中國醫藥大學新竹附設醫院
CHINA MEDICAL UNIVERSITY HSINCHU HOSPITAL

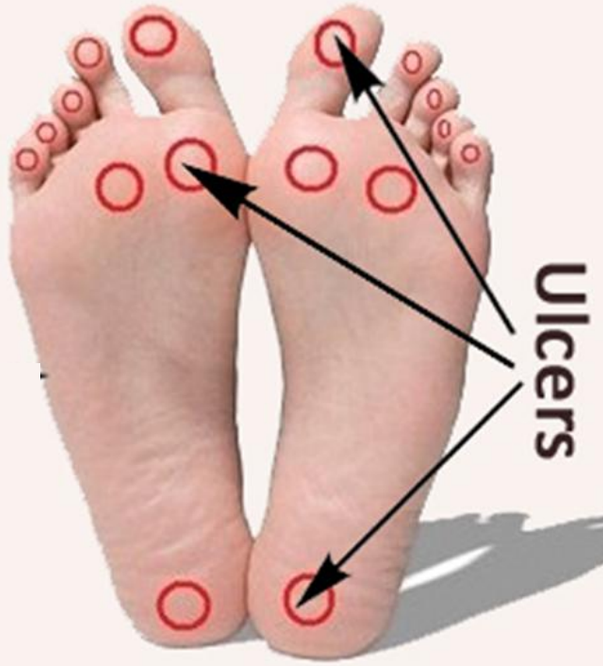
洗腎患者常見之下肢缺血性病變

心臟血管外科
齊修瑜

國防醫學院醫學系　學士
國立陽明交通大學生物醫學工程學系　博士

Peripheral Arterial Occlusive Disease

嚴重併發症 足部潰瘍介紹



Symptoms

- Redness on feet
- Warm or swollen feet
- Break in the skin or discharge
- Itching
- Dryness
- Pain and Stiffness
- Feeling unwell
- Ulcers or Blisters
- Sore Feet

糖尿病患 → 足潰瘍　25%

糖尿病足潰瘍 → 截肢　15%

潰瘍五年復發率　30-55% (英國)

糖尿病足五年存活率：30% (癌症 62%)

傷口：52%

傷口+血管阻塞：38%

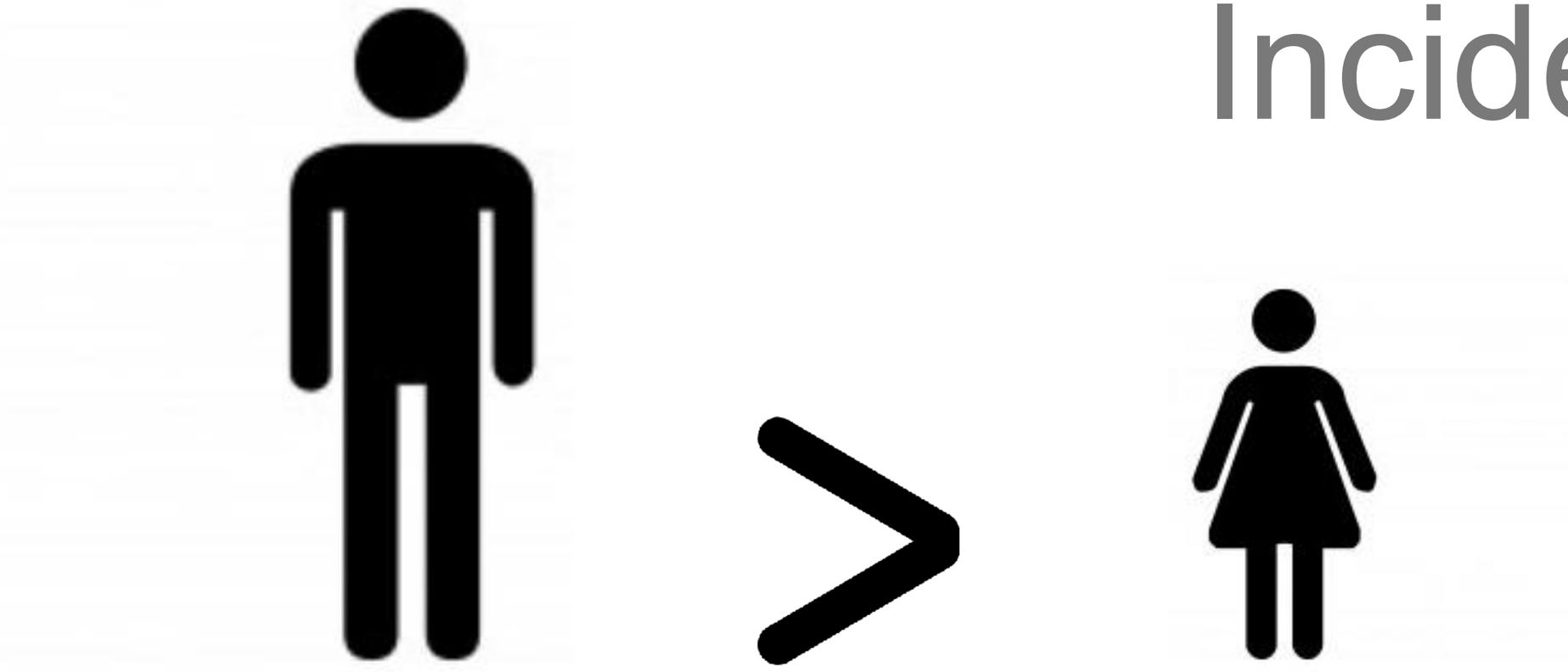
傷口+血管阻塞 + 感染截肢：27%

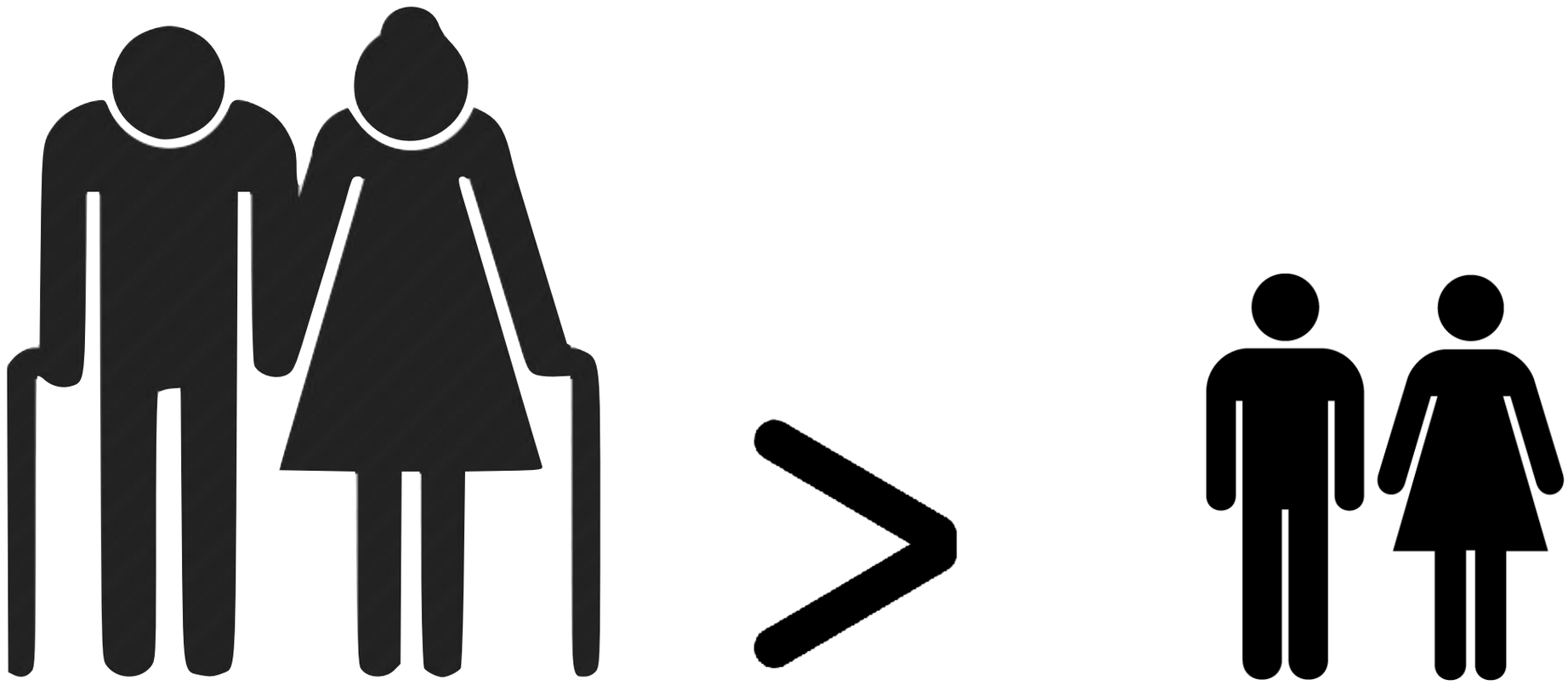
傷口+血管阻塞 + 感染截肢 + 洗腎：18%

+ 通血管：21%

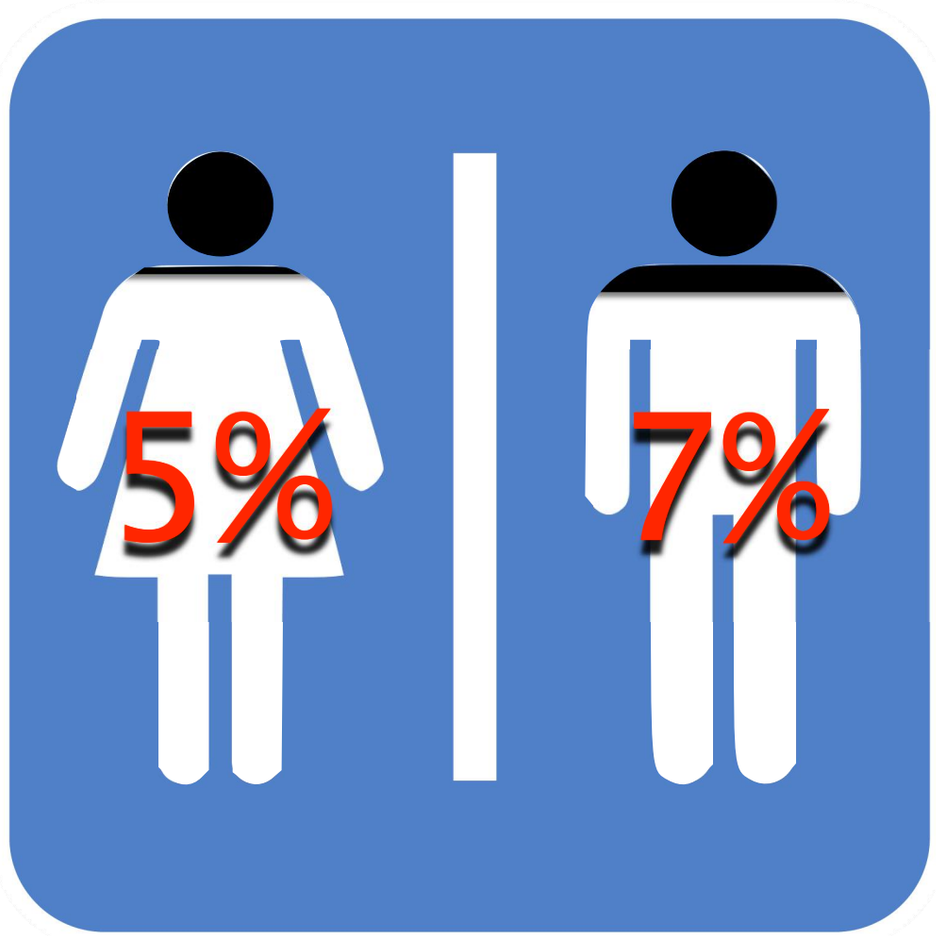
DM ≈CKD≈ PAOD

Incidence





65~69 y/o



>85 y/o

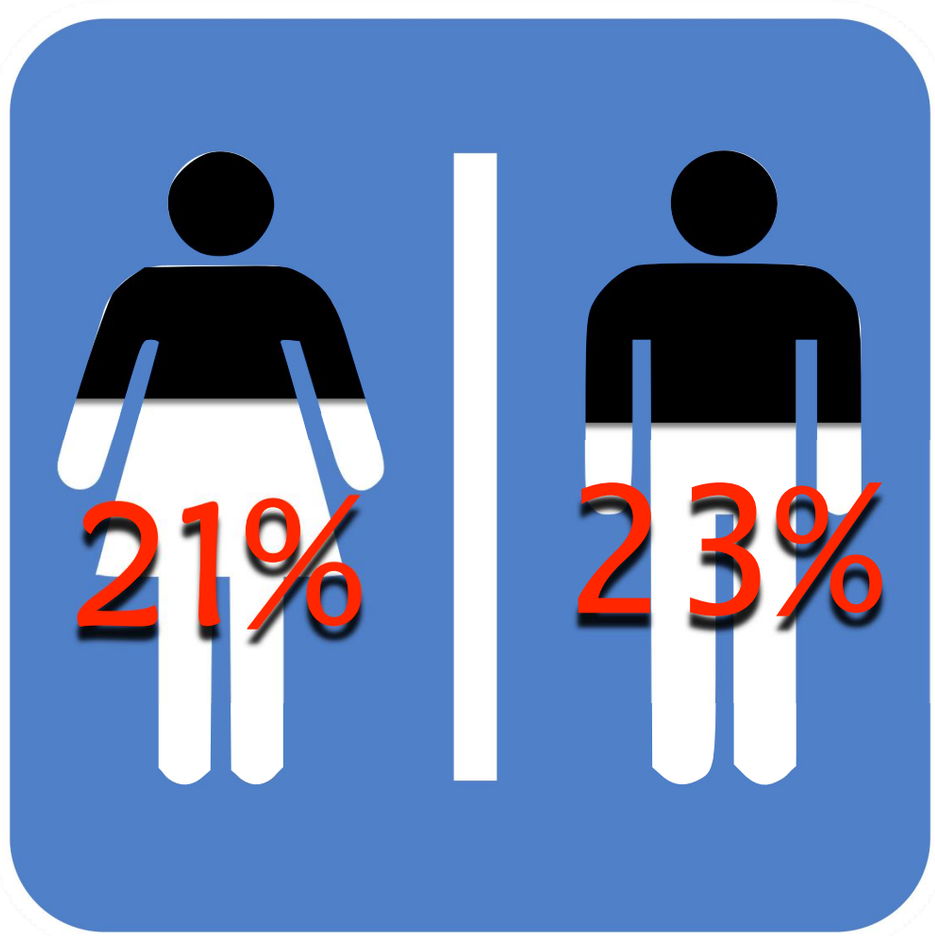


TABLE 80-1

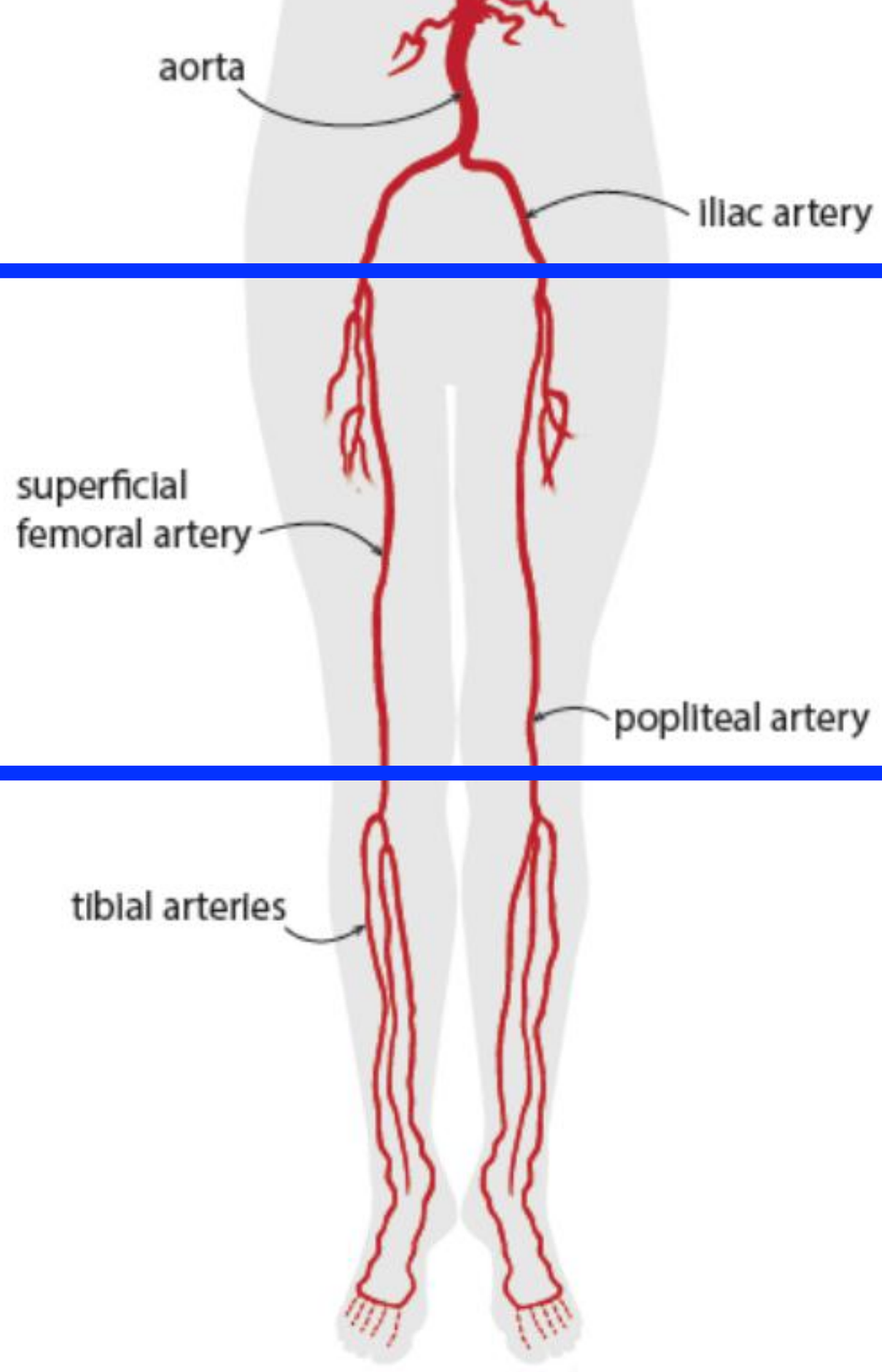
Causes of Peripheral Arterial Disease

Atherosclerosis	Arterial entrapment
Thrombus	Adventitial cyst
Embolism	Fibromuscular dysplasia
Dissection	Trauma
Vasculitis	Vasospasm

~30%

80%~90%

40%~50%


aorta
iliac artery
superficial
femoral artery
popliteal artery
tibial arteries

糖尿血管病變+血管鈣化+尿毒=「下肢動脈血管病變」的三重高風險

- 台灣透析患者中，超過一半會合併**糖尿病**，「末梢神經及血管病變」是糖尿病最常見的慢性併發症。一般來說，罹患糖尿病滿10年左右的患者當中，約有一半的人會併發神經病變，再過5到10年，就會逐漸演變為動脈血管病變。

- 末期腎臟病患者雖然可藉由血液透析或腹膜透析維持一定程度的生理機能，但終究無法取代正常的腎臟功能，病人的血液中的尿毒素仍較常人高，且無法正常的代謝鈣、磷、鉀等離子，都更為血管功能增添危機。

Classification

TABLE 80-3

Rutherford Classification of Peripheral Arterial Disease

GRADE	CATEGORY	CLINICAL DESCRIPTION
I	0	Asymptomatic; not hemodynamically correct
	1	Mild claudication
	2	Moderate claudication
	3	Severe claudication
II	4	Ischemic rest pain
	5	Minor tissue loss; nonhealing ulcer, focal gangrene with diffuse pedal ischemia
III	6	Major tissue loss extending above transmetatarsal level; foot no longer salvageable

Adapted from Rutherford RB. Standards for evaluating results of interventional therapy for peripheral vascular disease. Circulation. 1991;83(suppl 2):16.

TABLE 80-2

Fontaine Classification of Peripheral Arterial Disease

STAGE	SYMPTOMS
I	Asymptomatic
II	Intermittent claudication
IIa	Pain free, claudication walking >200 m
IIb	Pain free, claudication walking <200 m
III	Rest/nocturnal pain
IV	Necrosis/gangrene

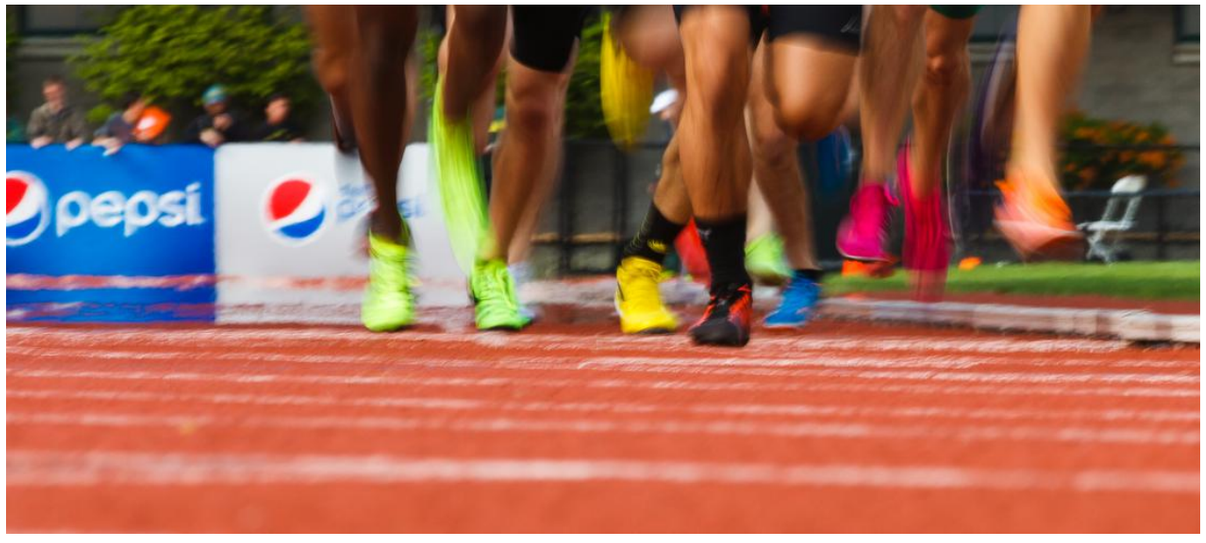
Adapted from Pentecost MJ, et al. Guidelines for peripheral percutaneous transluminal angioplasty of the abdominal aorta and lower extremity vessels. A statement for health professionals from a special writing group of the Councils on Cardiovascular Radiology, Arteriosclerosis, Cardio-Thoracic and Vascular Surgery, Clinical Cardiology, and Epidemiology and Prevention, The American Heart Association, Circulation 89(1):511–531, 1994.

Fontain	Rutherford	
I	1	
IIa	2	
IIb	3	
III	4	rest pain
IV	5	
IV	6	

Rutherford Fontain

Class1 Class I

Class 2 Class IIa



Class 3 Class IIb

Rutherford	Fontain
Class 4	Class III

Rest pain

Rutherford

Class 5

Fontain

Class IV

Rutherford

Class VI

Fontain

Class IV

Fontain	Rutherford	
I	1	
IIa	2	
IIb	3	
III	4	Resting pain
IV	5	
IV	6	

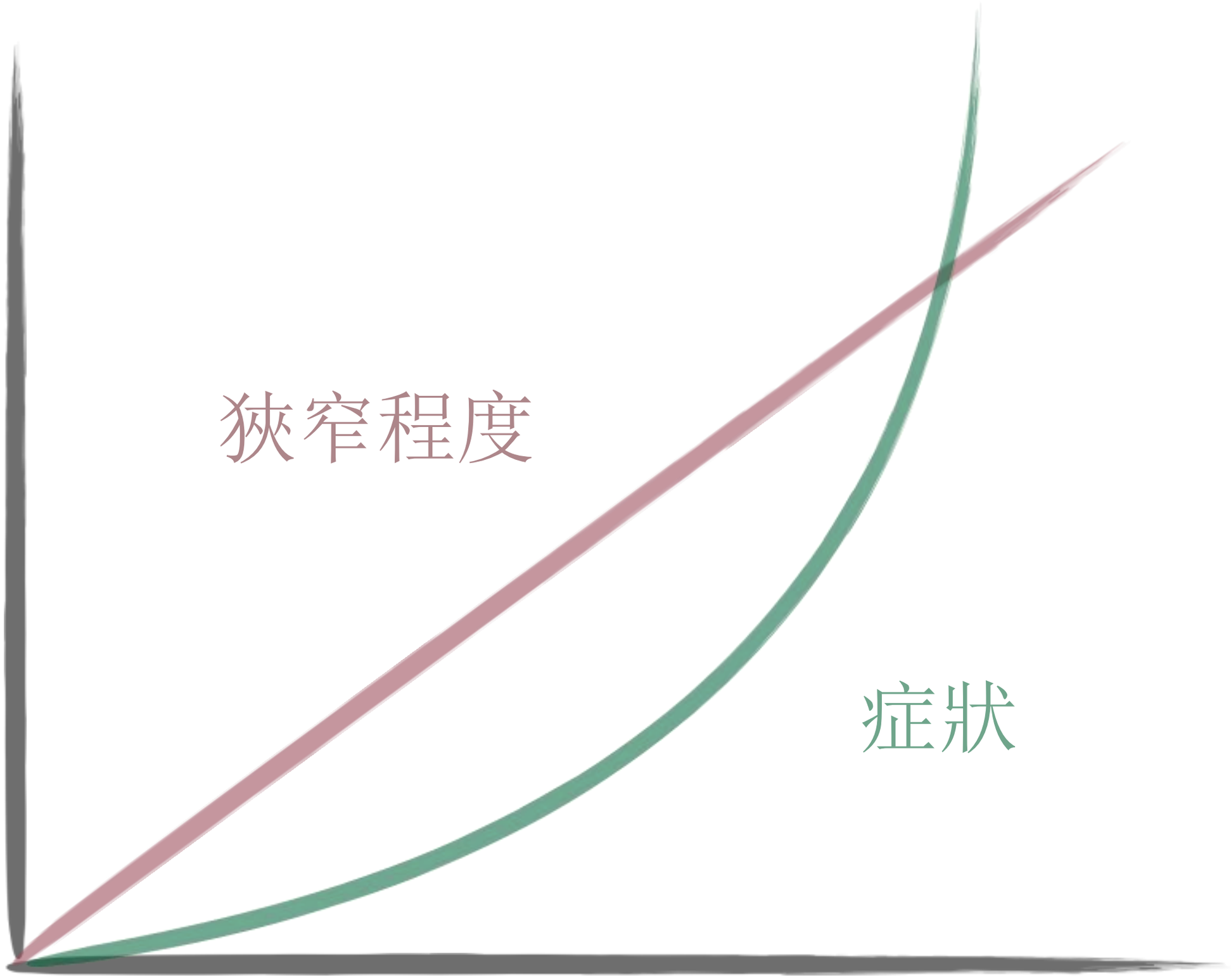
周邊血管病變分級

第1期：下肢常有發涼、麻木，腿部「抽筋」的狀況，若是老年患者易被誤認為缺鈣，延誤病情。因此足部發涼就是一個早期信號，是足部血循環不良的表現，一定要及早治療。

第2期：症狀是「間歇性跛行」，就是患者行走一段距離後，產生下肢疼痛，被迫停止運動，休息一會兒後，疼痛緩解，再次行走一段距離後，疼痛再次出現。隨著缺血的情況加重，病人行走的距離會越來越短。

第3期：症狀是「靜息痛」，患者休息時即可出現下肢疼痛，尤其在夜間入睡時疼痛更甚。

第4期：症狀則為組織缺血壞死，嚴重時，會出現肢體的發黑感染壞死，甚至危及生命，導致病人最終截肢。


狭窄程度
症狀

Evaluation

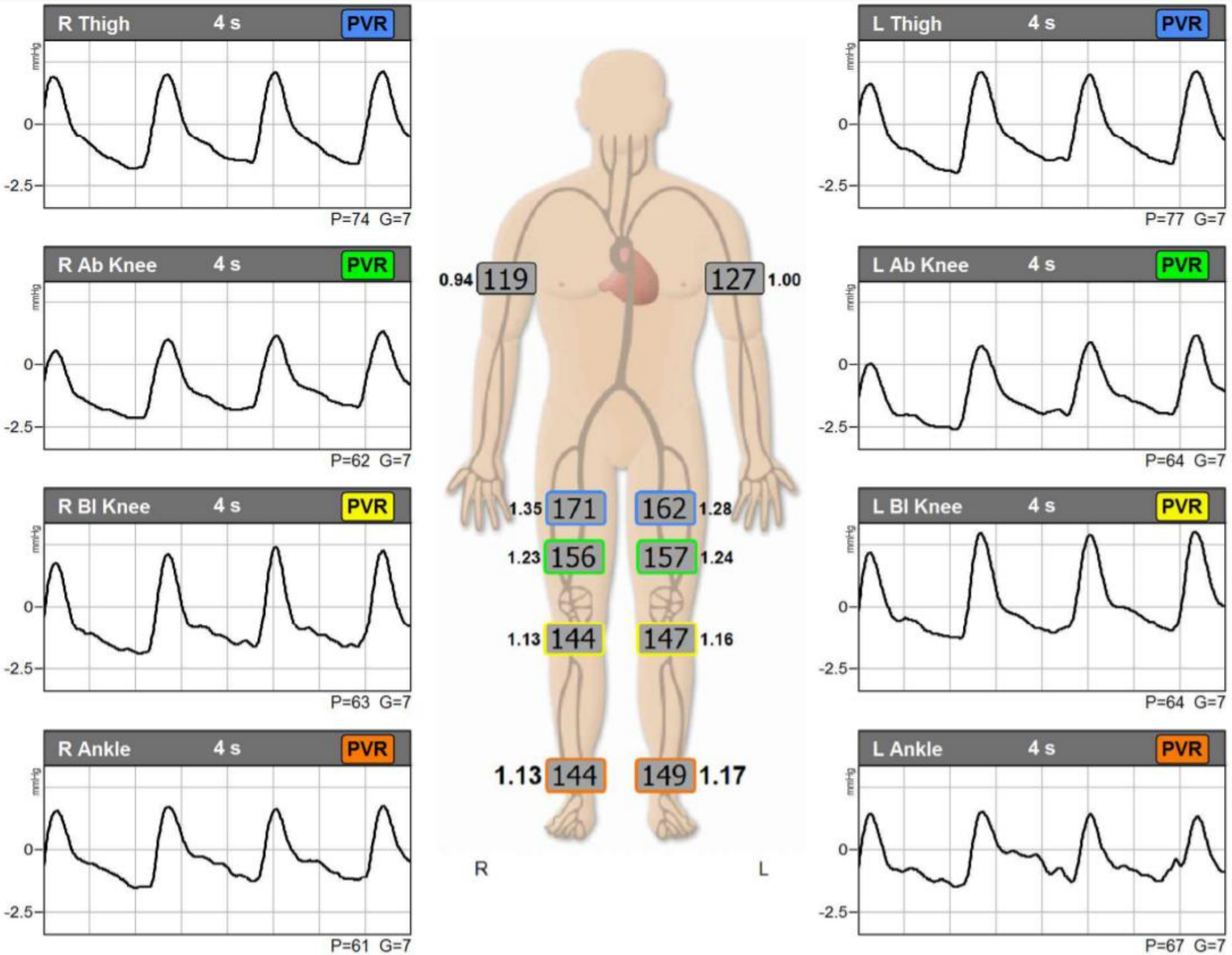
6P

冰冷(Poikilothermia or Cold）
蒼白(Pale or Pallor）
疼痛(Pain）
麻木(Paralysis）
脈搏微弱或缺乏(Pulselessness）
感覺異常(Parathesia）

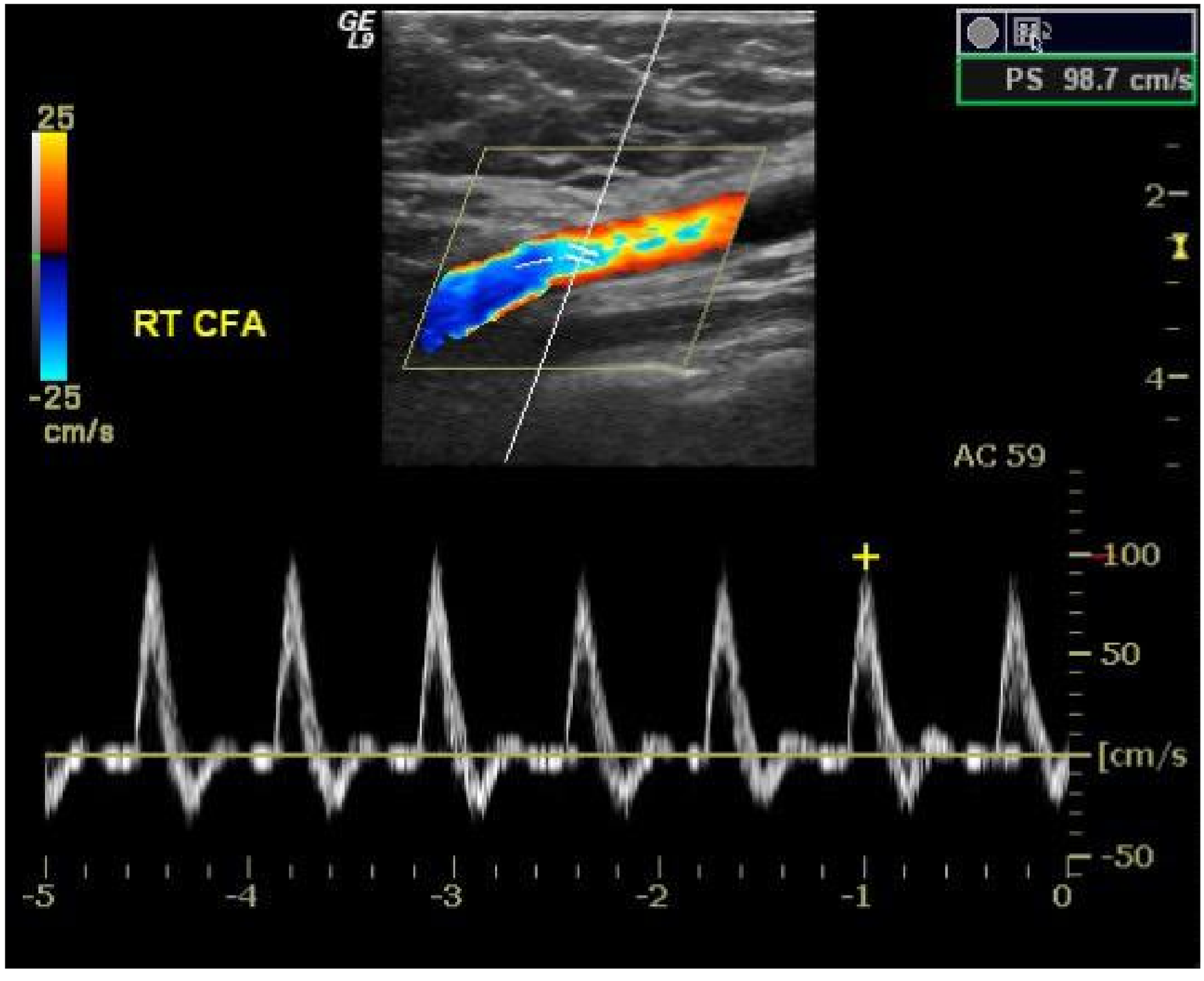
內科(心內,神內,家醫)
外科(神外,骨科,心外)
該看哪一科

Check Pulsation

周邊血管功能檢查儀


R Thigh 4 s PVR
mmHg
0
-2.5
P=74 G=7
L Thigh 4 s PVR
mmHg
0
-2.5
P=77 G=7
R Ab Knee 4 s PVR
mmHg
0
-2.5
P=62 G=7
L Ab Knee 4 s PVR
mmHg
0
-2.5
P=64 G=7
0.94 119
127 1.00
1.35 171
162 1.28
1.23 156
157 1.24
1.13 144
147 1.16
1.13 144
149 1.17
R
L
R Bl Knee 4 s PVR
mmHg
0
-2.5
P=63 G=7
L Bl Knee 4 s PVR
mmHg
0
-2.5
P=64 G=7
R Ankle 4 s PVR
mmHg
0
-2.5
P=61 G=7
L Ankle 4 s PVR
mmHg
0
-2.5
P=67 G=7

Sonogram



CTA

Angiogram


I: 16/41
FLTR: 10%
LNDMK: 0%
RIGHT
LEFT
W-B: 700
W-C: 90
X: 0.0
Y: 0.0
LAO: 0 CAUD: 1

Conventional surgery

vs

Endovascular treatment

改善周邊血液循環

- 內科治療

改善危險因子(Risk-Factor Modification)

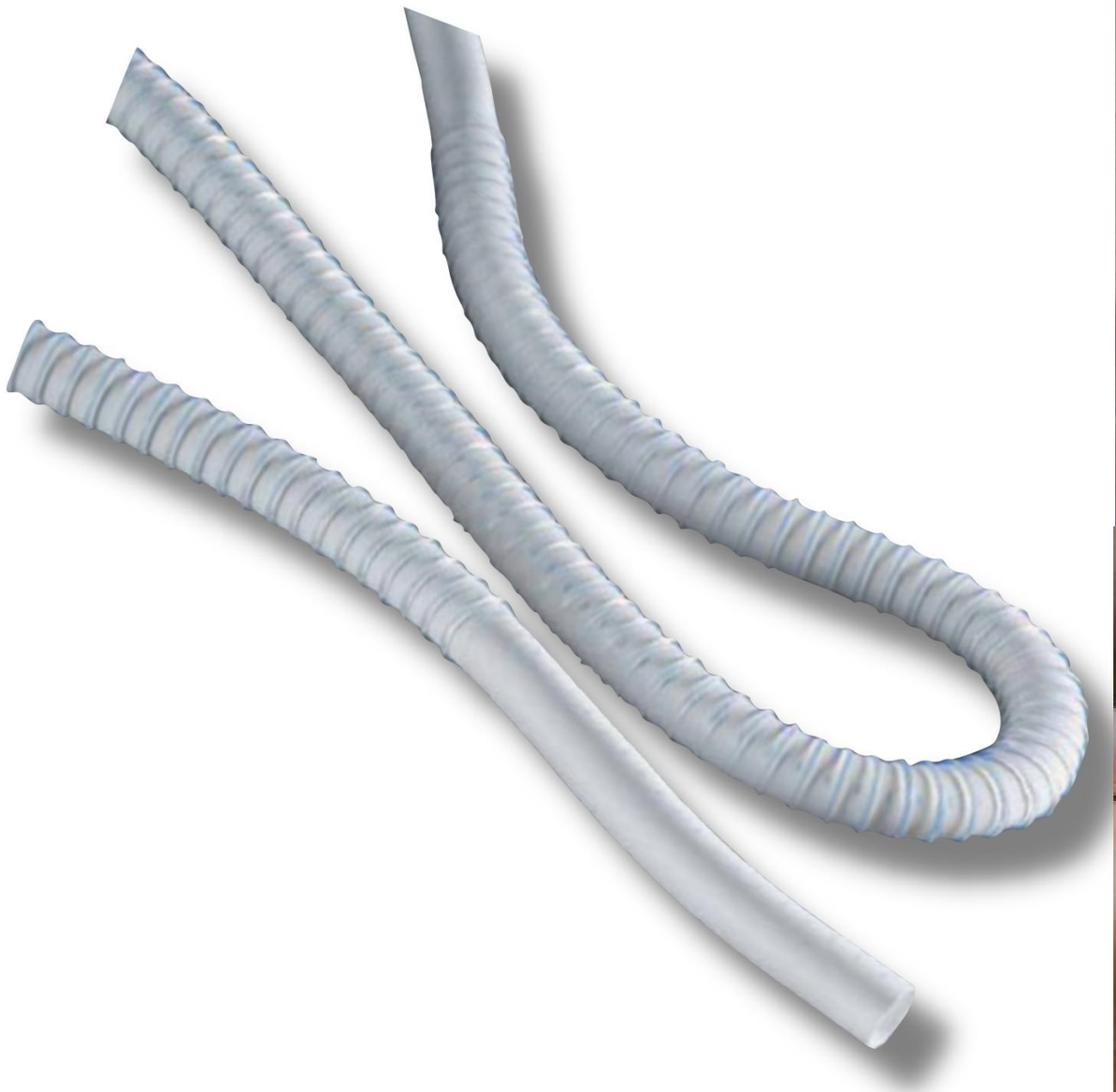
運動訓練(Exercise prescription)

藥物治療(Pharmacologic Therapy)

- 外科治療

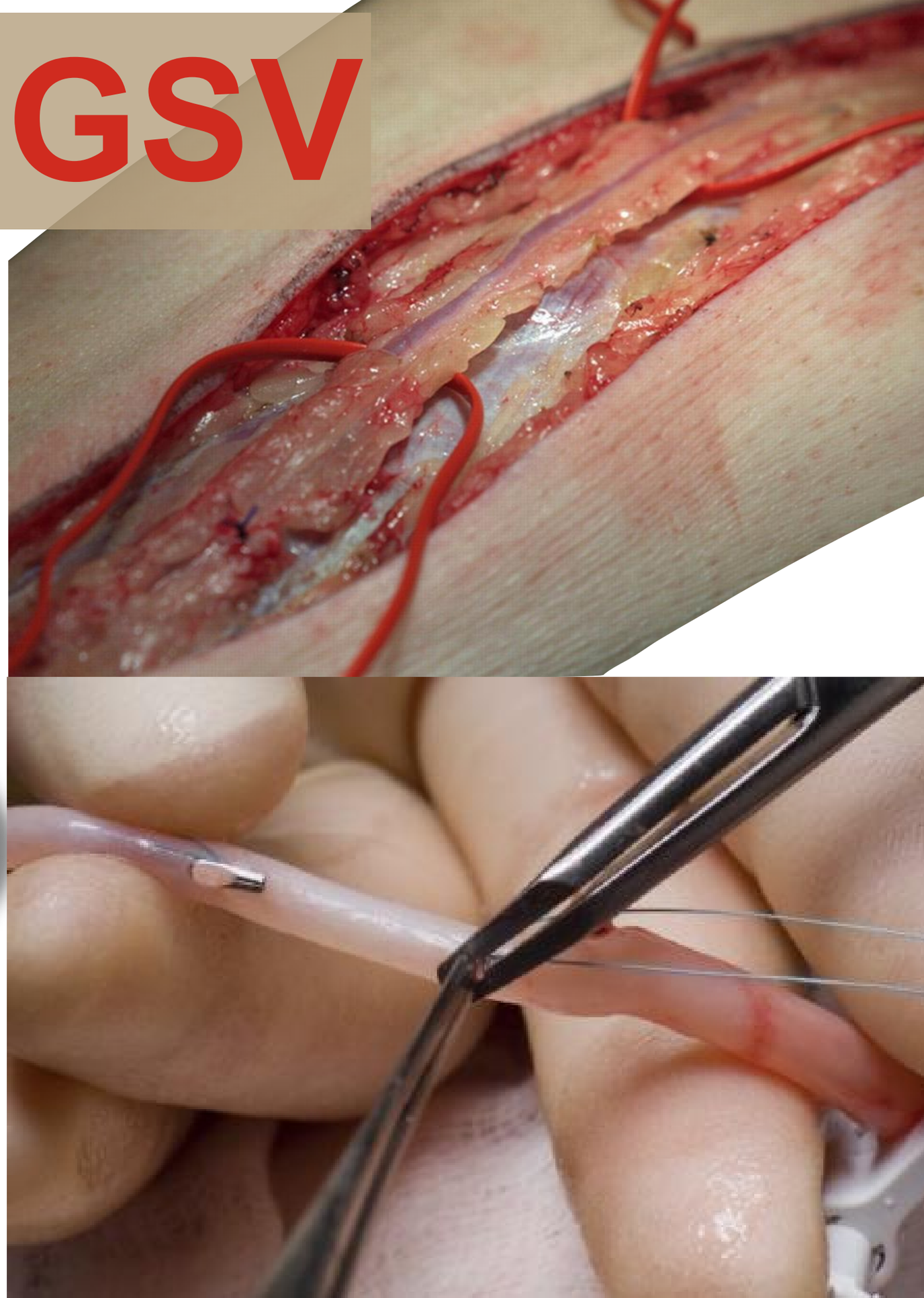
經皮穿刺動脈腔內整形術(PTA)

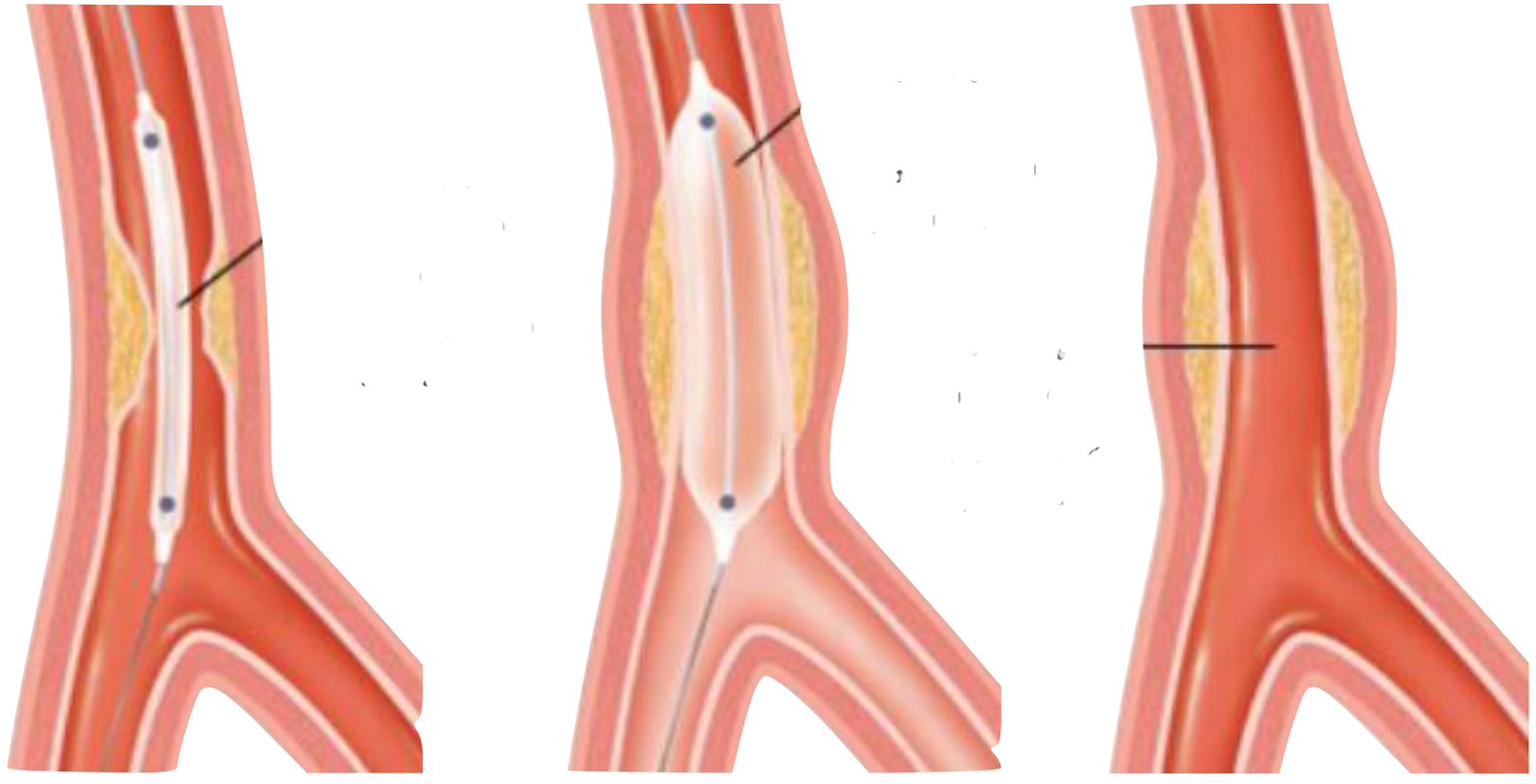
血管繞道手術(Bypass Surgery)



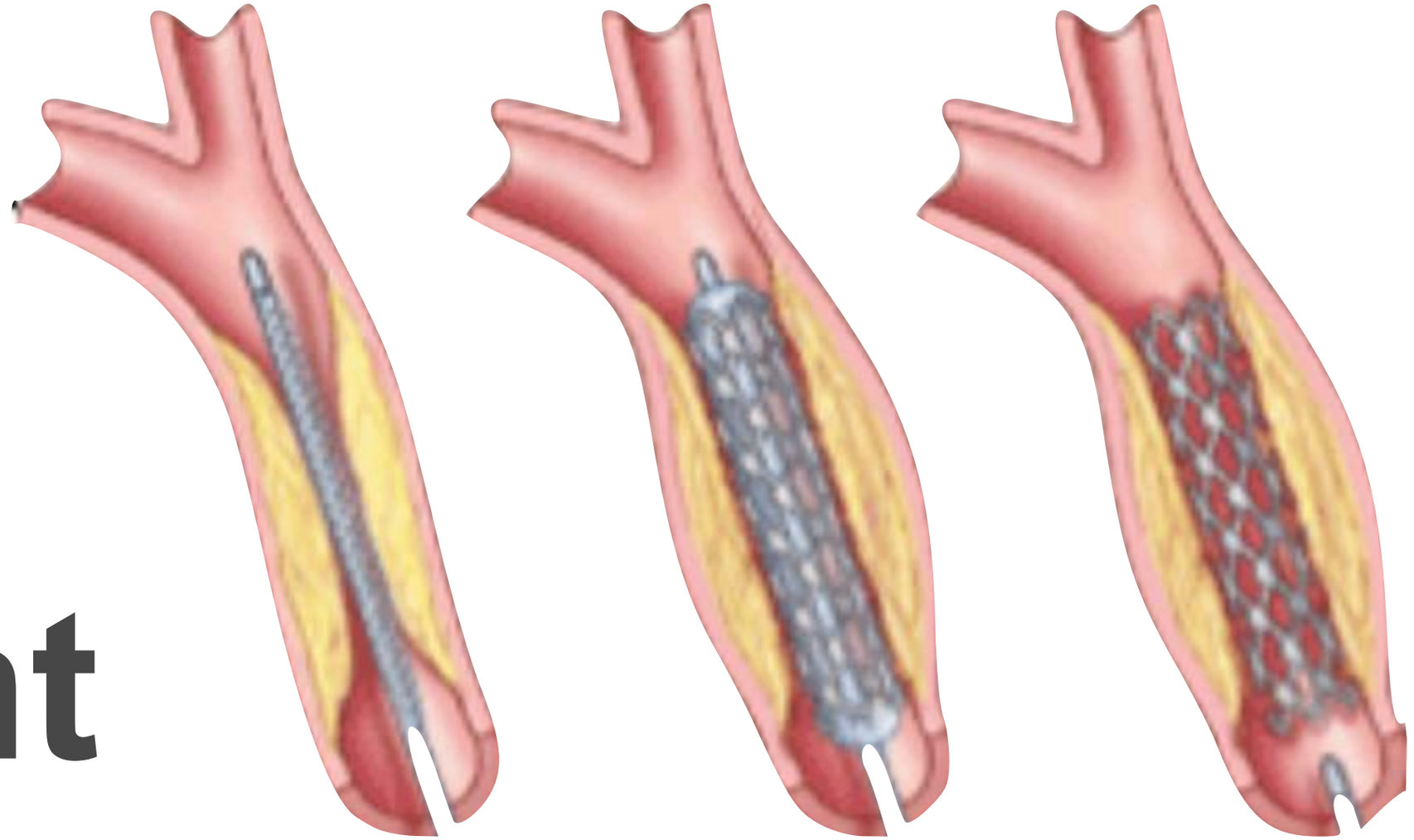
Graft

GSV





PTA



Stent

Stent

Bare-Metal Stent

Drug-Eluting Stent

Circulation

FREE ACCESS

ARTICLE

VASCULAR DISEASE

SESSION TITLE: ALONG THE CUTTING EDGE OF VASCULAR MEDICINE RESEARCH AND THE JAY D. COFFMAN EARLY CAREER INVESTIGATOR AWARD

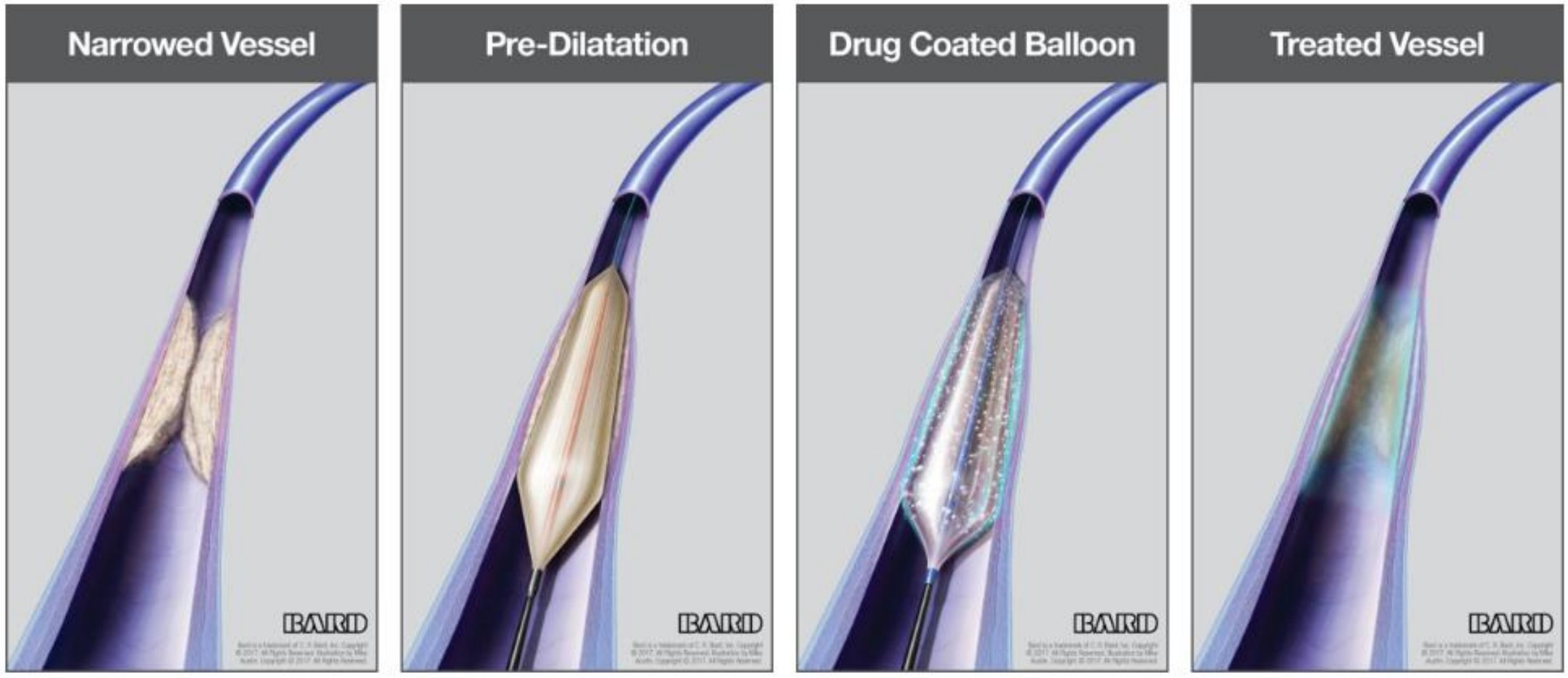
Abstract 14968: Drug-Eluting Stent for Lower Extremity Peripheral Artery Disease; is It Better Than Percutaneous Angioplasty or Bare-Metal Stent? A Meta-Analysis of Randomized Controlled Trials

Alejandro Lemor, Shawn Lee, Abel Casso Dominguez, Carlos A Gongora, Farid Gholitabar, Supreeti Behuria, and Ramesh M Gowda

Originally published 29 Mar 2018 | Circulation. 2016;134:A14968

Conclusions: Using the totality of the data available through 2016, this meta-analysis confirms the benefits of DES in reducing the risk of binary stenosis, revascularization and amputations in patients with PAD when compared with PTA or BMS placement, without a significant difference in all-cause mortality.

Drug-Coated Balloon (DCB)



Circulation:
Cardiovascular Interventions

OPEN ACCESS

ARTICLE

Long-Term Clinical Effectiveness of a Drug-Coated Balloon for the Treatment of Femoropopliteal Lesions

Five-Year Outcomes From the IN.PACT SFA Randomized Trial

John A. Laird, Peter A. Schneider, Michael R. Jaff, Marianne Brodmann, Thomas Zeller, D. Chris Metzger, Prakash Krishnan, Dierk Scheinert, Antonio Micari, Hong Wang, Michele Masters, Gunnar Tepe

Originally published 14 Jun 2019 | https://doi.org/10.1161/CIRCINTERVENTIONS.118.007702 | Circulation: Cardiovascular Interventions. 2019;12:e007702

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Tools Share

Conclusions:

The IN.PACT SFA randomized trial demonstrates that the IN.PACT Admiral DCB continues to perform better than PTA through 5 years with higher freedom from clinically driven target lesion revascularization. The sustained safety and effectiveness profile of this DCB supports its use as a preferred treatment choice compared with PTA for femoropopliteal lesions.

e-Journal of Cardiology Practice

Current Volume

Previous volumes - e-Journal of Cardiology Practice

Articles by Theme

Subscribe

Angioplasty and stenting for peripheral arterial disease of the lower limbs

Vol. 16, N° 8 - 18 Apr 2018

Assoc. Prof Mohammad Sherif , FESC

Progress in the field of percutaneous transluminal angioplasty (PTA) has led to the extension of its use for complex lesions. The main technique is balloon angioplasty; however, restenosis occurs frequently in the lower limb arteries. Therefore, stenting is often performed to improve the result and achieve long-term patency.

Recent tools to improve the results of PTA are drug-eluting stents and balloons, which decrease the development of neointimal hyperplasia. Results have been better compared with conventional balloon dilatation or bare metal stents.

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日本臨床研究1年結果證實，GORE® VIABAHN®血管內覆膜支架是治療SFA複雜型病變的首選裝置

新臨床研究顯示，自擴張支架在SFA長條形、複雜型病變中具有卓越的暢通率，與既往研究結果一致

Proven again

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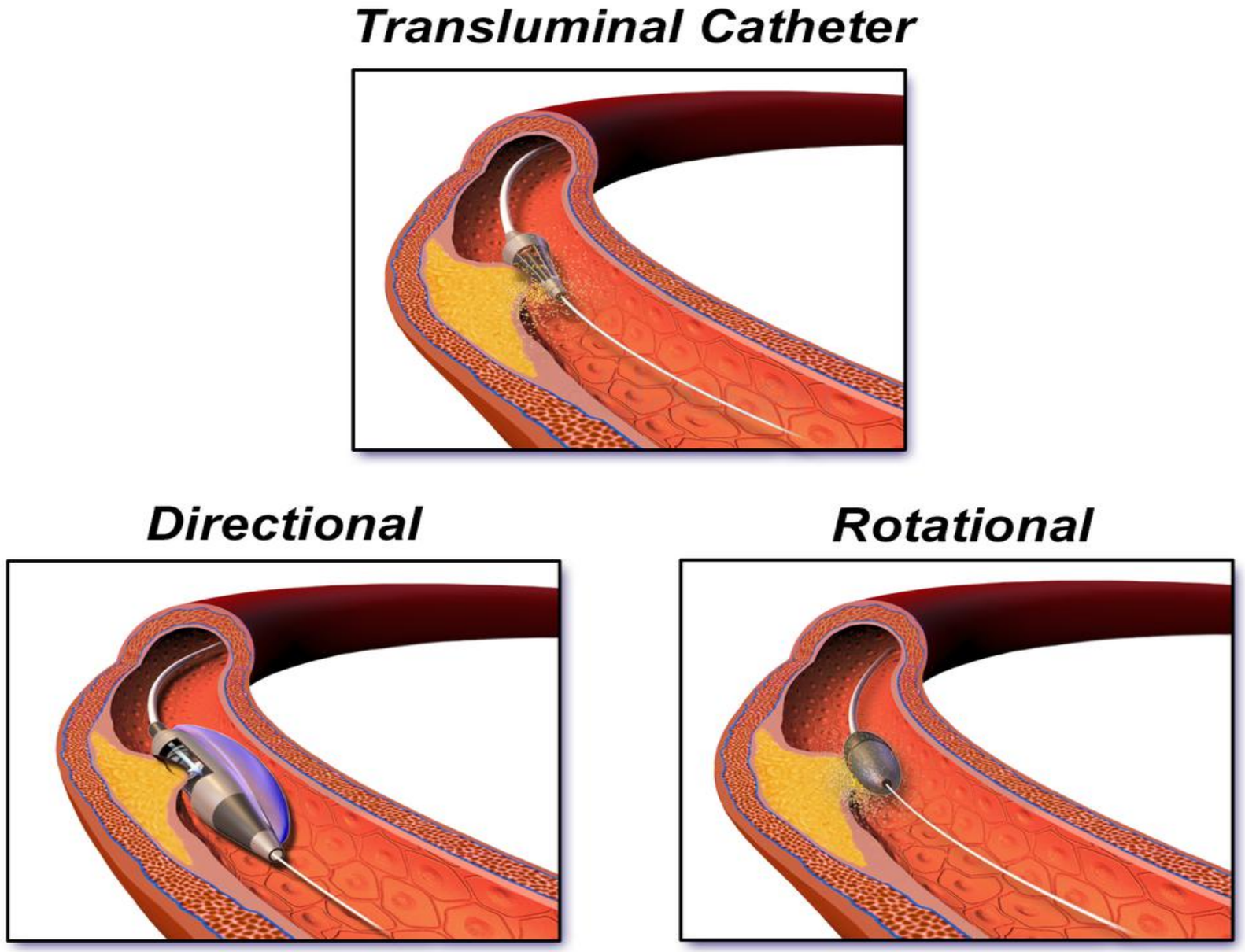
Endoprosthesis

Highlights of the late-breaking clinical data presented by Prof. Takao Ohki, MD, PhD at VIVA 2016

Atherectomy



Types of Atherectomy

Rotational Atherectomy

全文內容

Directional Atherectomy with Antirestenotic Therapy for Femoropopliteal Artery Disease: A Systematic Review and Meta-Analysis

Yanhua Zhen MM, Zhihui Chang MD, Chuanzhuo Wang MD, Zhaoyu Liu MD 及 Jiahe Zheng MD

Journal of Vascular and Interventional Radiology, 2019-10-01, 卷 30, 期 10, 頁面 1586-1592, Copyright © 2019 SIR

Journal of Vascular and Interventional Radiology

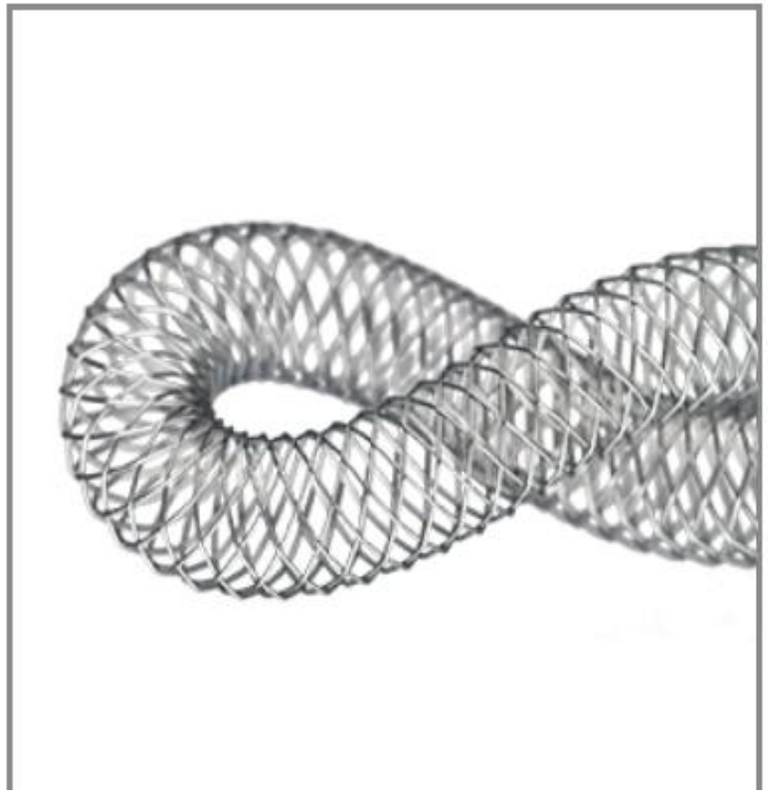
Abstract

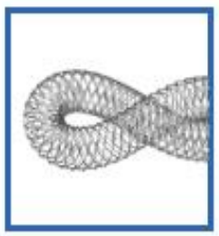
Systematic literature searches using Embase, PubMed, and Cochrane Library for directional atherectomy with antirestenotic therapy (DAART) in femoropopliteal artery disease (FPAD) from January 2002 to

Conclusions

This meta-analysis showed that DAART did not demonstrate statistically significant advantages in terms of bailout stent placement, technical success, primary patency, and TLR at 12 months compared with PCB angioplasty alone. RCTs with more patients are needed to further characterize the potential benefits of DAART.

SUPERA™ STENT — LIKE NO OTHER STENT





The Supera™ Peripheral Stent is indicated for the superficial femoral artery (SFA) and the proximal popliteal artery. Engineered by a unique interwoven wire technology, this nitinol stent offers physicians unmatched clinical outcomes[5-16] across varied lesion complexities and lengths.[1-4]

To learn more about Supera™ Stent, simply request a free demonstration and your local Abbott representative will be in touch shortly.

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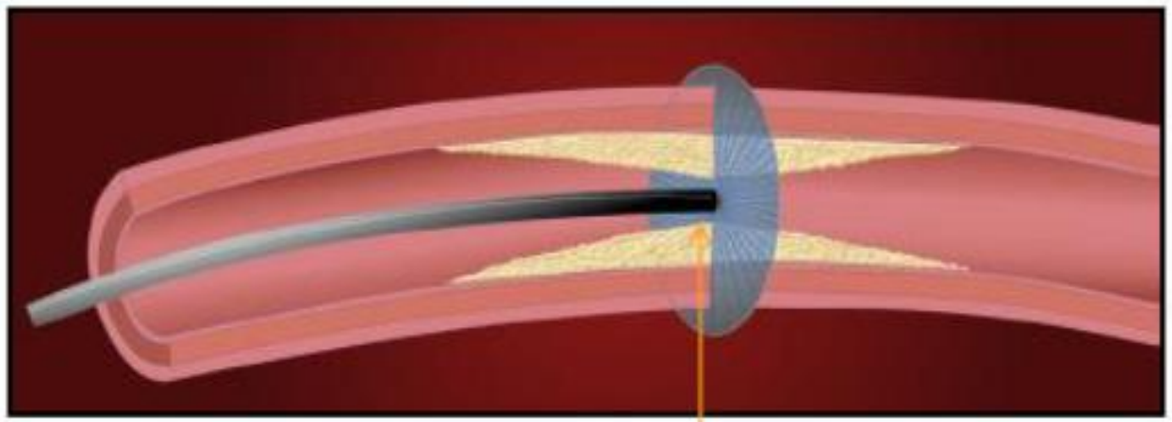
IntraVascular UltraSound

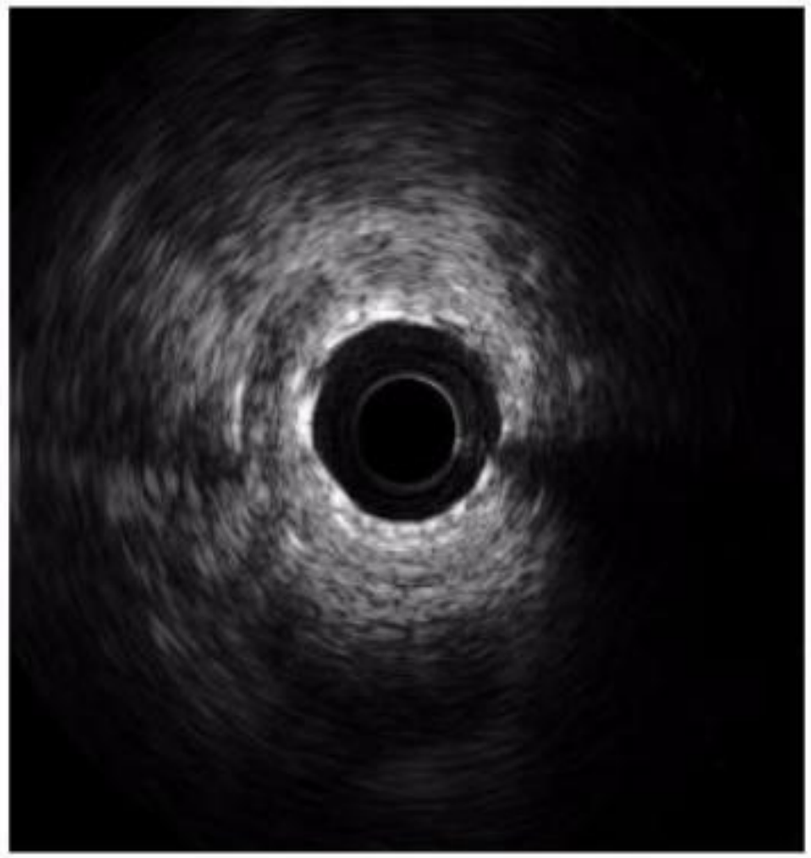
Ultrasound Principles



Transducer

OptiCross™ 18

Peripheral Imaging Catheter

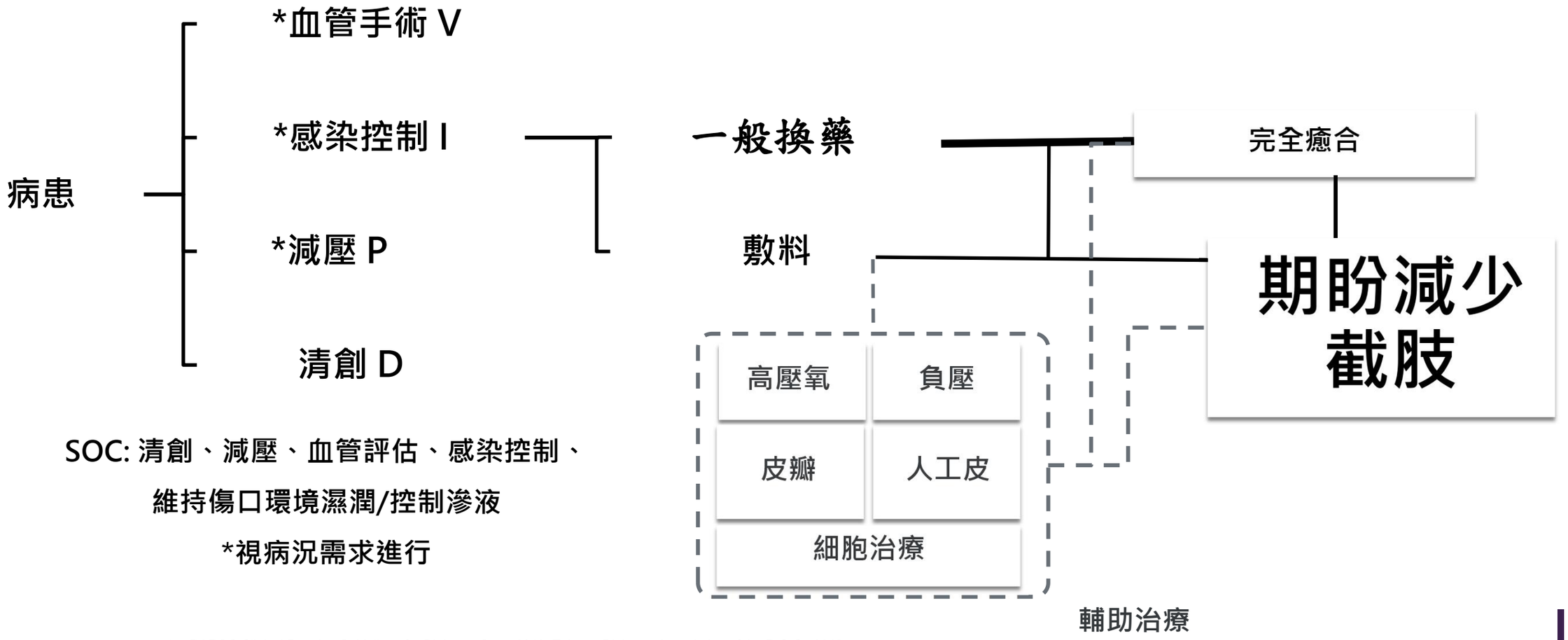


OptiCross Image

High frequency sound waves are emitted from the 30 MHz transducer of the OptiCross™ catheter, echo off vessel walls and are sent back to the Polaris system

Polaris System processes the signal into an image used for diagnostics

足潰瘍治療



1. DAROC Clinical Practice Guidelines for Diabetes Care- 2018, Taiwan, Diabetes Association of the R.O.C., 2018
2. Prevalence and Medical Resource of Patients with Diabetic Foot Ulcer: A Nationwide Population-Based Retrospective Cohort Study for 2001–2015 in Taiwan

潰瘍傷口處理

- 適當的手術清創移除碎屑(debris)，焦痂(eschar) ，及周邊的壞死組織。
- 選擇適當敷料，保持傷口適度濕潤及控制過 多的滲出物，以促進傷口癒合。
- 無菌傷口照顧：無菌技術。
- 注意營養問題：血中白蛋白、血色素...等檢 驗值的監測並與營養師討論治療方針。

速必一 乳膏 (衛部藥製字第060827號)

- 產品描述

  含1.25%到手香萃取物(PA-F4, 0.25%)與積雪草萃取物(S1, 1%)乳膏外觀為黃綠色至淡綠色，供局部使用

- 適應症

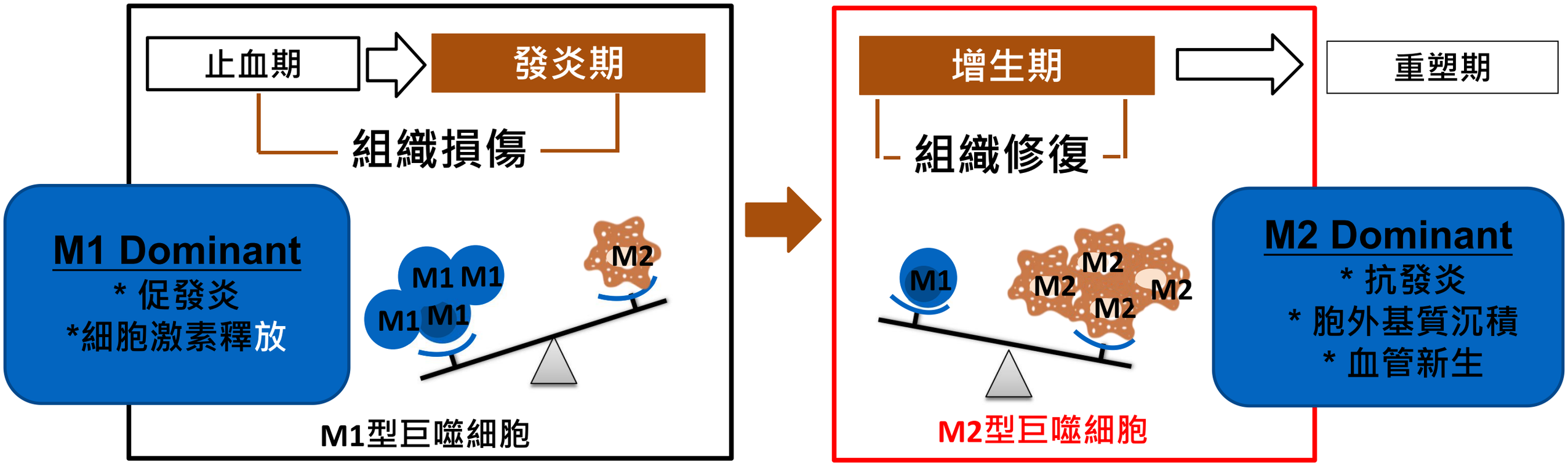
  糖尿病足部傷口潰瘍

- 用法用量

  本品須由醫師處方使用

  本品於患部每日塗抹兩次，須完全覆蓋傷口

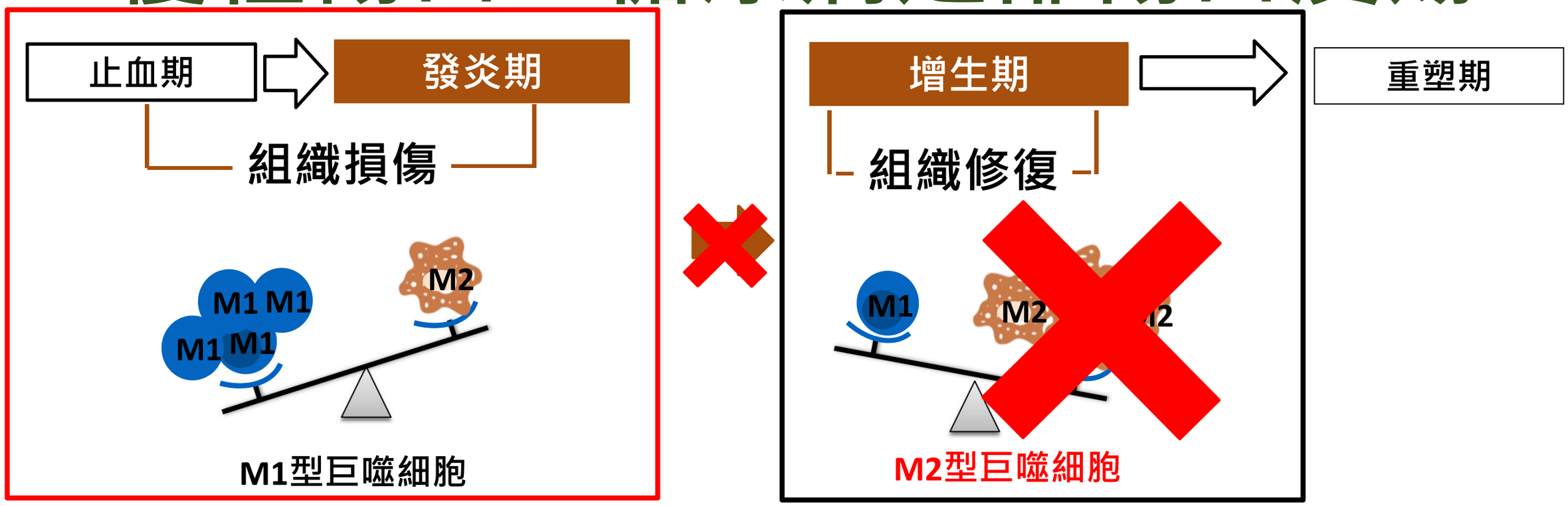
正常傷口



正常傷口癒合過程伴隨M1型巨噬細胞促發炎作用，
與M2型巨噬細胞活化，發揮抗發炎、促進胞外基質沉積、
促使血管生成作用，促使傷口組織修復

Lancet 2005; 366: 1736–43, Adv. Sci. 2019, 6, 1900513

慢性傷口 – 糖尿病足部傷口潰瘍



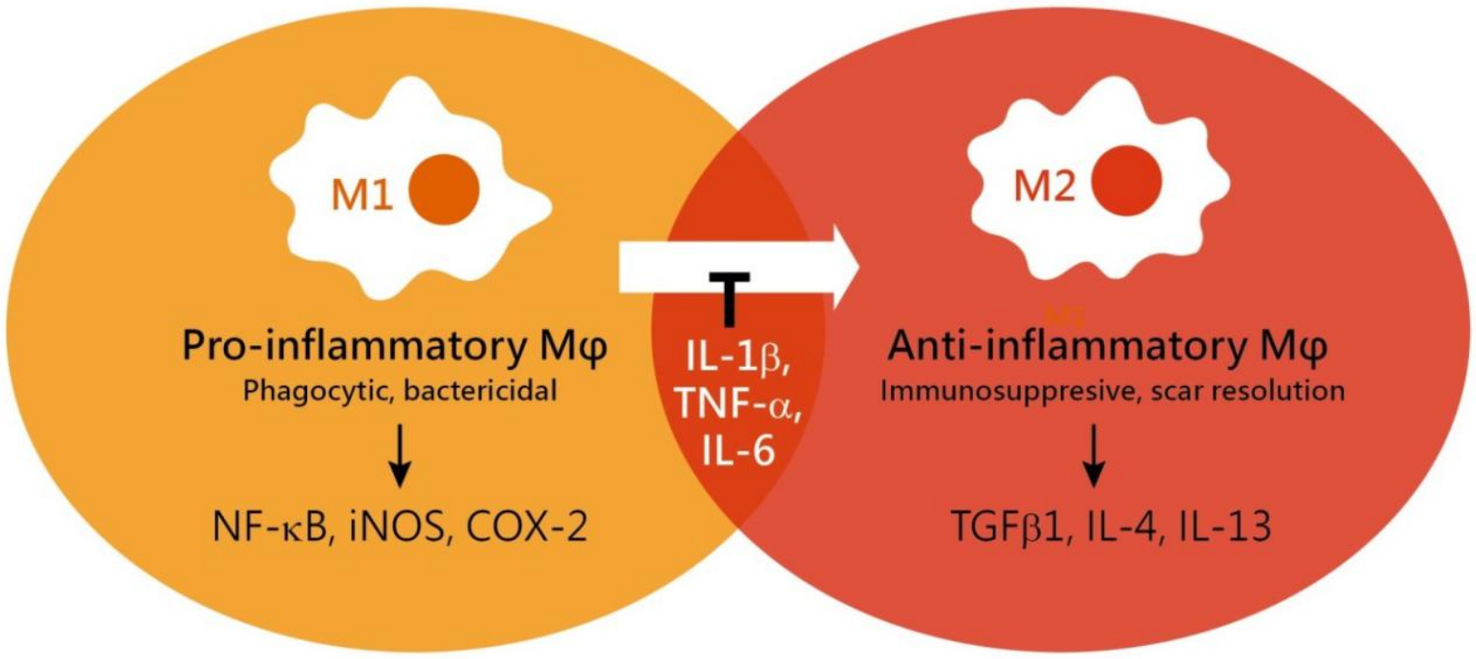
M1 → M2

糖尿病足潰瘍傷口在組織損傷期，M1型巨噬細胞累積，

持續產生發炎現象，M2型巨噬細胞無法生成，導致傷口無法癒合

作 用 機 轉

速必一在組織損傷發炎期
抑制M1發炎反應，促進M2極化
加速組織修復



使糖尿病足潰瘍　轉化為正常傷口

平 衡 M 1 / M 2 巨 噬 細 胞　　速 效 促 進 完 全 癒 合

Conclusion

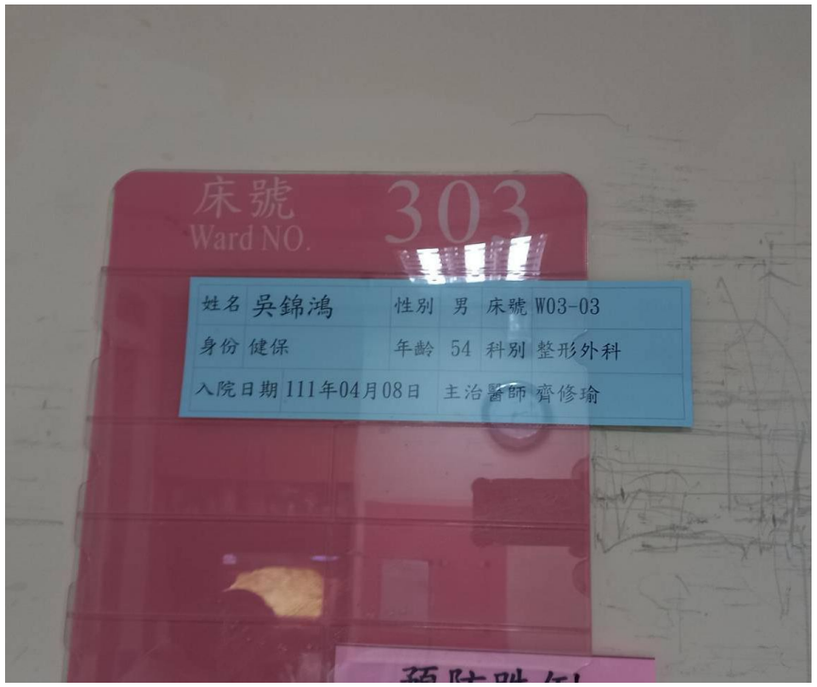
下肢缺血性病變各科遇到的困難!!

- 整形外科:血糖控制;血管評估
- 內科系:對傷口的掌握;血管評估
- 心臟血管外科:血糖控制?對傷口的掌握?

案例分享


OPD

- 54歲男性/傷口大小10*10cm　HBA1C:13.2



2022.04.08入院

2022.04.11
第一次清創完

2022.04.18
第二次清創完

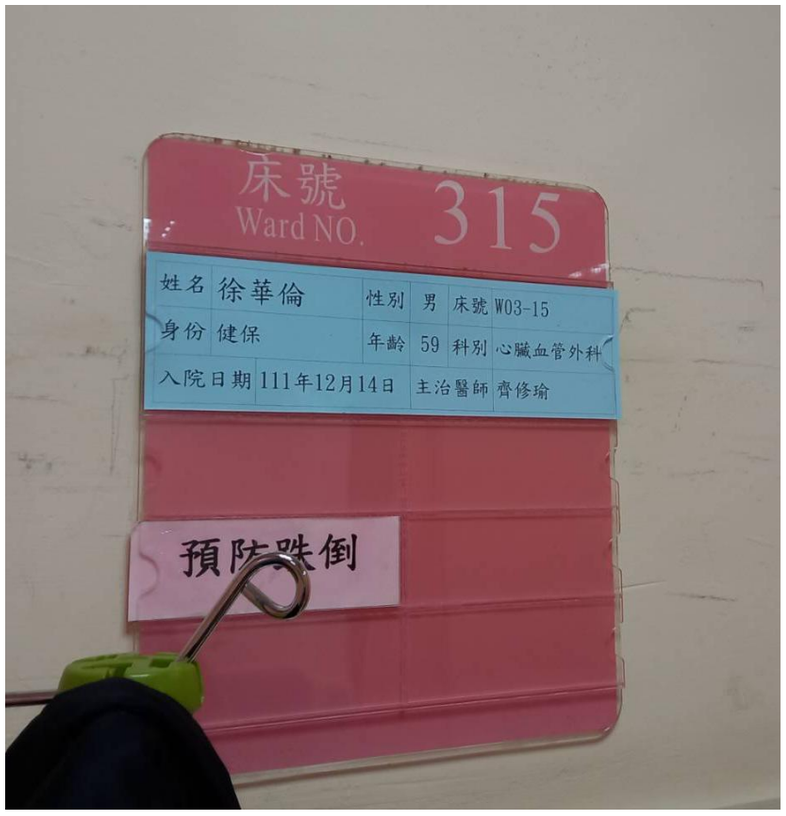
2022.05.20

2022.05.31

2022.06.07 植皮

2022.06.17
出院後第一次回診

·59歲男性/傷口大小10*8cm, HBA1C:13.2



111.12.19

111.12.26

112.01.06

112.02.17

112.04.17

困難癒合的預後指標

傷口	患者
• 傷口深度	• HbA_{1c}
• 傷口位置	• BMI
• 傷口大小	• 吸煙狀況
• 傷口持續時間	• 血管病變

Reference：EWMA (2008), Wounds International Vol. 2 (2011), Chronic Wound Care Management and Research (2016), Journal of Diabetes and its Complications(2017)

Thank you