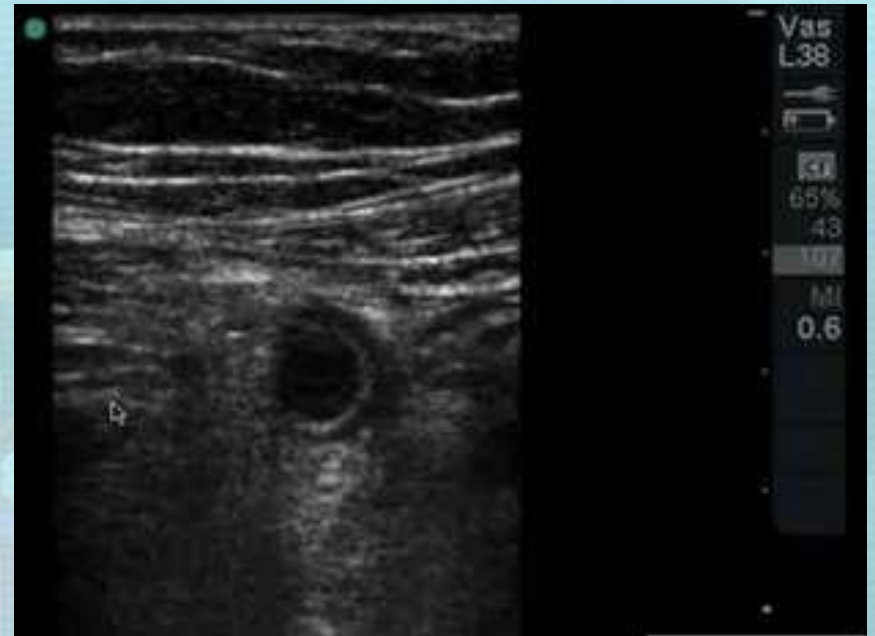
- X-ray abd. ⇒ tidak khas, jarang membantu Dx
  - ⇒ tampak apendicolith
  - ⇒ *Air-fluid level* ⇒ ileus lokal
  - ⇒ Udara bebas (*free air*) ⇒ perforasi
- Barium enema ⇒ = appendicogram
  - ⇒ appendiks tidak terisi kontras (hanya u/ kasus appendicitis kronis)
- USG ⇒ dilatasi lumen & dinding tebal
  - ⇒ u/ ♀ membantu mencari kelainan ginekologi
- CT-Scan ⇒ **Gold Standar (Norton et al)**



Foto Polos Abdomen



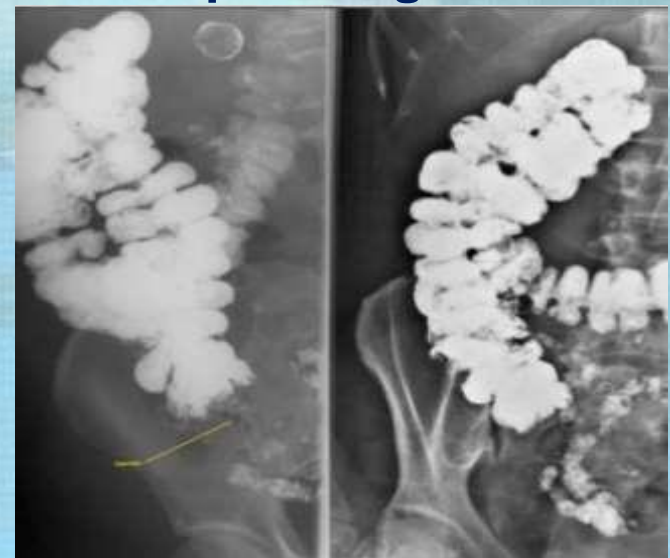
USG Appendiks



CT Scan abdomen/pelvik



Apendicogram



# Alvarado score

Bila:

- Skor 1-4** ⇒ Tidak dipertimbangkan mengalami apendisitis akut
- Skor 5-6** ⇒ Dipertimbangkan kemungkinan Dx apendisitis akut tetapi tidak perlu tindakan operasi segera /dinilai ulang ⇒ Dx: Observasi nyeri RLQ
- Skor 7-8** ⇒ Dipertimbangkan kemungkinan (suspect) apendisitis akut
- Skor 9-10** ⇒ Hampir definitif apendisitis akut & dibutuhkan tindakan bedah

	Yang Dinilai	Skor
Gejala	Nyeri beralih (Ligart's sign)	1
	Anoreksia	1
	Nausea/Vomiting	1
Tanda	Nyeri tekan fossa iliaka Dx	2
	Nyeri lepas	1
	Kenaikkan temperature	1
Laboratorium	Leukositosis	2
	Neutrofil bergeser kekiri	1
	Skor Total	10

1. A = appendicitis pain point
2. L = leukositosis
3. V = vomiting
4. A = anorexia
5. R = rebound tenderness fenomena
6. A = abdominal migrate pain
7. D = degree of cecus
8. O = observation of hemogram



# DIAGNOSIS BANDING

## 1. Acute Mesenteric Adenitis

- Anak-anak
- Nyeri diffuse
- Observasi ⇨ *self limited disease*

## 2. Acute Gastroenteritis

- Diare, mual, muntah
- Nyeri tidak terlokalisir

## 3. Meckel's Diverticulitis

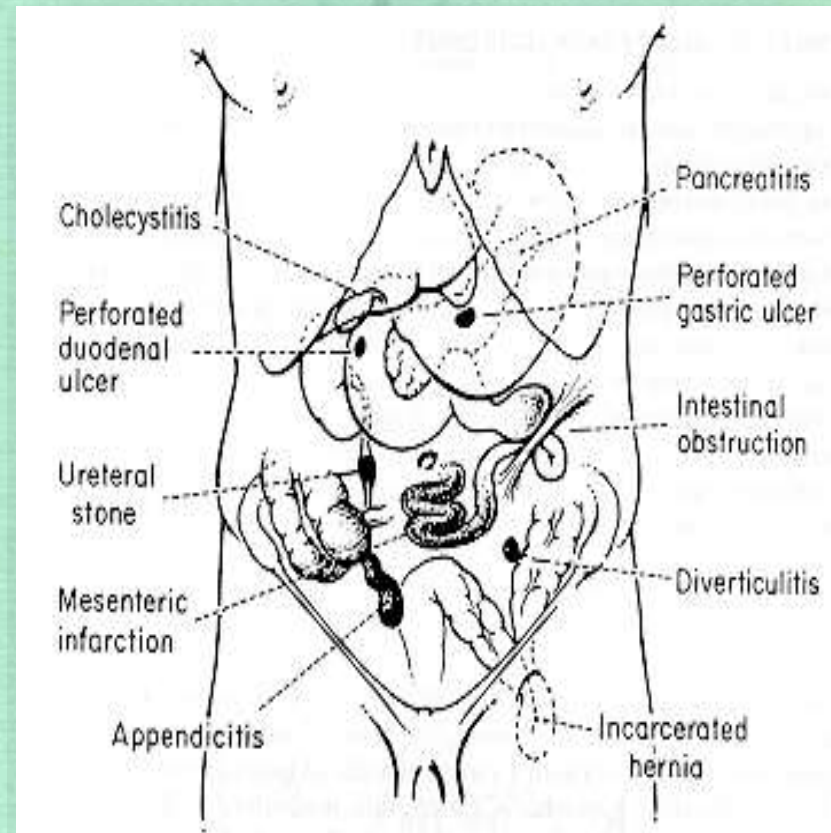
## 4. Intussusception

- Umur <2 th
- Kolik, BAB bercampur darah
- Massa seperti sosis di RLQ

## 5. Perforated Peptic Ulcer

## 6. Colonic Lesions

## 7. Epiploic Appendicitis



## 8. Crohn's Enteritis

- Demam
- Nyeri perut kanan bawah
- Leukositosis
- Diare
- Anoreksia
- Mual, muntah

## 8. Urinary Tract Infection

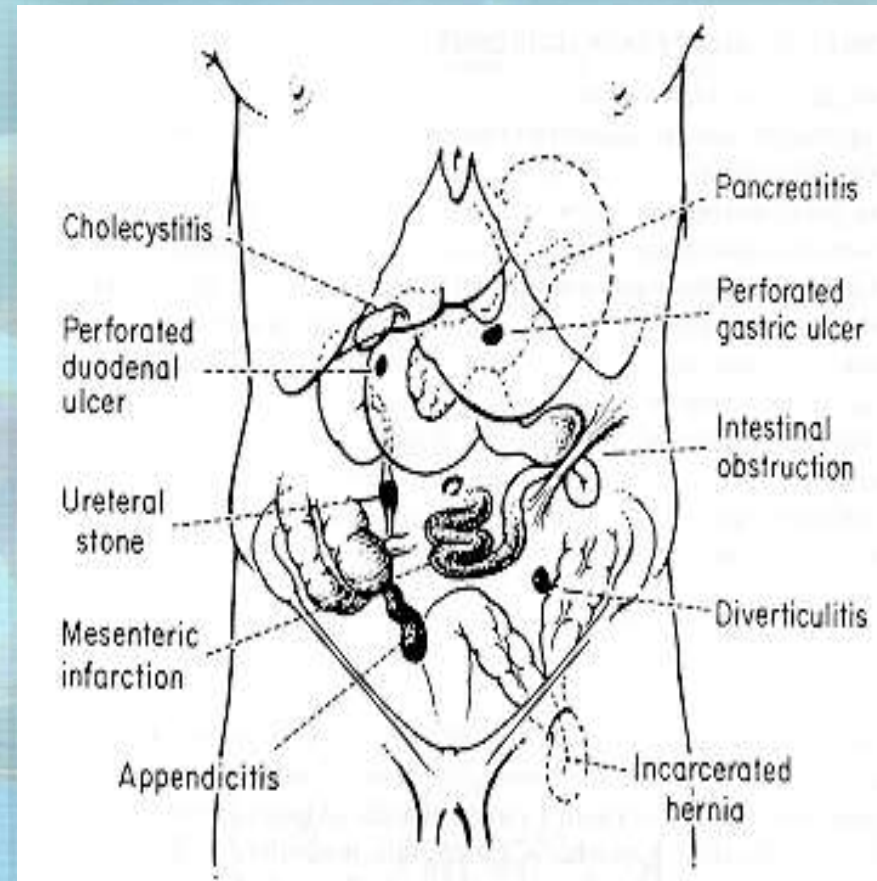
- Nyeri CVA
- Pyuria
- Bakteriuria

## 9. Ureteral Stone

- Nyeri
- Hematuria
- Demam
- Leukositosis

## 10. Gynecologic Disorders

- Pelvic Inflammatory Disease
- Ruptured Graafian Follicle
- Ruptured Ectopic Pregnancy → **anemis**
- Twisted Ovarian Cyst

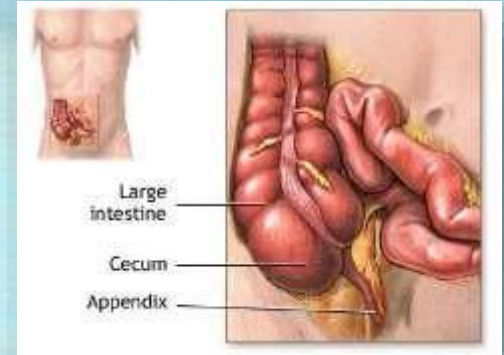




# PENATALAKSANAAN

❑ Terapi pilihan satu-satunya ⇨ apendektomi

- ❑ Pre-op:
- Puasa
  - AB profilaksis
  - H<sub>2</sub> blocker
  - Rehidrasi
  - Analgetika ----- ????



❑ Jenis operasi tgg derajat komplikasi:

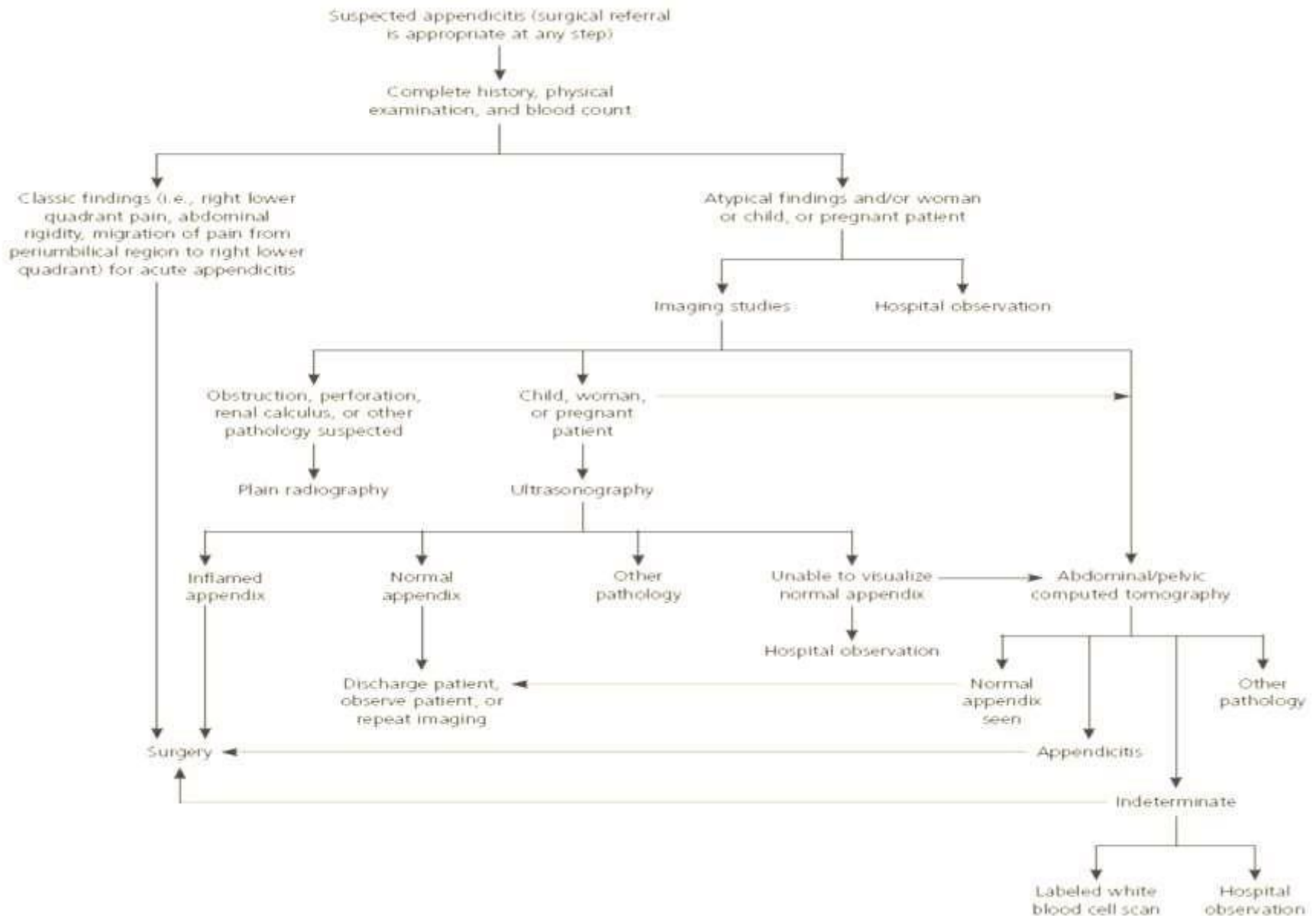
- Apendisitis akut ⇨ apendektomi simpel / Laparoskopik
- Apendisitis kronis ⇨ apendektomi simpel / Laparoskopik
- Apendisitis abses ⇨ laparotomi
- Apendisitis perforata ⇨ laparotomi
- Periappendikular infiltrat ⇨ laparotomi

❑ Jenis insisi apendektomi simpel:

- Mc Burney incision = Gridiron's incision (oblique)
- Rocky-Davis incision = Lantz's incision (transverse)



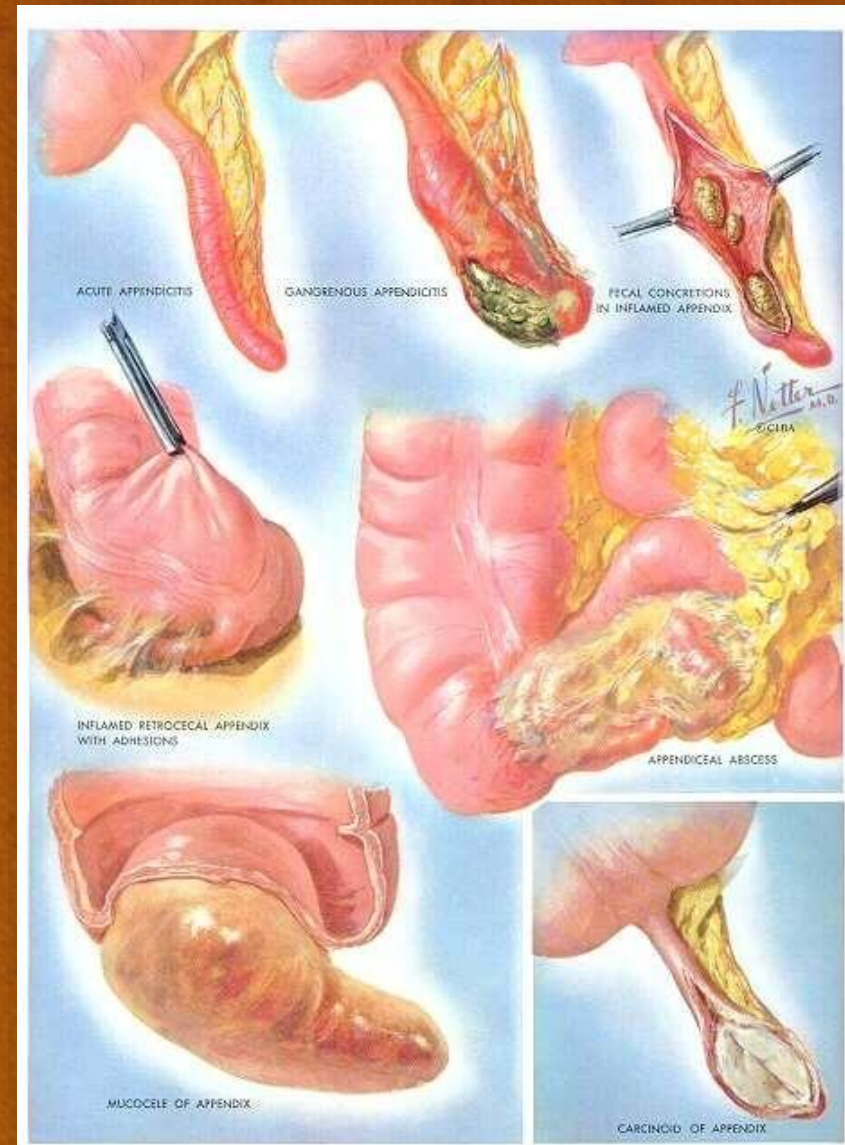
# Diagnosis and Management of Appendicitis





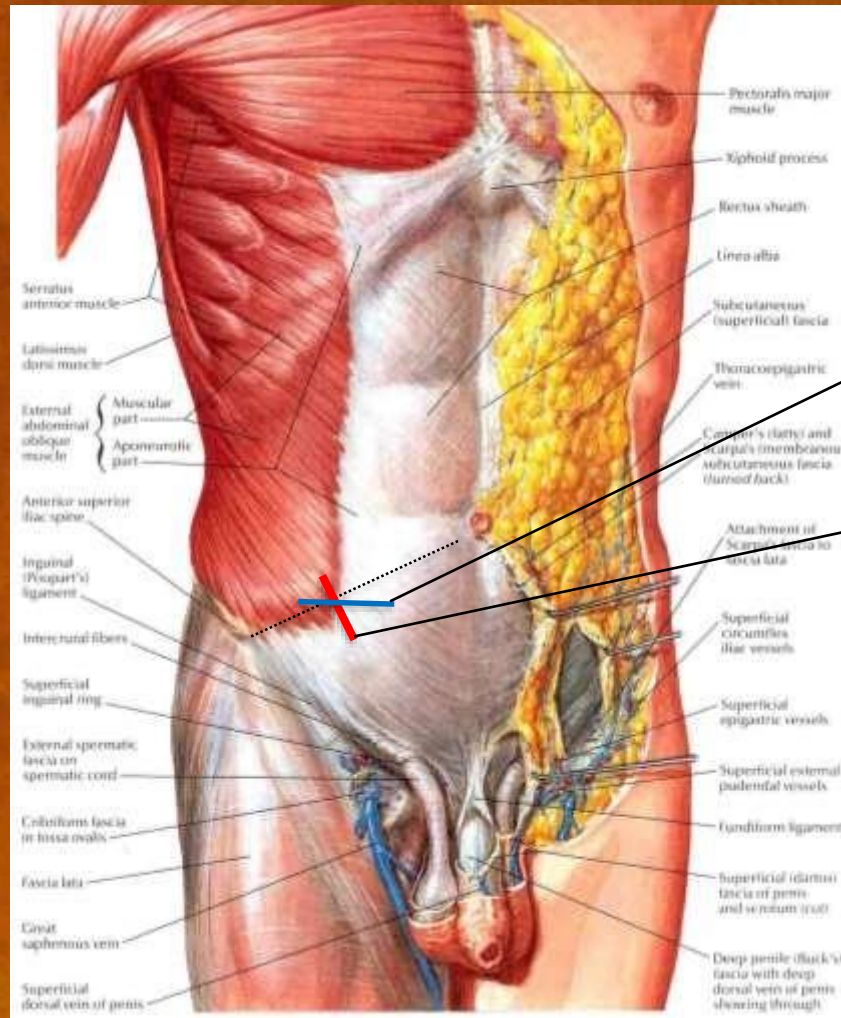
# KOMPLIKASI

- Bakteri mencapai peritoneum dan pembuluh darah  $\Rightarrow$  gangren, perforasi, abses, peritonitis (mortalitas 5%)
- < 12 jam  $\Rightarrow$  94 % simpel
- < 36 jam  $\Rightarrow$  2 % ruptur
- Meningkat 5%/12 jam





# APPENDEKTOMI SIMPLE



Lantz's incision

Mc Burney's incision  
(Gridiron's incision)

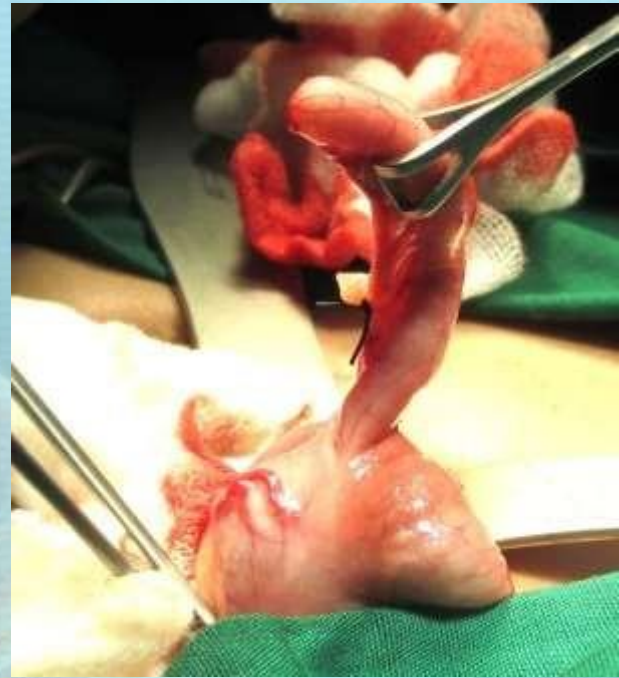




**APPENDICITIS AKUT**





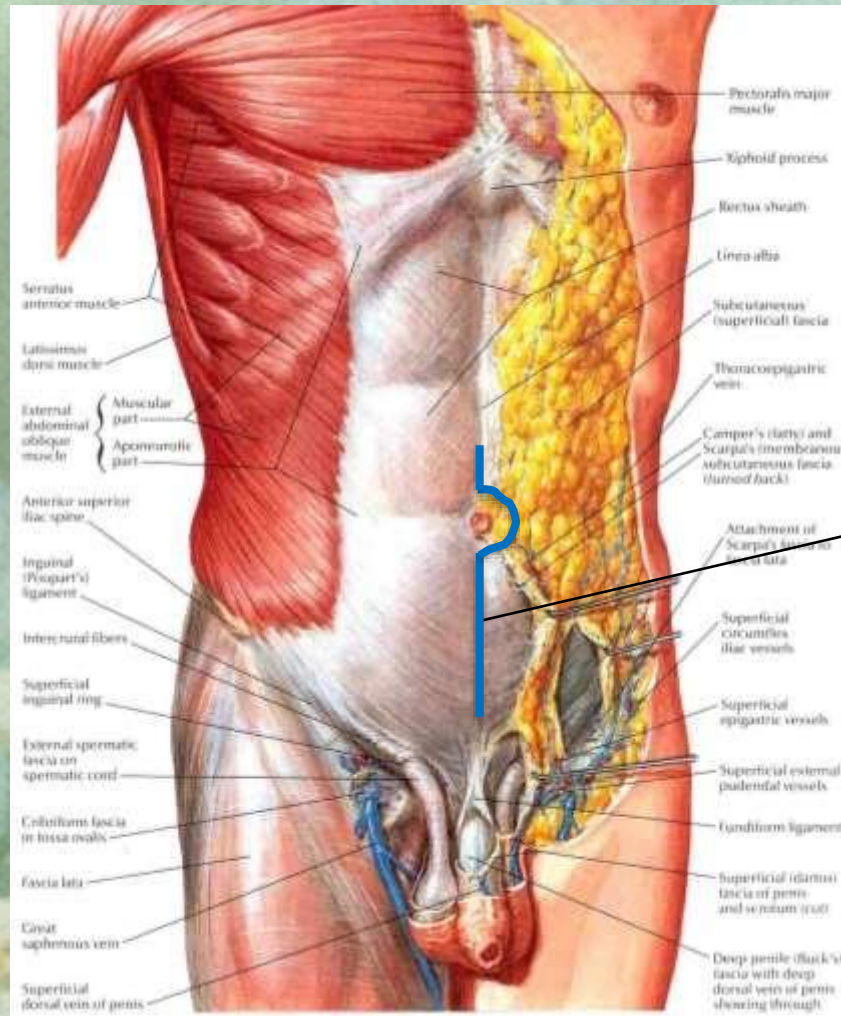


**APPENDICITIS AKUT**





# APPENDEKTOMI LAPAROTOMY



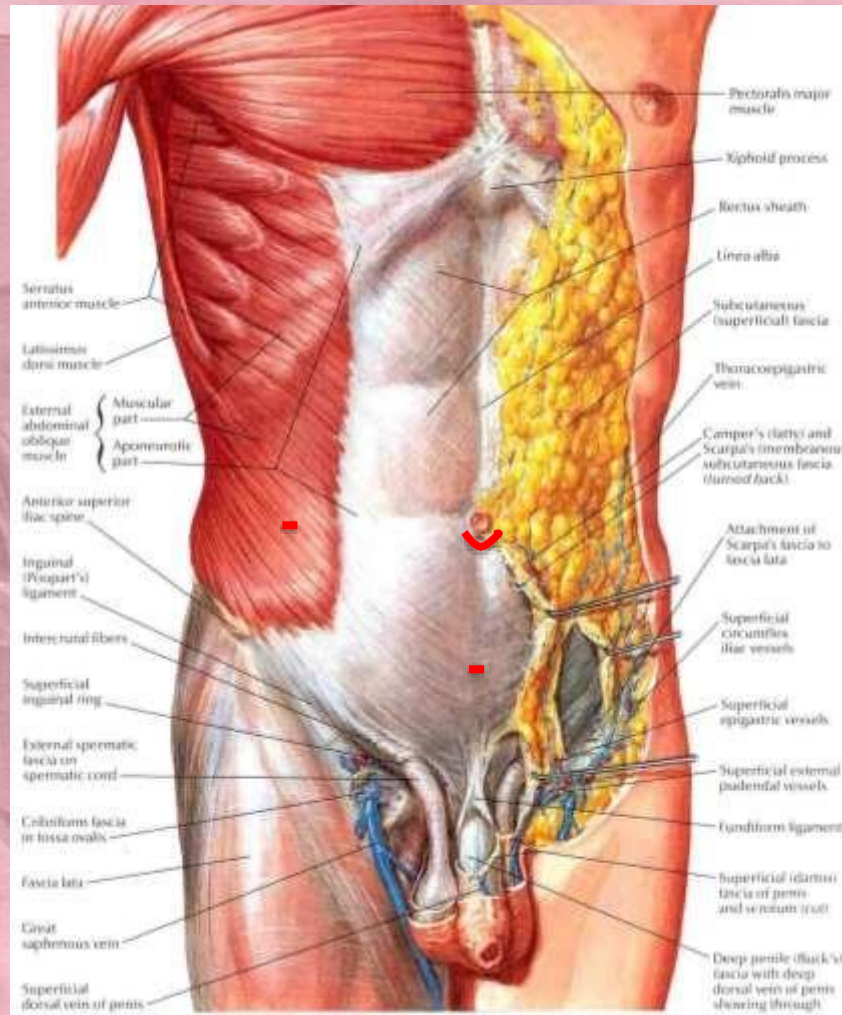
Midline, s incision







# APPENDEKTOMI LAPAROSKOPIK



# PERALATAN LAPAROSKOPIK





- ❑ Insisi ke-1 (1 cm) ⇒ smile incision infraumbilikal
- ❑ Tujuan: a. Inseri veres needle ⇒ u/ mengisi CO<sub>2</sub> intra abdomen (pneumoperitoneum)  
b. Inseri laparoscope ⇒ u/ melihat organ intra abdomen



- ❑ Inseri Trocar 10mm dgn teknik “blind”
- ❑ Tujuan: u/ memasukkan laparoscope (video camera)





☐ Insisi ke-2 (0,5 cm) ⇨ suprapubic



□ Insisi ke-3 (0,5 cm) ⇒ RLQ sejajar umbilicus







# PROGNOSIS

- Mortalitas ⇨ 0,1% pada apendisitis akut, 3% bila ruptur, 15% bila ruptur pada geriatri
- Etiologi † ⇨ sepsis tak terkontrol, emboli paru, abses
- Komplikasi yang mungkin terjadi:
  - Akut ⇨ infeksi luka operasi
  - Kronis ⇨ perlengketan, ileus obstruksi, hernia







**MATUR SUWUN**