The P's of Pancreas Transplantation

The Ohio State University

Mitchell Henry

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Suggested by (Panky)Peter Stock to be implemented by me (Poor Professor)!

PANCREAS PROBLEMS

1. *Pankey prep (back table)*
2. *Panky parts*
3. *Pankey put (pancreas party)*
4. *Pankey peek*
5. *Pankey poke (the biopsy)*
6. *Pankey pus (panky poop, panky pee)*
7. *Pankey pull*
8. *Pankey post*
9. *Panky pain*

A Chance To Cut
Is A
Chance To Cure

Diabetes Control and Complications Trial (DCCT)

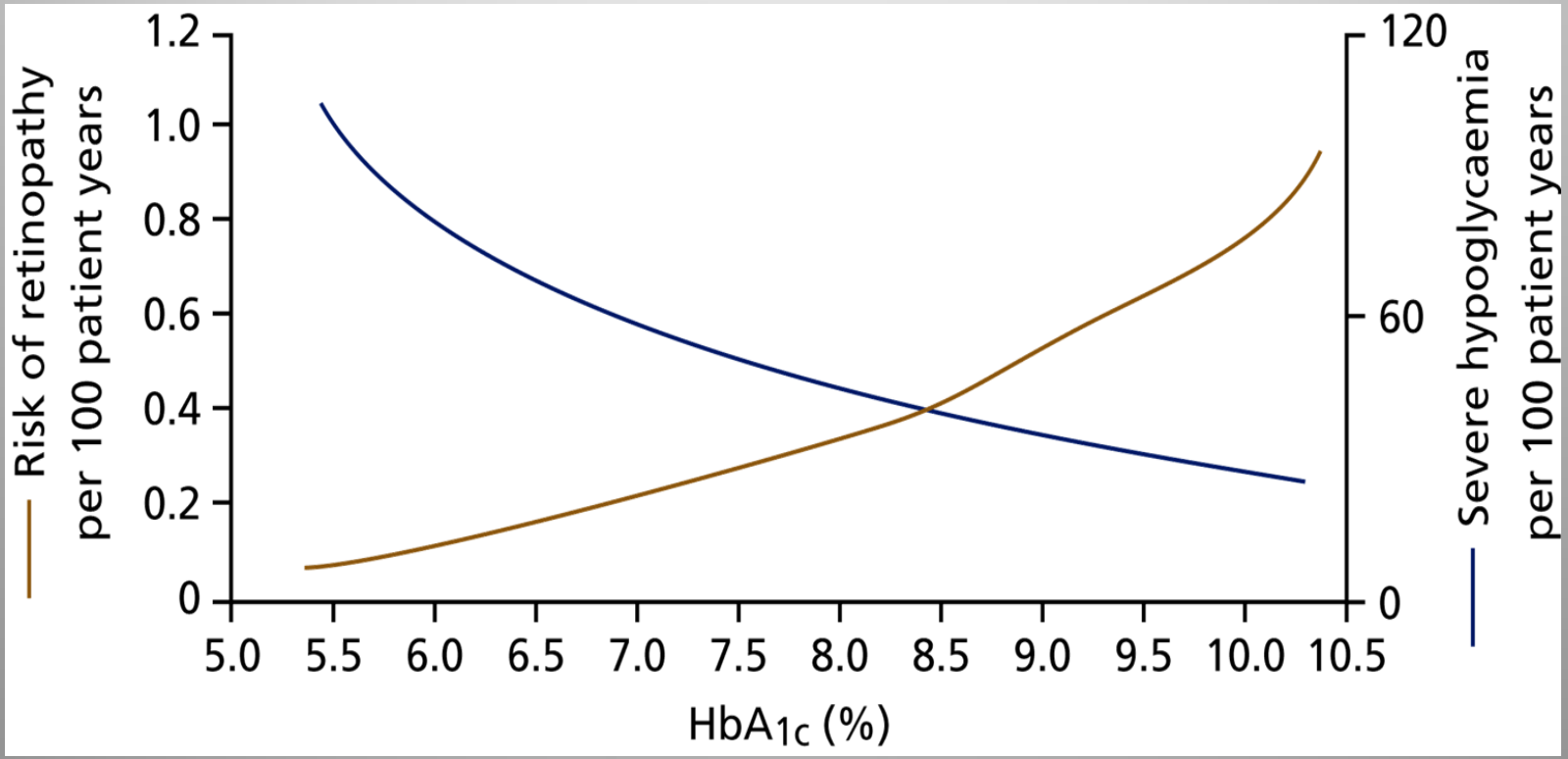
- ***The Diabetes Control and Complications Trial Research Group NEJM 1993***
- ***Sentinel trial of aggressive glucose control***
- ***1441 pts randomized to conventional or intensive insulin therapy***
- ***Follow up 6.5 year***

Diabetes Control and Complications Trial (DCCT)

- ***Risk reduction***
  - ***Retinopathy 63% p<0.002***
  - ***Nephropathy 54% p<0.04***
  - ***Neuropathy 60% p<0.002***
- ***<5% of persons were able to achieve an A1C <6.1%***
- ***Intensive group had 3-fold increased risk of hypoglycemia***

DCCT Research Group. New Engl J Med 1993;328:977

The Balance Between Prevention of Complications and Development of Hypoglycemia: DCCT



DCCT Research Group. New Engl J Med 1993;328:977.

Pancreas Transplantation

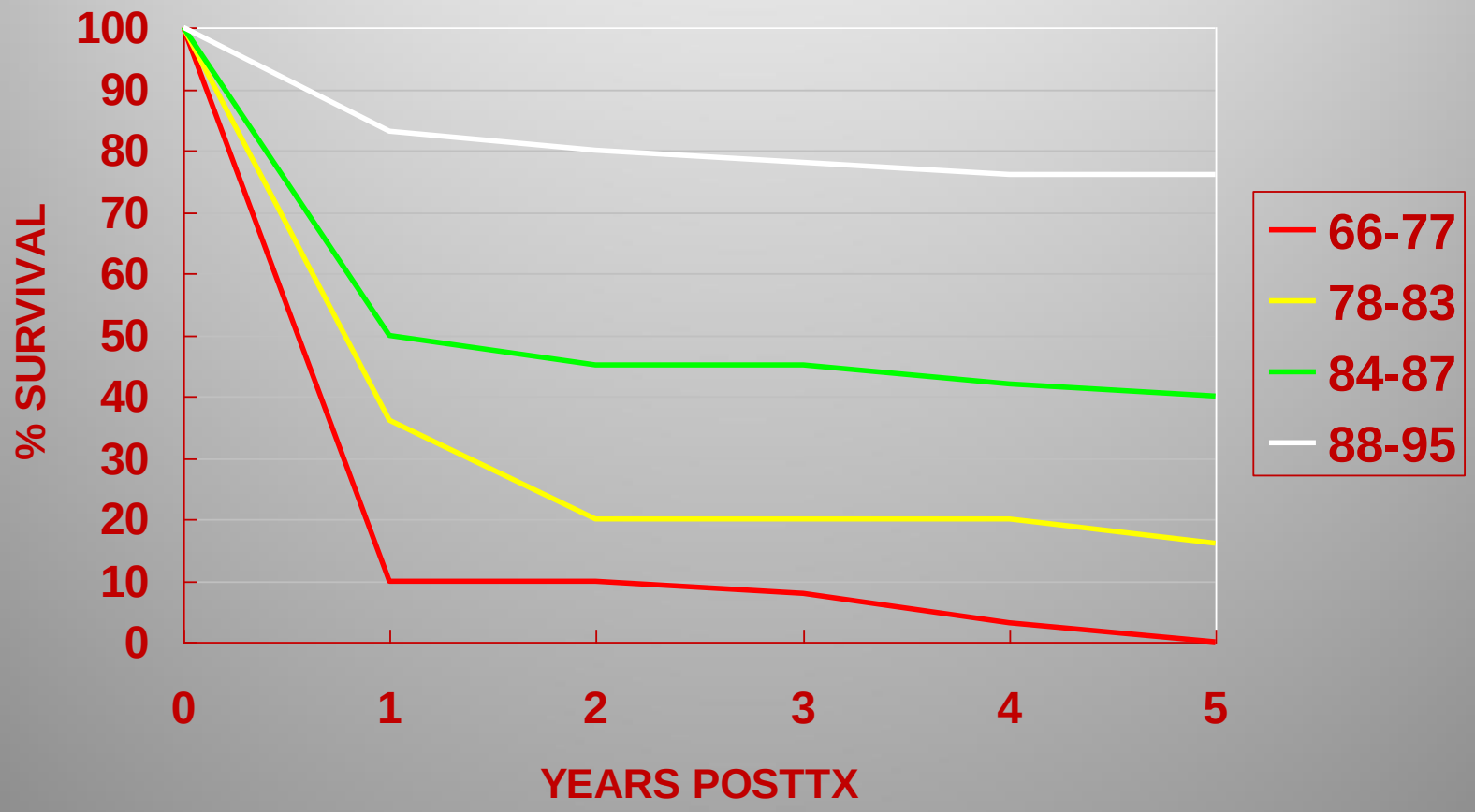
Goal

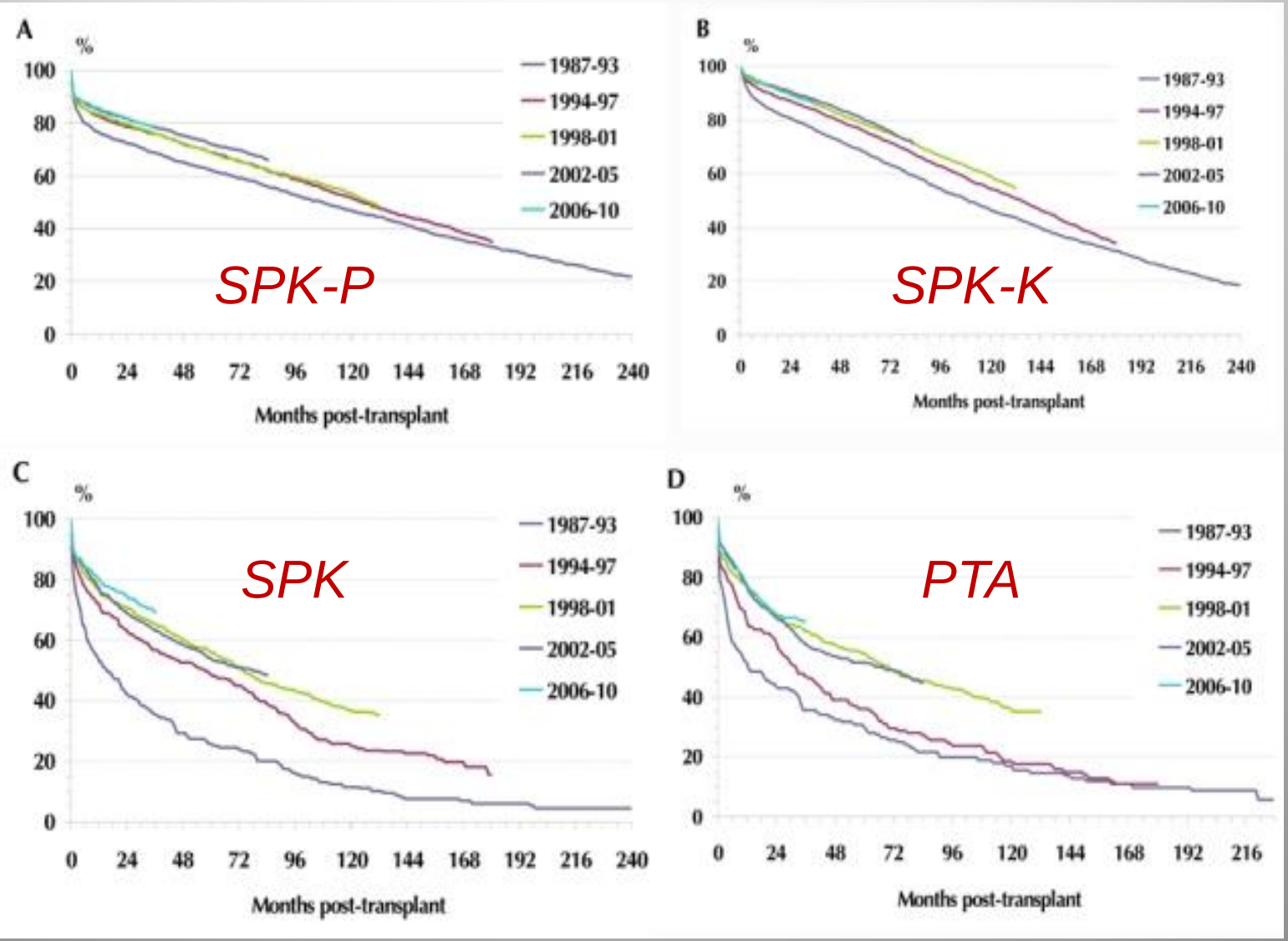
- ***To eliminate the acute complications of diabetes***

- ***By achieving normoglycemia, to slow , stop or even reverse the chronic pathophysiologic injury 2º to IDDM***

Pancreas Survival

Early Eras





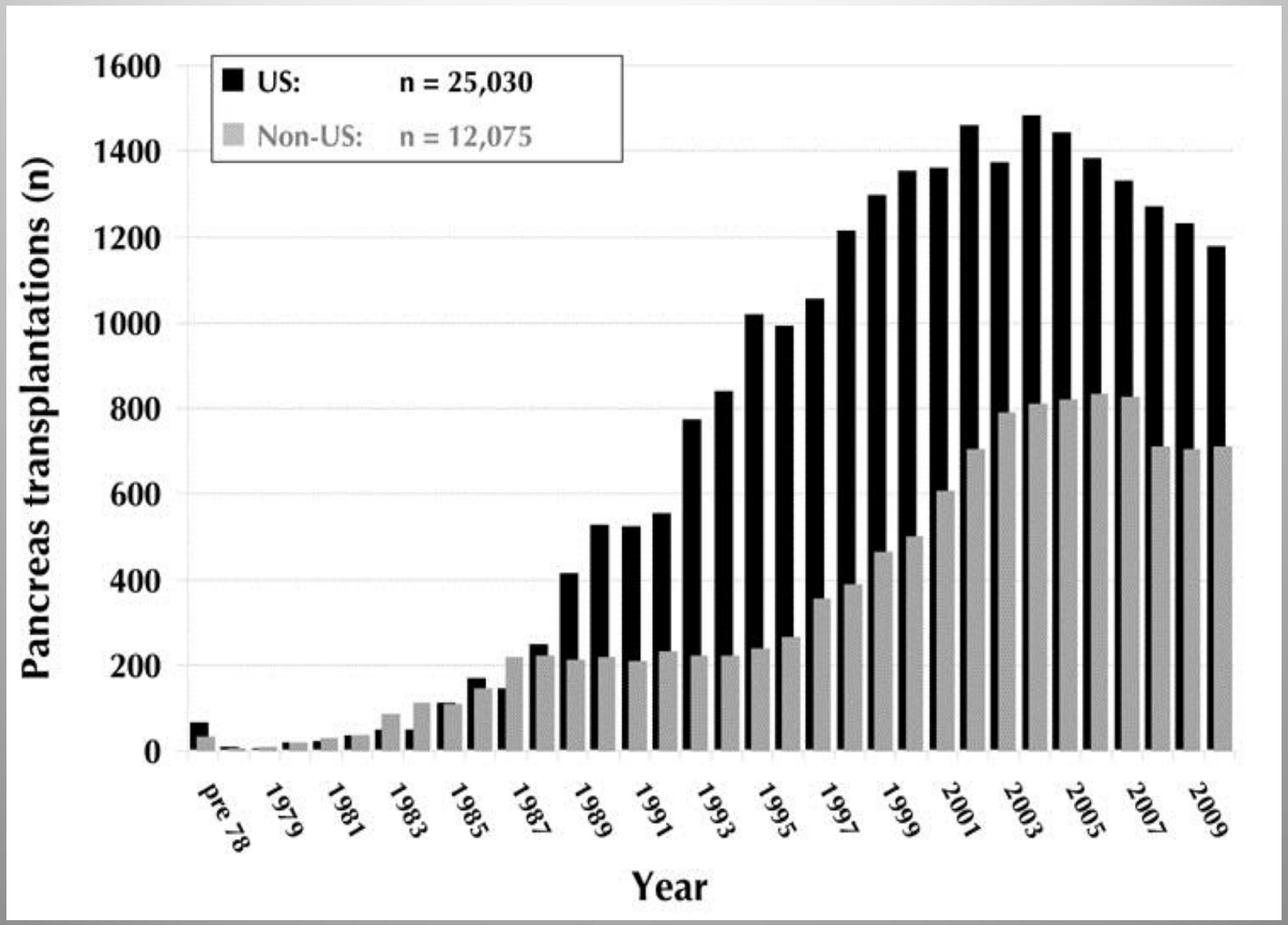
Graft survival by era

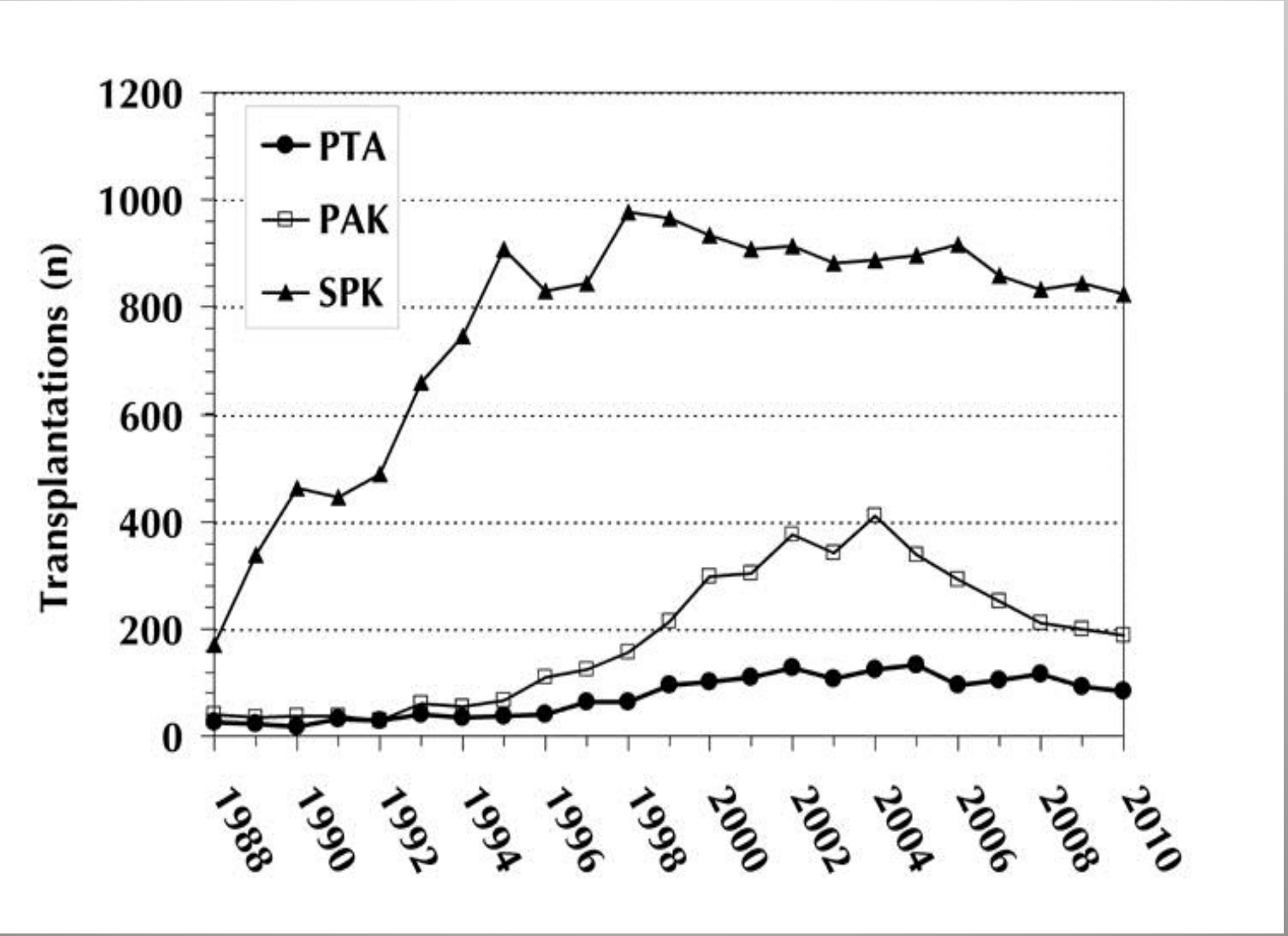
Patient Survival

Kidney tx alone vs simultaneous Kidney/Pancreas tx

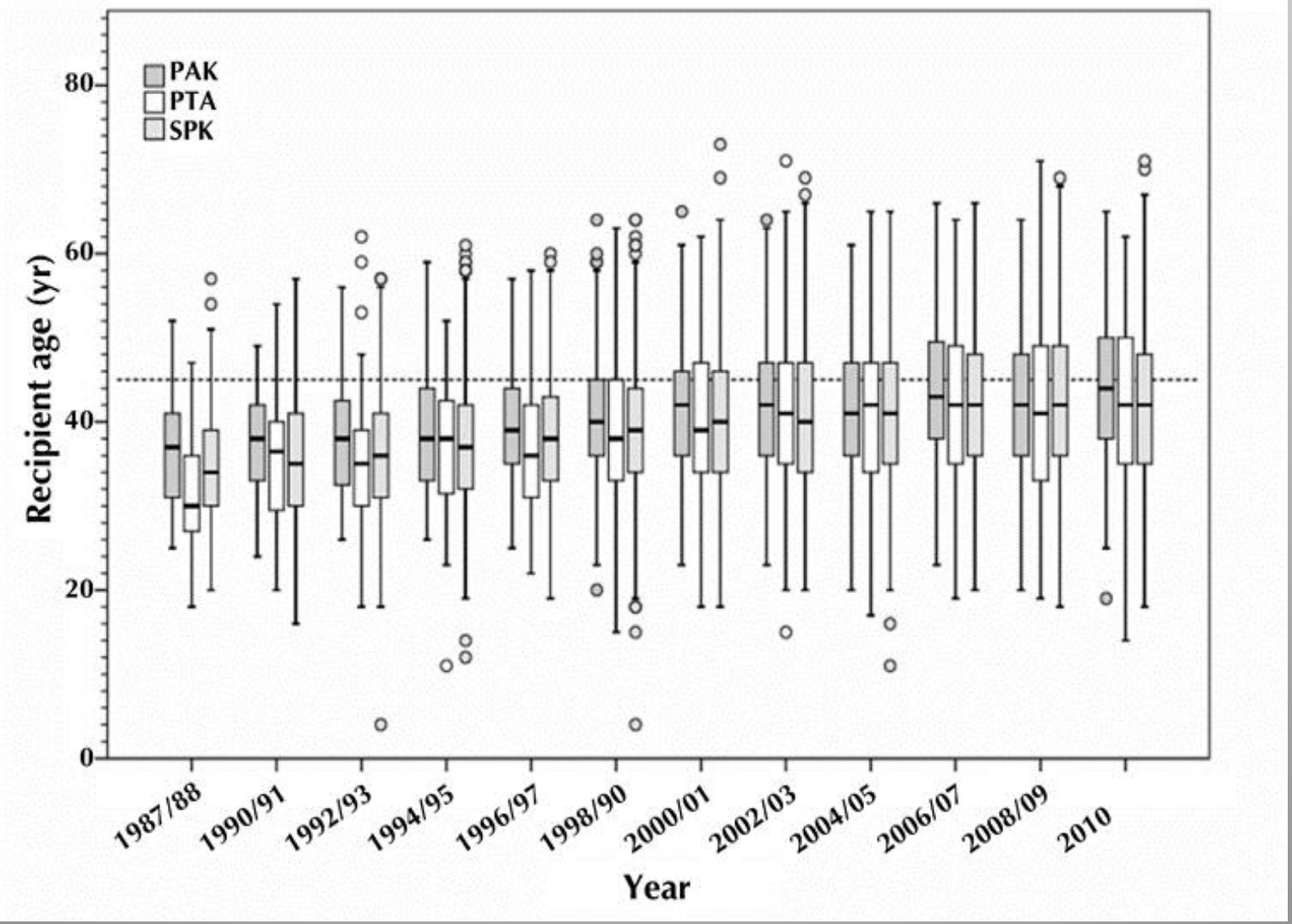
Tyden et al

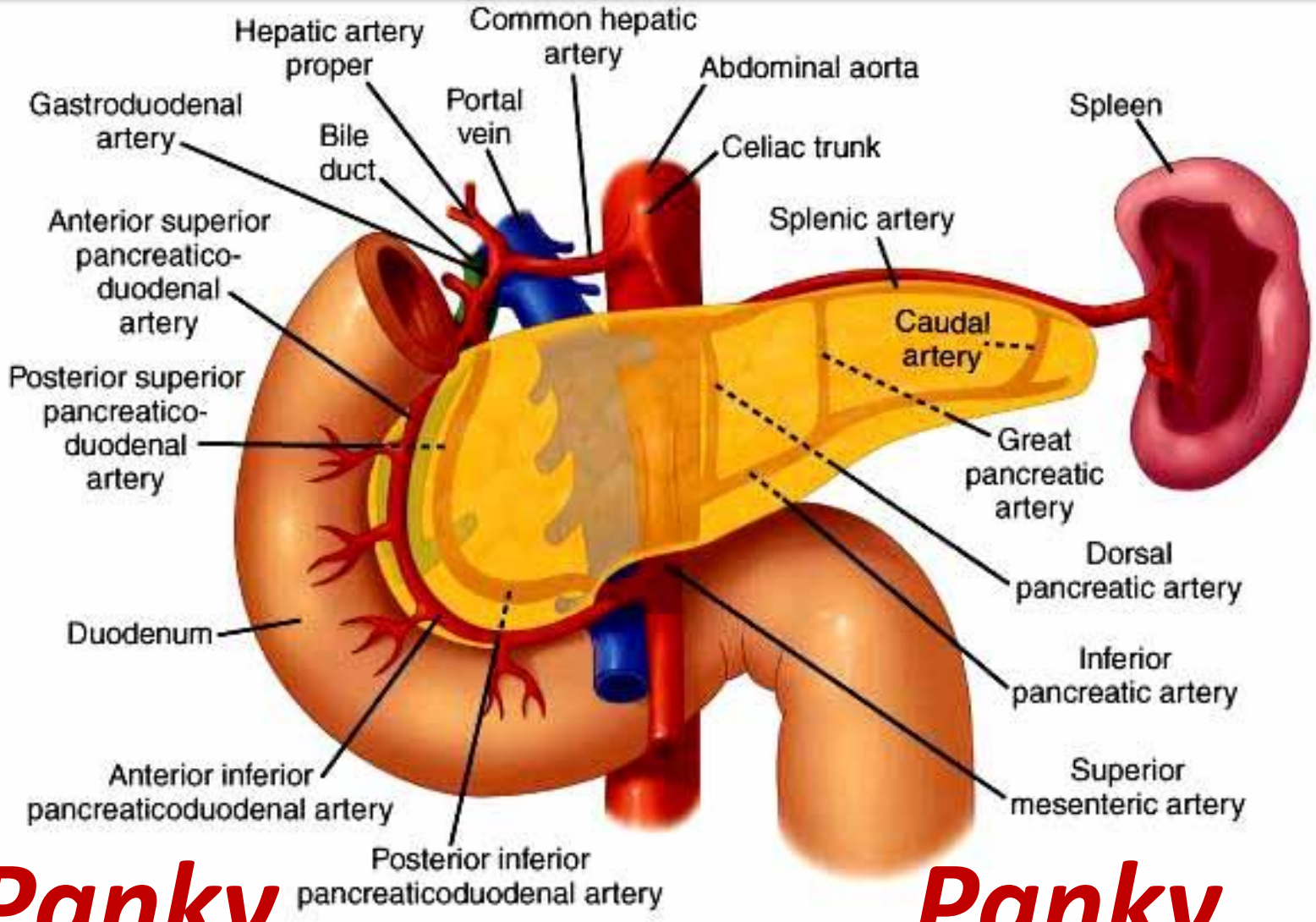
Life style versus life saving?


US: n = 25,030
Non-US: n = 12,075
Pancreas transplantations (n)
1600
1400
1200
1000
800
600
400
200
0
pre 78
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
Year



US tx's by year


PAK
PTA
SPK
Recipient age (yr)
0
20
40
60
80
1987/88
1990/91
1992/93
1994/95
1996/97
1998/90
2000/01
2002/03
2004/05
2006/07
2008/09
2010
Year



Pancreas Transplantation

Technical considerations:

- ***Donor***

- ***Backtable***
  - ***Arterial supply***
  - ***Venous drainage***
  - ***Duodenum***
  - ***Spleen***

- ***Tx Procedure:***
  - ***Exocrine drainage***
  - ***Venous drainage***

Pancreas Transplantation

Technical considerations:

- ***Donor***

- ***Usually procured en bloc with liver and split on back table***

- ***Virtually no arterial scenarios where pancreas and liver can't both be procured***

- ***In situ flush trending toward non-viscous fluids, for better capillary access/cooling***

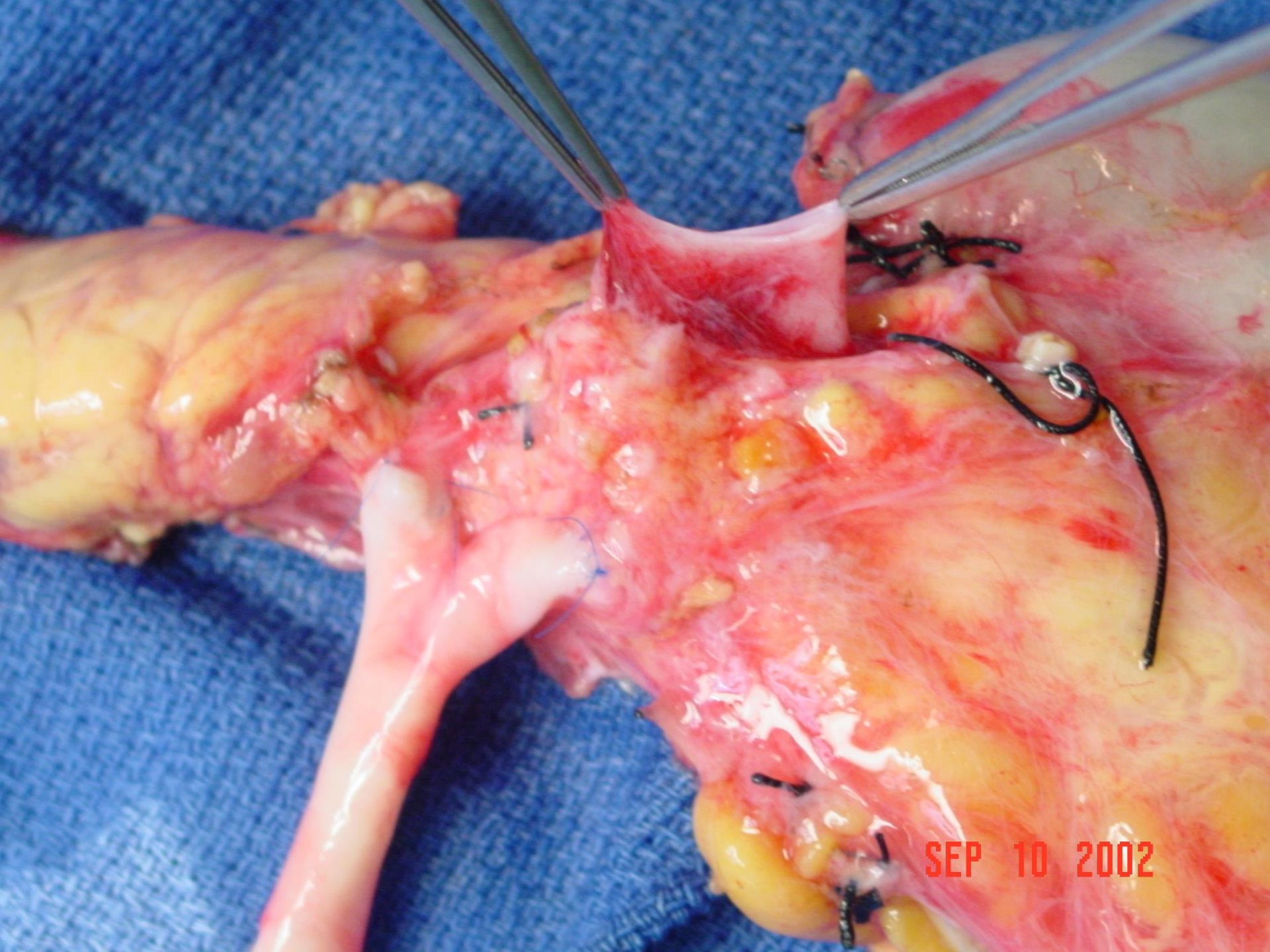
Pancreas Transplantation

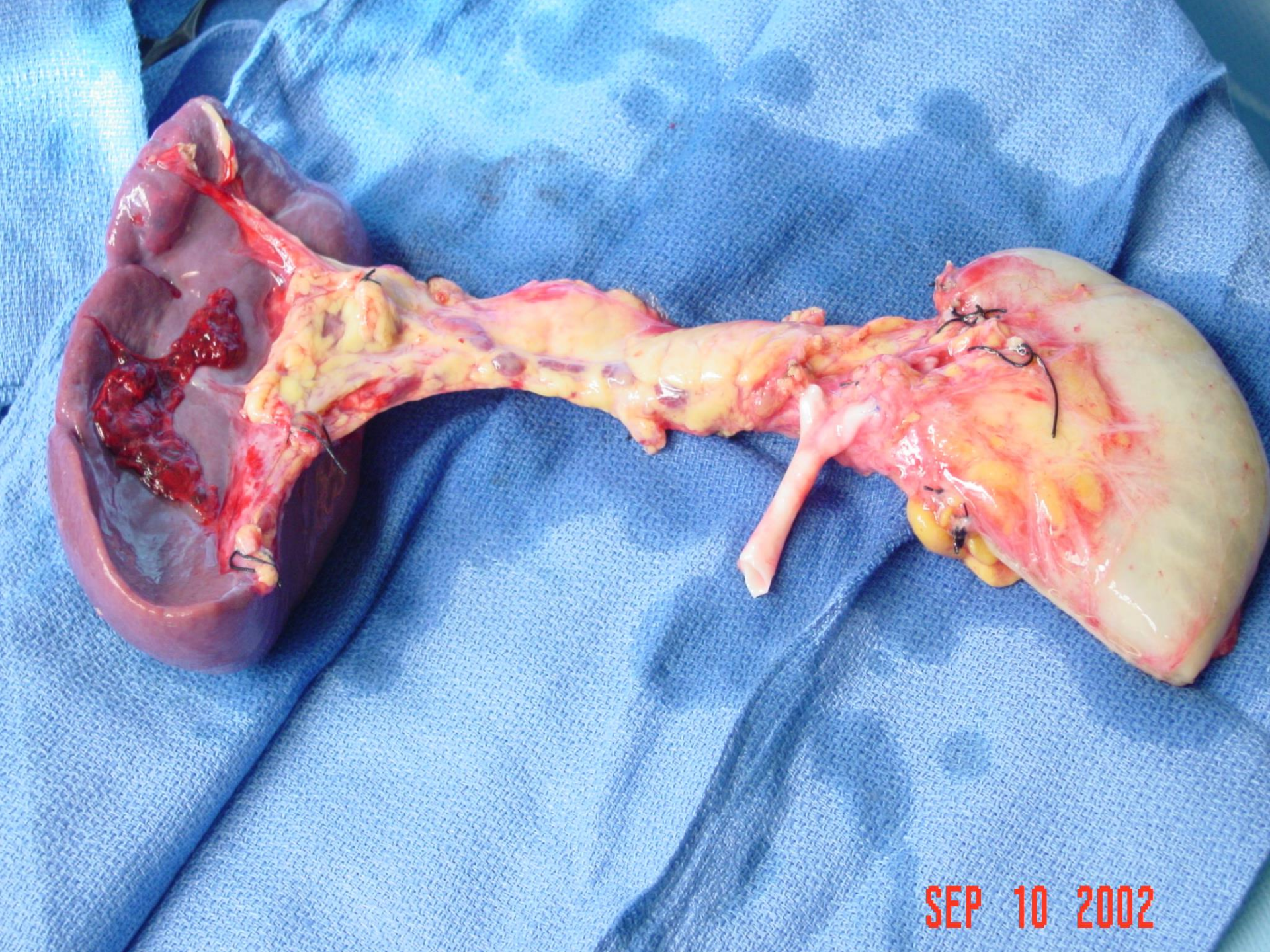
Technical considerations:

- ***Backtable***

- ***Arterial supply***
  - ***Y-grafting to SMA and splenic artery***
  - ***Choose best graft available - iliacs***
  - ***Can endarterectomize if necessary***
  - ***"Short enough" with proper orientation***

- ***Venous - portal vein***
  - ***"A little" dissection from parenchyma***
  - ***Gently shorten – some advocate venous grafting***


SEP 10 2002


SEP 10 2002

Pancreas Transplantation

Technical considerations:

- ***Backtable***

- ***Duodenum***
  - ***Depends on choice of exocrine drainage***
  - ***Enteric - shorten enough to avoid ischemia***
  - ***Bladder – significant shortening to decrease fluid losses***
  - ***Can mark sphincter by passing dilator down bile duct to mark exit site***
  - ***Stay right on duodenum with dissection***

Panky Put

Pancreas Transplantation

- ***Tx Procedure***

- ***Incision - Initially bilateral retroperitoneal***
  Midline vs low transverse

- ***SPK***
  - Pancreas first - watch for bleeding,
  adequate perfusion
  - Kidney second

Pancreas Transplantation

Tx Procedure

<u>Exocrine drainage</u>

Enteric drainage - 80+% of programs

Advantages

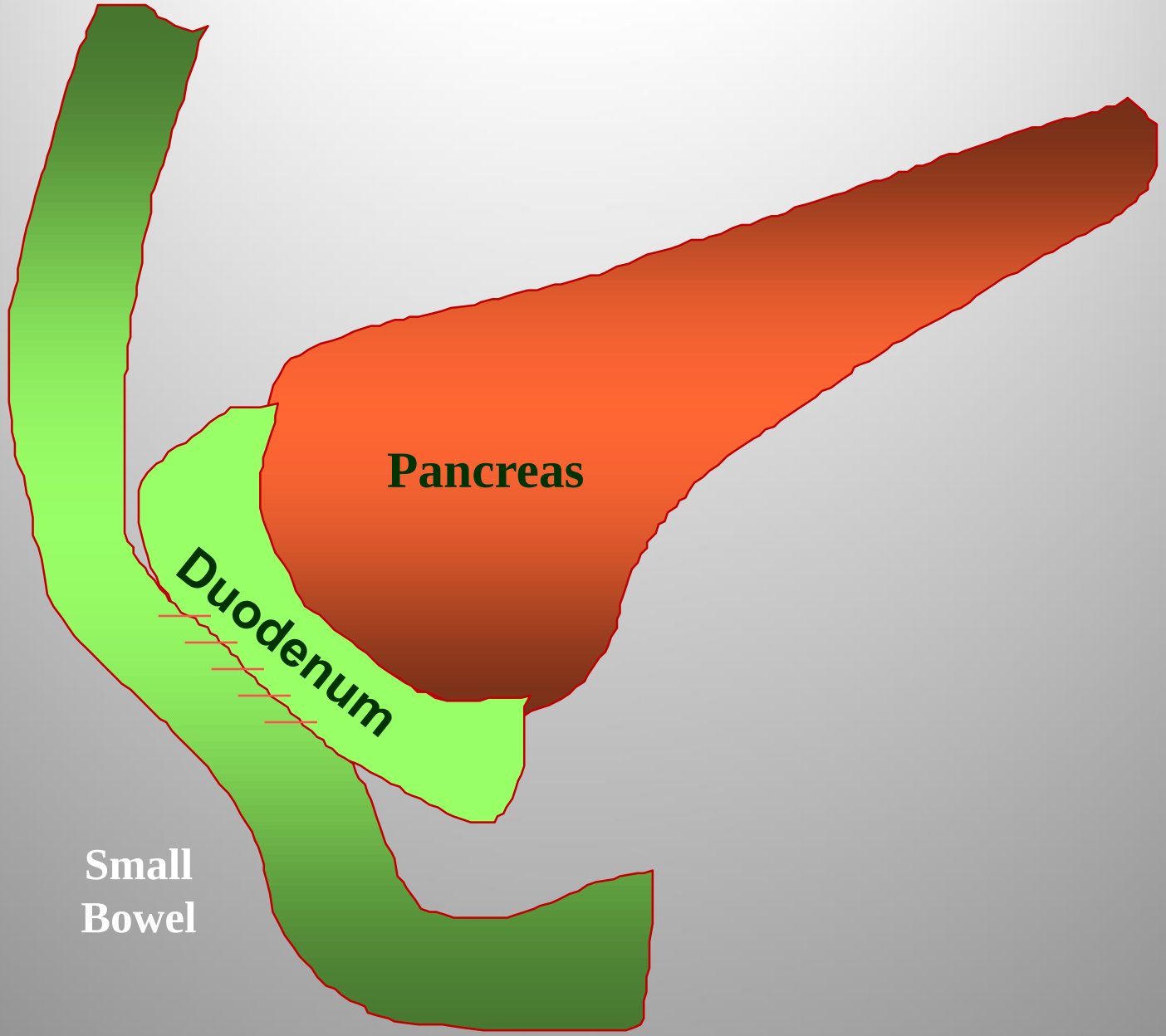
- more "physiologic"

- avoid dehydration, acidosis, K^+ issues

Disadvantages

- early leaks – can be disastrous

- ?? increased intra-abdominal infections, small bowel obstructions


Pancreas
Duodenum
Small
Bowel

Pancreas Transplantation

Tx Procedure

Exocrine drainage

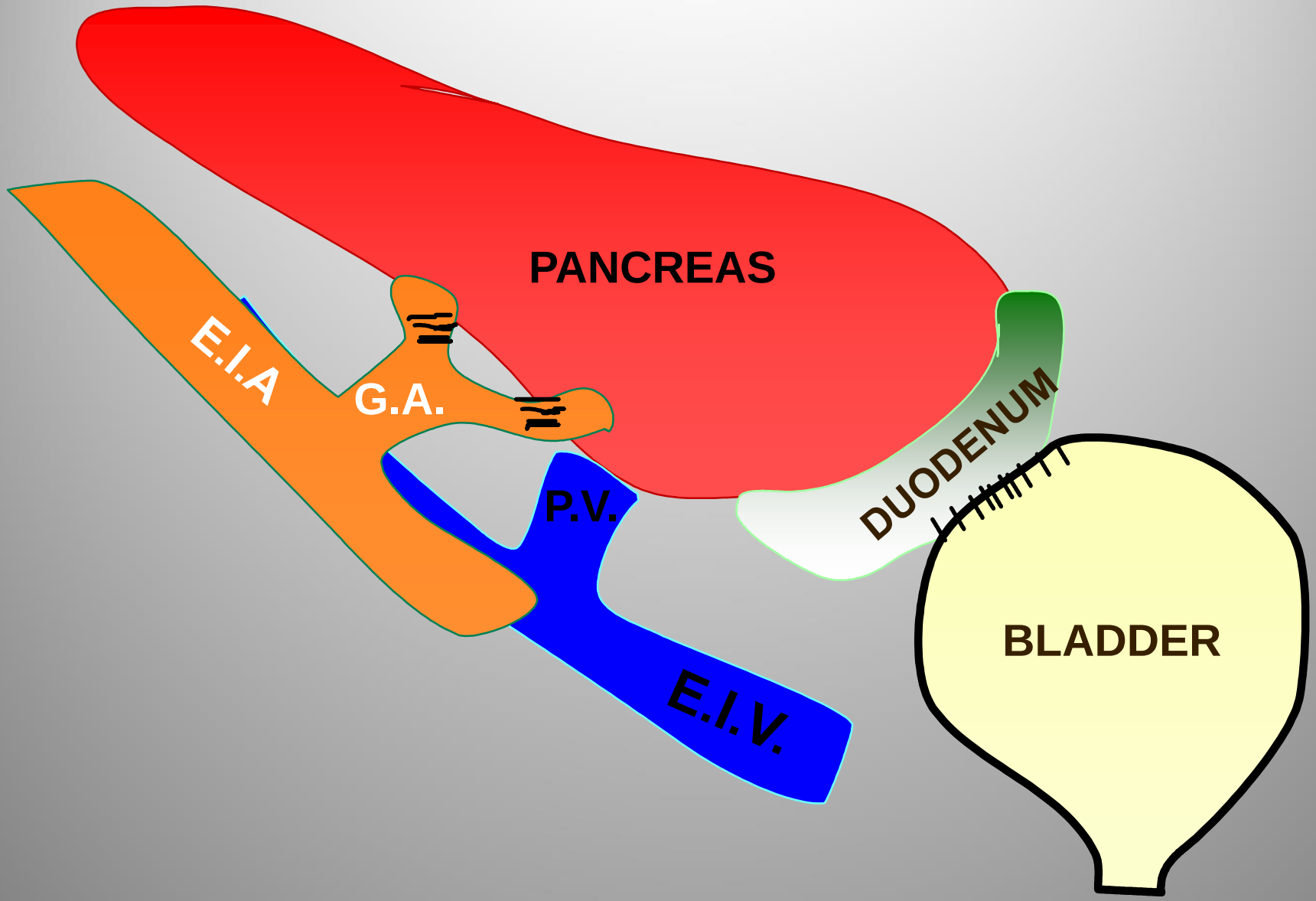
Bladder drainage – minority of programs

Advantages

- monitor urinary amylase (isolated tx's)
- improved blood pressure control
- Safety
- early and late leaks easily managed

Disadvantages

- need for enteric conversion (50% of time at Wisconsin, 7% at OSU)


PANCREAS
E.I.A
G.A.
P.V.
E.I.V.
DUODENUM
BLADDER

Pancreas Transplantation

Tx Procedure – orientation, vessels

- ***<u>Enteric drainage</u> - head pointing cephalad***
  Artery – ext or cm iliac, aorta, others
  Vein – iliacs or vena cava (or mesenteric veins)
  GI – side-to-side, or defunctionalized loop

- ***<u>Bladder drainage</u> - head pointing caudad***
  - ***Artery – external or common iliac art***
  - ***Vein – external iliac vein***

Pancreas Transplantation

Tx Procedure - duodenal anastomosis

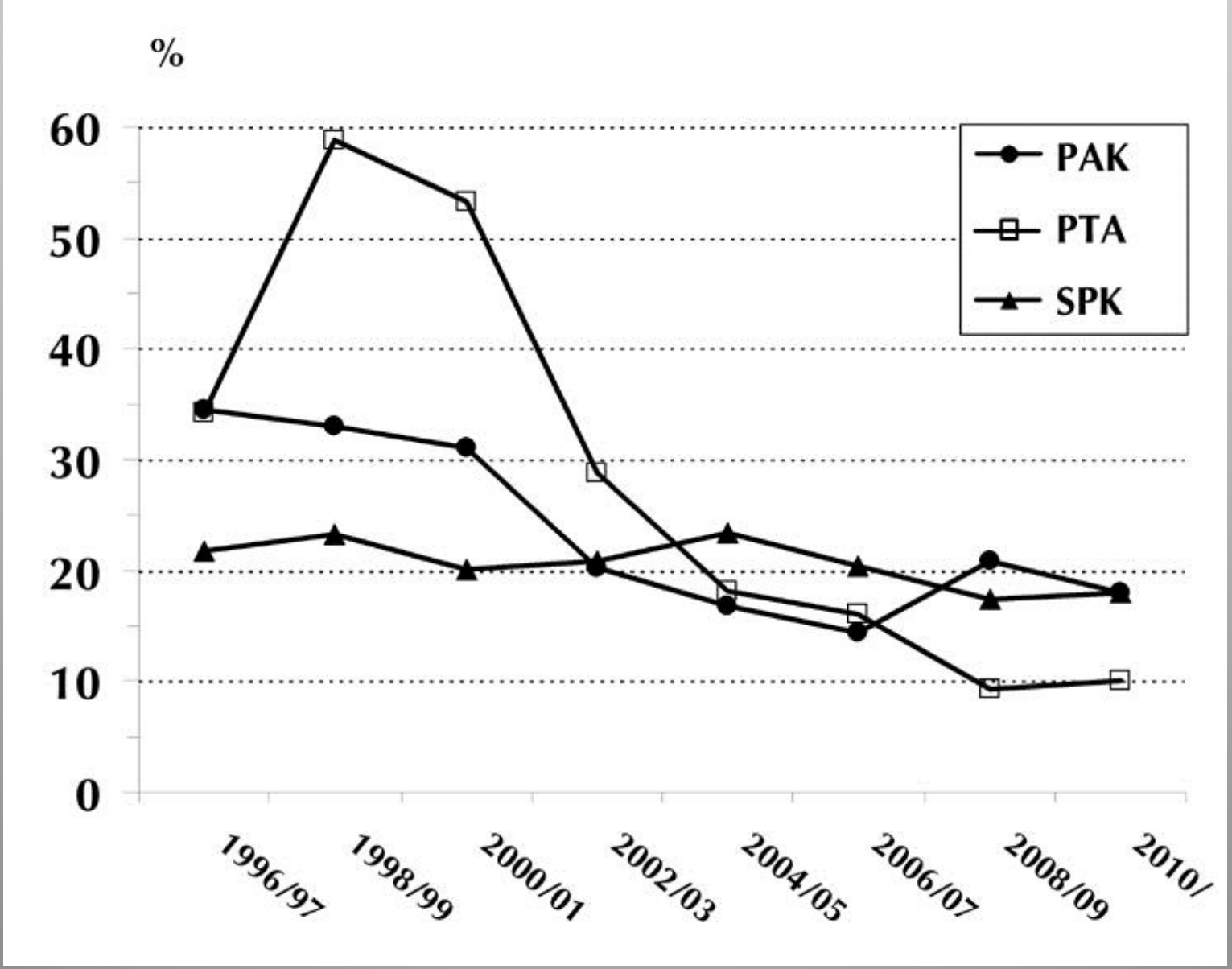
- ***Enteric drainage***
  GI – side-to-side, or defunctionalized loop
  Side-to-side – suture probably not important, some have stapled (may have increased incidence of bleeding)

- ***Bladder drainage***
  - ***Side-to-side – absorbable suture for mucosa, second layer not important***

Pancreas Transplantation

Tx Procedure – Portal/mesenteric venous drainage of pancreas

- ***Portal venous drainage - "physiologic"***
  -Systemic drainage - hyperinsulinemia
  -Non-tx patients - accelerated atherosclerosis
  - ***No evidence to prove an advantage***
  - ***Currently done infrequently***



Portal drainage over time

Panky Points

Pancreas Transplantation

Technical considerations: Miscellaneous

- Spleen - prefer to leave on at transplant
  - Works as a "handle" during procedure
  - Doubles initial flows during reperfusion

- Intra- versus Extra- peritoneal placement
  - Initially placed retro- in kidney tx incision, not a good idea
  - Some still advocate placing in a retro-peritoneal position at end of procedure

- Use peritoneal clearance to your advantage
- Perioperative insulin - no + evidence

Panky
Pus/Poop/Pee

Pancreas Transplantation

Peri-pancreatic (PP!) Fluid Collections

- Bladder drainage provides some safety for leaks, Foley versus IR / reexploration
- My bias is if you scrutinize recent literature, there are more intra-abdominal infections and procedures required with enteric drainage
- European literature reflects U.S. experience 20 years ago

Singh RP Transplantation 2013;95: 1263

Pancreas Transplantation

Peri-pancreatic (PP!) Fluid Collections

- Singh - 223 consecutive pancreas tx,'s
  - 16% with PP fluid collections
  - Panc survival 68% vs 85%
  - Infections 75% vs 46%
  - BD 13% vs ED 19%
  - 56% cultured bacteria
  - early rejection in 50% (vs 23% without)

Singh RP Transplantation 2013;95: 1263

Panky Poke

Pancreas Transplantation

- ***Stated incidence of rejection is highest of abdominal transplants***
- ***Lots of things happen in pancreas recipients – when things happen, feel compelled to biopsy or treat***
- ***Should have really good evidence that there is nothing else going on***
- ***Pancreas biopsy not routine – can help, but need to have enough to do well and someone capable to read them accurately***

Panky Pull

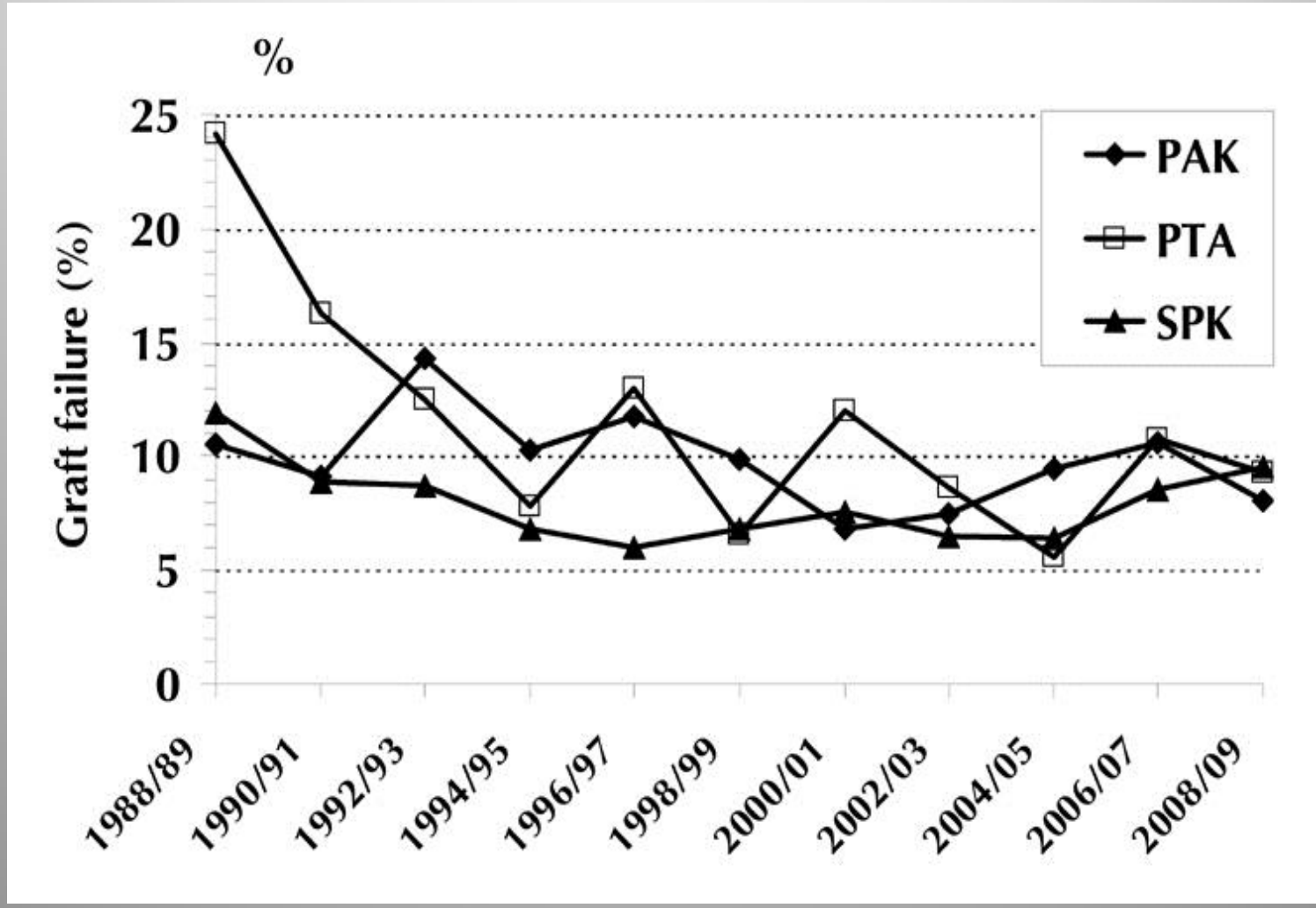
Pancreas Transplantation

Technical considerations:

- *"Technical failures"*
  Approximately 8-10% - mostly thrombosis

- *Fairly constant over recent times*
- *No good evidence to say heparin, ASA, other plt inhibitors make a difference*

- *Time to retire the term "technically successful" and move on*



Technical failure over time

Panky Peek

Pancreas Transplantation

Aggressive re-exploration

- Issues of viability
- Unexplained fever / leukocytosis / elevated creatinine / ileus
- Pancreas recipient who is not doing well and you do not know why

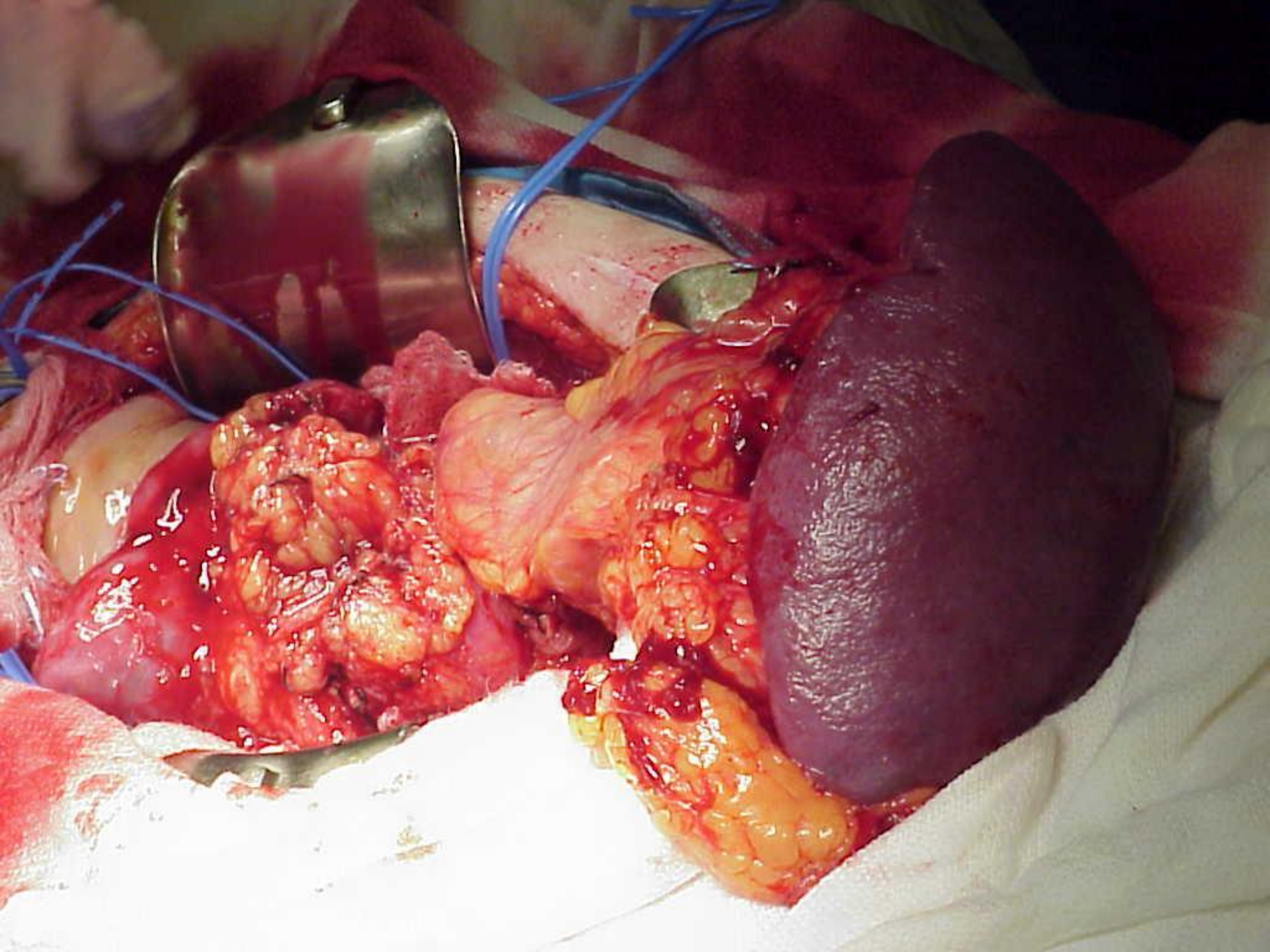
Panky Pain

Pancreas Transplantation

There is pain after a pancreas transplant

- ***However, the worst pain is felt by the docs associated with caring for these patients***
- ***One reason for low tx numbers is the effort by the team to care for these folks***
- ***On the other hand, these procedures can completely change the lives, not to mention length of life, of these patients***

Panky
Pretty



Pancreas Transplantation

It's hard work but it's worth it !

But it can be frustrating – even Peter Stock and some of his closest friends can be affected

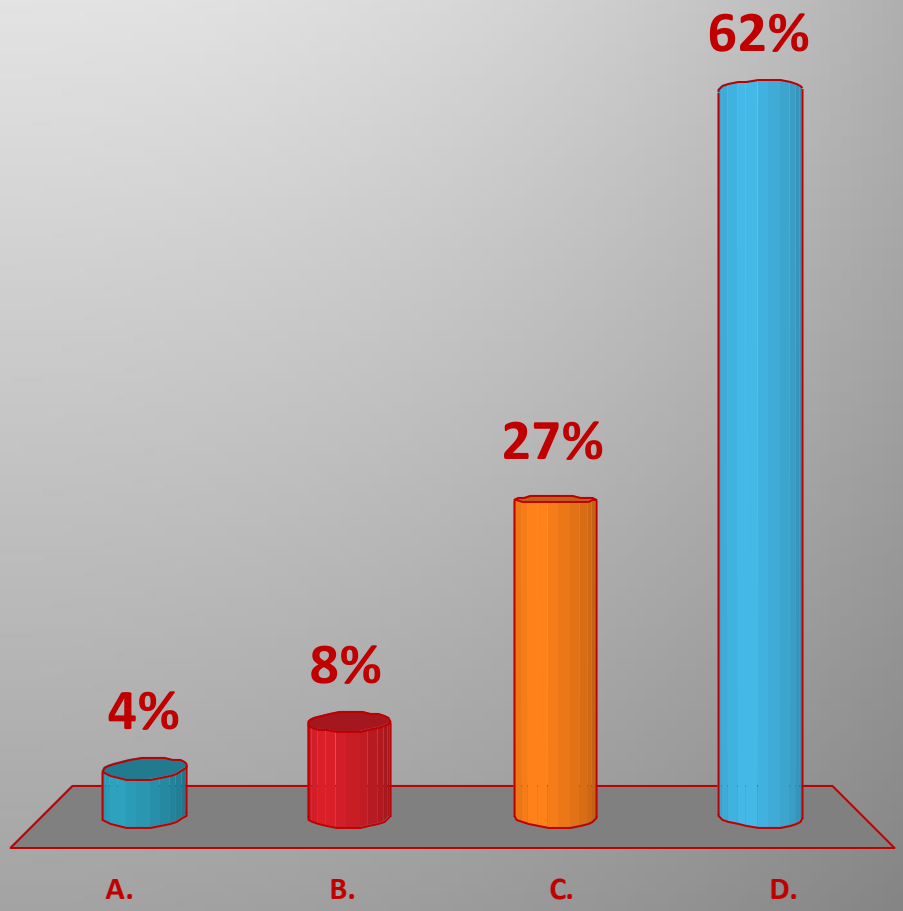
Pancreas Transplantation

It's hard work but it's worth it !

But it can be frustrating – even Peter Stock and some of his closest friends can be affected

Following my fellowship, I intend on concentrating on transplanting:

A. Kidneys
B. Kidneys and pancreata
C. Livers
D. All of the above



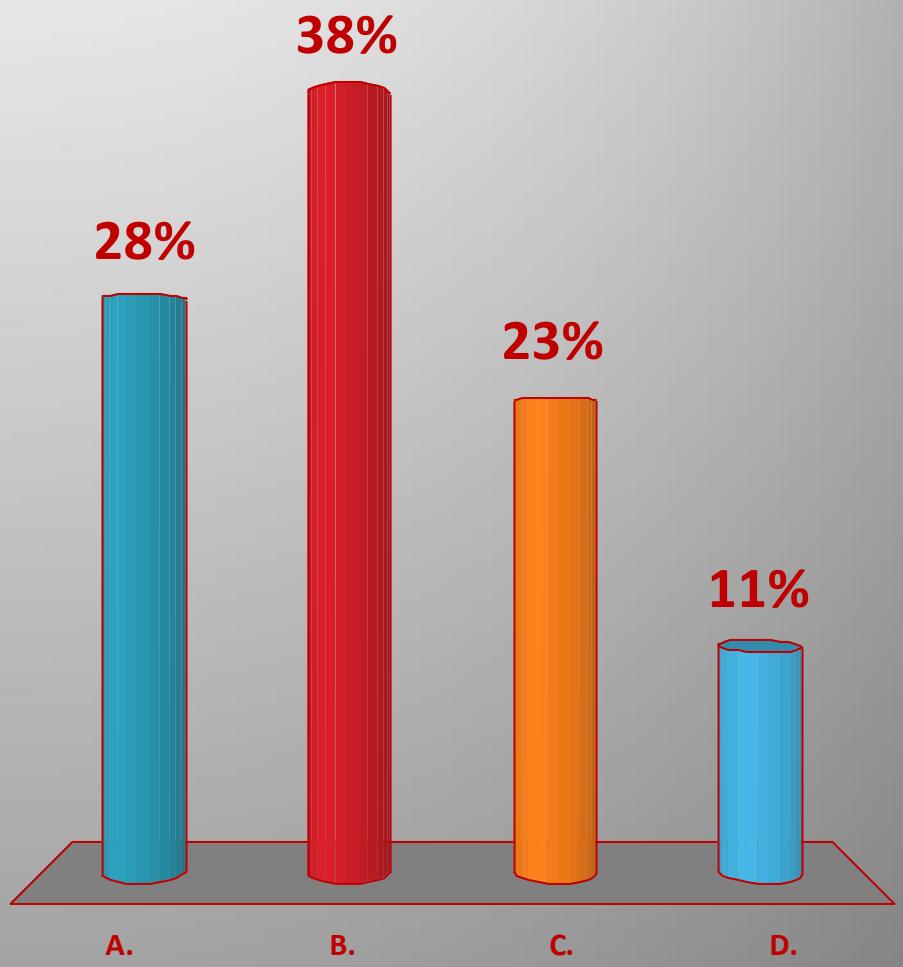
At my center, the incidence of re-exploration following K/P transplants is:

A. < 5%

B. 5-10%

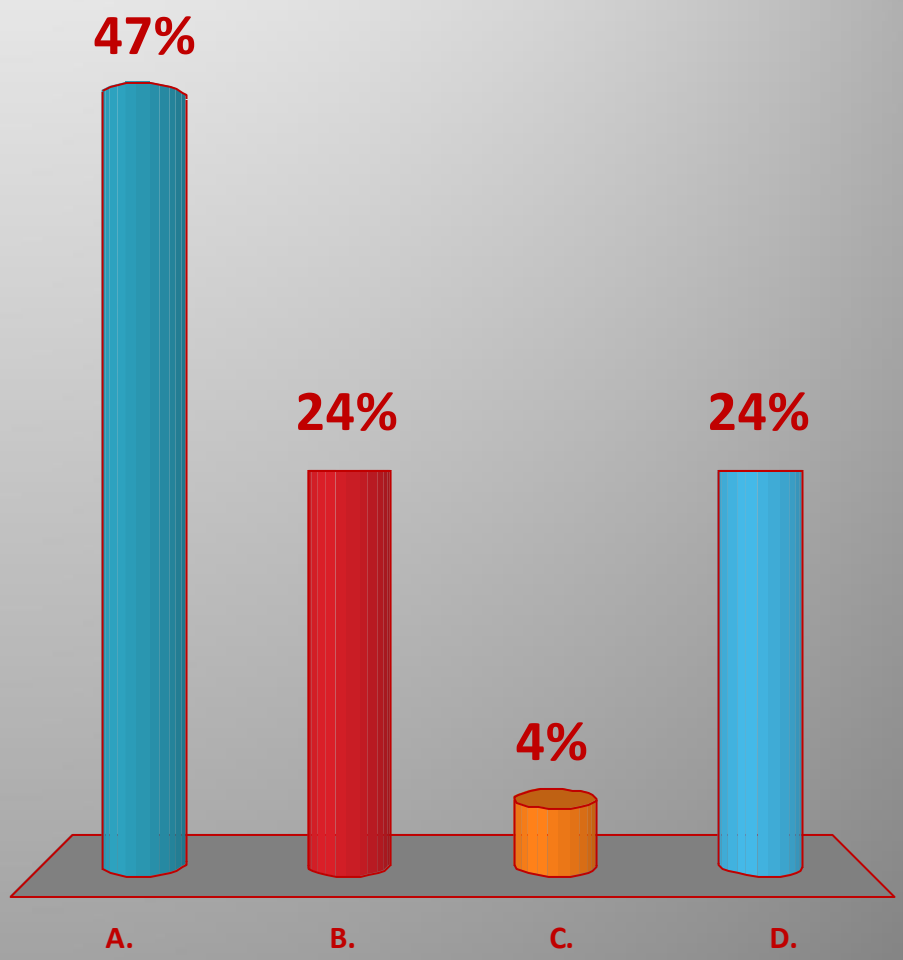
C. 11-20%

D. >20%



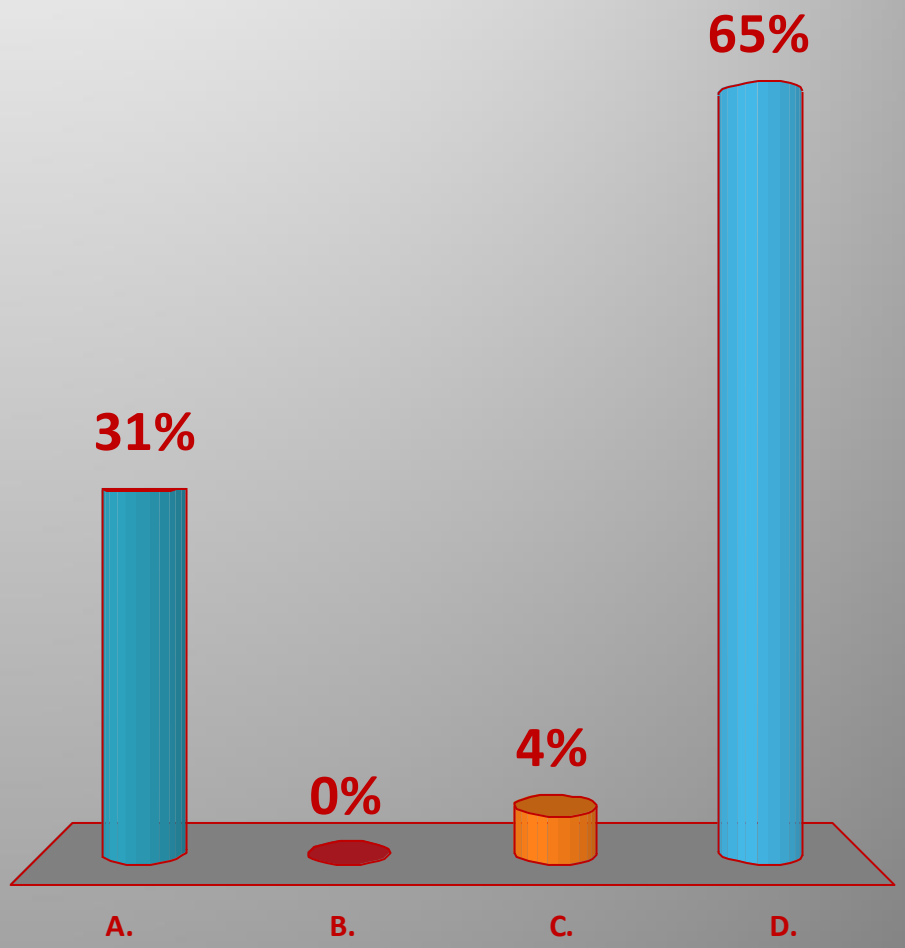
I think the reason K/P transplantation volumes are decreasing because:

A. Fewer optimal organ donors
B. Fewer optimal recipients
C. Allocation issues
D. Too many complications



Kidney / pancreas transplantation can be described as:

A. Life enhancing
B. Physiologic
C. Life saving
D. 1 & 3



Successful pancreas transplantation can actually reverse:

A. Pre-existing neuropathy
B. Retinopathy
C. Financial obligations in our health care system
D. Peter's obsessions with Panky Parties