

# Impact of Intravascular Ultrasound-guided Drug-eluting Stent Implantation on Patients with Chronic Kidney Disease: Results from ULTIMATE trial

*Jun-Jie Zhang, MD, PhD, FSCAI*

*Nanjing First Hospital, Nanjing Medical University*

*On behalf of ULTIMATE Trial Investigators*



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

# Background

- ULTIMATE trial has reported the clinical advantages of IVUS guidance for all-comer patients undergoing DES implantation.
- It still remains controversial that routine IVUS guidance could be beneficial to patients with CKD.

# Methods

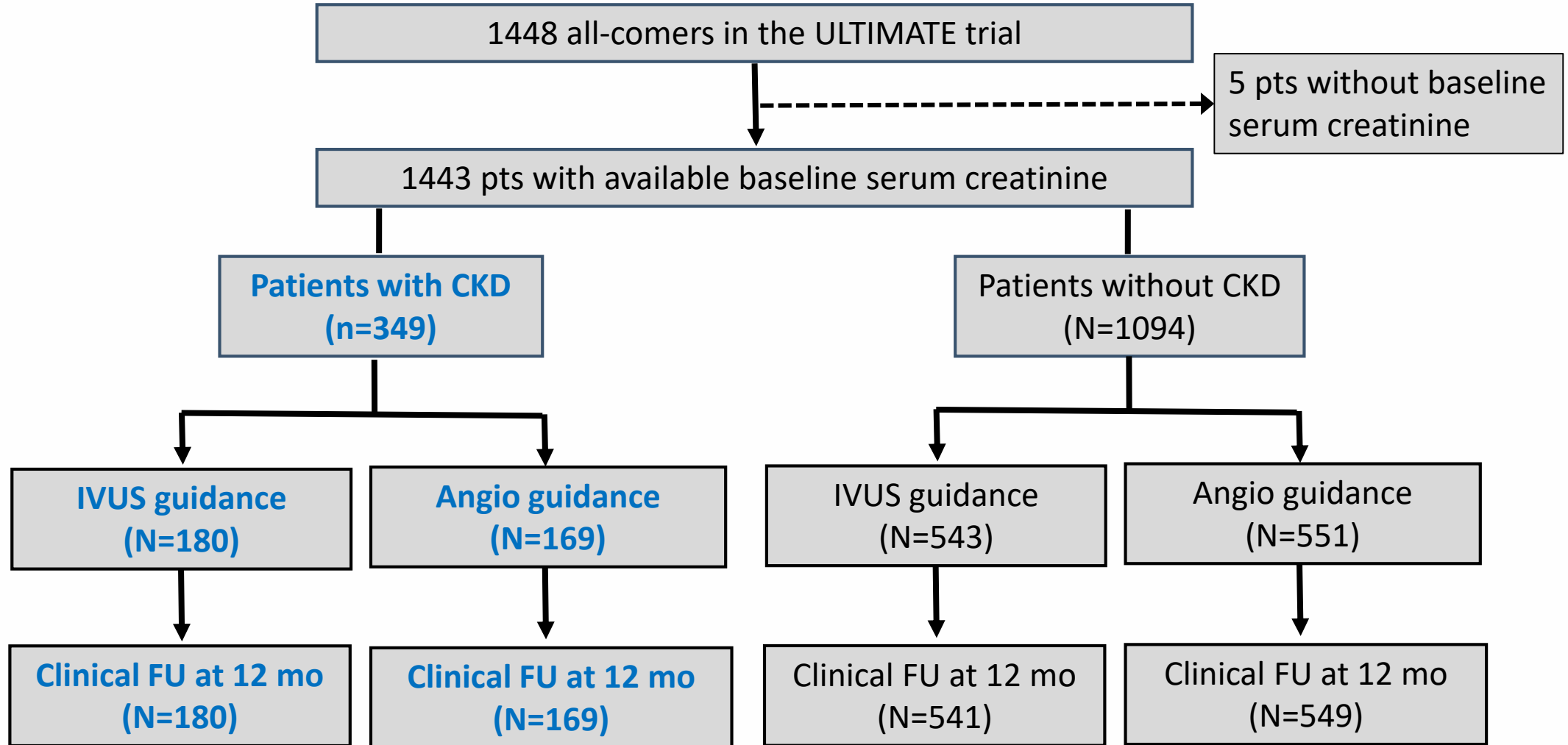
- The present study was a prespecified CKD subgroup analysis of the ULTIMATE trial.
- CKD was defined as an eGFR  $< 60$  mL/min/1.73 according to the CG formula.
- CKD-EPI and MDRD equations were also used to explore a sensitivity analysis.



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

# Enrollment



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

# Clinical Outcomes

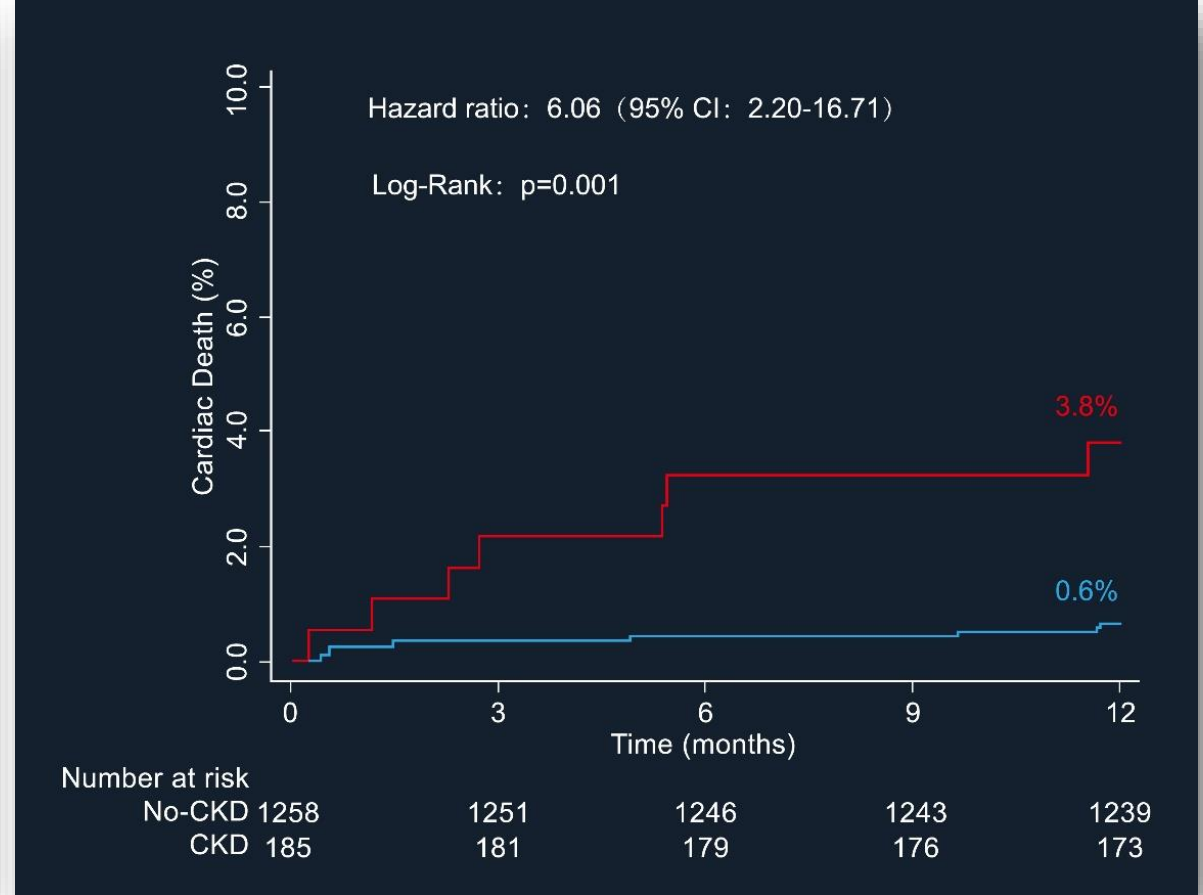
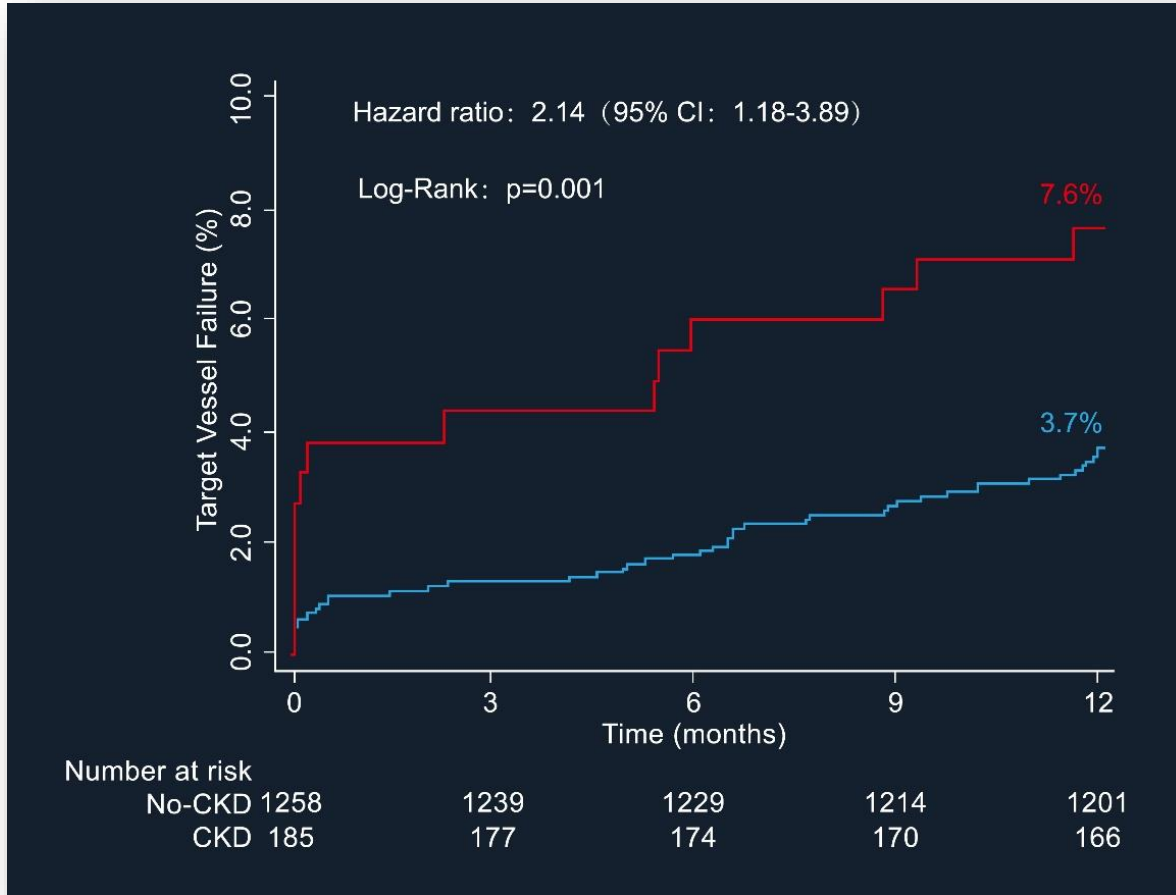
	CKD (n=349)	No CKD (n=1094)	<i>P</i>
<b>Primary endpoint at 30-day</b>			
TVF, %	2.6	1.0	0.03
<b>Primary endpoint at 12-month</b>			
TVF, %	7.2	3.2	0.001
Cardiac death, %	2.9	0.5	<0.001
TV-MI, %	2.0	1.0	0.14
TVR, %	2.9	2.0	0.32
<b>Safety endpoint at 12-month</b>			
Definite/probable ST, %	0.6	0.4	0.60



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

# Patients with CKD Lead to Higher Risk of TVF or Cardiac Death



**SCAI**

Society for Cardiovascular  
Angiography & Interventions



# Impact of IVUS guidance on Patients with CKD

	CKD (n=349)			No CKD (n=1094)		
	IVUS-guided (n=180)	Angio-guided (n=169)	<i>P</i>	IVUS-guided (n=543)	Angio-guided (n=551)	<i>P</i>
<b>Primary endpoint at 30-day</b>						
TVF, %	0.6	4.7	0.01	0.9	1.1	0.78
<b>Primary endpoint at 12-month</b>						
TVF, %	3.9	10.7	0.01	2.6	3.8	0.25
Cardiac death, %	2.2	3.6	0.91	0.2	0.7	0.51
TV-MI, %	0.6	3.6	0.05	1.1	0.9	0.75
TVR, %	1.1	4.7	0.04	1.7	2.4	0.40
<b>Safety endpoint at 12-month</b>						
Definite/probable ST, %	0	1.2	0.14	0.2	0.5	0.32

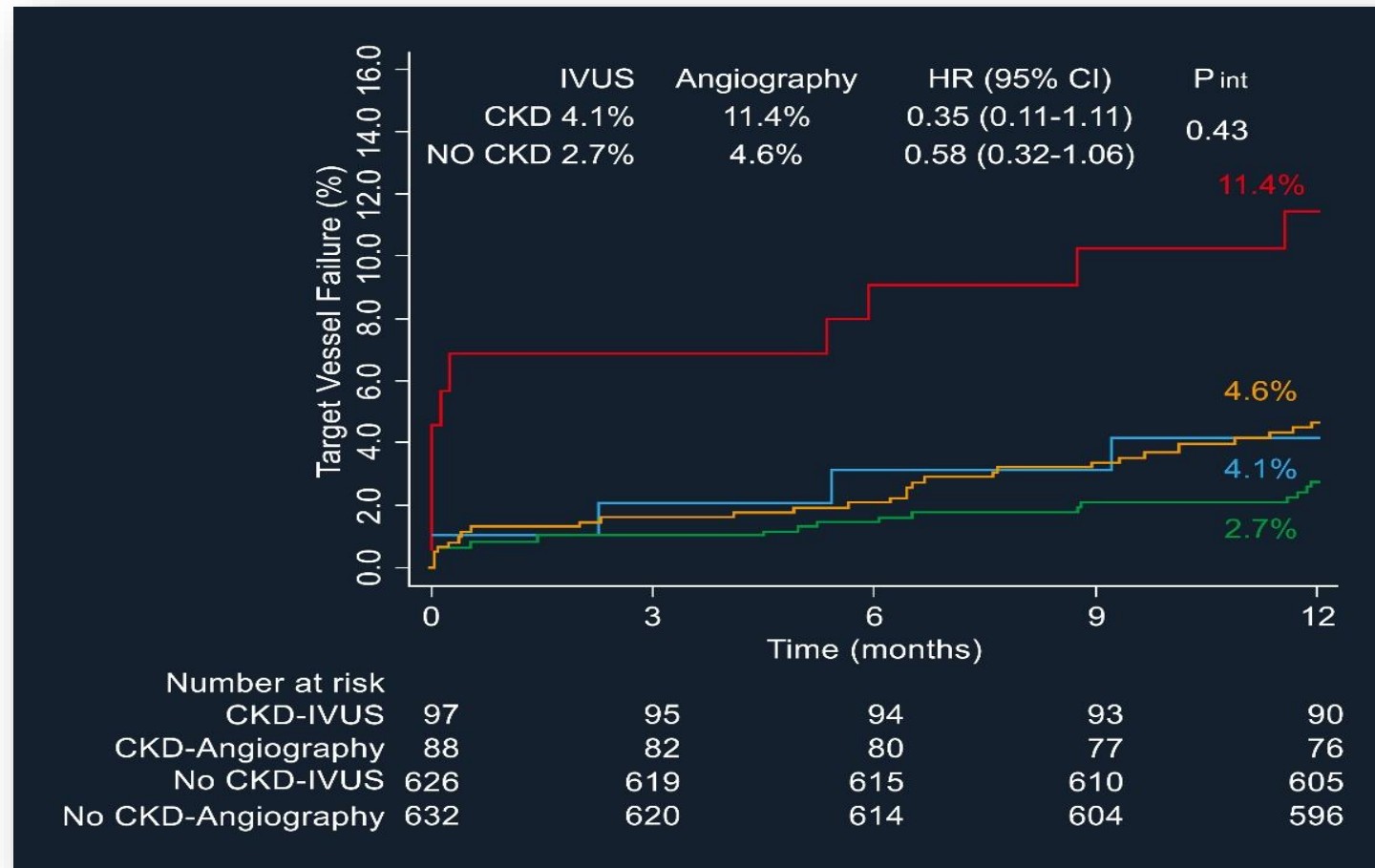
\* All *P* for interaction > 0.05



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

# IVUS-guidance Reduced TVF in CKD



**SCAI**

Society for Cardiovascular  
Angiography & Interventions

— CKD-IVUS      — CKD-Angiography  
— No CKD-IVUS      — No CKD-Angiography

# Independent Predictors of 12-month TVF

	Adjusted HR (95% CI)	<i>p</i>
Age > 75 years	1.83 (1.07-3.14)	0.03
<b>CKD</b>	<b>2.66 (1.19-5.95)</b>	<b>0.02</b>
Stent length (per 10 mm)	1.11 (1.01-1.23)	0.03
IVUS guidance	0.48 (0.28-0.82)	0.01



**SCAI**

Society for Cardiovascular  
Angiography & Interventions



# Limitation

- It was not a randomized trial, and potential biases may have existed.
- The regimen of hydration with the use of isotonic saline for CKD patients was at the physician's discretion in the ULTIMATE trial.
- The secondary endpoint of the ULTIMATE trial did not include the incidence of bleeding.

# Conclusion

- The present prespecified subgroup analysis from the ULTIMATE trial demonstrated that CKD patients undergoing DES implantation were associated with a higher risk of TVF during 12 months of follow-up.
- More importantly, the risk of TVF in CKD patients could be significantly decreased through IVUS guidance, compared to angiography guidance.



**SCAI**

Society for Cardiovascular  
Angiography & Interventions