

What's next when upper limb access sites are exhausted?

Lower limb AV access is the best choice



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Disclosure

Speaker name: **Miltos Lazarides**

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- I have the following potential conflicts of interest to report:
 - Consulting
 - Employment in industry
 - Shareholder in a healthcare company
 - Owner of a healthcare company
 - Other(s)
- I do not have any potential conflict of interest



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Bilateral central vein stenosis: options for dialysis access and renal replacement therapy when all upper extremity access possibilities have been lost

Emma Aitken¹, Andrew J. Jackson¹, Ram Kasthuri¹, David B. Kingsmore²

- 62 of the 1063 ESRD patients 2009-2012 had bilateral central vein stenosis /occlusion with no upper limb access option (5.7%)

Aitken et al, J Vasc Access 2014;15 : 466





Upper limb options exhausted

Lower limb access

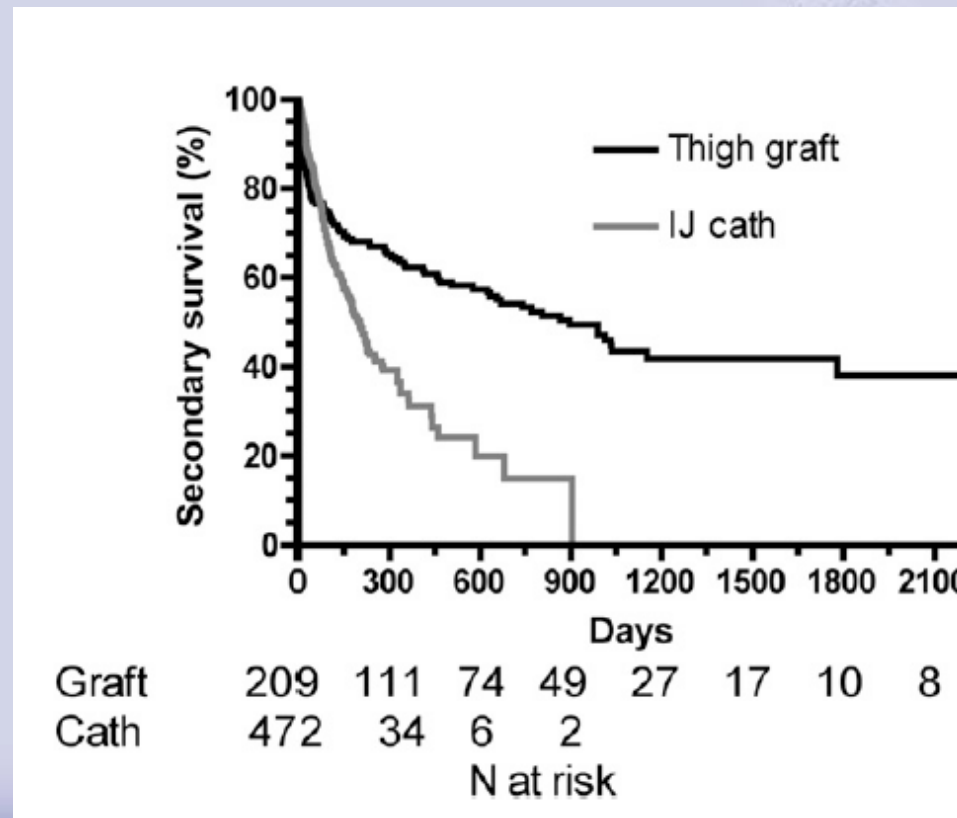
Permanent catheters

HeRO device

Thoracic grafts



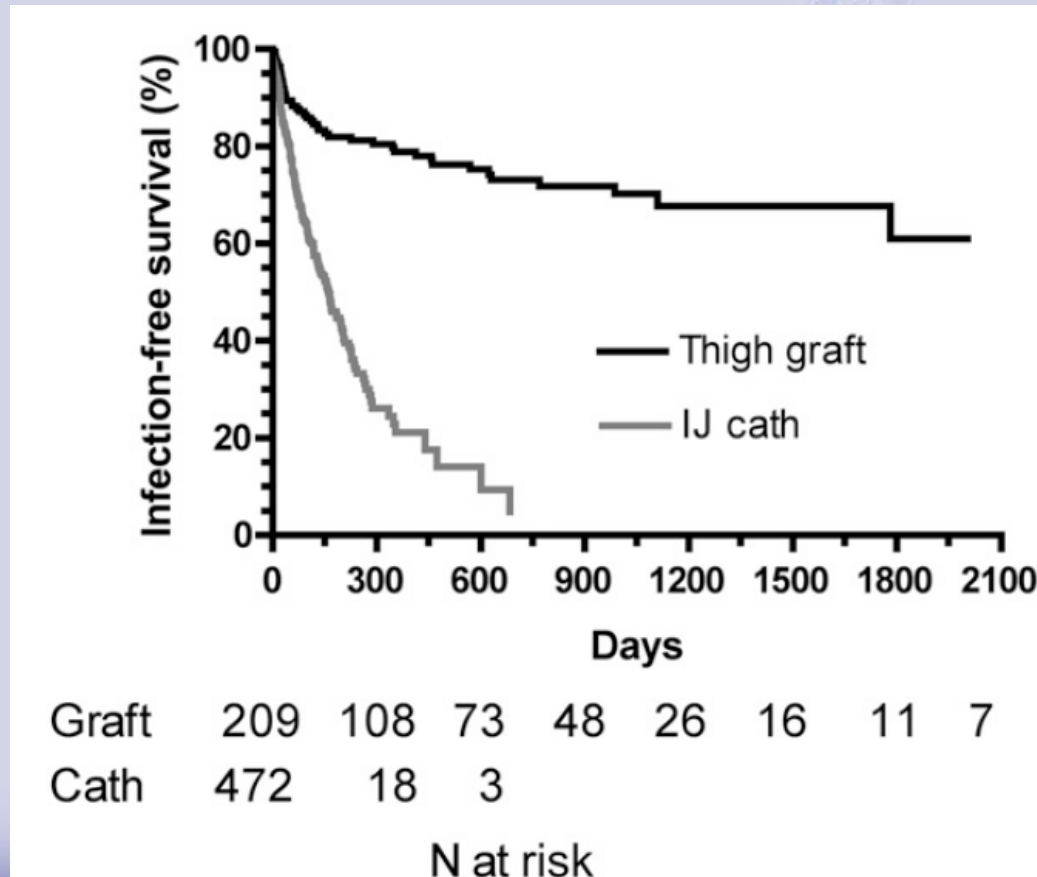
Secondary survival of thigh grafts vs. tunneled internal Jugular catheters



Song Ong et al, Clin J Am Soc Nephrol 8: 804, 2013

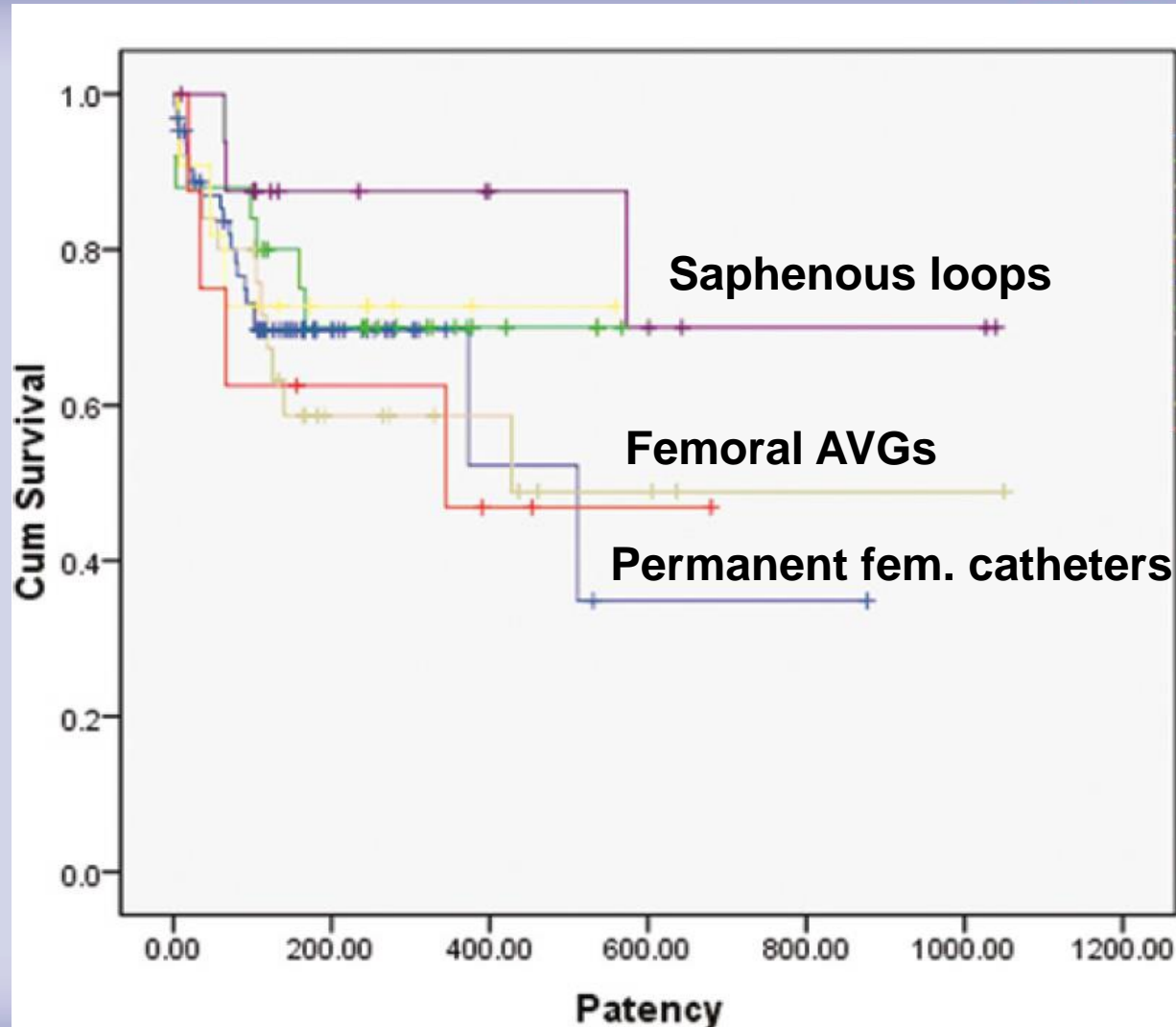


Infection free survival of thigh grafts vs. tunneled internal Jugular catheters



Song Ong et al, Clin J Am Soc Nephrol 8: 804, 2013





Aitken et al, J Vasc Access 2014;15 : 466



	Permanent fem. catheters	Femoral AVGs	Saphenous loops
Primary assisted patency at 12 months	28%	24%	57%
Secondary patency at 12 months	28%	42%	78%

Aitken et al, J Vasc Access 2014;15 : 466



**Upper limb options
exhausted**

**Lower limb
access**

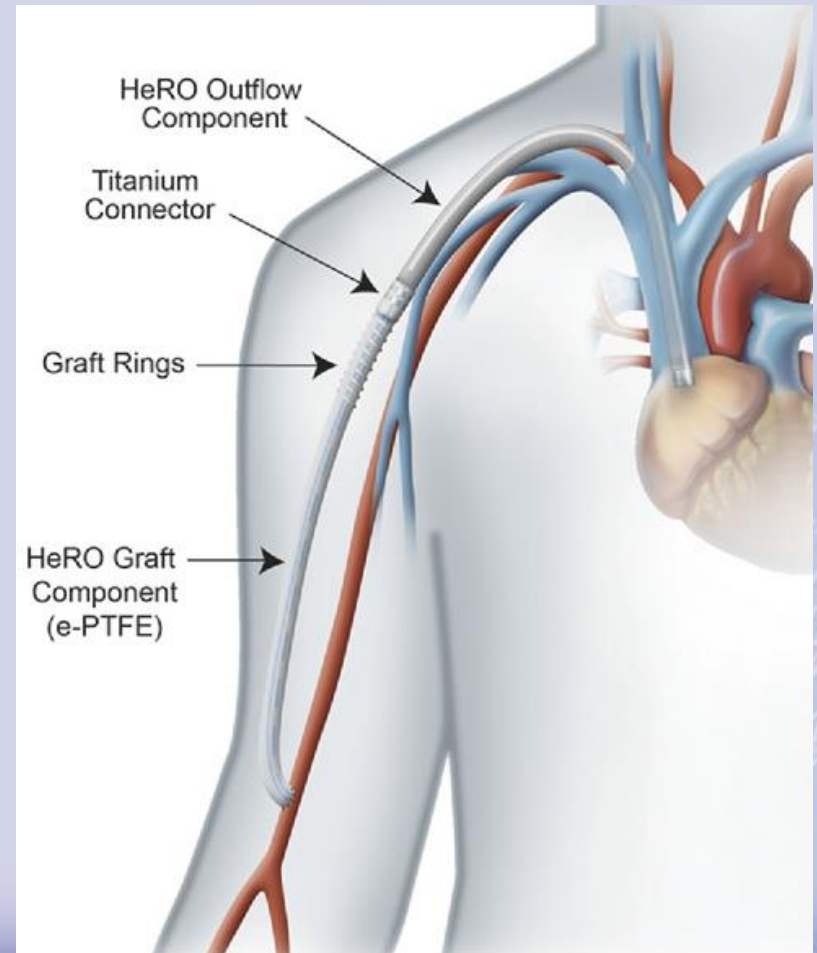
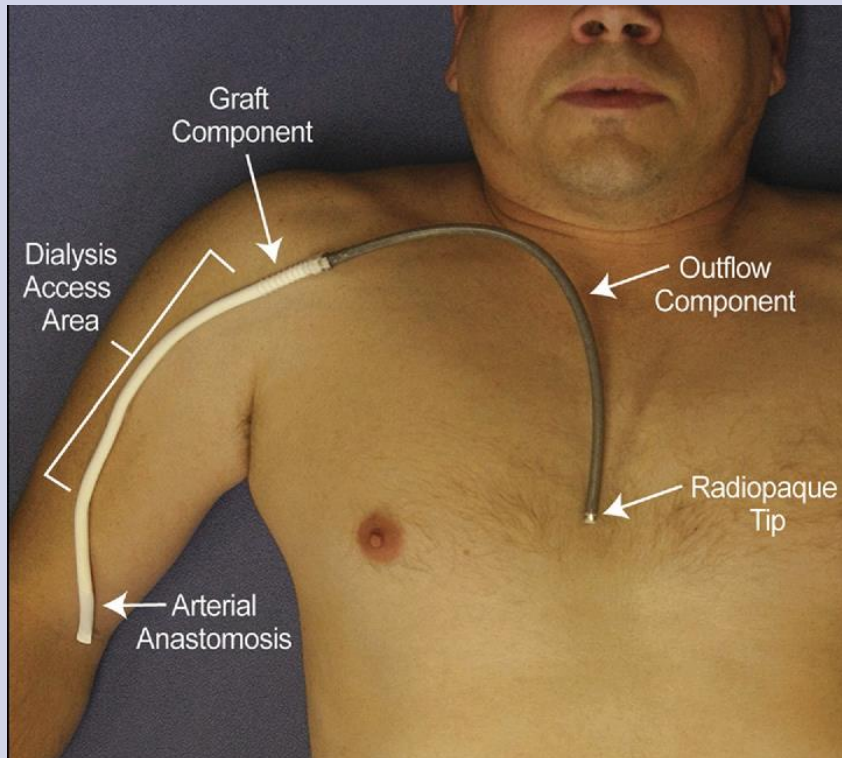
~~**Permanent
catheters**~~

HeRO device

Thoracic grafts

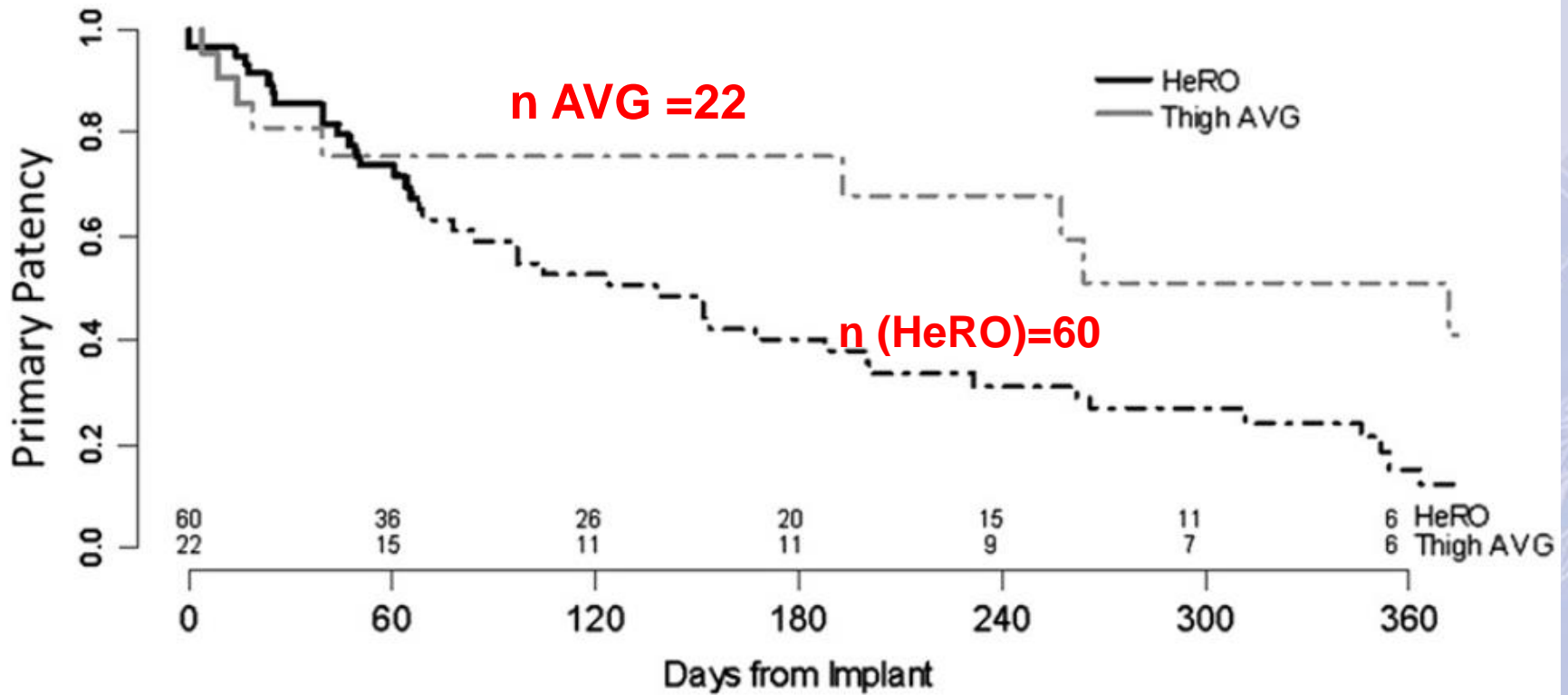


HeRO device



Katzman HE et al J Vasc Surg, 2009

HeRO vs. Thigh AV Grafts



Steerman SN et al J Vasc Surg, 2013

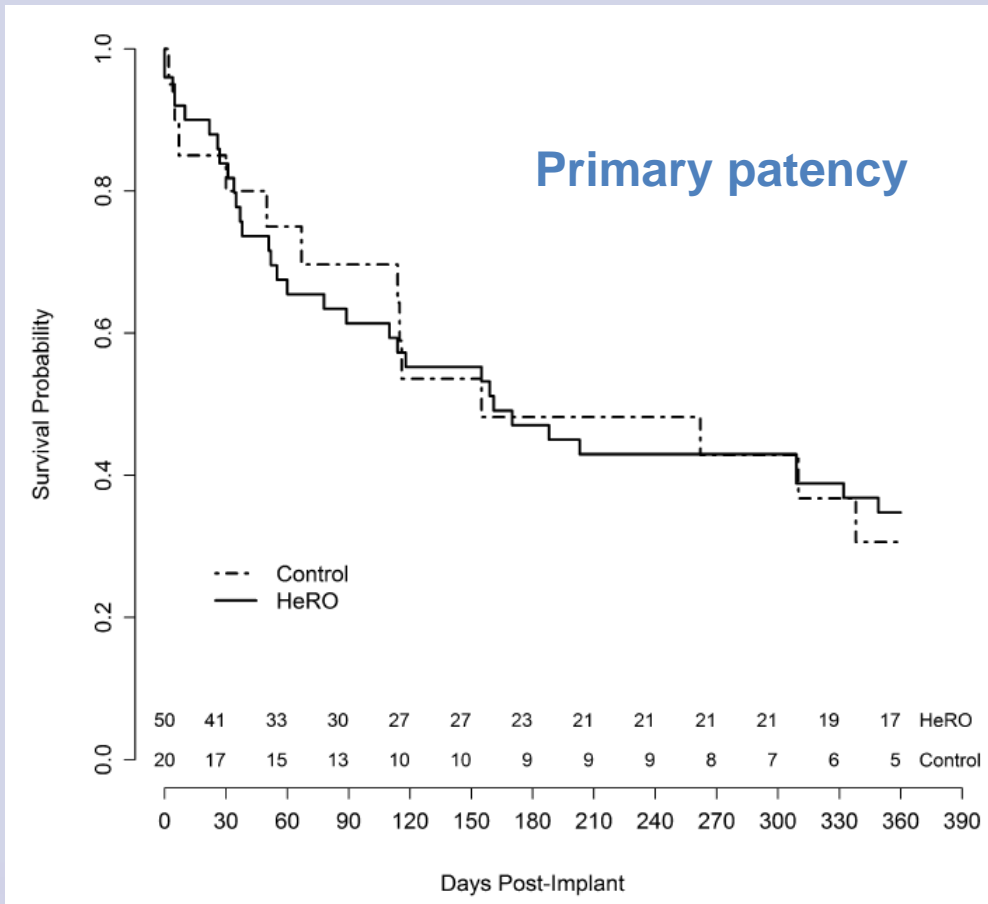


HeRO vs. Thigh AV Grafts

- The number of interventions to maintain patency was 2.21 per year in the HeRO group and 1.17 per year in the AVG group (P=0.003)
- AVG cost ranges from 700-\$900 just for the device. For the HeRO, the device cost is \$2300 plus the cost of any adjunct procedures



Comparison of HeRO vs. conventional AVGs (RCT N=72)



Inclusion criteria: all patients having minimal central venous stenosis as assessed by venous mapping

Nassar JM et al, Seminars in Dialysis 2014



Report on the Hemodialysis Reliable Outflow (HeRO) experience in dialysis patients with central venous occlusions

Justin R. Wallace, MD,^a Rabih A. Chaer, MD,^b and Ellen D. Dillavou, MD,^b *Pittsburgh, Pa*

- **N=21**
- **Should be used as a last resort**
- **Very high incidence of steal in women (24%)**
- **12-month primary and secondary patency were 11% and 32%, respectively**

Wallace JR et al, J Vasc Surg 2013;58:742



**Upper limb options
exhausted**

**Lower limb
access**

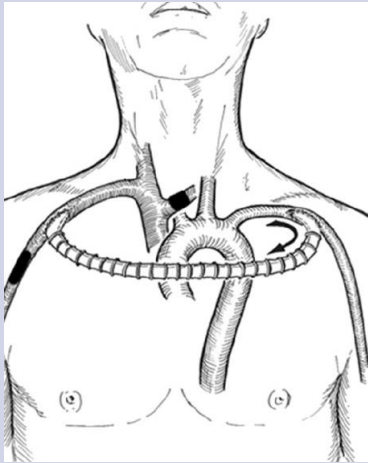
~~**Permanent
catheters**~~

~~**HeRO device**~~

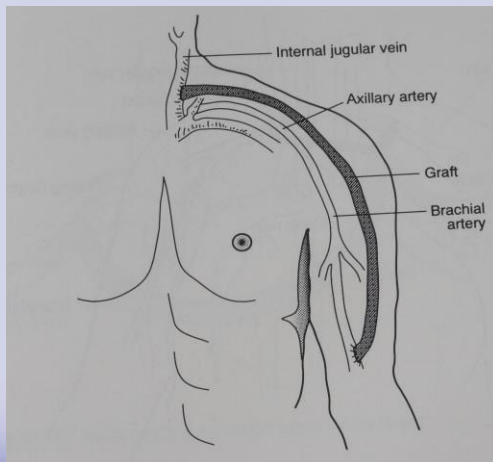
Thoracic grafts



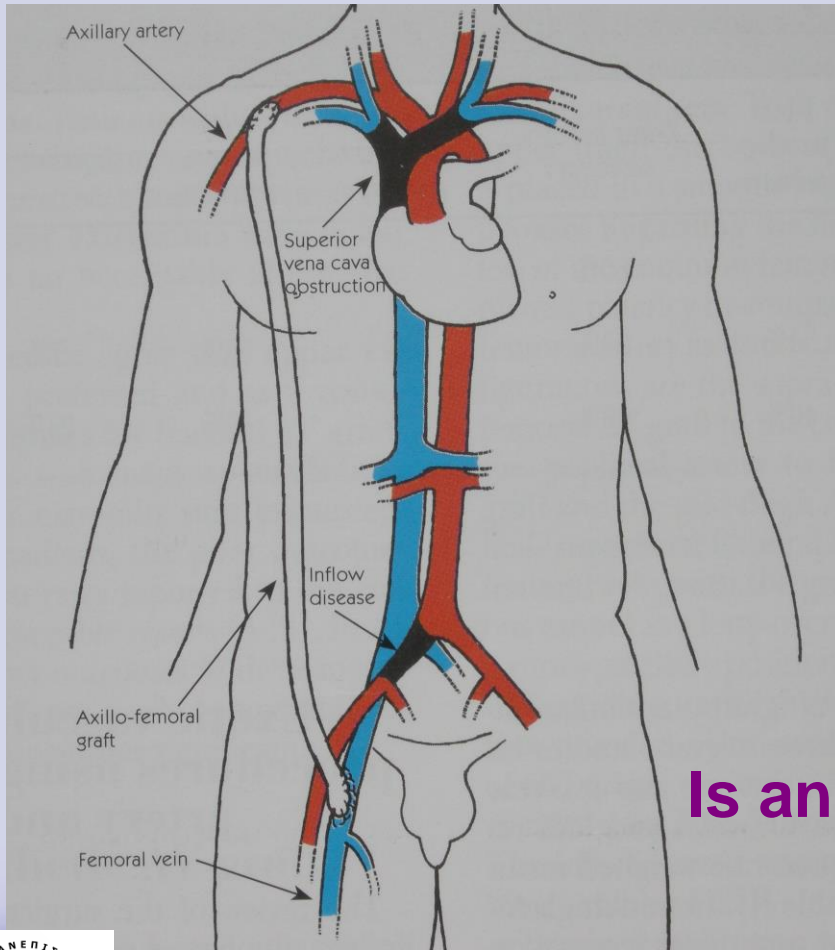
Thoracic grafts



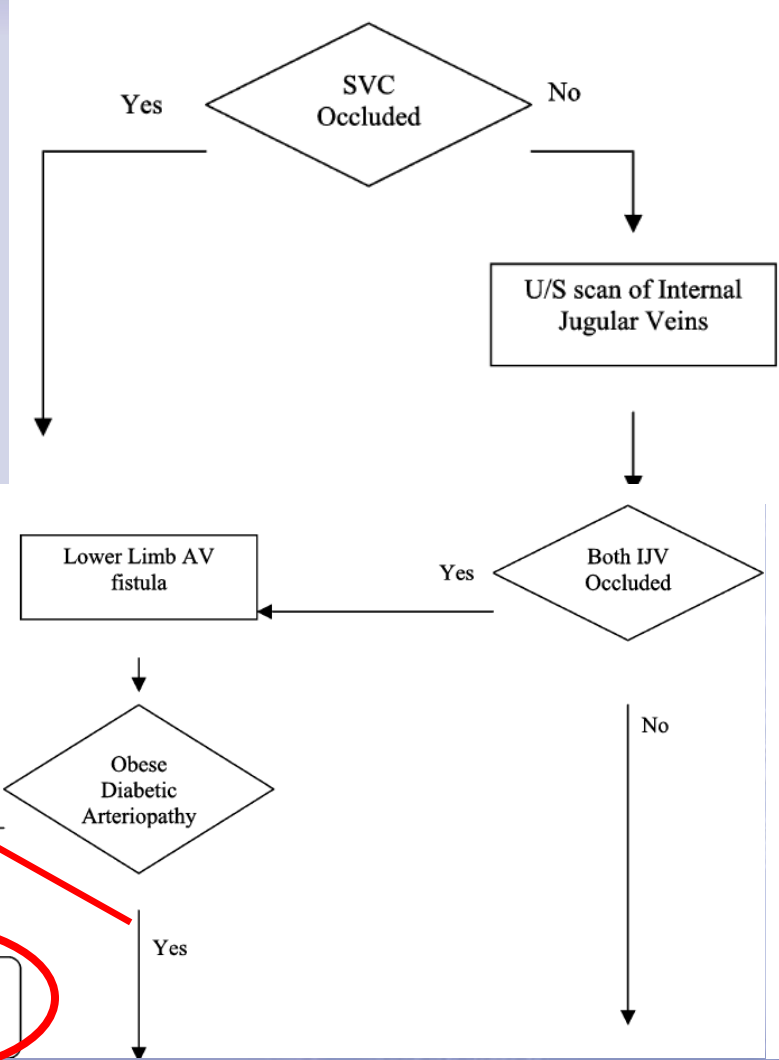
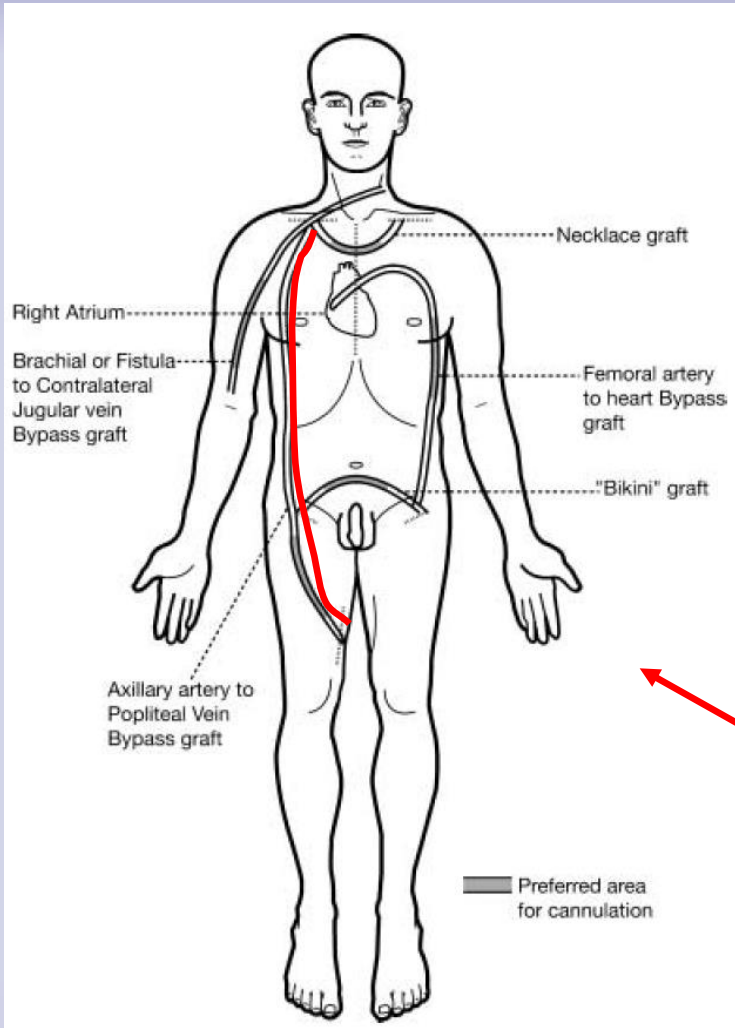
- The use of thoracic grafts presupposes that one outflow vein exists
- There is always need of synthetic graft use
- There are no data comparing against lower limb access



Axillo-femoral AV graft



Is an attractive option in PAD patients



Chemla E et al Semin Dial 2006 & Ann Vasc Surg 2005



Lower limb vascular access

Autologous

Prosthetic

Femoral Vein Transposition

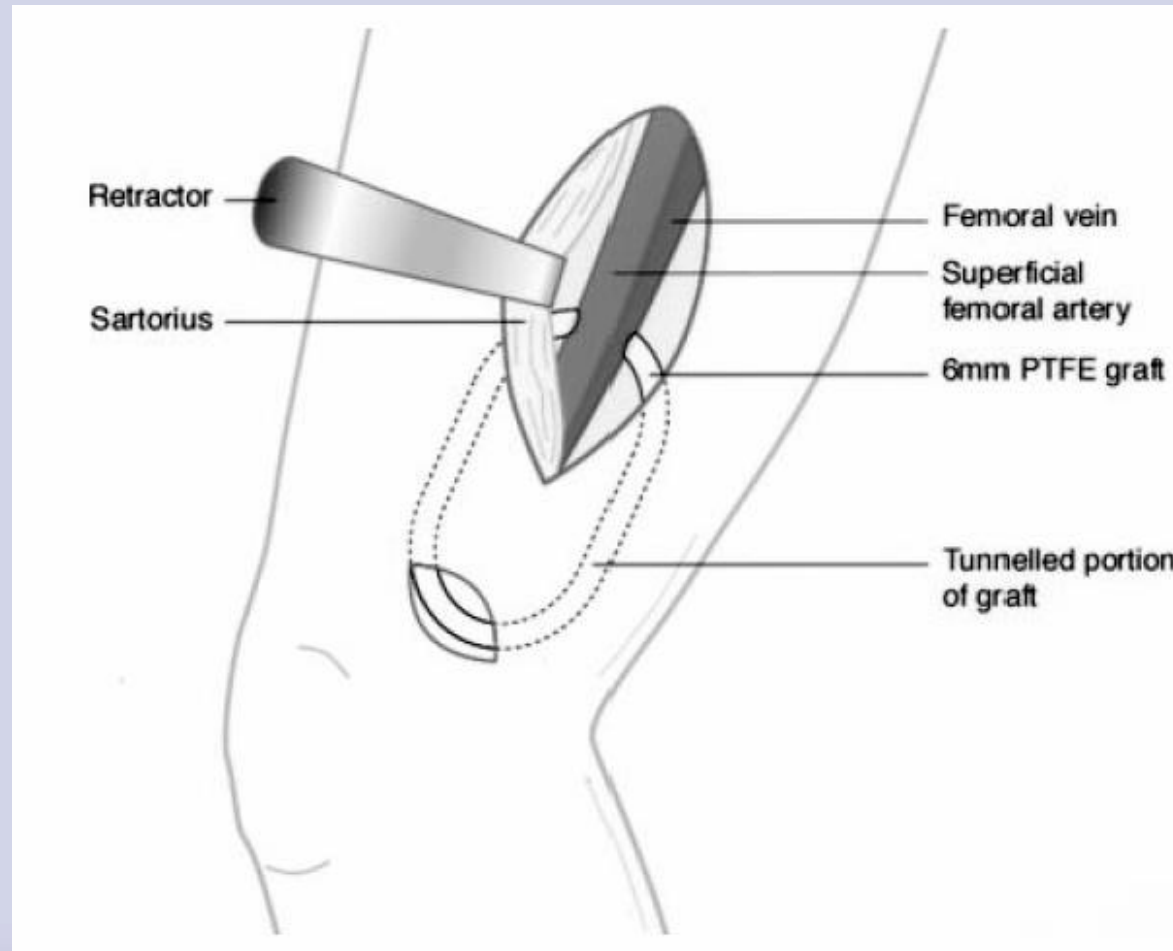
Saphenous vein loop



Case series of upper thigh AV grafts

	n	1-year patency	2-year patency	Infection rate	Ischemia rate
Tashijan	73	83%	83%	22%	1%
Khadrra	74	77%	62%	16%	3%
Bhandari	46	85%	77%	35%	
Taylor	45			18%	16%
Cull	116	68%	54%	41%	11%
Miller	63	62%	39%	11%	0%
Englesbe	30	41%	26%	27%	3%
Korzets	37	73%	65%	5%	11%
Vogel	134	62%		20%	
Slater	22		80%	9%	
Hazinedaroglou	17			24%	18%

Mid-thigh loop AV graft



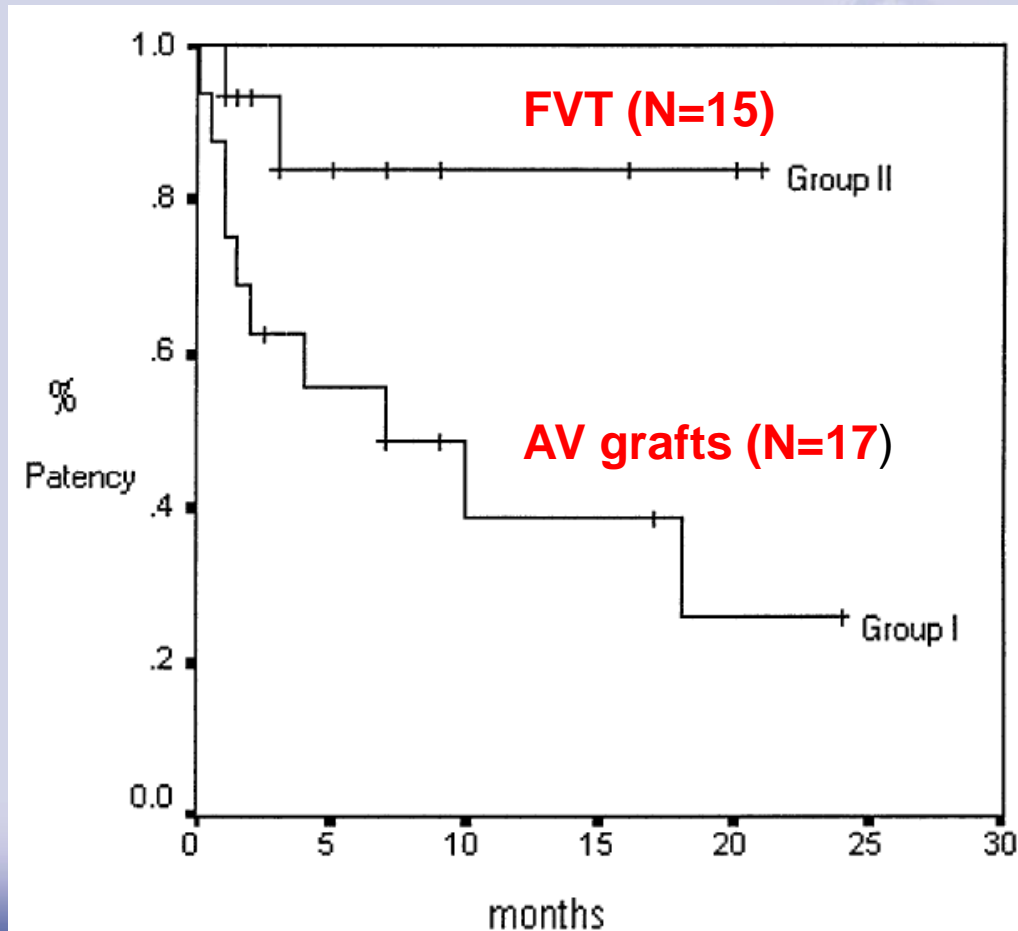
Bagul et al, Ann R Coll Surg Engl, 2006

Case series of mid- thigh AV grafts

	n	1-year patency	2-year patency	Infection rate	Ischemia rate
Flarup 2003	14	64%	18%	7%	Not reported
Bagul 2006	20	60%			Not reported
Scott 2006	46	68%	43%	21%	Not reported
Gilbert 2010	16		75%	12.5%	Not reported
Aitken 2014	25	42%		20%	Not reported



Femoral v. transposition vs. femoral loop grafts



Hazinedaroglu et al, Transplant proc, 2004



Results of saphenous loops

Author	n	Outcome
Lynggaard F (1981) Int Urol Nephrol	8	2 fatal external bleeding episodes
Gorski TF (1998) Am Surg	5	average patency 11 months
Pierre-Paul D (2004) Ann Vasc Surg	7	mean primary patency 7 months
Shankar VK (2004) Eur J Vasc Endovasc Surg	4	10 months patency ≈20%
Chemla E (2005) Ann Vasc Surg	6	5 clotted after an average of 4 months





Recent saphenous loop series

Author	n	Outcome
Keshelava G (2010) J Vasc Access	7	6 patent after an average of 17 months
Correa JA (2010) BMC Surgery	56	12month patency 65%
Aitken E (2014) J Vasc Access	17	12month patency 78%



Lower limb vascular access

Autologous

~~Prosthetic~~

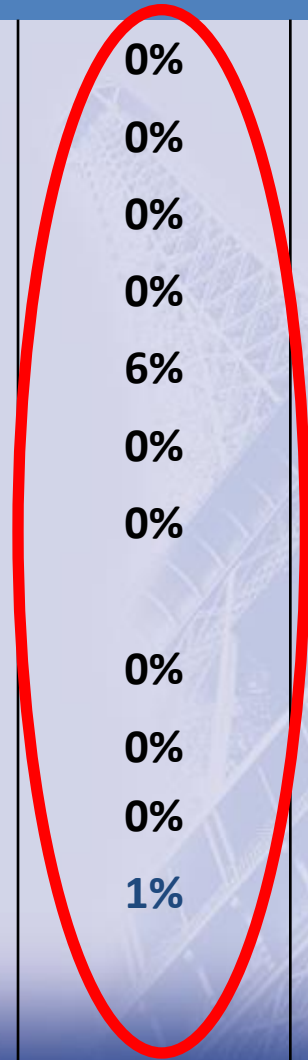
Femoral Vein
Transposition

~~Saphenous vein
loop~~



Case series of FV transposition

	n	1-year patency	2-year patency	Infection rate	Ischemia rate
Huber 2000	1	100%		0%	0%
Jackson 2000	2	100%		0%	50%
Gradman 2001	25	87%	87%	0%	36%
Kapala 2003	2			0%	0%
Hazinedaroglou 2004	15		85%	6%	33%
Gradman 2005	22	100%	94%	0%	0%
Chemla 2006	5			0%	0%
Scollay 2010	12				16%
Georgakarakos 2011	3			0%	0%
Brahmanandam 2012	6			0%	0%
Alcocer 2012	25			0%	4%
Bourquelot 2012	70	91%		1%	7%
Wartman 2014	9		100%		1%

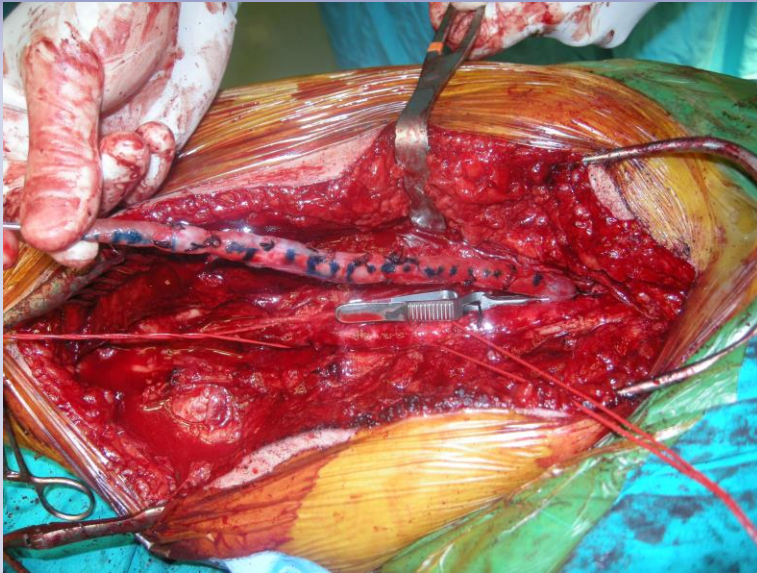


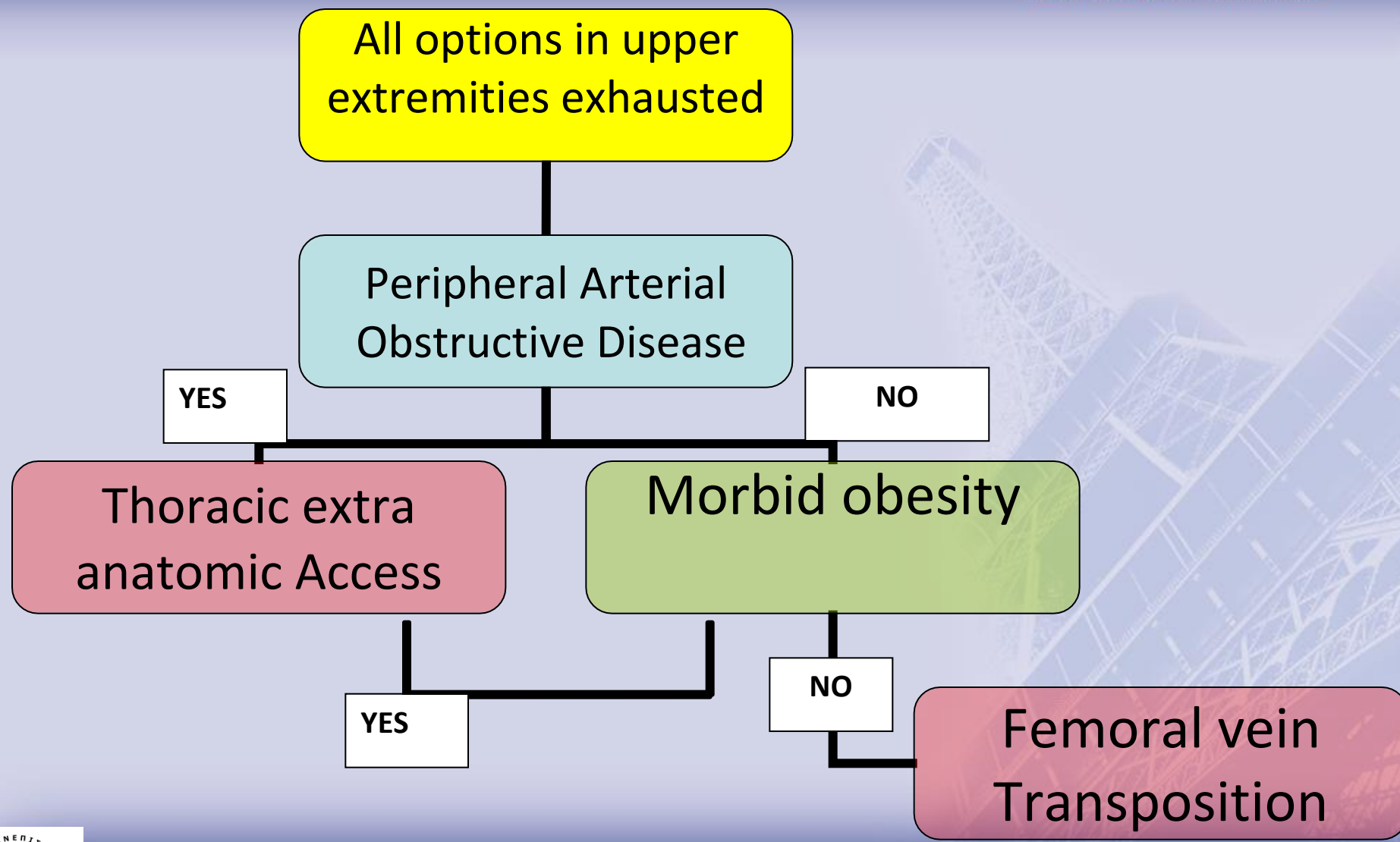
Femoral vein transposition

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Qu'est-ce que
tu en penses
Eric?



je suis d'accord
avec ta
proposition!

