When Are Prosthetic Grafts As Good As Veins?

Vascular Study Group of New England

Jack L. Cronenwett, M.D.

Dartmouth-Hitchcock Medical Center

Disclosure

- I do not have any potential conflicts of interest.

Great Saphenous Vein Grafts

- Better patency than prosthetic grafts below the knee if a single segment of good quality saphenous vein is available.

- Good quality GSV is not available in > 20% of patients

Alternate Vein vs. Prosthetic

- 83 Pts without GSV for BK popliteal bypass
- Primary patency:

	n	1 Year	5 Year
Alternate Vein	33	65%	55%
Prosthetic	50	73%	52%

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- On warfarin: 62% prosthetic, 27% vein
- Non-randomized, but with proper patient selection and anticoagulation, patency was equivalent for prosthetic and alternative vein grafts to the below-knee popliteal

- Belkin et al, J Vasc Surg, 2012

Dutch BOA Study

- Randomized trial anticoag vs ASA
  - Warfarin INR 3-4.5
  - Aspirin 80 mg/day
- One year patency equivalent:

	Aspirin	Warfarin	Hazard	95% C.I.
All	78%	78%	0.95	0.82-1.11
Vein	80%	**87%**	0.69	0.54-0.88
Prosthetic	**75%**	70%	1.24	1.03-1.55

- Warfarin benefited Vein, ASA Prosthetic
- More bleeding complications with warfarin

- Dutch BOA Study Group, Lancet, 2005

Graft Flow Rate and Warfarin

- 130 Prosthetic leg bypass grafts
- Multivariate predictors of thrombosis:
  - Low graft flow (<45 cm/sec): OR 6.7
  - Not on therapeutic warfarin: OR 8.4
- One-year patency:
  - High flow: 87%
  - Low flow: 54%

  P<.01
  - Low flow on warfarin: 85%
  - Low flow not on warfarin: 29%

  P<.001

- Bandyk et al, J Vasc Surg, 2007

VSGNE Below-Knee Bypass for Critical Limb Ischemia

- 1,664 BK popliteal, tibial (2003-2009)

- 81% Single segment GSV (n= 1,356)
- 19% Prosthetic (n= 308)

- Patient selection and management determined by individual surgeons (not randomized).

- Suckow et al, Ann Vasc Surg, 2013

VSGNE Below-Knee Bypass

	n	Coronary Disease	Prior Bypass	Tibial (vs. BK Pop)	Warfarin
Saphenous Vein	1356	34%	25%	48%	22%
Prosthetic	308	49%	46%	24%	51%

All Patients, All Comparisons P<.01

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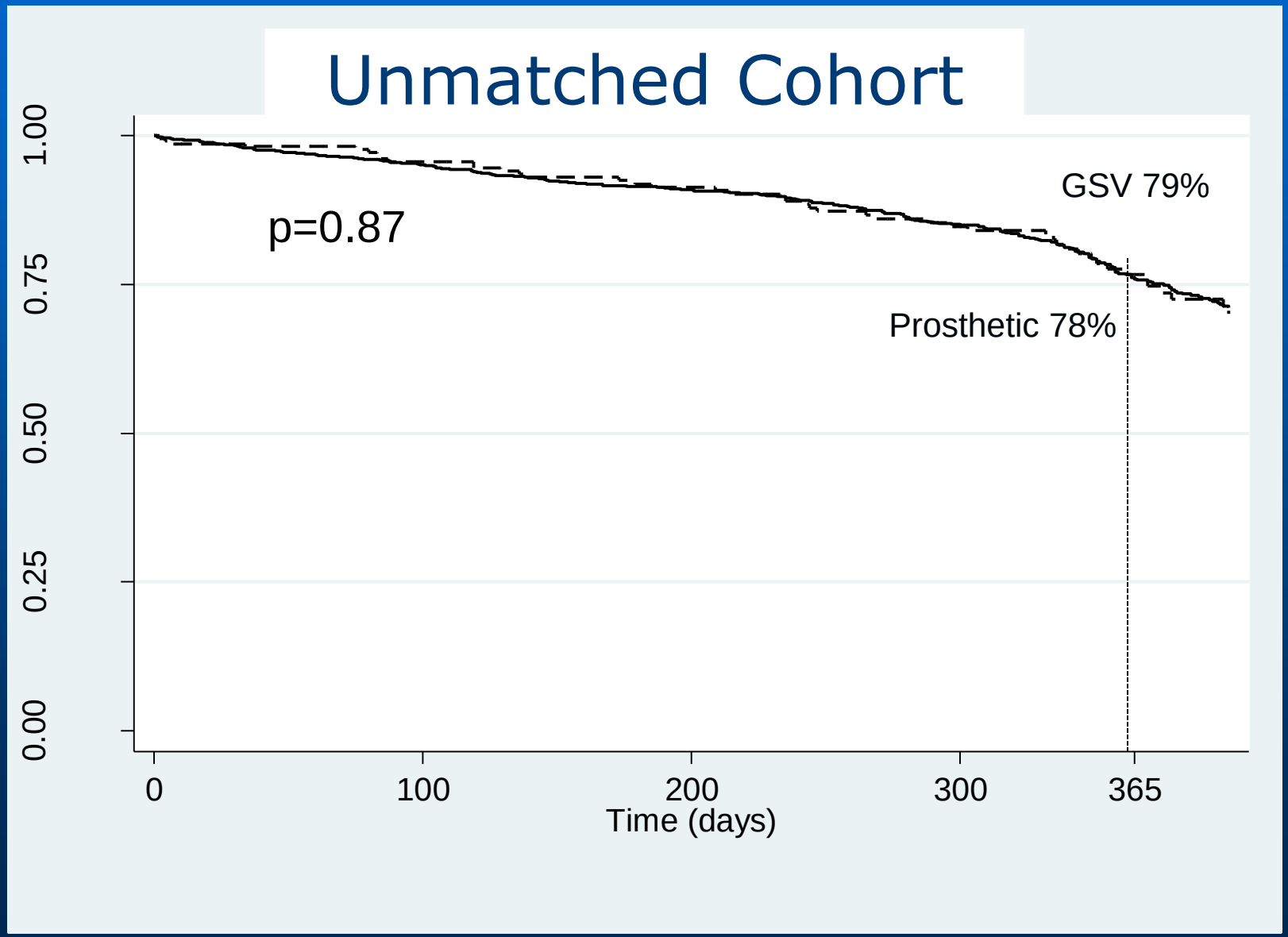
Propensity matched to control for baseline differences:

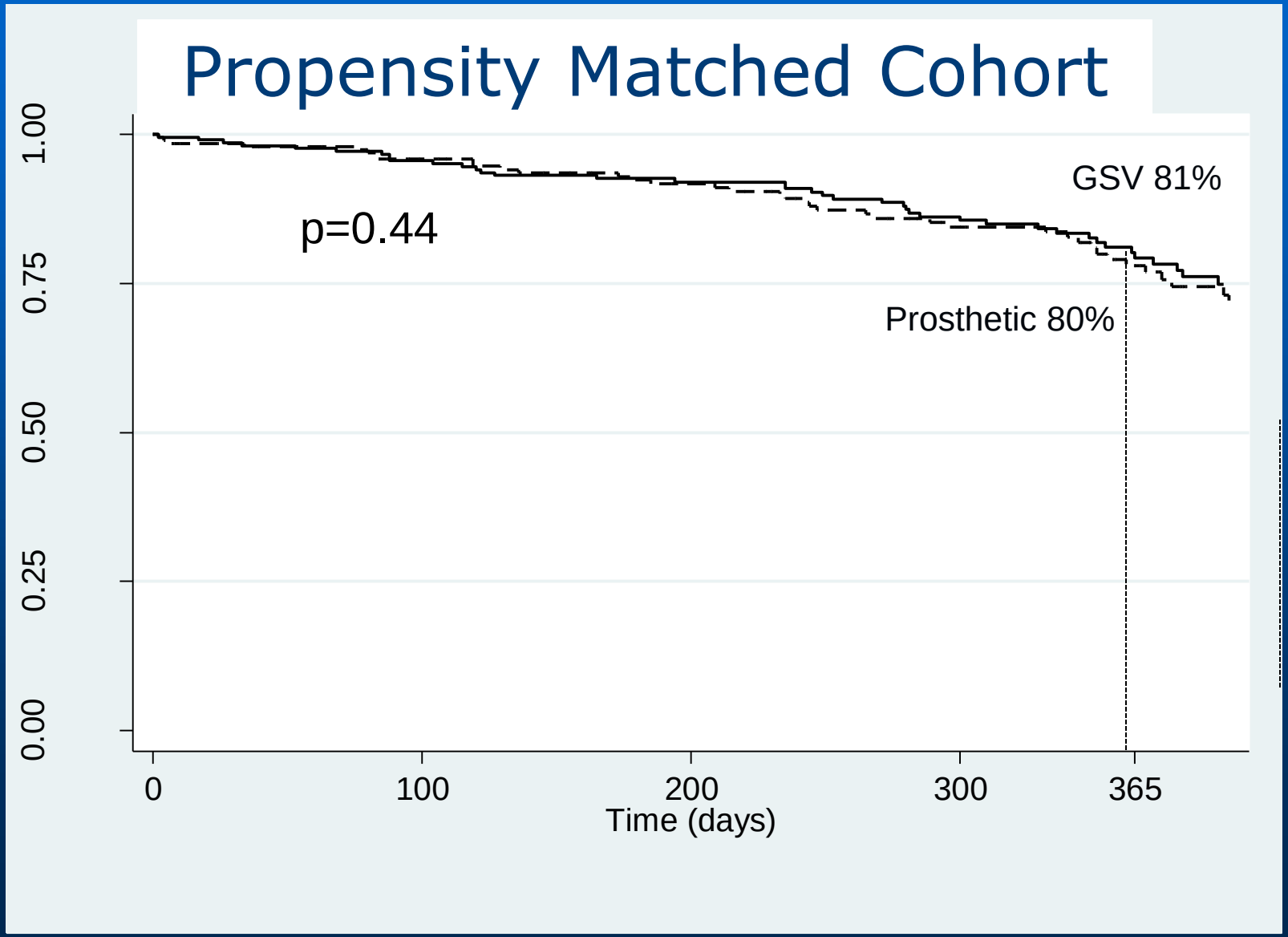
	n	Coronary Disease	Prior Bypass	Tibial (vs. BK Pop)	Warfarin
Saphenous Vein	278	49%	46%	23%	44%
Prosthetic	278	48%	46%	25%	48%

Propensity Matched Patients, All Comparisons ns

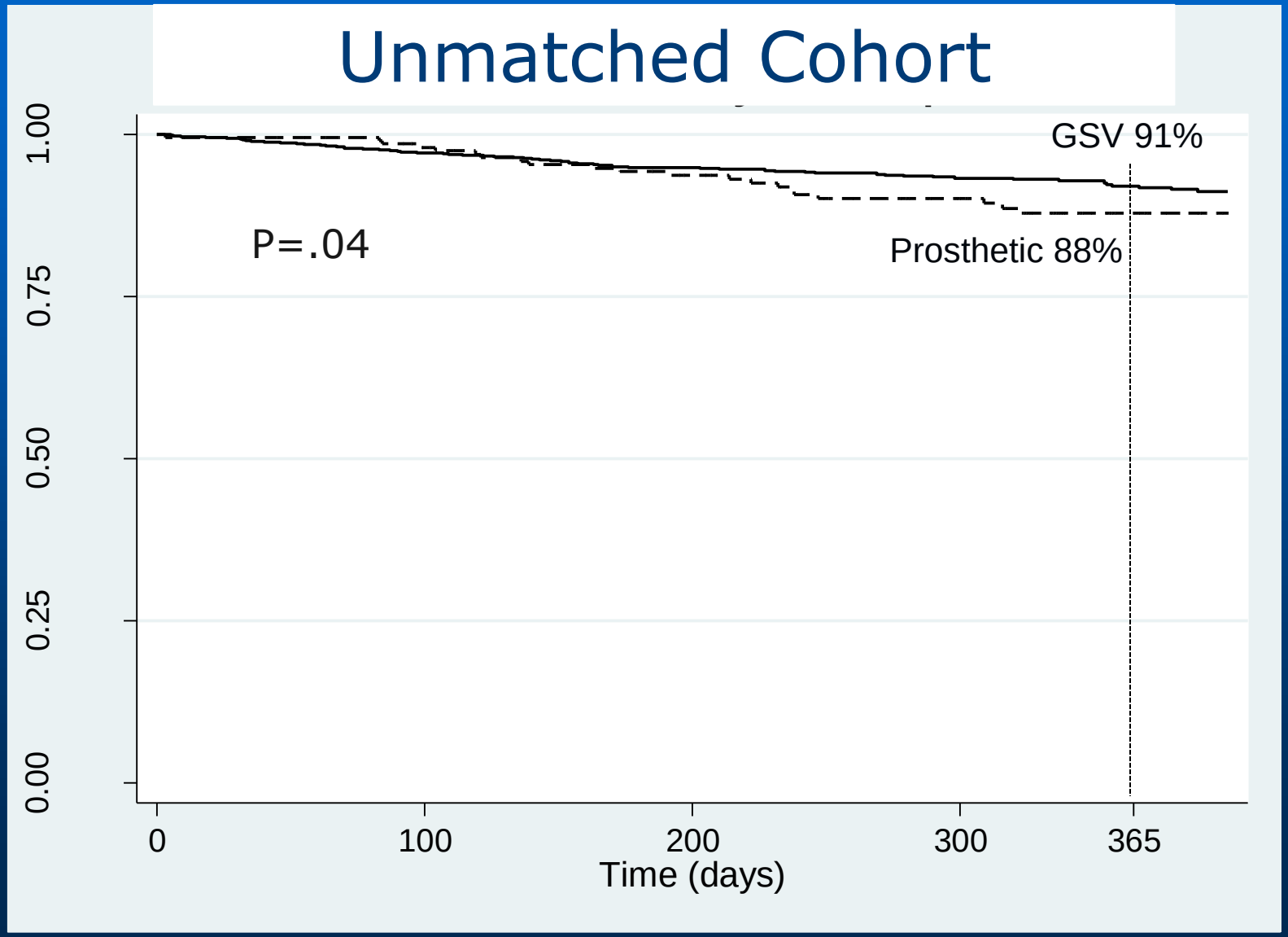
One Year Primary Patency



One Year Primary Patency



Limb Salvage



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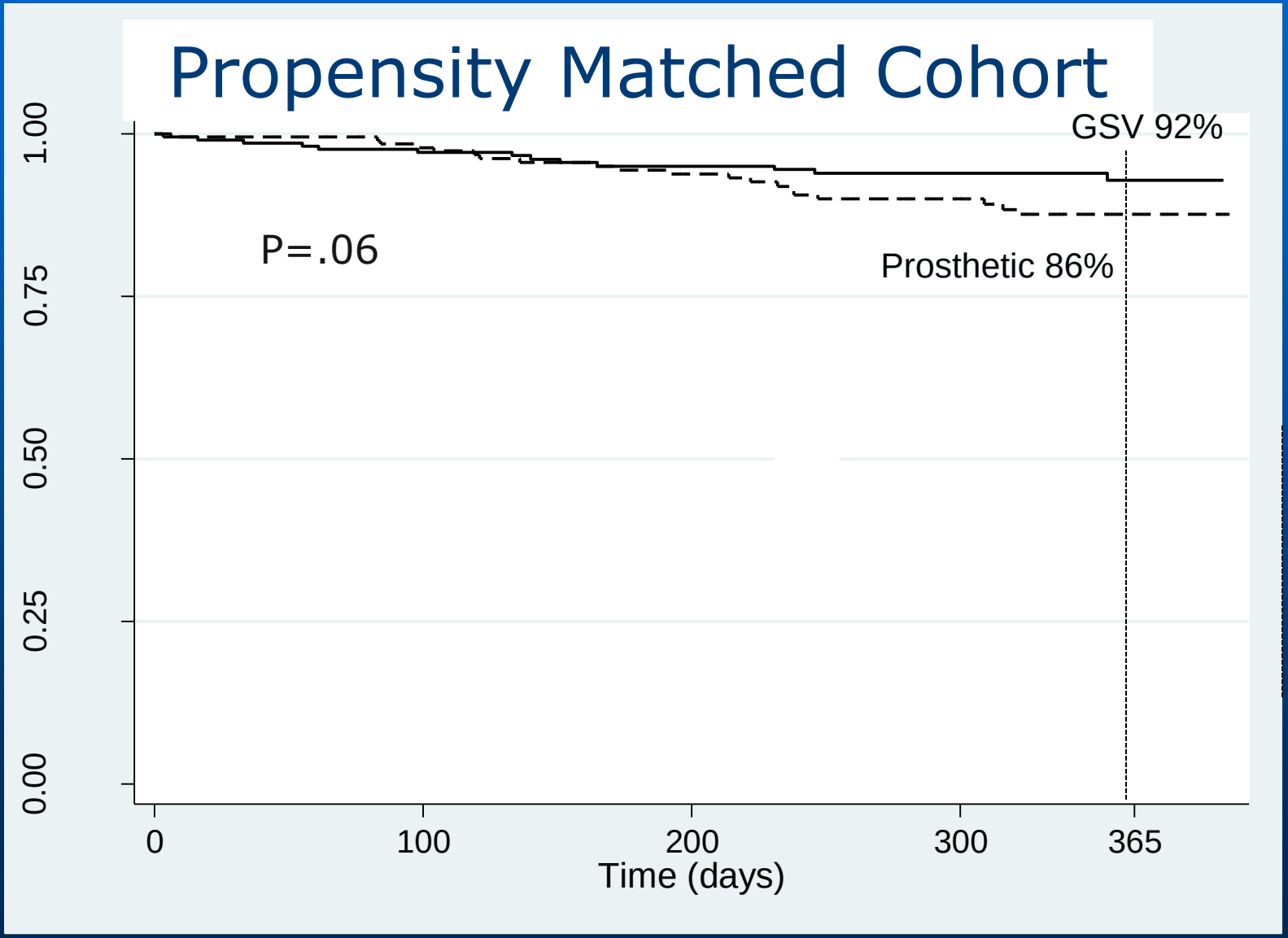

Limitations

- Not a randomized trial
  - Represents real world practice
- Only one year follow-up
  - Vein might be better in long term
- Anticoagulation used selectively
  - Likely in grafts at high risk to thrombose
- Can’t conclude that prosthetic grafts are as good as vein grafts

Conclusion

- In real world practice in New England, surgeons used prosthetic grafts for 20% of below knee bypasses for CLI, but used warfarin in 50% to achieve 80% one year patency, comparable to single segment GSV.

- Optimal patient selection likely influenced this positive outcome.

Prosthetic Graft Adjuncts

- Heparin bonding to PTFE grafts - RCT
  - Fem-pop (AK, BK) 1 year primary patency:
    - Hep bonded: 86% (n=107)
    - Plain PTFE: 69% (n=125)
    - Scandinavian Study, Eur J Vasc Endovasc Surg, 2011
- Distal vein patch/cuff - RCT
  - Fem-pop PTFE bypass, 1 year patency:
    - AK: Cuff 80%, No Cuff 84%, p=ns
    - BK: Cuff 80%, No Cuff 65%, p=.03
    - Joint Vascular Research Group, J Vasc Surg, 1997

When Should Prosthetic Grafts Be Used for Leg Bypass?

- Patients with inadequate GSV
  - Good GSV has better long term outcome
- Patients with limited life expectancy
  - Initial ulcer healing, lower risk procedure
- Patients who can tolerate warfarin
  - Warfarin in prosthetic grafts with poor outflow (low flow) is likely beneficial

Vascular Study Group of New England

30 Participating Hospitals

www.vsgne.org