



# **Impact of Donor-Recipient Body Surface Area Mismatch on Deceased Donor Kidney Transplant Outcomes**

Understanding the Role of Body Surface Area  
Ratio in Transplant Success

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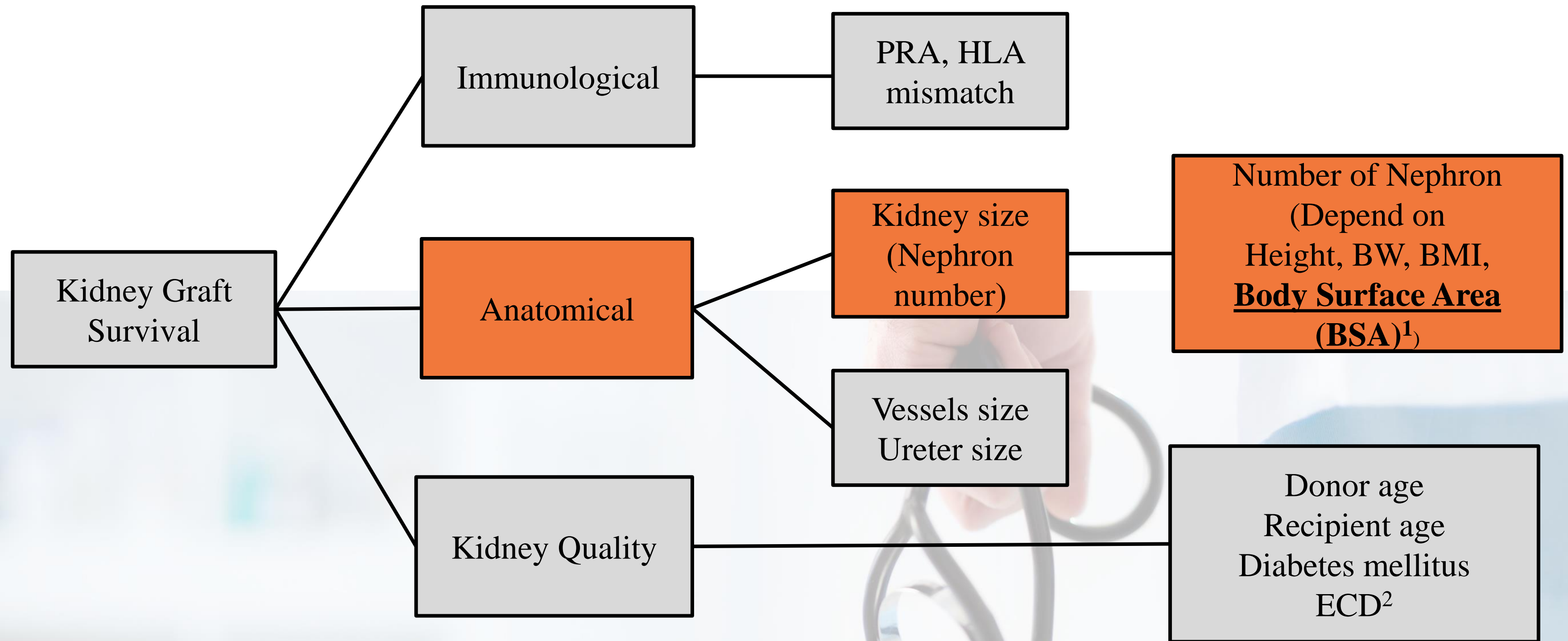
## Background and Definition

“Nephron underdosing theory” lead to graft failure

### Outcomes

Primary : Death-censored graft survival

Secondary : Change of eGFR of each group



1.Giral M, Nguyen JM, Karam G, et al. Impact of graft mass on the clinical outcome of kidney transplants, J Am Soc Nephrol, 2005, vol. 16 (pg. 261-268)

2.Expanded criteria donor (ECD) : Donor age  $\geq 60$ , or Donor age  $\geq 50$  with  $\geq 2/3$ : HT, Death from stroke, Cr  $\geq 1.5$

**Patients undergoing Deceased donor kidney transplant (DDKT)  
at Ramathibodi Hospital  
between 1<sup>st</sup> January 2010 – 31<sup>th</sup> December 2022  
(n = 1,124)**

Mosteller formula:  $BSA (m^2) = \sqrt{\frac{\text{height (cm)} \times \text{weight (kg)}}{3600}}$

**Exclusion (n = 30)**

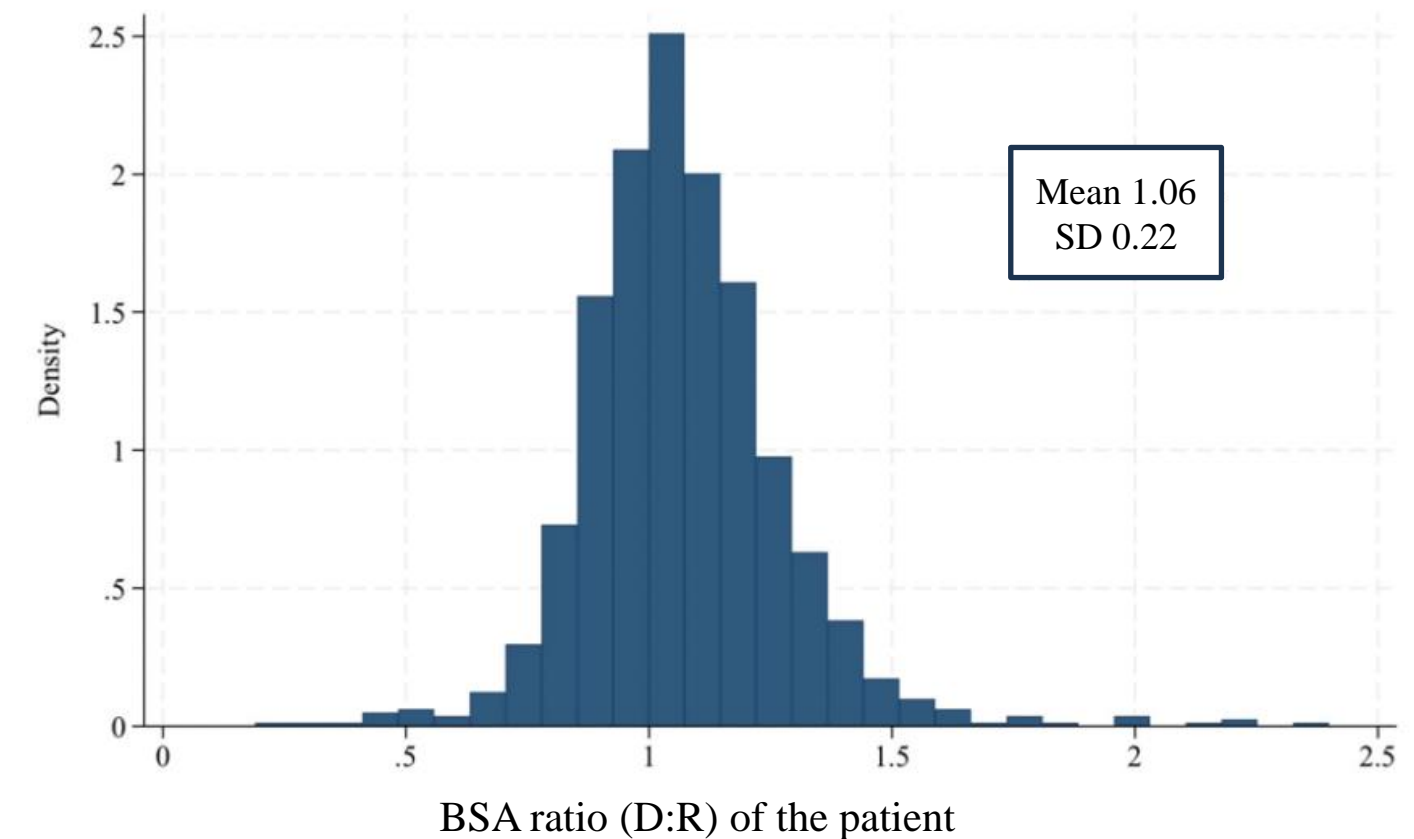
- Age < 8, > 70 (n = 6)
- Combine kidney and liver transplant (n = 4)
- Died within 7 days after transplant (n = 4)
- Missing or incomplete data (n = 16)

**Patients undergoing DDKT  
at Ramathibodi hospital included  
in the analysis (n = 1,094)**

**Relatively small Donor  
BSA D:R < 0.90  
(n = 185, 16.91 %)**

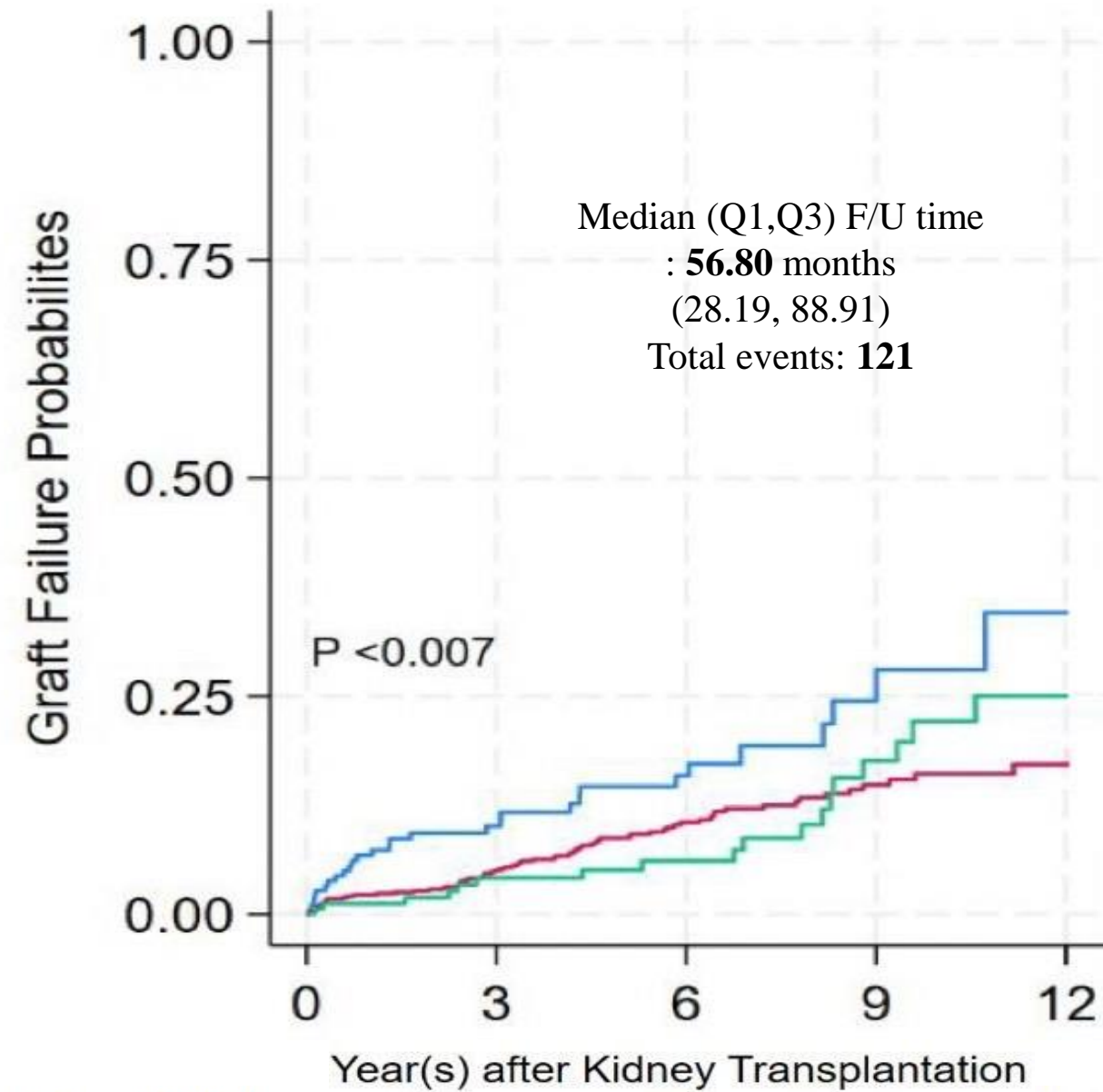
**Matched BSA  
BSA D:R 0.90 – 1.25  
(n = 743, 67.91 %)**

**Relatively large Donor  
BSA D:R > 1.25  
(n = 166, 15.17 %)**



# Results

Kaplan-Meier curves for probabilities of death-censored graft failure



Number at risk					
	0	3	6	9	12
Small-donor group	185	114	64	21	8
Matched-donor group	743	547	312	150	59
Large-donor group	166	122	84	40	11



Variables	Univariate			
	HR	95% CI	P-value	
<b>Graft failure</b>				
<b>BSA group (Match-donor: reference group)</b>	Match-donor	1.94	1.27-2.99	0.002
	Large-donor	1.01	0.60-1.69	0.97
<b>Donor age (year)</b>	1.02	1.01 – 1.04	< 0.01	
<b>Recipient age (year)</b>	0.98	0.96 – 0.99	< 0.01	
<b>Female donor to Male Recipient</b>	1.12	0.65 – 1.92	0.69	
<b>Diabetes Mellitus</b>	1.16	0.71 – 1.90	0.54	
<b>PRA &lt; 50%</b>	0.71	0.44 – 1.13	0.15	
<b>ECD donor</b>	2.16	1.49 – 3.14	< 0.01	
<b>AKI donor</b>	0.64	0.31 – 1.34	0.23	
<b>HLA mismatch</b>	1.17	1.01 – 1.36	0.04	



# Conclusion

**BSA D:R ratio** can be a helpful tool for considering kidney size mismatch in transplantation

**Graft Failure:** a correlation between **smaller donor kidneys** (BSA D:R < 0.90) and **higher graft failure rates**, compared to kidneys from size-matched (BSA D:R 0.90 – 1.25) or larger donors (BSA D:R > 1.25)