

# Arterial Disease

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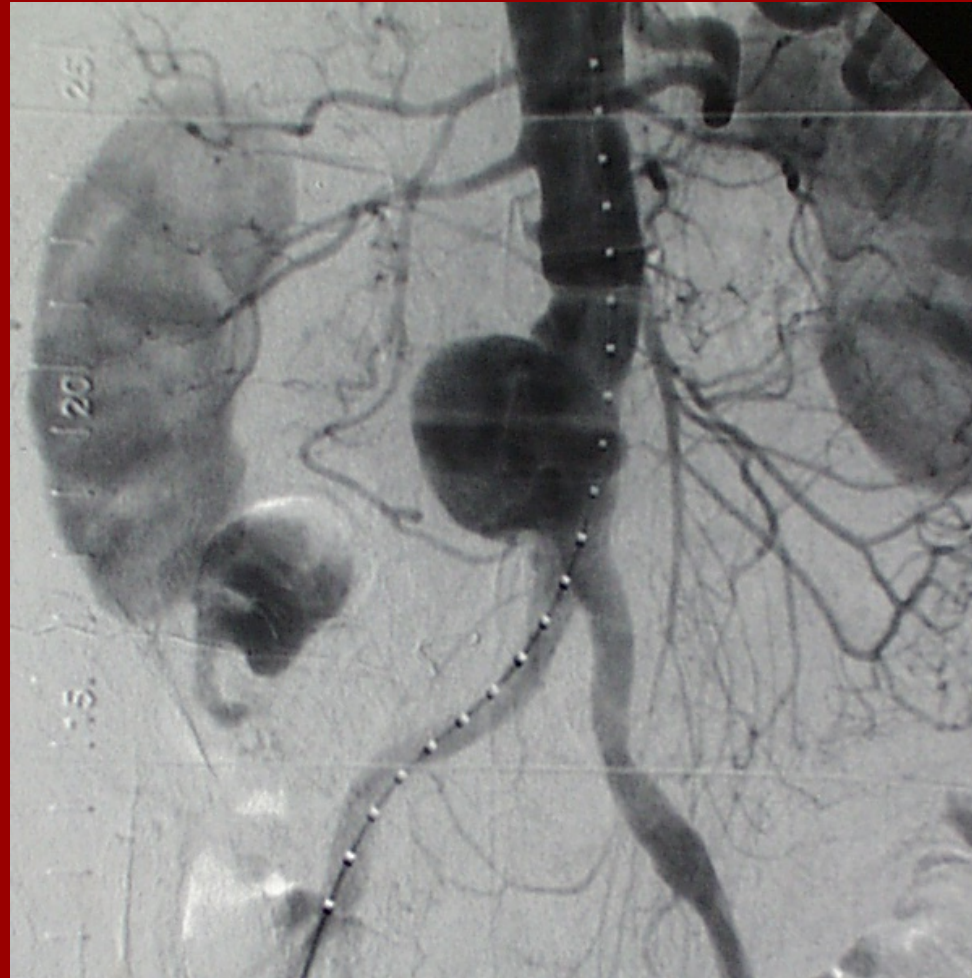
GP CME 2008

June 21

# Topics for Discussion

- Screening for Abdominal Aortic Aneurysm
- Acute and chronic lower limb ischaemia
- Non invasive assessment of lower limb ischaemia

# Abdominal aortic aneurysm



# AAA Epidemiology

- 10th leading cause of death in males >65
- M:F 6:1
- Men 50-59 0.9% prevalence
- Men 75-80 10.3% prevalence
- Women 75-80 2.1% prevalence
- (Women have delayed age of onset)

# AAA increasing incidence

- Aging population
- Detection rates
- Age independent increase
- (CAD decreasing)

# AAA Screening by U/S

- Disease common and natural history known
- Long latency period
- Intervention improves outcome
- U/S inexpensive and accurate
- Normal U/S may never need repeating

# At risk population

- Male
- Age >65
- Smoker
- Hypertensive
- Relative of AAA pt (esp male)

# International AAA screening

- Gloucester aneurysm screening program
- Chichester RCT 6058 men 65-80
- Viborg, Denmark RCT 12658 men 65-73
- Multicentre Aneurysm Screening Study (MASS) 70495 men 65-74
  - Aneurysm related deaths reduced from 113 to 65

# Tauranga AAA screening study

- 1995-1996
- Males 65-74 yrs old
- 1150 invited
- 899 screened (78%)
- Ultrasound scan

# Tauranga AAA screening study

- >2.5cm            149pts            17%
- >3cm                54pts                6%
- >4cm                16pts                2%
- >5cm                7pts                  1%
- >9cm                2pts

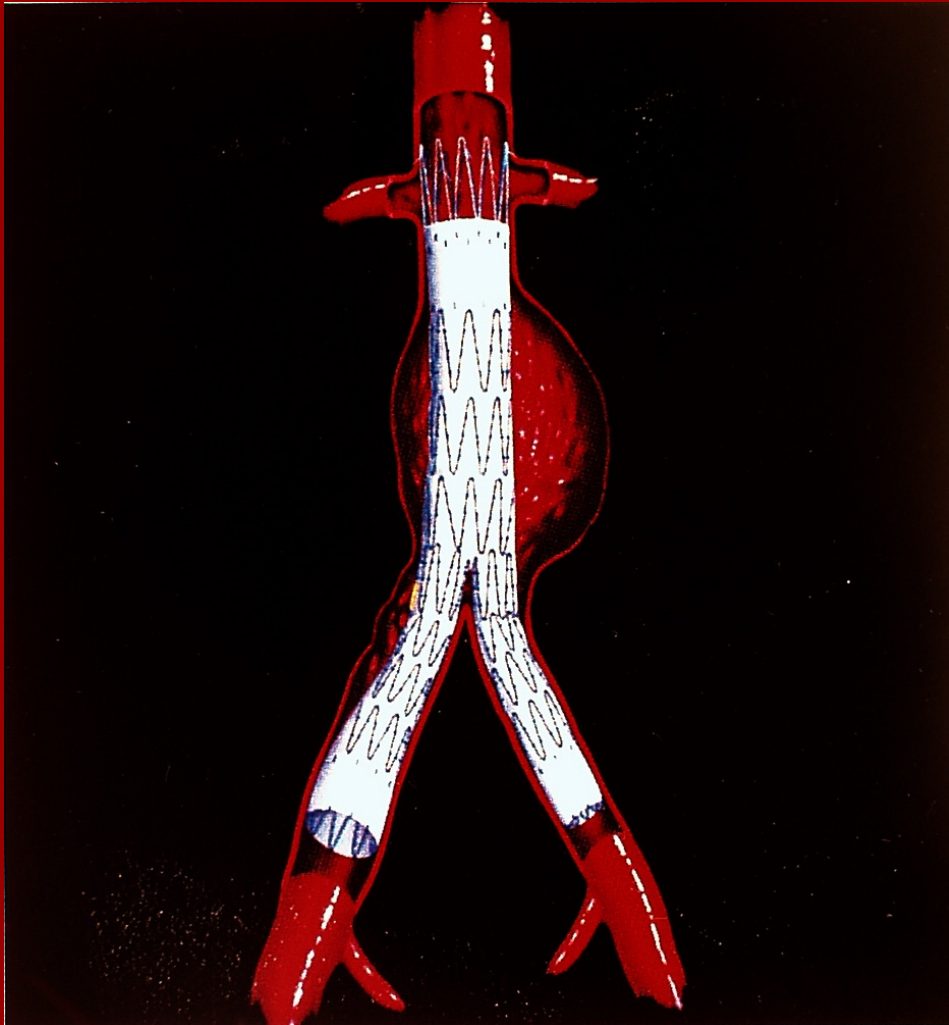
# AAA risk factors

- Age,sex
- Smoking (x1.5)
- PVD (x2)
- Hypertension (x1.5)
- Sibling with AAA (x4)

# AAA risk of rupture

- 5cm 5-10% per year
- 6cm 10-15% per year
- 7cm 15-20% per year
- 8cm 20-40% per year
- 9cm 40-60% per year
- 10cm 80-100% per year

# Endoluminal graft for AAA



- Minimally invasive
- Groin incisions
- Secured by radial force +/- hooks
- Low morbidity
- Low mortality
- Need infrarenal “neck”

# Acute Lower Limb Ischaemia

- History and Exam crucial
- Acute v chronic
- Embolus v thrombus
- Limb threat?

# Aetiology of Acute Ischaemia

- Embolus
- Thrombosis (acute on chronic)
- Thrombosed popliteal aneurysm
- Thrombosed bypass graft
- Acute aortic dissection

# GP management

- REFER
- Usually to ED for same day intervention

# 6 Ps

- Pain
- Pulseless
- Pallor
- Poikilothermia
- Paraesthesia
- Paralysis

# Investigations for embolism

- History, exam
- ECG
- ?arteriogram
- exploration

# Investigations for thrombosis

- Arteriography routine
- Preoperative workup
- Vein map etc

# Chronic Ischaemia

- Claudication
- Rest pain
- Ulceration
- Gangrene

# Diagnosis

- Treadmill ABI
  - Detects presence of pvd
  - Relates disease to symptoms
  - Assess severity of symptoms
  - Assess other medical conditions

# Claudication v Rest pain

- Exercise
- Location
- Night pain > 2/52 req opiates
- Rest pain implies critical ischaemia (ie threatened limb)

# Management of claudication

- Risk factor modification
- Exercise
- Reassurance (benign course)
- Intervention only for short distance, significant lifestyle impairment
- Angioplasty / surgery

# GP role in claudication

- Smoking
- BP
- Chol
- Aspirin, statin
- Surveillance
- Re-refer if deteriorating (usually non urgent)

# GP followup

- Limited FU in vascular clinic (appropriate)
- Continued risk factor management
- Otherwise see only for problems
- Urgent referral if ?blocked graft

# Non invasive assessment of lower limb arterial disease

- Confirmation of vascular disease
- Document resulting physiological and functional derangement
- Relationship to symptoms
- Identify disease progression
- Followup

# The Comprehensive Lower Limb Arterial Study

- History (and examination)
- ABPI and Waveforms
- Treadmill test
- Segmental pressures
- PPG + toe pressures
- Duplex scan

# Why do Doctors request the test?

- Pain at rest
- Pain on exercise
- ulcers
- Can't feel pulses ?arterial disease
- “bad circulation”
- Prior to orthopaedic surgery

# ABPI



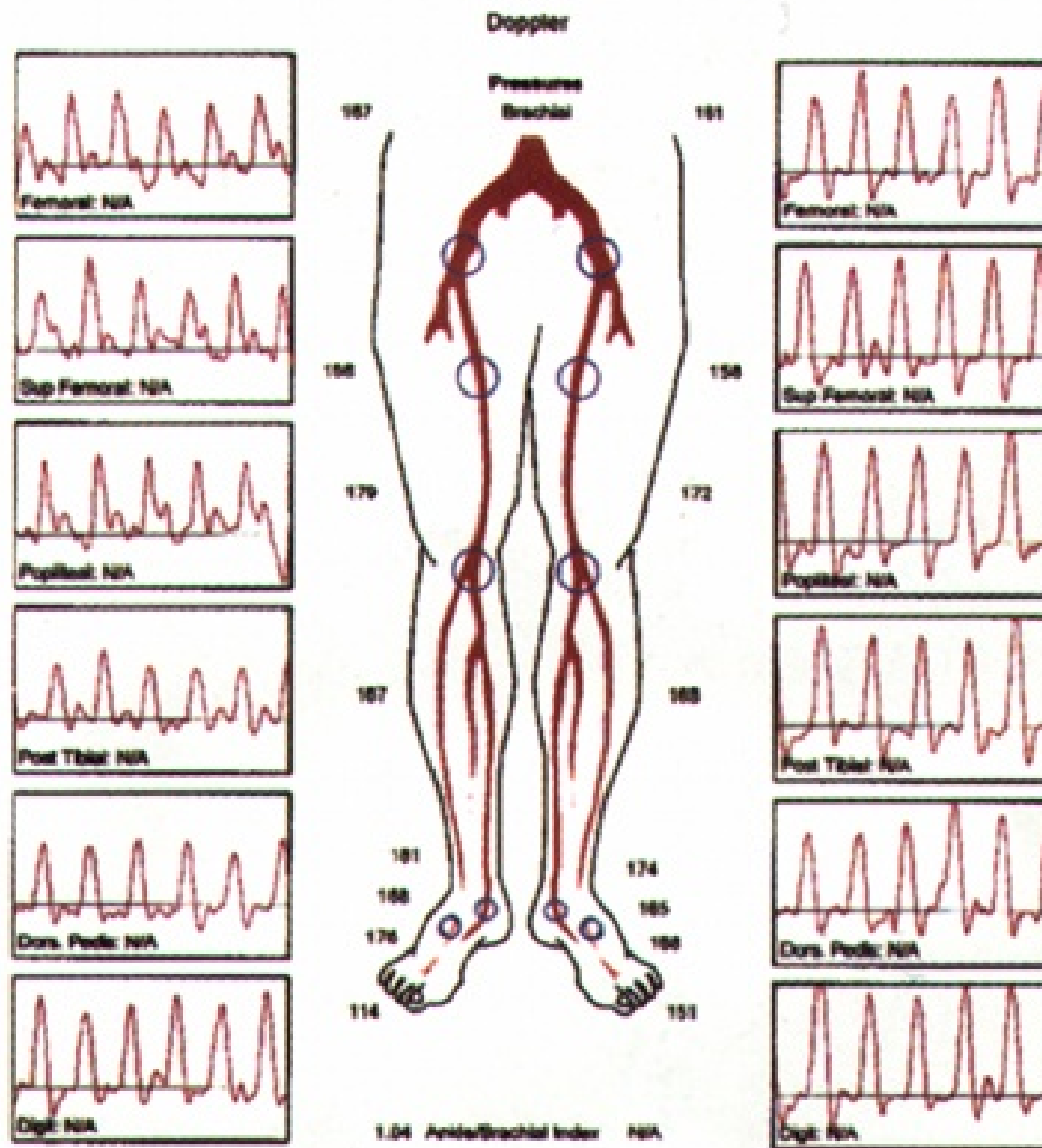
# ABPI and severity of disease

- ABPI
  - 0.95-1.2
  - 0.70-0.89
  - 0.40-0.69
  - <0.40
- SEVERITY
  - Normal
  - Mild
  - Moderate
  - Severe

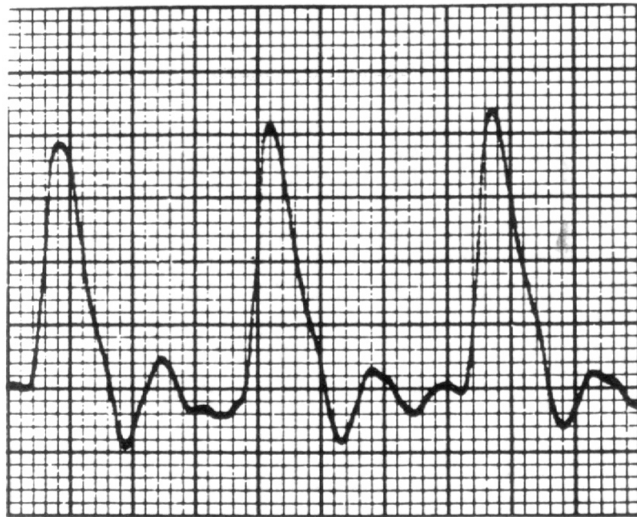
# ABPI and Waveforms



Model 3100 Mini-Lab with VIP System

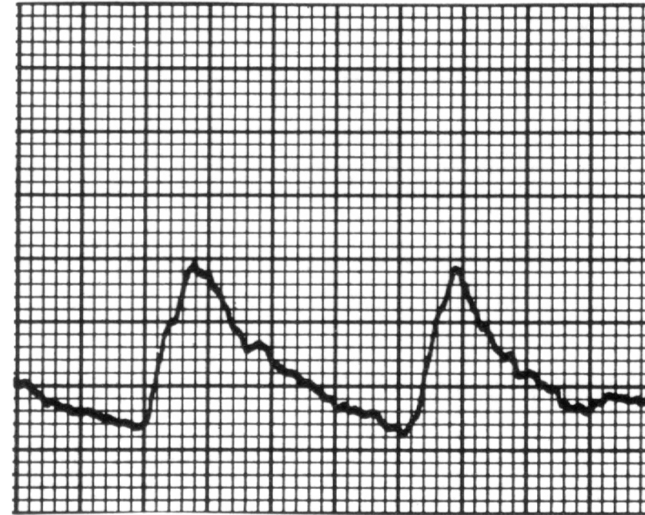


**Normal**



**Triphasic**

**Abnormal**

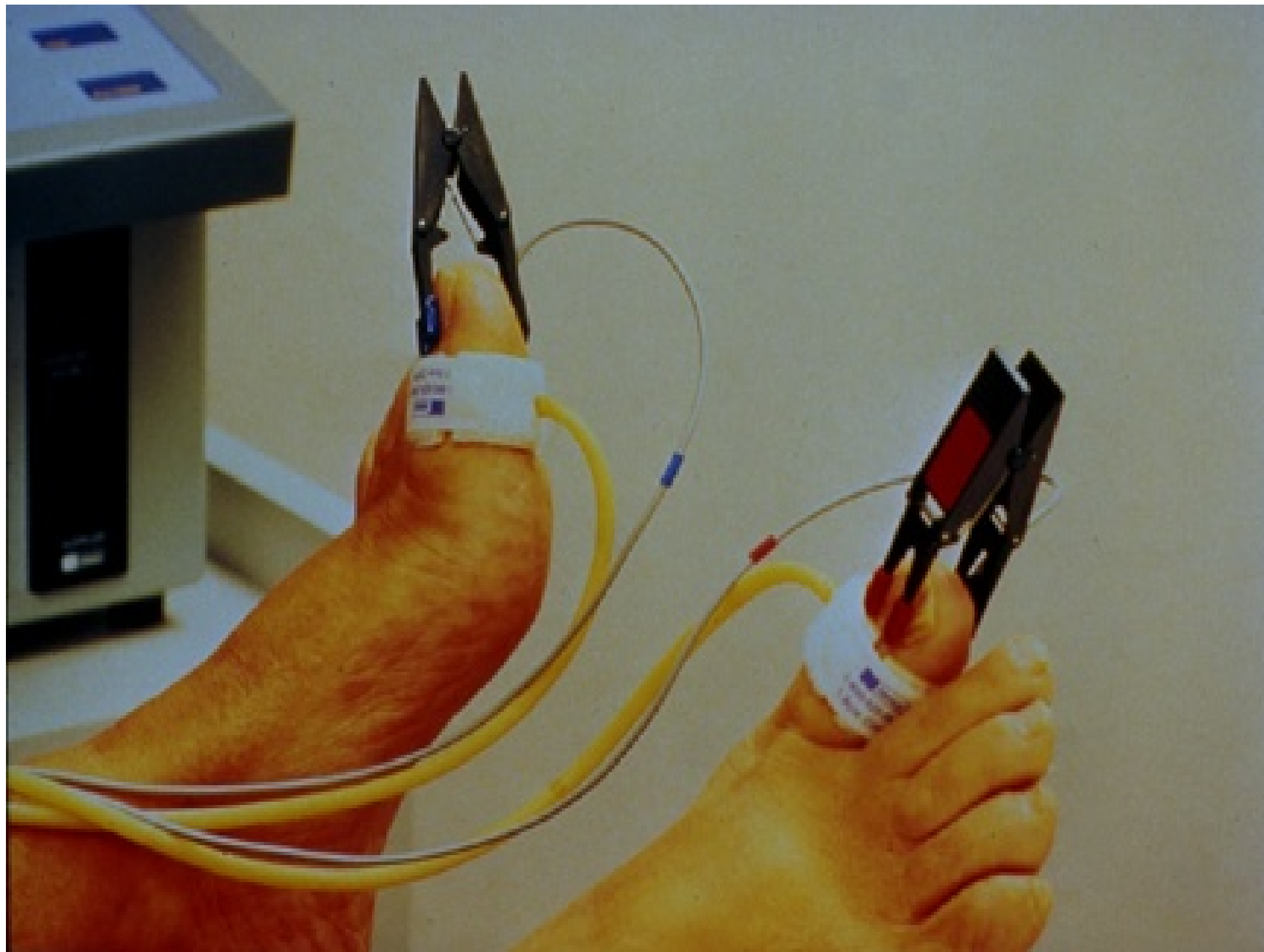


**Monophasic**

# 'Incompressible vessels'

**No excuse for inadequate examination**

- Diabetes, calcified arteries
- ABPI high or unrecordable
- Waveforms
- PPG + toe pressure
- 'Height pressures'



# ARTERIAL DISEASE



**RETURN OF PULSE IS SYSTOLIC PRESSURE**

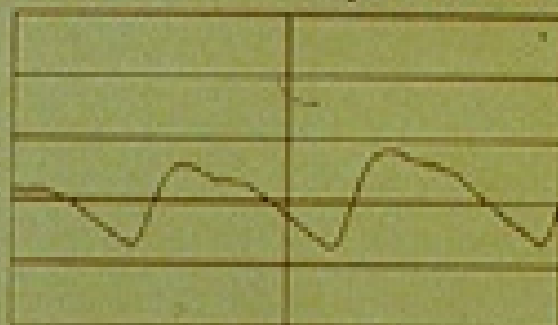


56 mm Hg

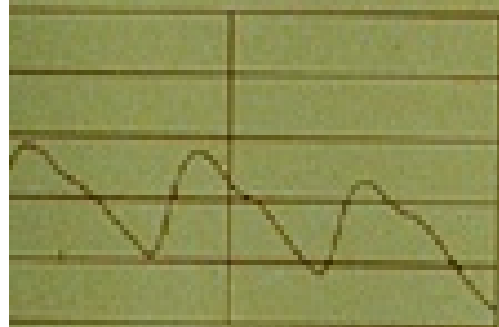
Imex Medical Systems

Right brachial pressure = 128  
Reform Site G

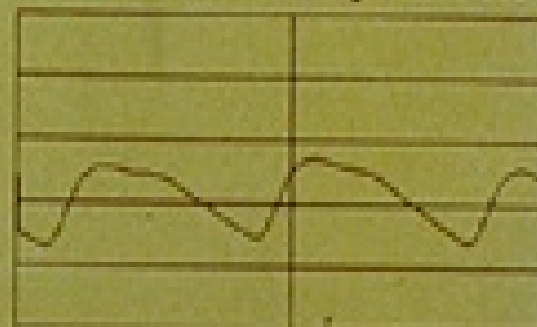
TBI = 0.97 Right 3rd Toe



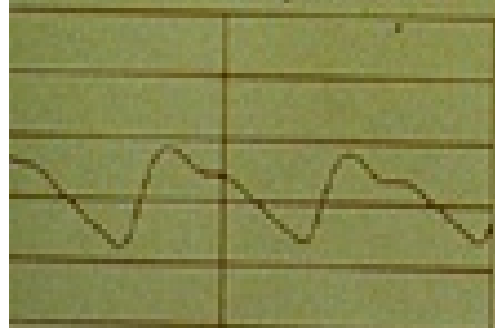
TBI = 0.95 Right 4th Toe



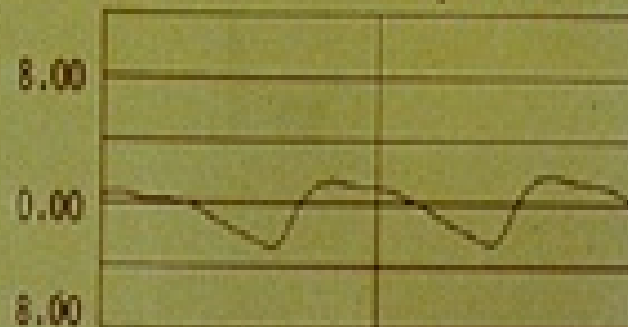
TBI = 0.93 Right 2nd Toe



TBI = 0.94 Right 5th Toe



TBI = 0.99 Right Great To



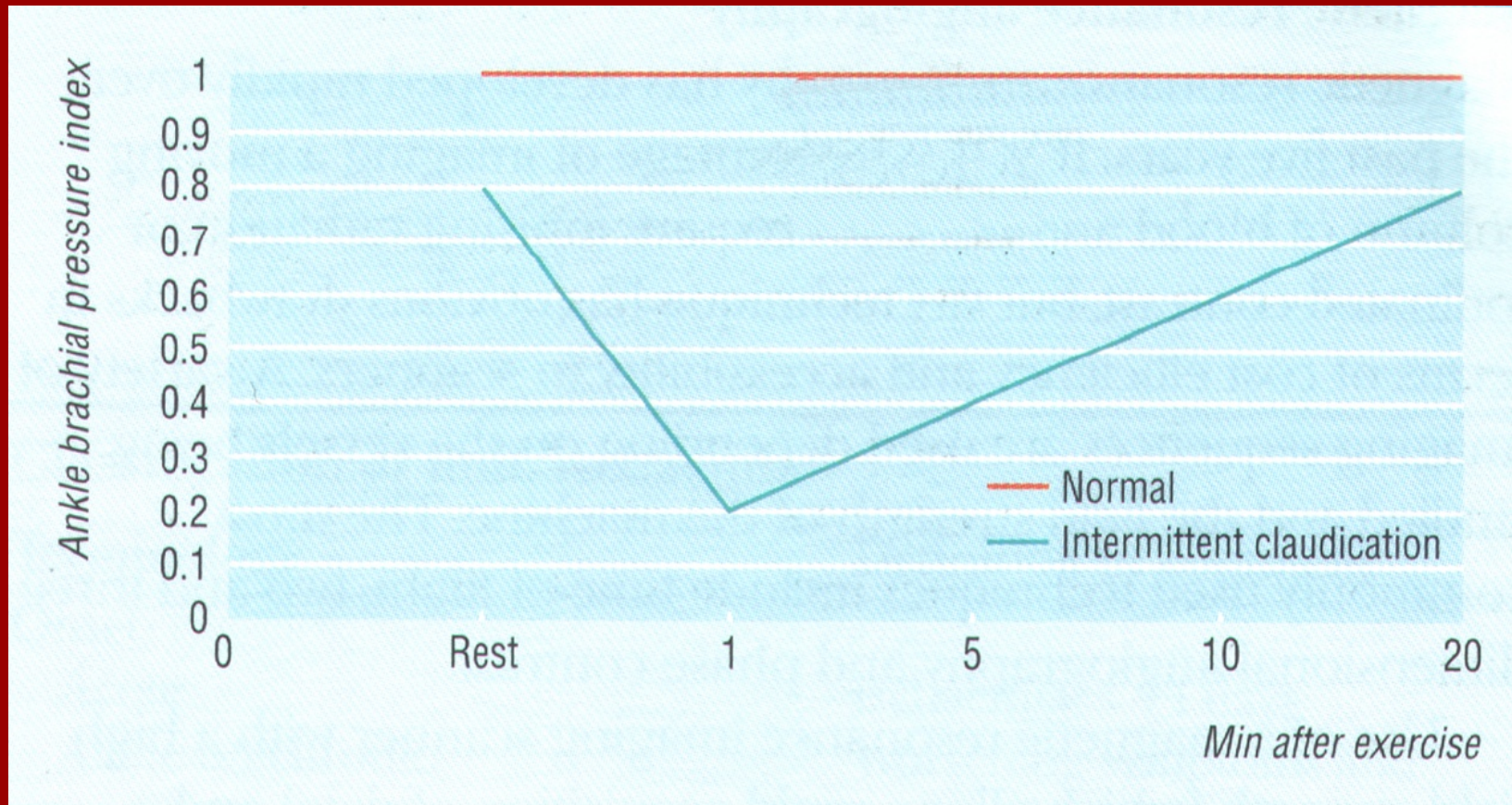
# Height Pressures



# Exercise test for

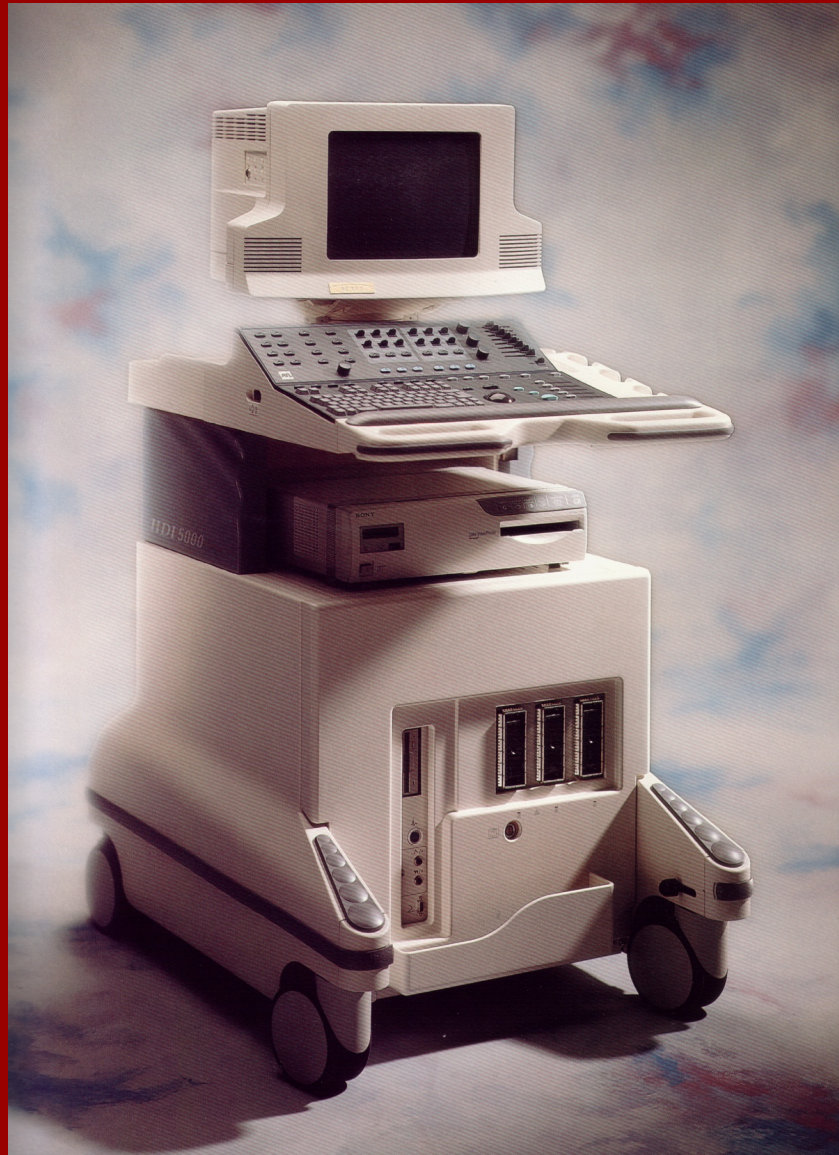
- Symptoms on exercise
- Claudication vs Pseudoclaudication
- “The ankle pressure after exercise is the most sensitive sign of the presence of arterial disease”

# Exercise test



# Segmental Pressures



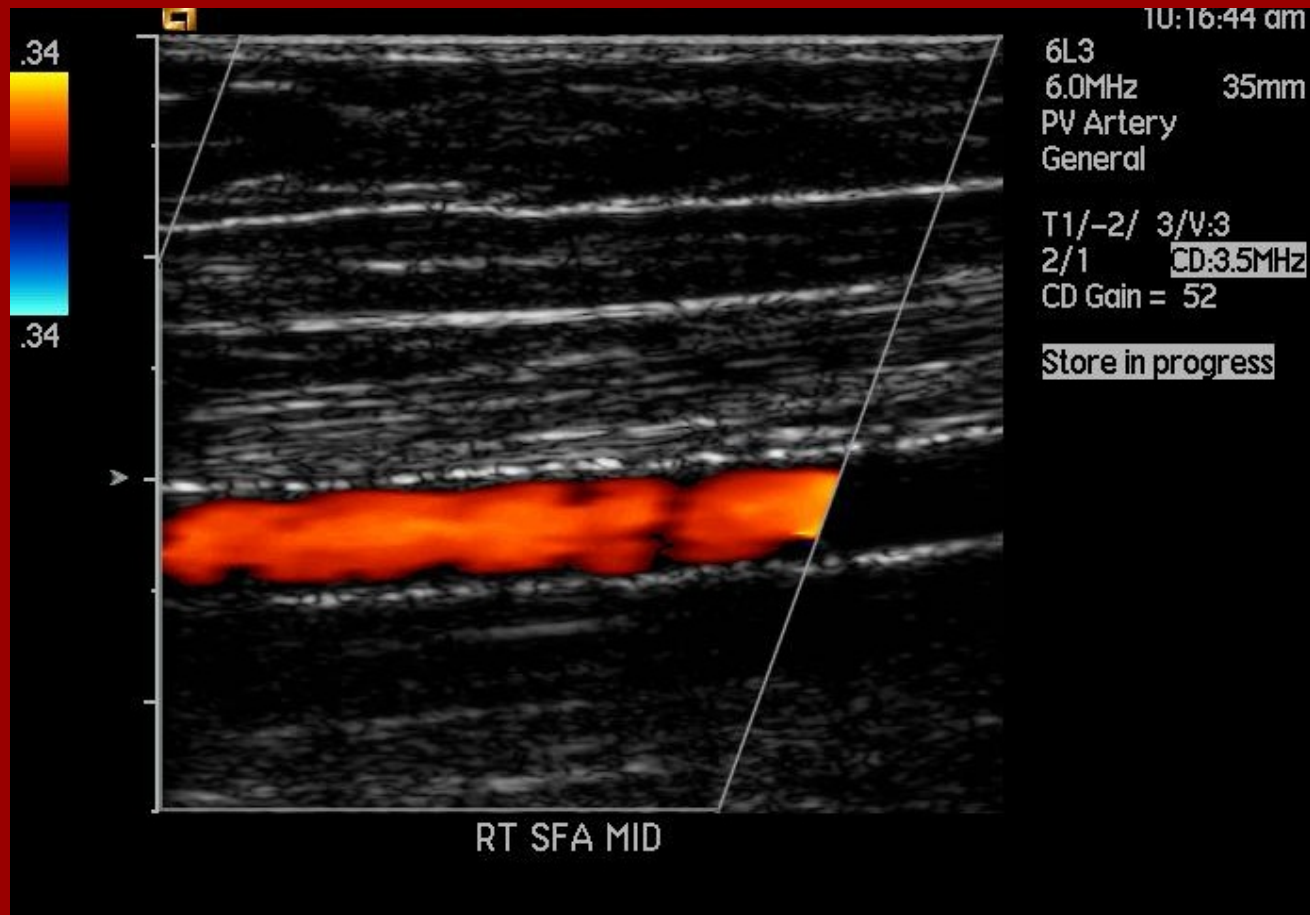


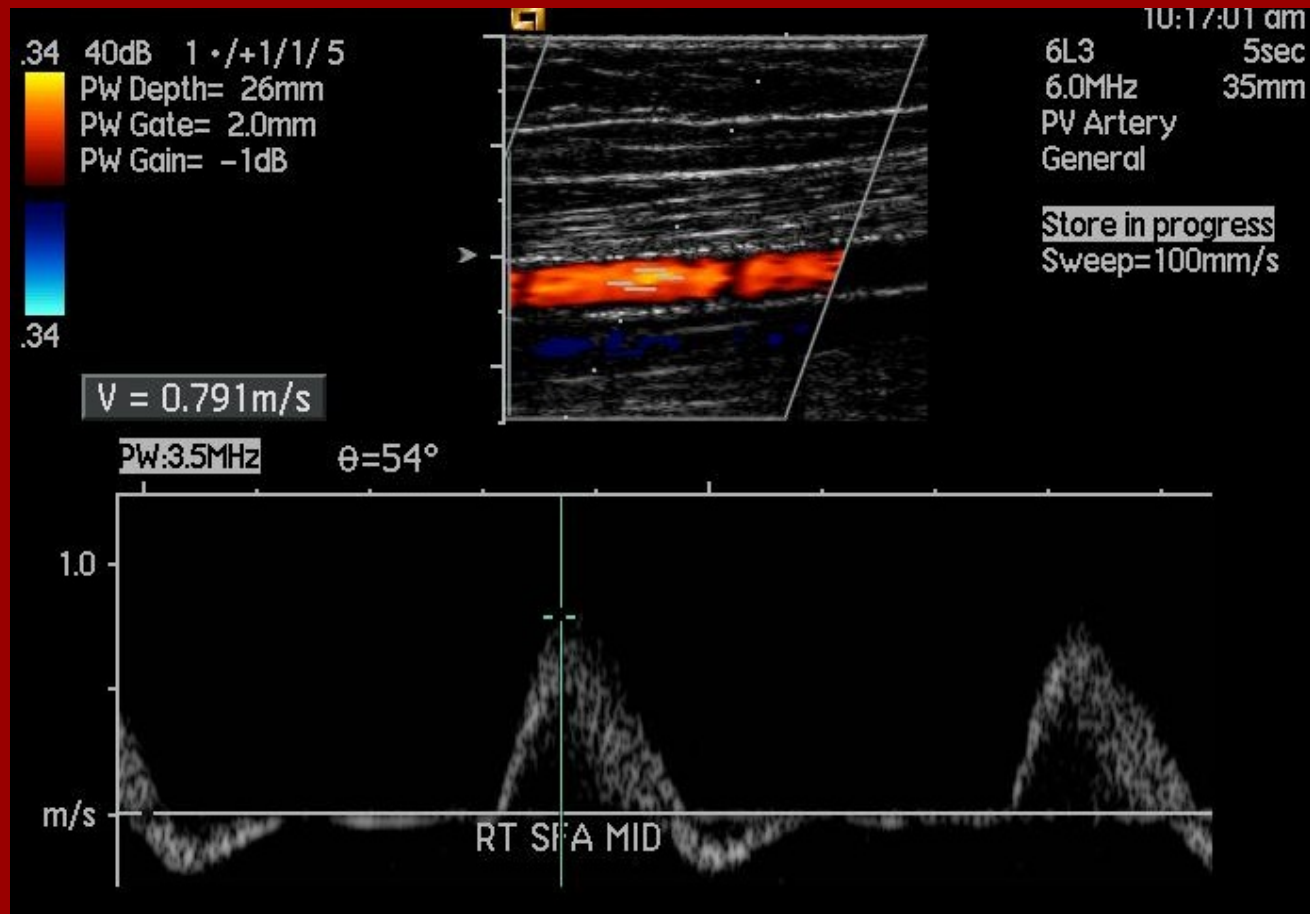
# Lower limb arterial duplex

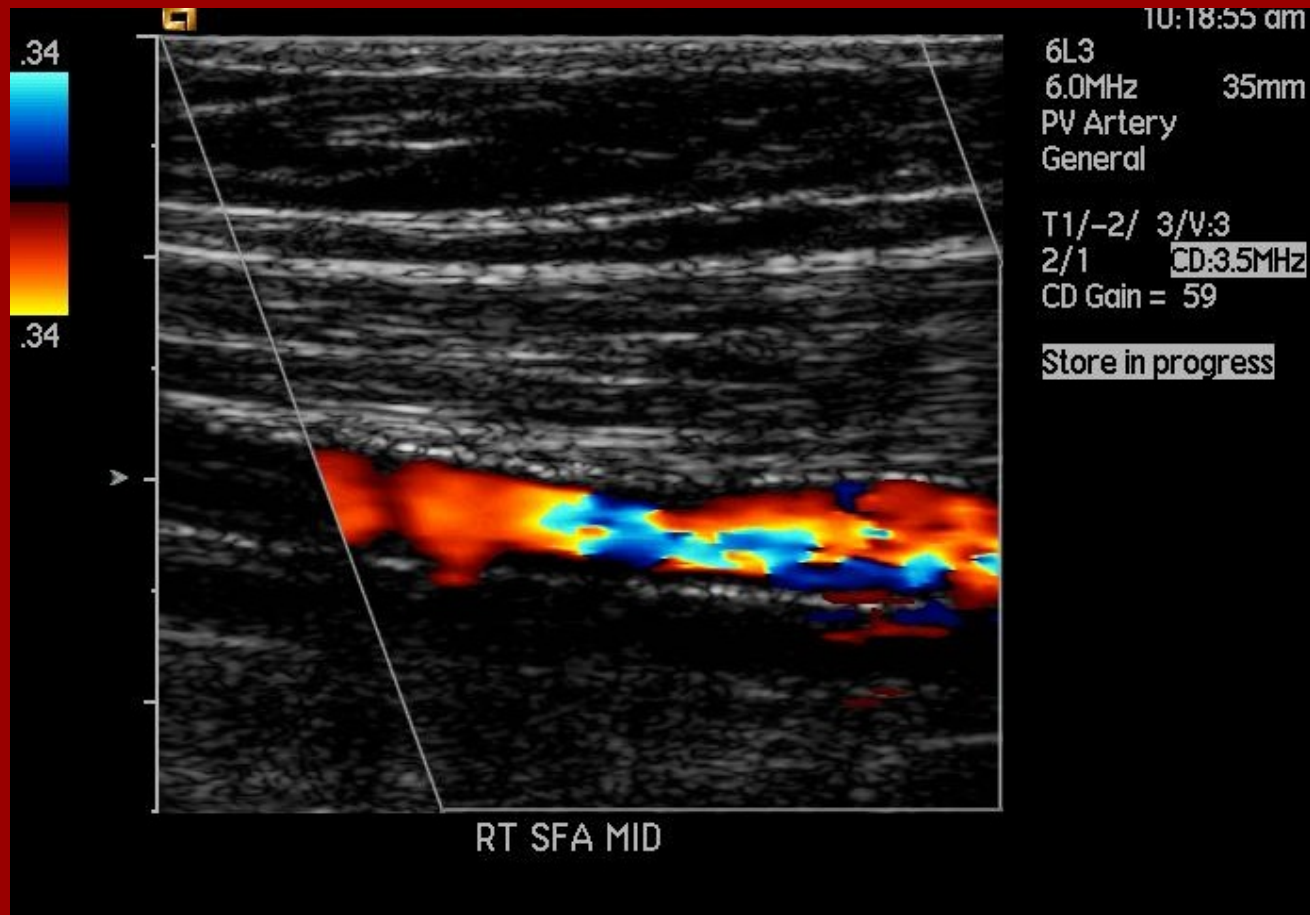
- Anatomical test
- Look for treatable lesions
  - (ie need to understand rationale for Rx)
  - Iliac stenosis / occlusion
  - SFA stenosis / occlusion
  - ?angioplastiable lesion
  - ?enough info for surgery

# Lower limb arterial duplex

- Aorta to calf vessels
- Difficult areas
  - Iliacs
  - Calf vessels









# Other non invasive tests

- MRA
  - False positives
  - Useful for renal arteries (+ duplex)
  - User dependent
- CTA
  - Radiation
  - Cost
  - Anatomical test

# Conclusions

- Claudication
  - Manage risk factors
  - Avoid intervention if poss
  - Non invasive assessment
- Critical ischaemia
  - Intervention is for limb salvage
- Screening for AAA





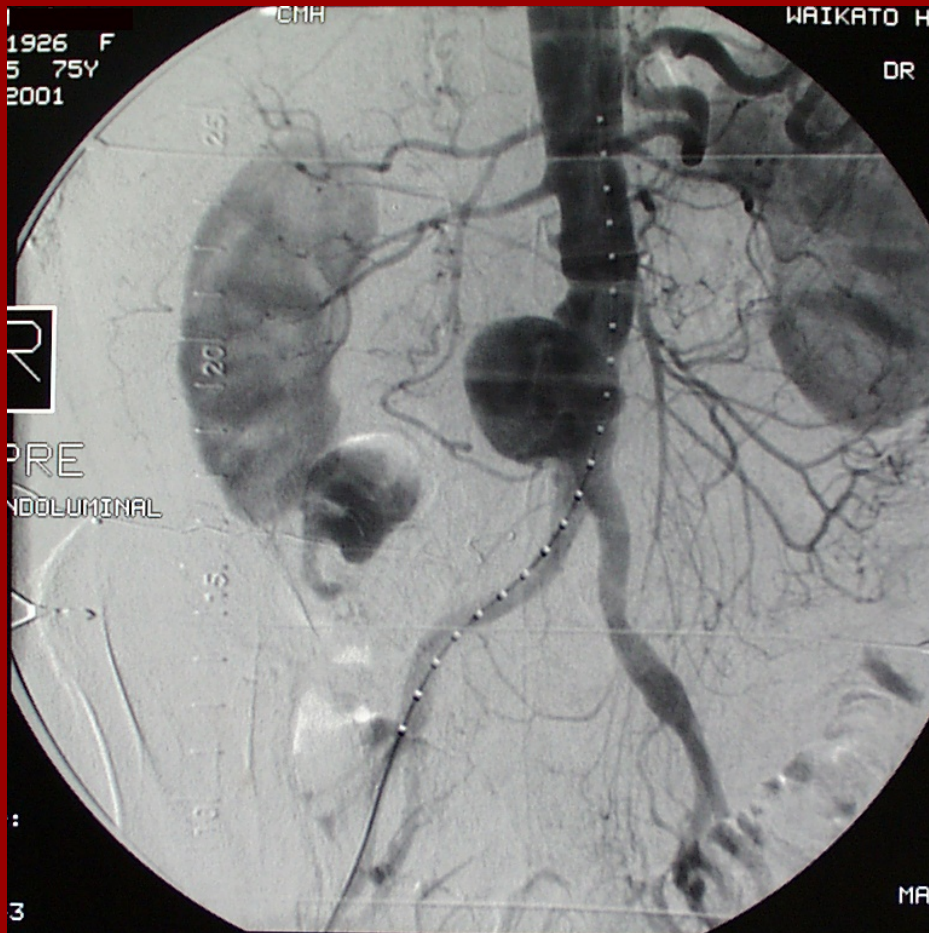








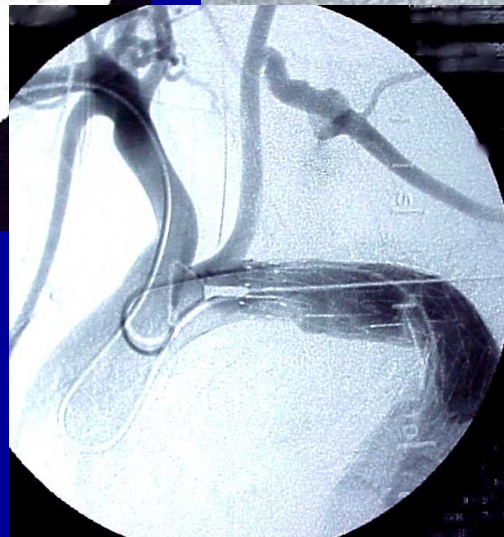
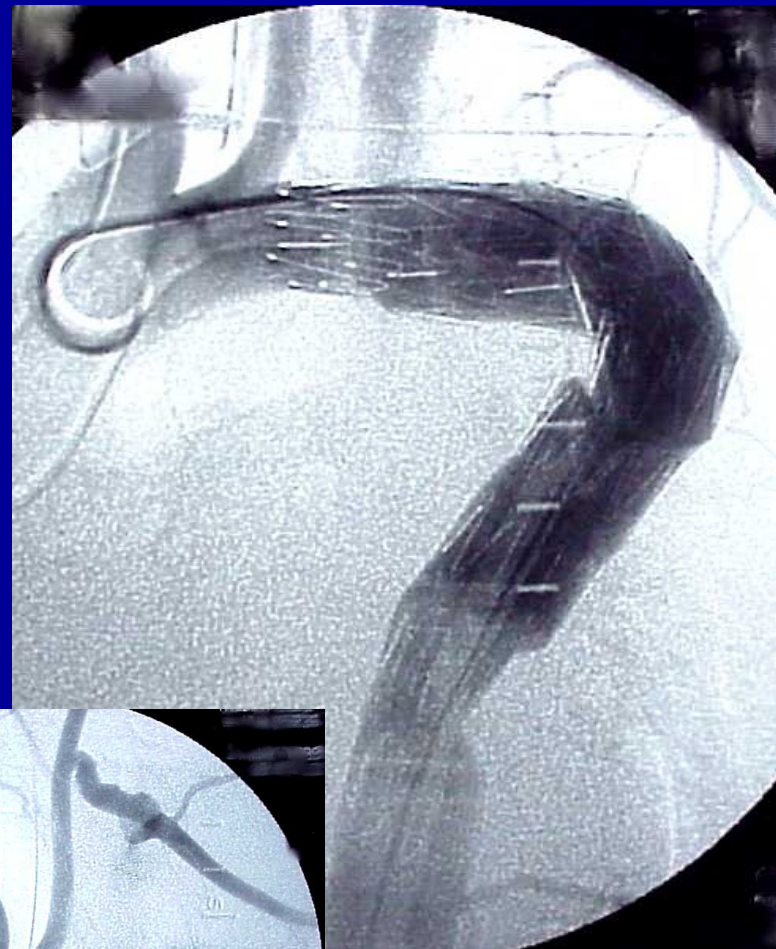
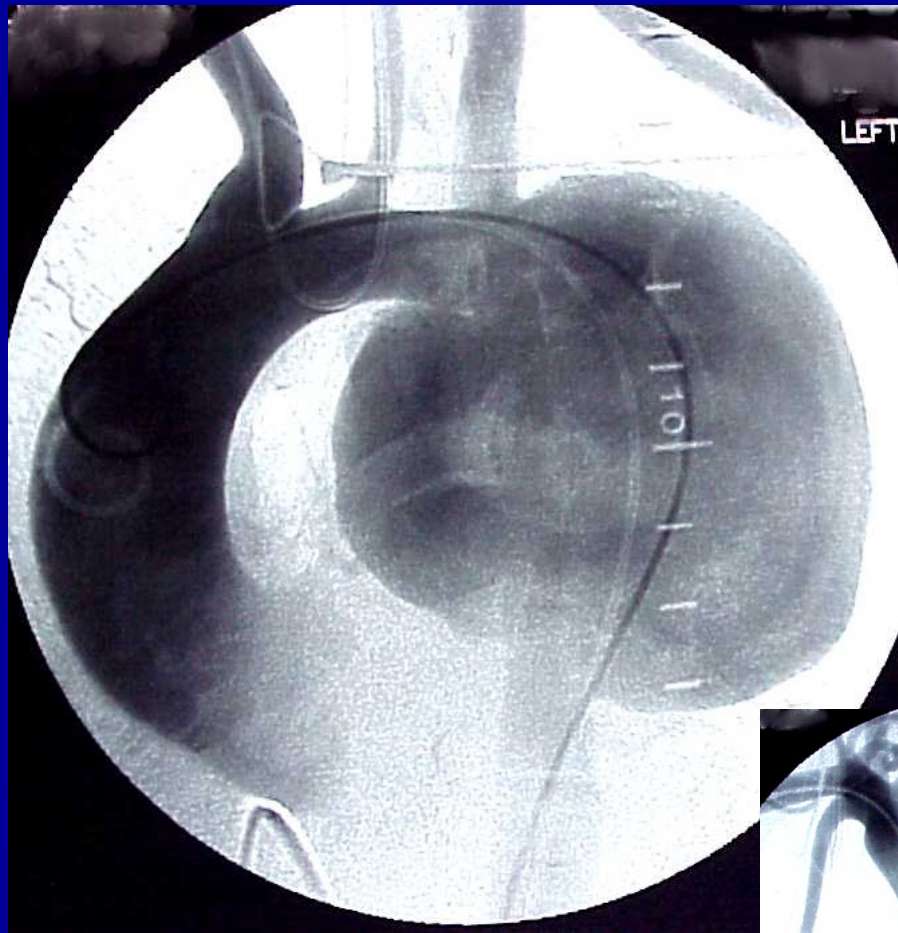
# Abdominal Aortic Aneurysm



- Dilatation >3cm
- 95% infrarenal
- Repair if >5cm
- Repair if symptomatic

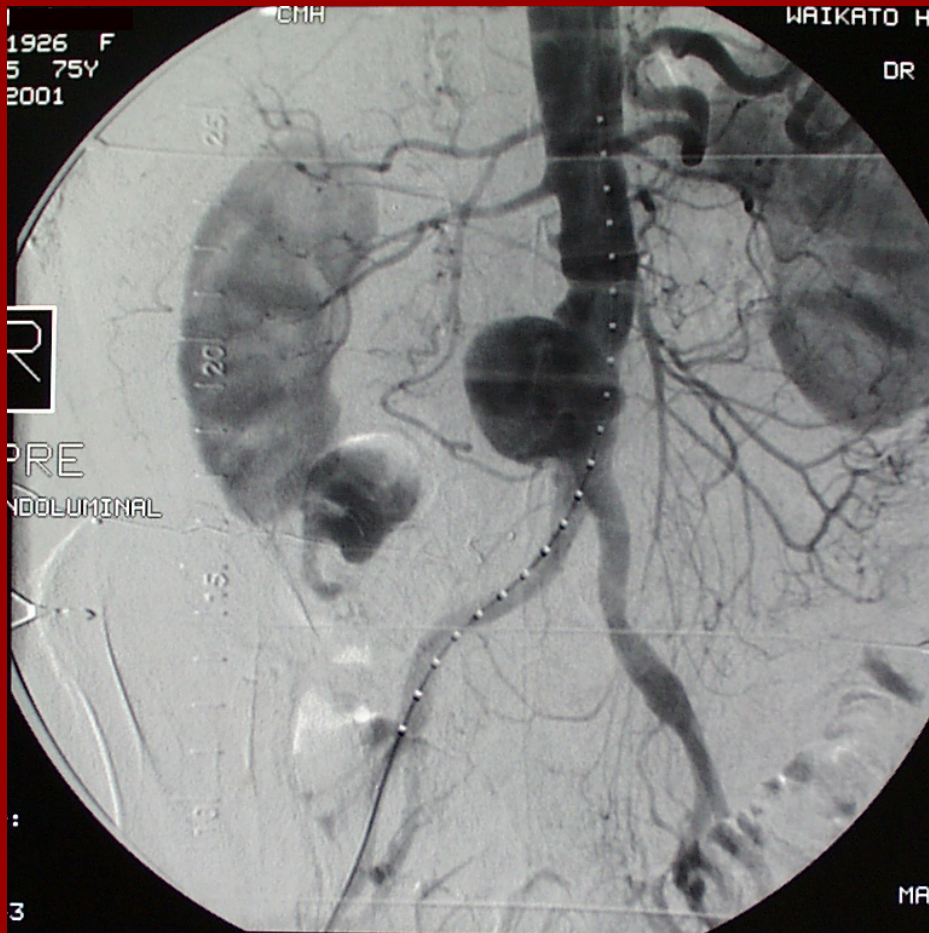






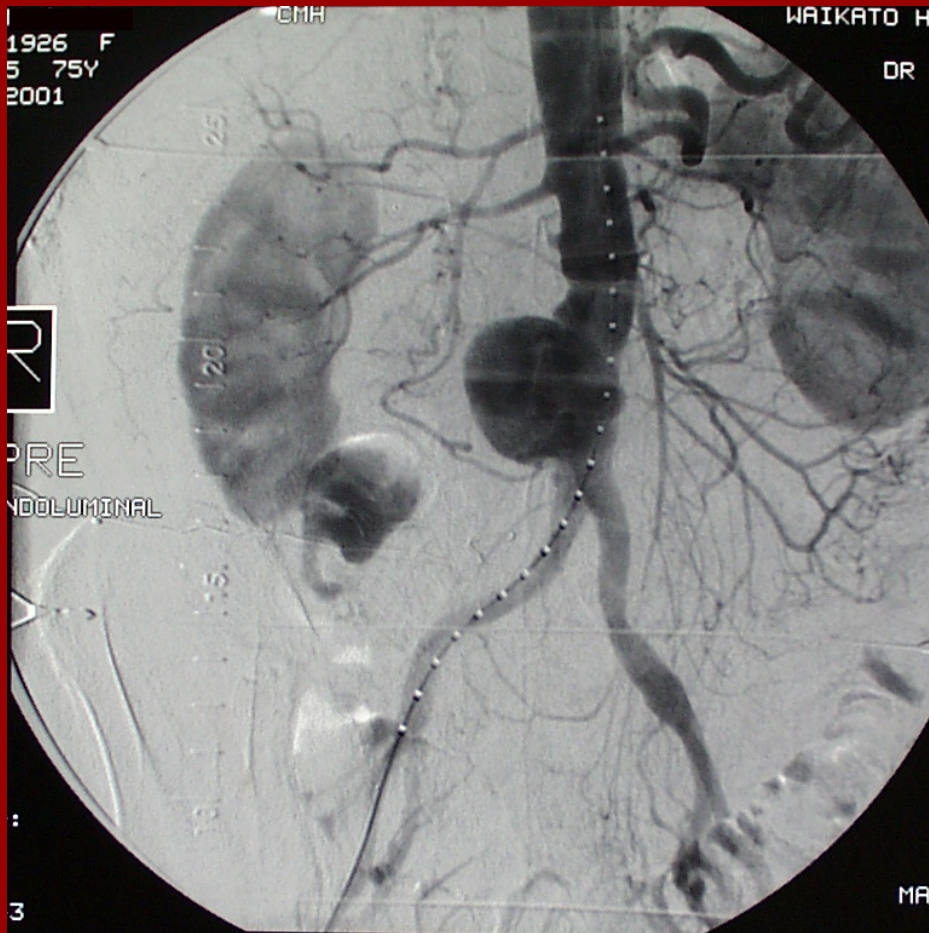
**THORACIC AORTA  
ENDOLUMINAL GRAFT**

# Abdominal Aortic Aneurysm



- Dilatation >3cm
- 95% infrarenal
- Repair if >5cm
- Repair if symptomatic

# H & LB criteria



- Neck length >2cm
- Neck diameter <28mm
- Angulation minimal
- Minimal flare
- Minimal thrombus
- Iliac access (tortuosity, calcification, stenosis)