Risk factors for mortality after pancreas-after-kidney transplant: importance of a functioning kidney

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Pancreas After Kidney Transplant

- Pancreas after kidney (PAK) transplant is a viable option for diabetic patients with ESRD who undergo living or deceased kidney transplant alone.
- However, long-term graft and patient loss after PAK is significant.
- 1-yr all-cause pancreas graft survival in PAK recipients is approximately 79%; at 3 years, it is 66%.
  - Contrast to SPK: 92% 1-year all-cause pancreas graft survival rate, 86% at 3 years

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Kidney Graft Survival Rates for PAK, SPK, LKD-KI

	1 year	3 year	5 year
PAK-KI AC graft survival	94.8%	86.3%	75.8%
LKD-KI AC graft survival	94.5%	87.8%	79.5%
SPK-KI AC graft survival	91.0%	83.0%	75.0%
PAK patient survival	96.0%	91.2%	84.9%
LKD-KI patient survival	98.2%	95.7%	92.5%
SPK patient survival	95.0%	92.0%	89.0%

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Cohort and Methodology

- Kidney graft and patient survival in Pancreas-After-Kidney (PAK) transplant recipients from 1/2000-12/2009 who also have a confirmed UNOS record of a kidney transplant (N=2349).
- Maximum follow-up time was 10 years.
- Those with a previous simultaneous kidney-pancreas (SPK) transplant are excluded (N=490).
- Data is from the Scientific Registry of Transplant Recipients (SRTR).
- Cox Proportional Hazards models were used to model survival from pancreas transplant. Time-dependent covariates of pancreas or kidney graft failure were included.

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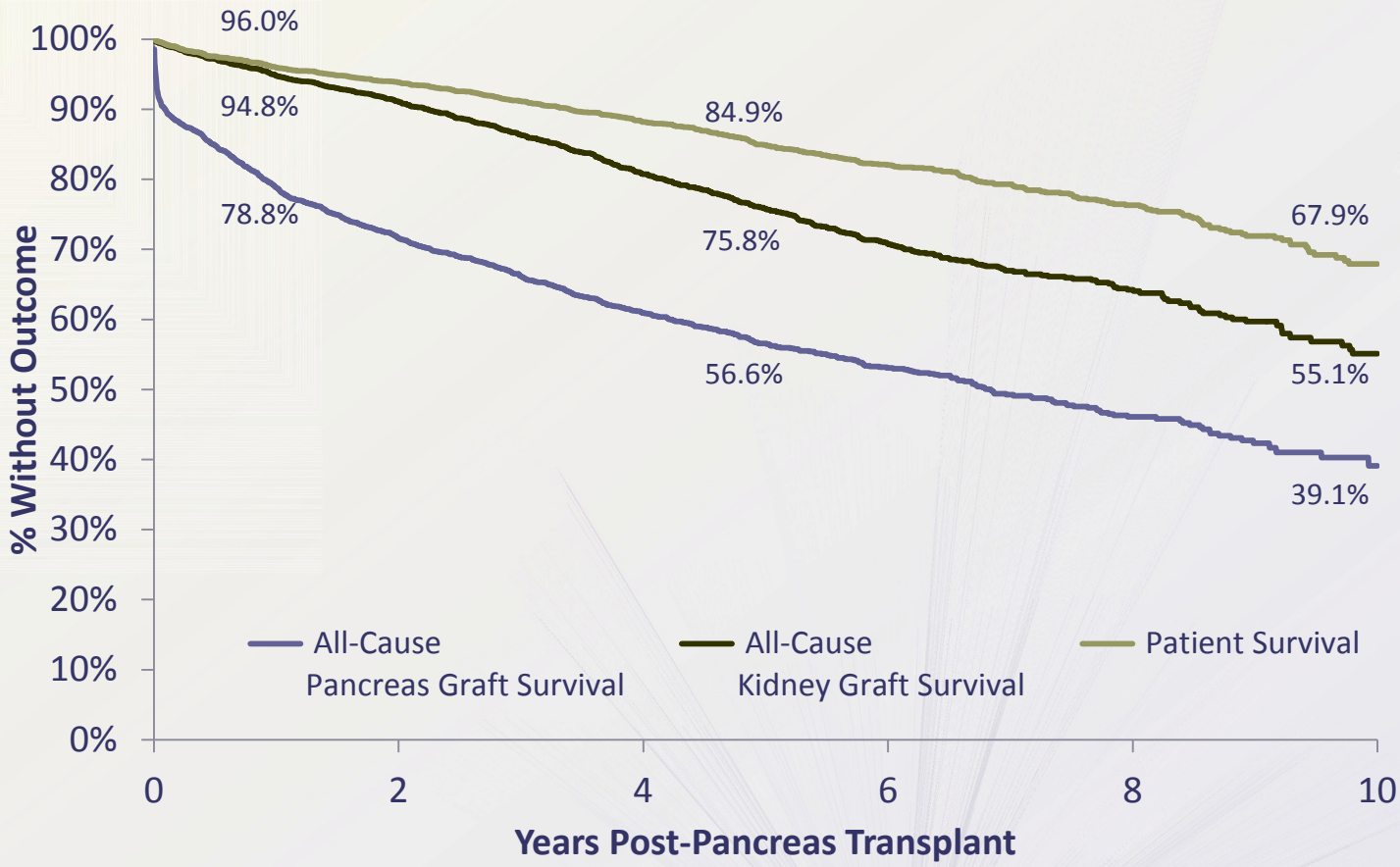
Kaplan-Meier All-Cause Survival Curves for PAK recipients, transplanted 2000-2009



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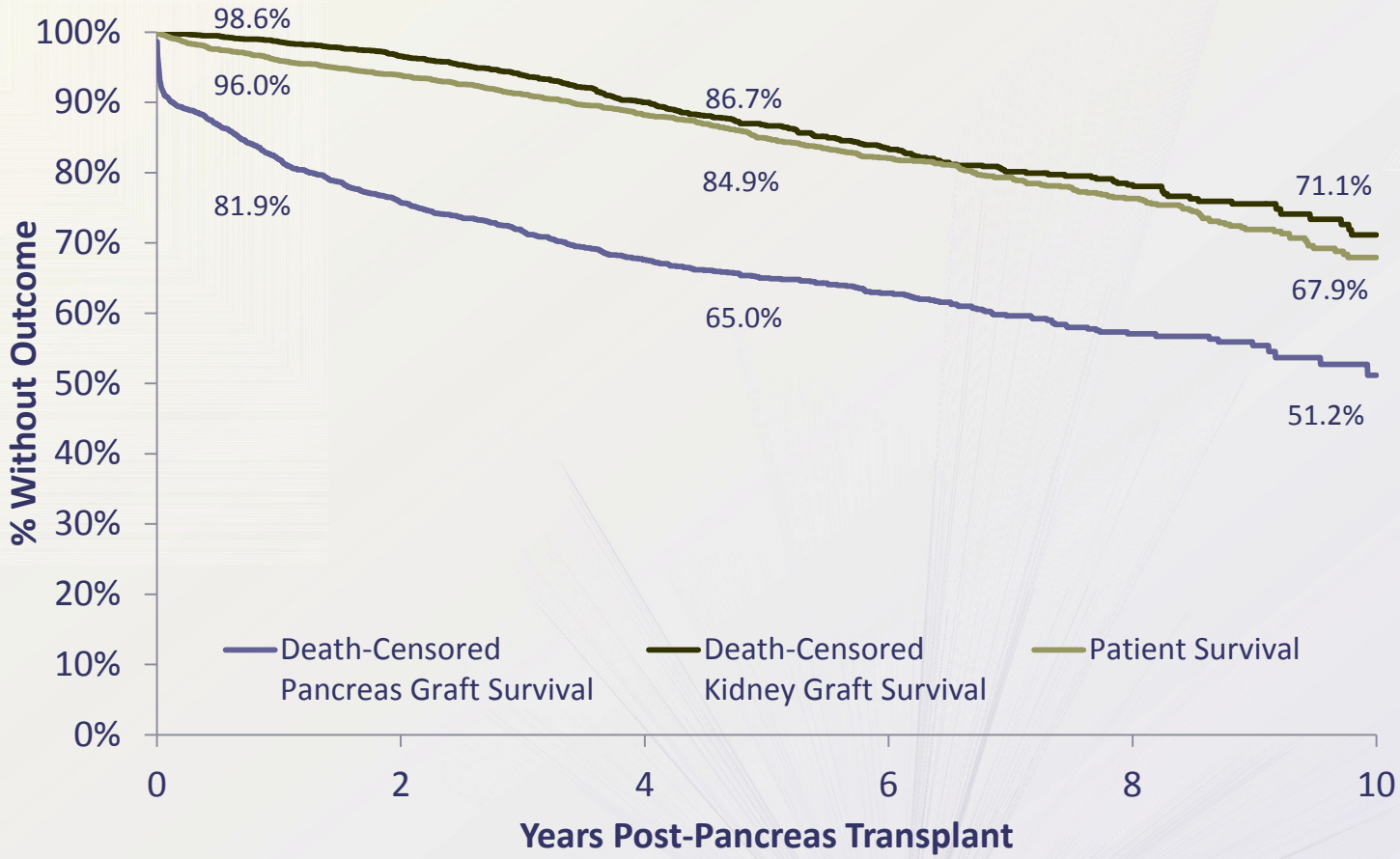
Kaplan-Meier Death-Censored Survival Curves for PAK recipients, transplanted 2000-2009:



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Patient Survival

- Of 2349 patients included, 442 (18.8%) died prior to censor date (September 30, 2010).
- Average length of follow-up for patients who died was 1337 days (43.9 months); average for patients who survived to censor date was 2163 days (71.1 months).
- Index of concordance: 72.9, 95% CI = (70.2, 75.6)
  - Describes ability of model to accurately rank observations

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Adjusted Predictors of Patient Survival

- **Graft failure**
  - Kidney failure: $p<0.0001$
  - Pancreas failure: $p<0.0001$
- **Body Mass Index (BMI)**
  - Recipient, at time of pancreas transplant: $p=0.005$
  - Pancreas donor: $p=0.009$
- **Estimated Glomerular Filtration Rate (eGFR)**
  - Recipient, at pancreas transplant: $p=0.03$
  - Recipient, post-kidney transplant: $p=0.007$
  - Pancreas donor: $p=0.04$
- **Age**
  - Recipient, at transplant: $p<0.0001$
  - Kidney donor: $p=0.11$ (marginal predictor)
- **Private insurance at pancreas transplant:** $p<0.0001$
- **Karnofsky performance status at kidney transplant:** $p=0.04$

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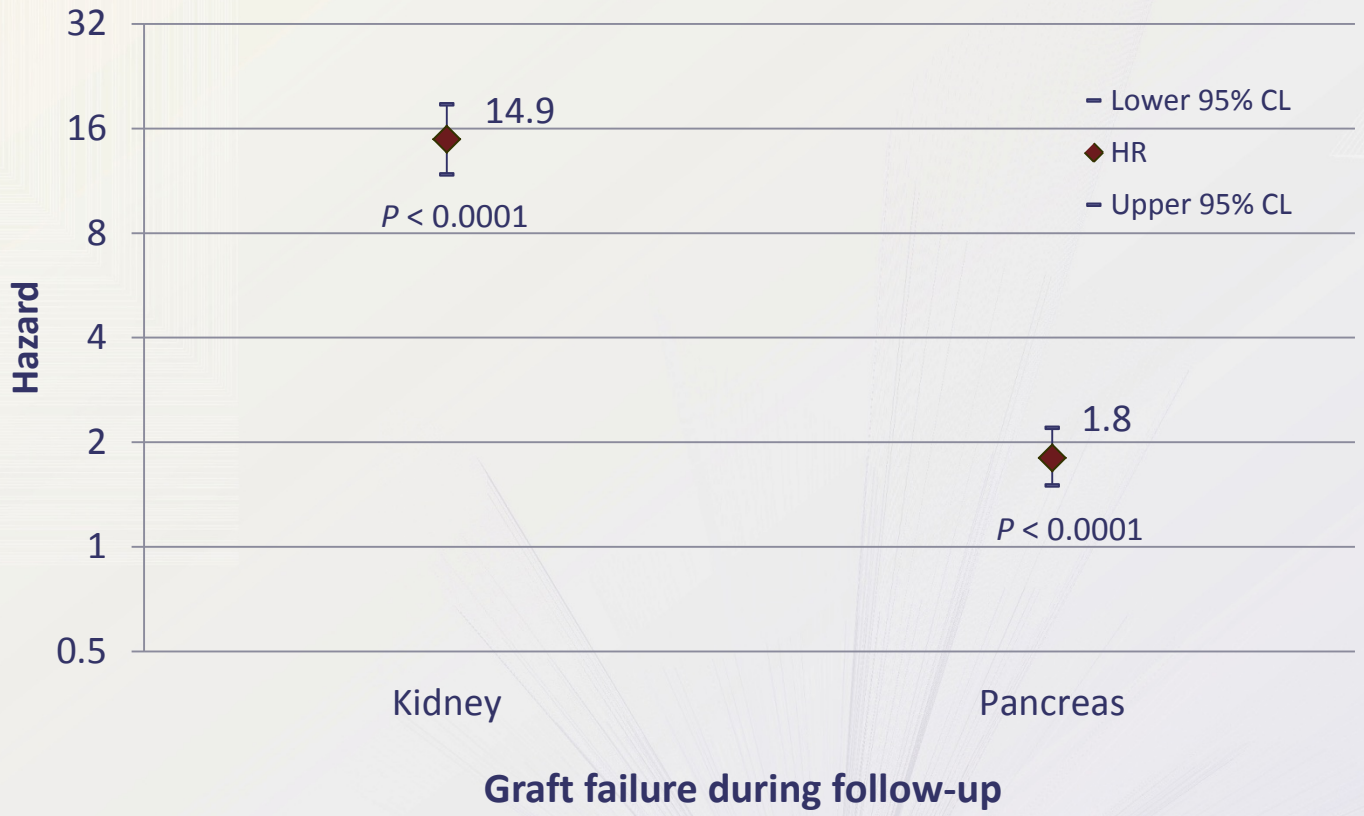
Adjusted Predictors of Patient Survival: Graft failure during follow-up



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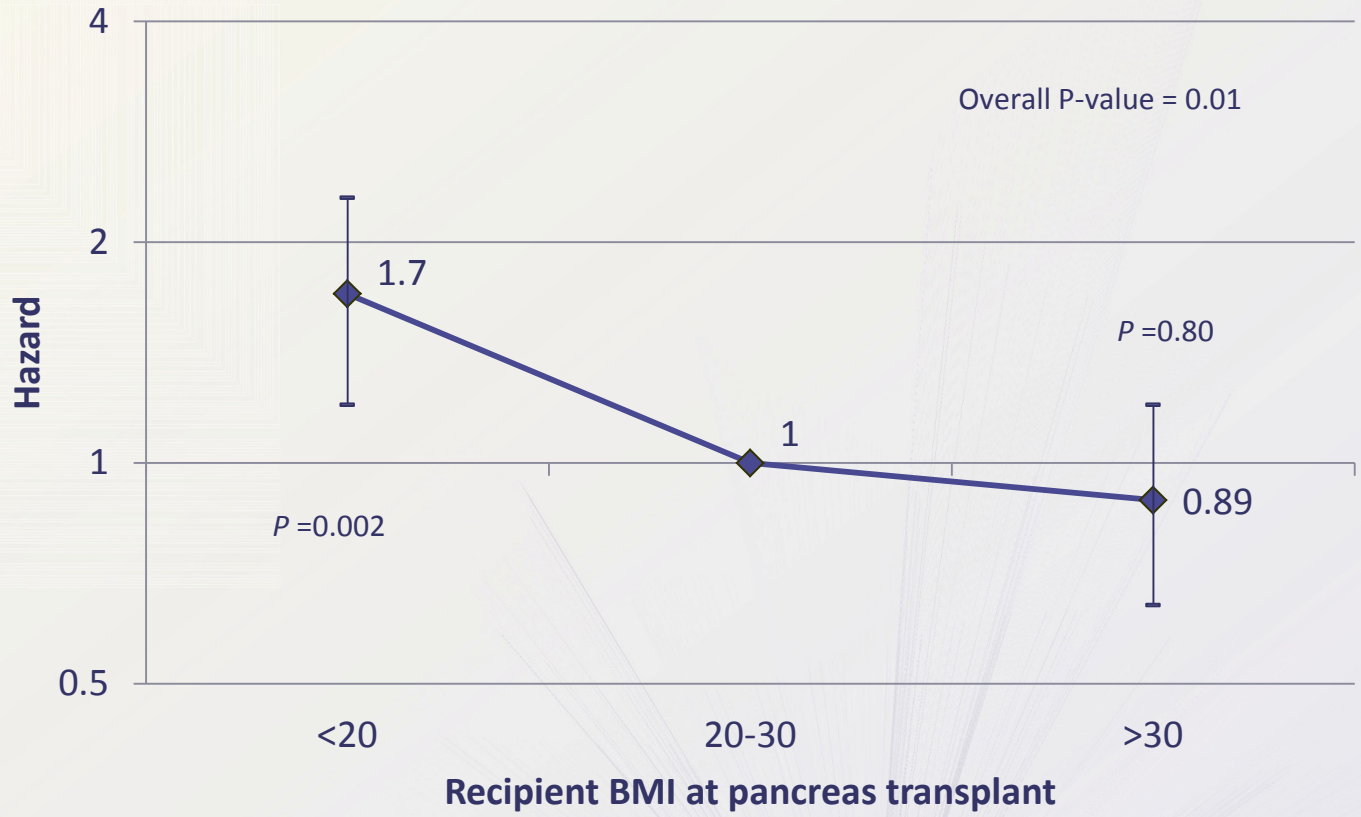
Adjusted Predictors of Patient Survival: Recipient BMI at transplant



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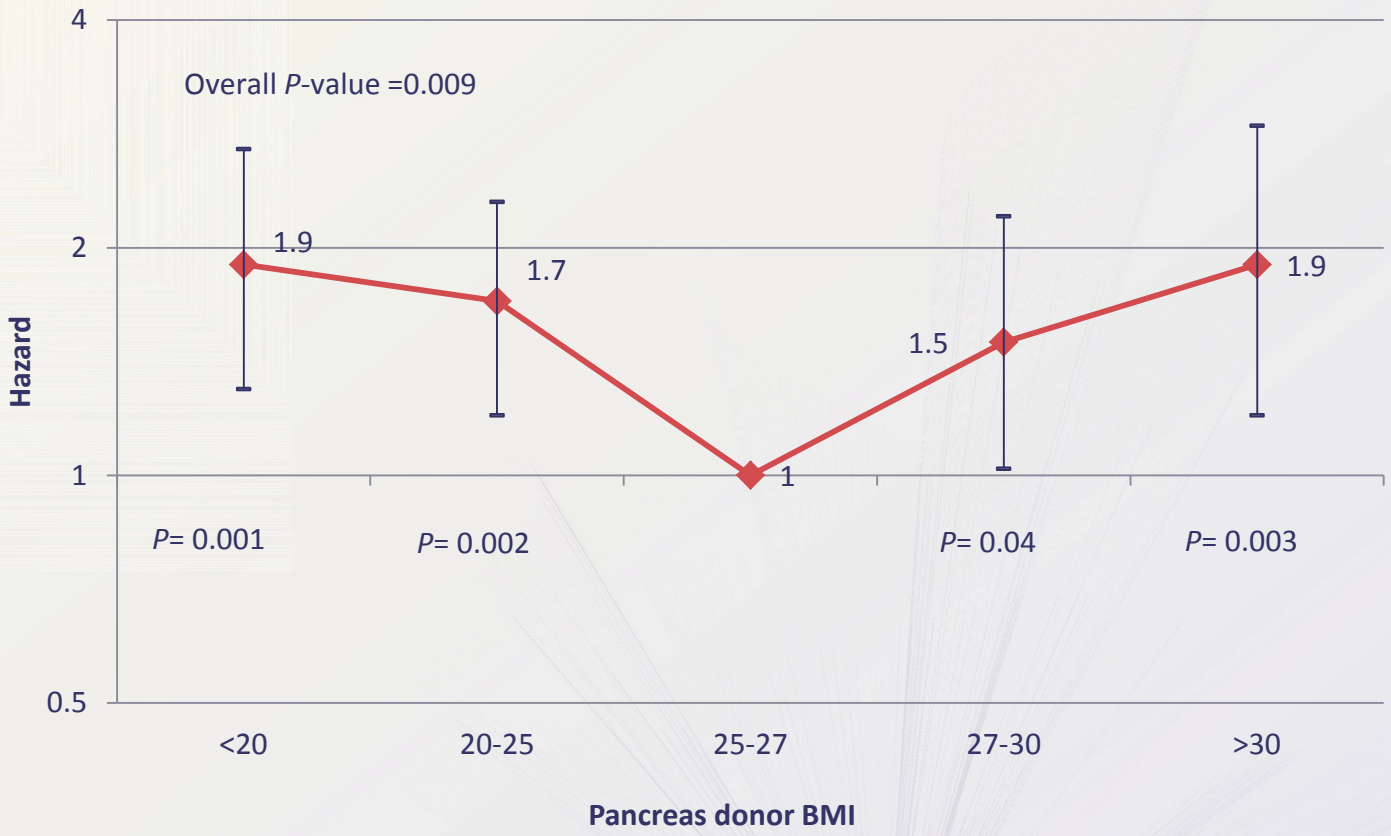
Adjusted Predictors of Patient Survival: Pancreas donor BMI



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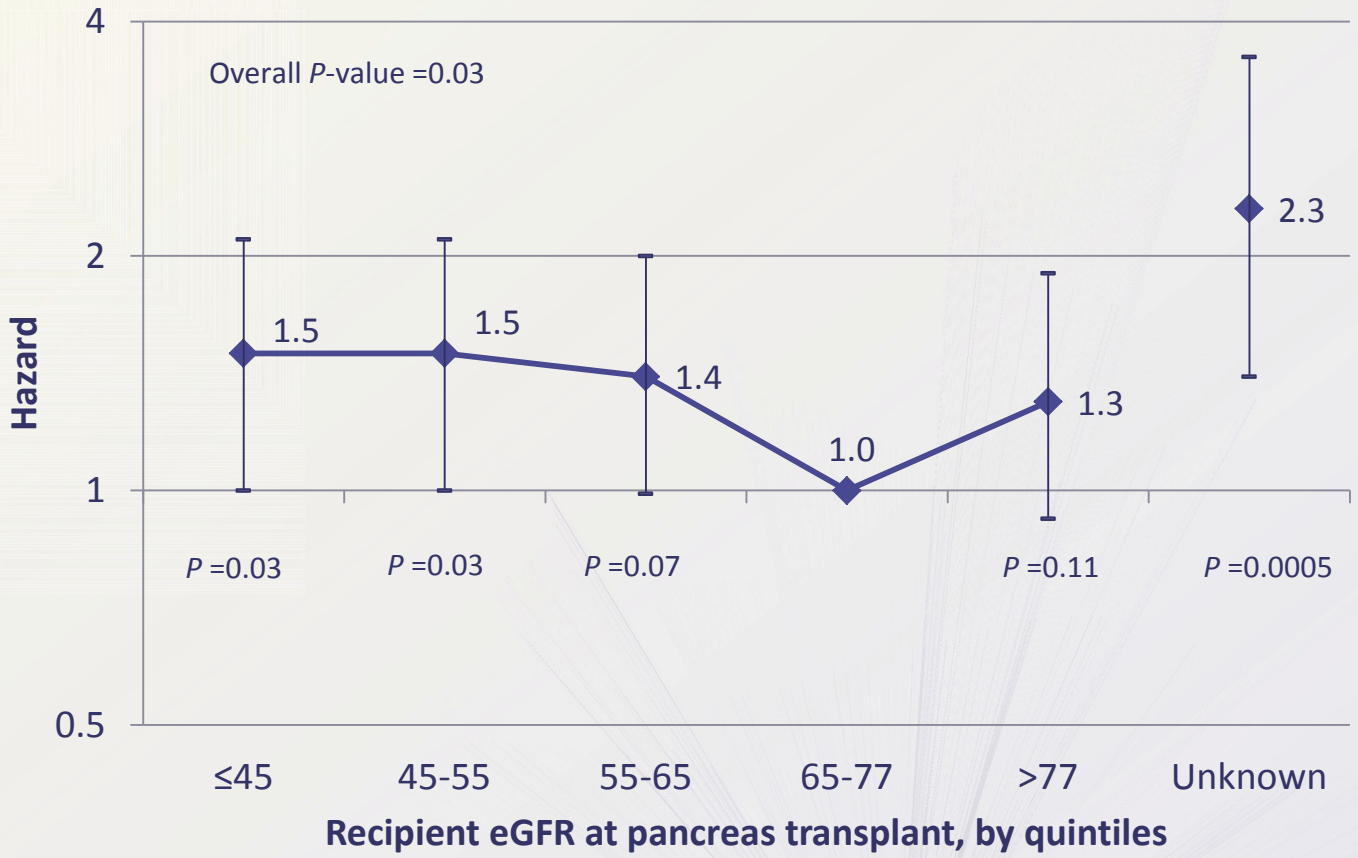
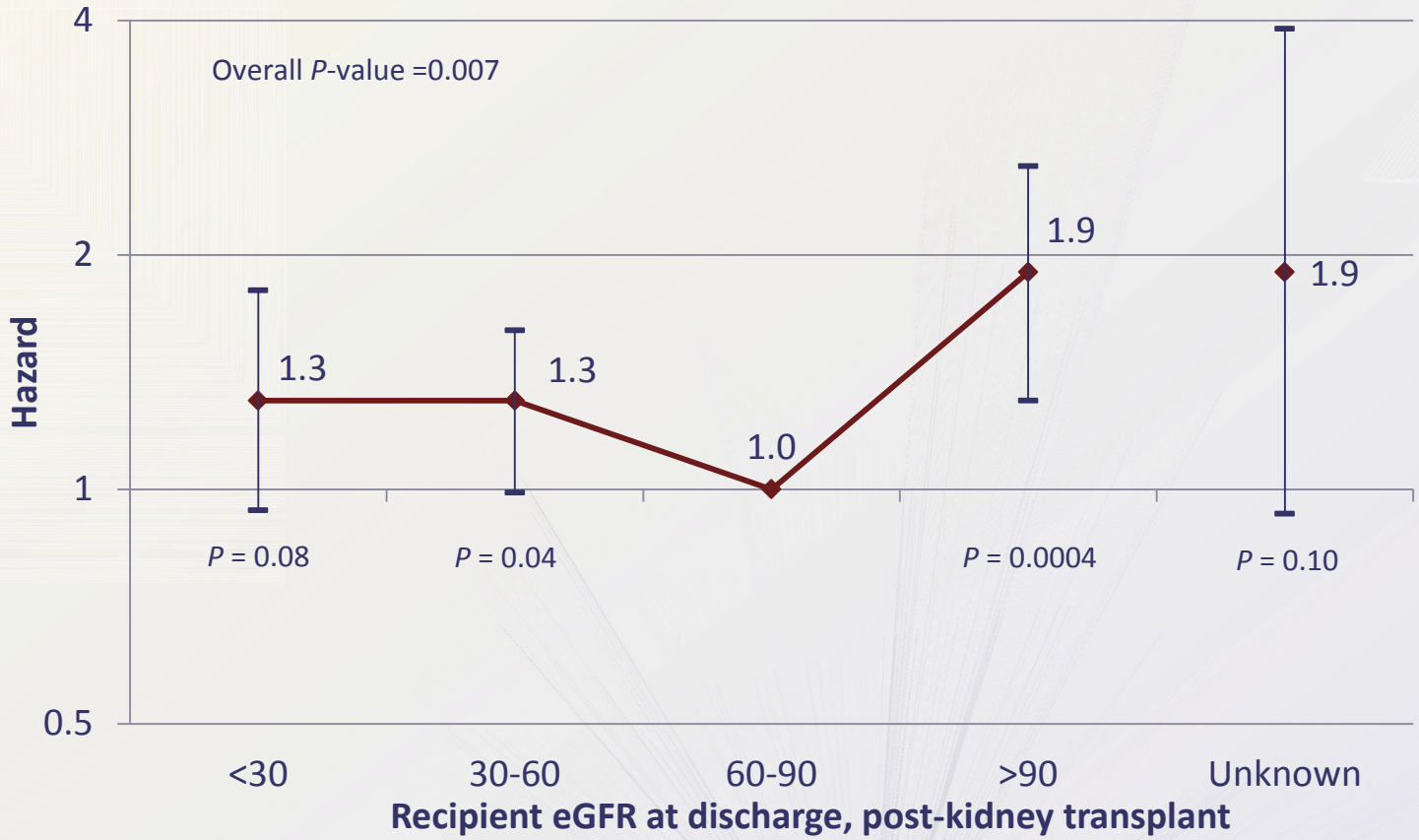
Adjusted Predictors of Patient Survival: Recipient eGFR at pancreas transplant



Adjusted Predictors of Patient Survival: Recipient eGFR at discharge, post-kidney transplant



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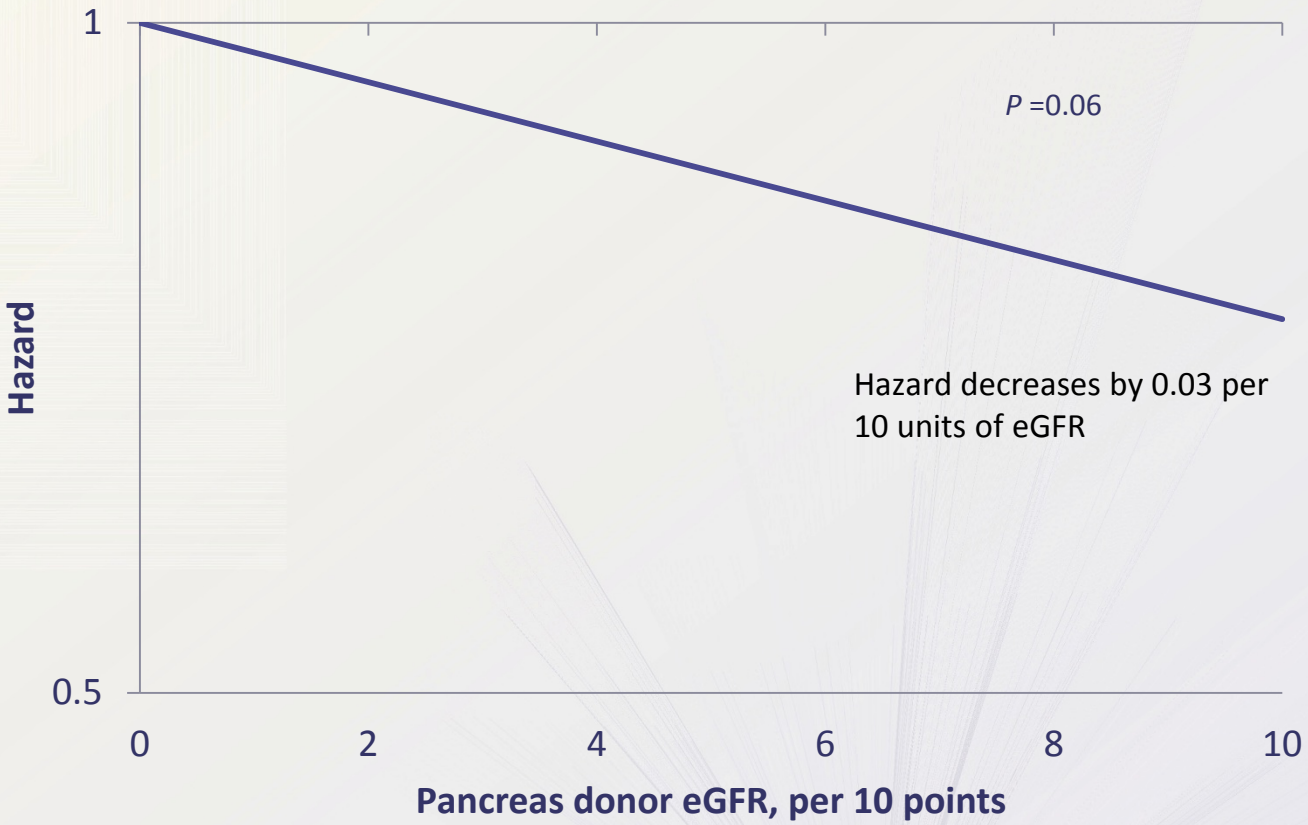
Adjusted Predictors of Patient Survival: Pancreas donor eGFR



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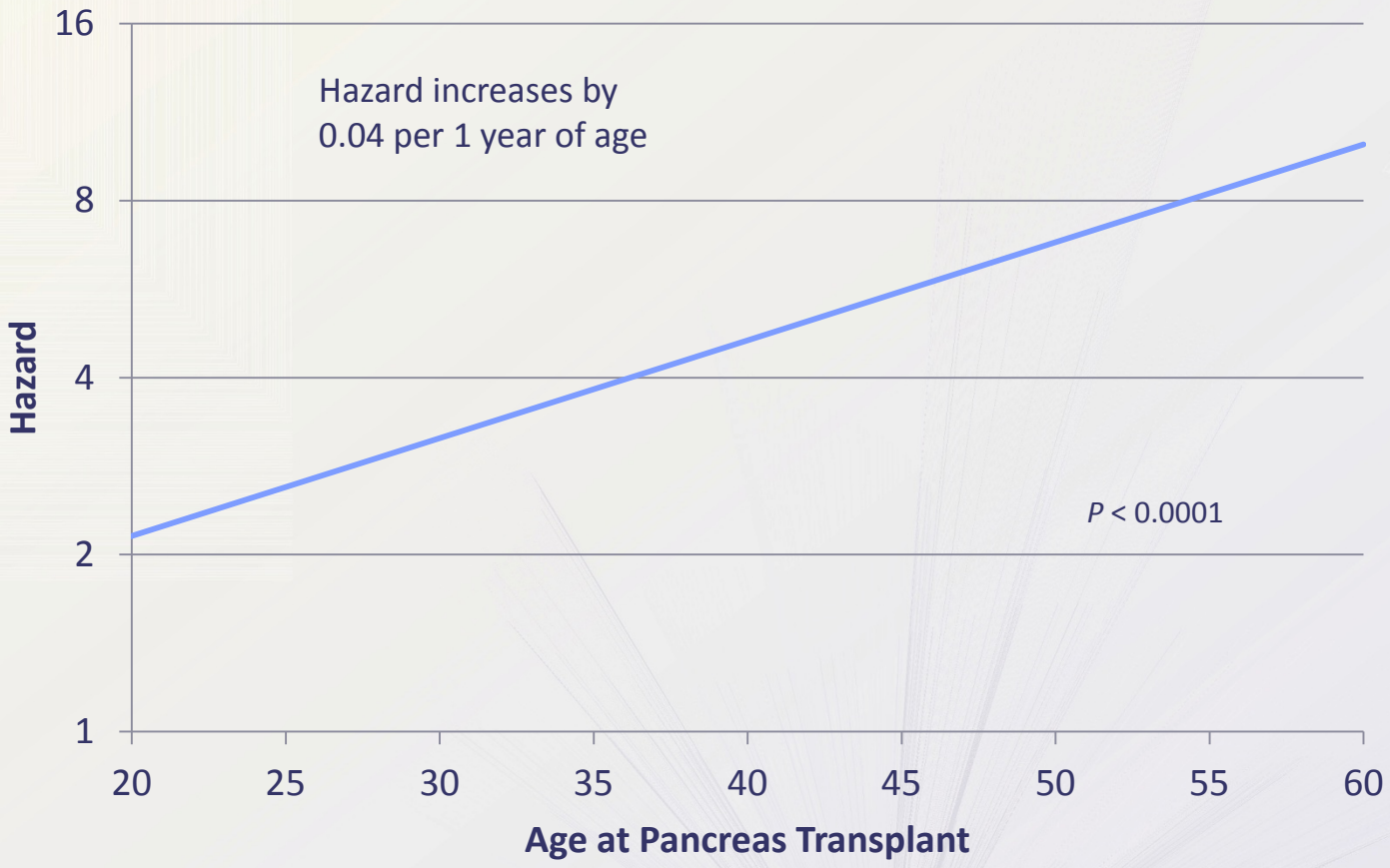
Adjusted Predictors of Patient Survival: Age at transplant



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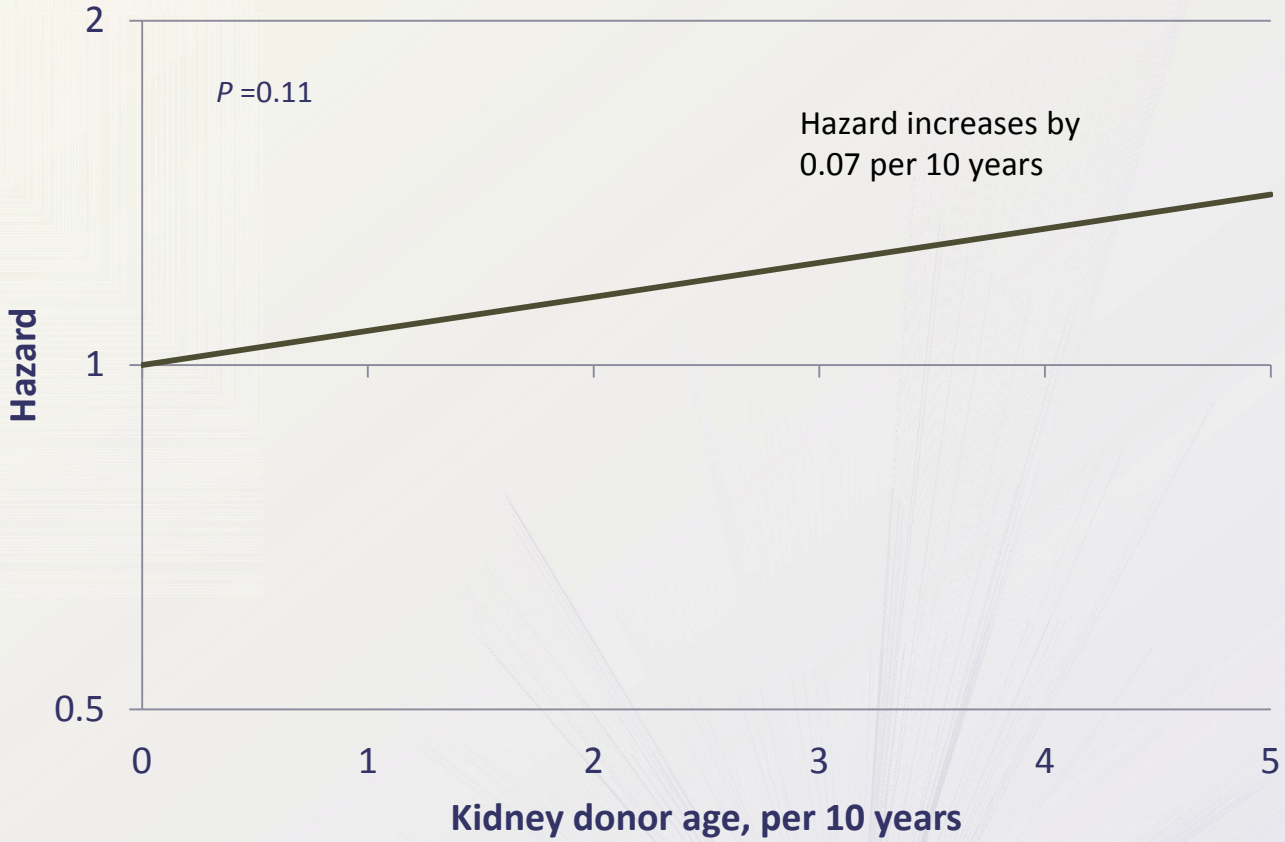
Adjusted Predictors of Patient Survival: Kidney donor age



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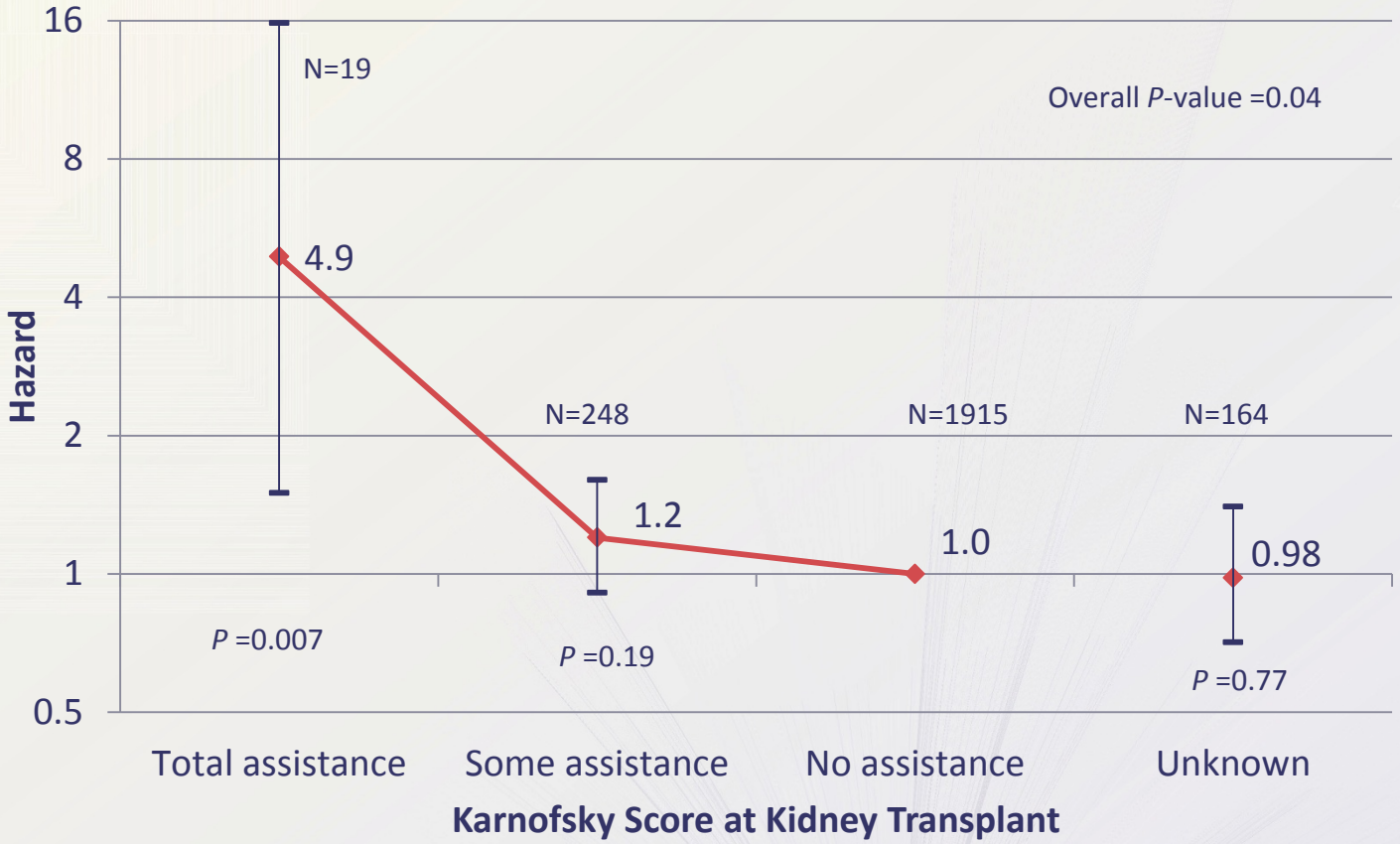
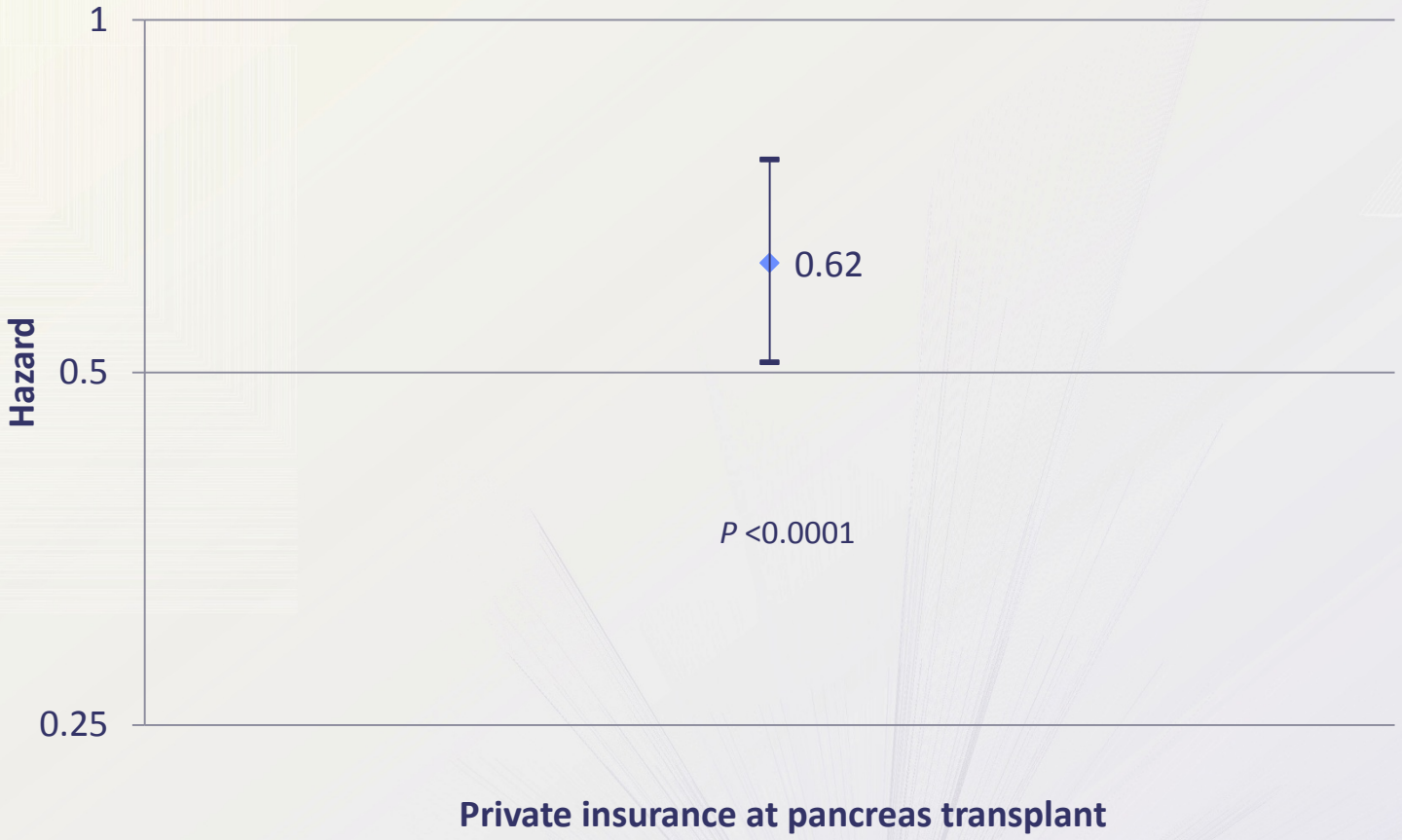
Adjusted Predictors of Patient Survival: Karnofsky Performance Status (KPS)



Adjusted Predictors of Patient Survival: Private insurance at pancreas transplant



All-Cause Kidney Graft Failure

- Pancreas graft failure (preceding kidney failure) is an independent predictor (*P*=0.0007, HR=1.3).
- Strongest predictors were BMI at transplant (*P*<0.0001); kidney donor age (*P*<0.0001*)*, eGFR at pancreas transplant (*P*<0.0001*)*, gain in BMI from kidney to pancreas transplant (*P*=0.001*)*; kidney donor eGFR (*P*=0.004).
- Pancreas donor eGFR was not an independent predictor, though it was marginally significant as a single predictor (unadjusted).

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Conclusions

- Characteristics of the pancreas donor and transplant are significantly predictive of patient survival.
- They are also associated, though less strongly, with kidney graft failure.
- Living donor kidney-alone outcomes are similar to PAK-KI outcomes, though patient survival in PAK-KI is worse.

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