

# Renal Function after Kidney or Liver Transplant in HIV Infected Patients using Tenofovir

E Blumberg, D Stablein, L Frassetto,  
K Olthoff, B Barin, P Stock, and M  
Roland

On behalf of the investigators of Solid Organ  
Transplantation in HIV Multi-Site Study

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# Background

- TDF is a reverse transcriptase inhibitor active against HIV and hepatitis B
- Potential nephrotoxin
  - Fanconi Syndrome
  - Other mechanisms?
- Additional risk factors for nephrotoxicity
  - Concomitant nephrotoxic medications
  - Pre-existing renal disease, HTN, DM
- *HIV infected transplant recipients using TDF are potentially at high risk of renal dysfunction*

# Study Aims

- To describe TDF use among HIV-infected kidney and liver transplant recipients
- To compare renal function in HIV infected kidney or liver transplant recipients who do and do not use tenofovir
  - By organ
  - By calcineurin inhibitor
  - By time of initiation of tenofovir

# Study Design

- Subjects: Multi-center observational cohort study of HIV-infected kidney or liver transplant recipients
- Interventions: Antiretroviral and immunosuppressant regimens individualized
- Measurements: Pre- and post-transplant serum creatinine and urinary protein, blood, glucose
  - Basic demographics
  - Rejection

# Analysis

- Prevalence and timing of TDF use
  - Early use = within 14 days post-transplant
- Comparison of creatinine
  1. TDF initiated within 14 days post-transplant
  2. TDF initiated after 14 days post-transplant
  3. Other Antiretrovirals

“TDF group” limited to time on TDF and “Other ARV group” limited to time not on TDF
- By organ
- By calcineurin inhibitor

# Demographics

	No TDF (n=56)	Early TDF (n=42)	Late TDF (n=14)
Male	47 (84%)	37 (88%)	13 (93%)
Caucasian	22 (39%)	27 (64%)	13 (93%)
Age - median (range)	43 (9-71)	49 (30-71)	46 (33-60)

## Hepatitis B status

14 liver/1 kidney recipient Hep BsAg+

12 liver/4 kidney Hep B core Ab +

# Organ and Follow-Up

	No TDF (n=56)	Early TDF (n=42)	Late TDF (n=14)
<u>Organ</u>			
Kidney	41	11	5
Liver	13	29	9
Combined	2	2	0
<u>Mean # days TDF (<math>\pm</math> SE)</u>			
Kidney	NA	244 $\pm$ 75	449 $\pm$ 94
Liver		333 $\pm$ 52	415 $\pm$ 109
Mean f/u (months)	14	10	19*

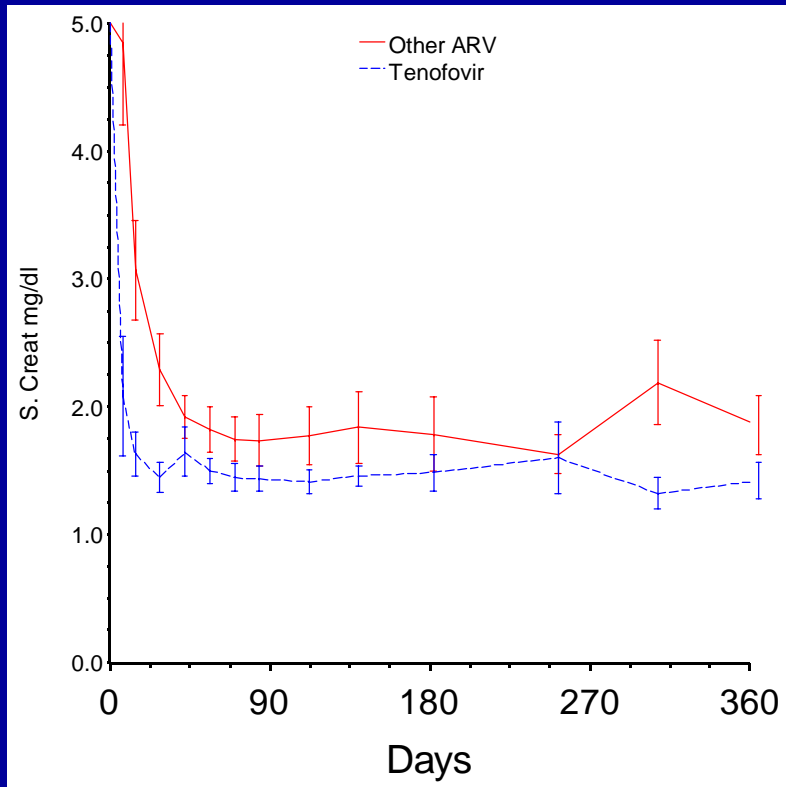
# TDF Use

- 56 of 112 (50%) HIV-infected transplant recipients used any tenofovir
  - 16/57 (28%) kidney recipients
  - 40/55 (73%) liver or liver/kidney recipients
- 42 (75%) initiated TDF prior to transplant
- 14 (25%) initiated TDF post transplant

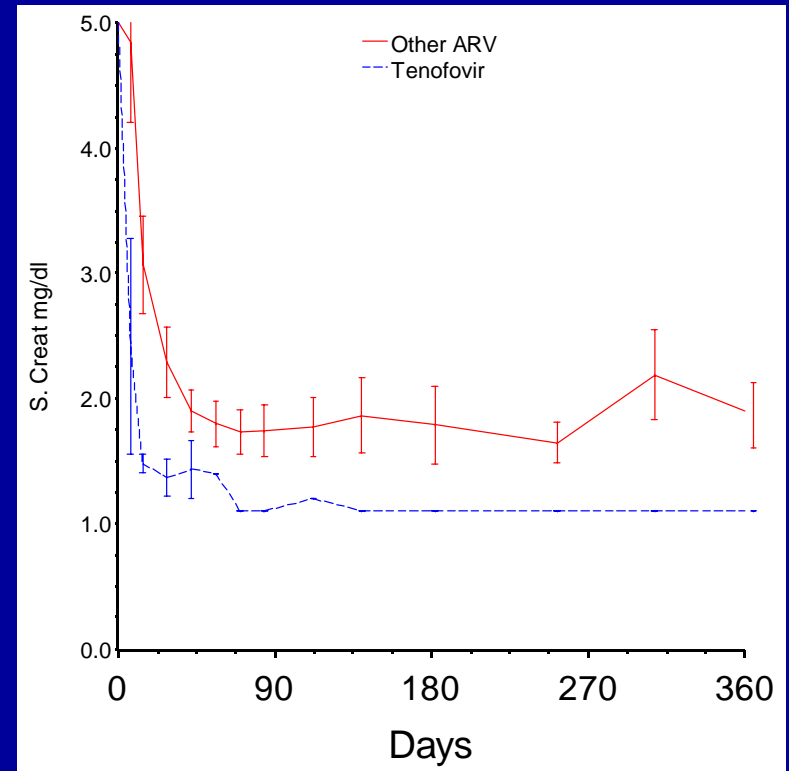
# Renal function

- No significant differences in serum creatinine or urinary protein, blood, or glucose in patients using or not using tenofovir.
- Serum creatinine did not increase over 101 days (median, range 24-377) in 5 kidney and 8 liver patients who initiated tenofovir post transplant.

# Serum Creatinine After Kidney Transplantation

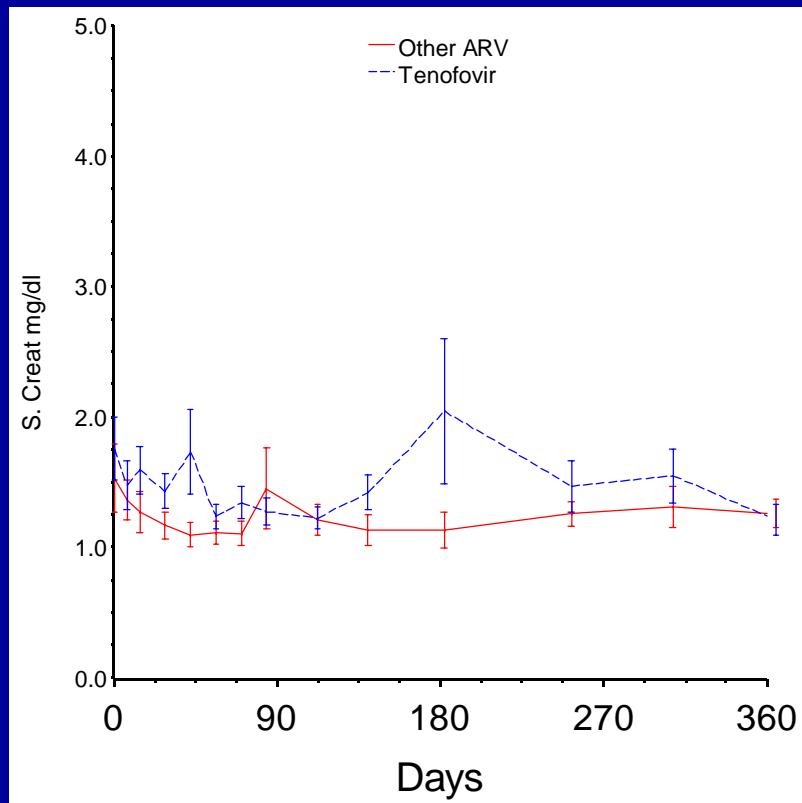


TDF initiated within 14 days  
post-transplant

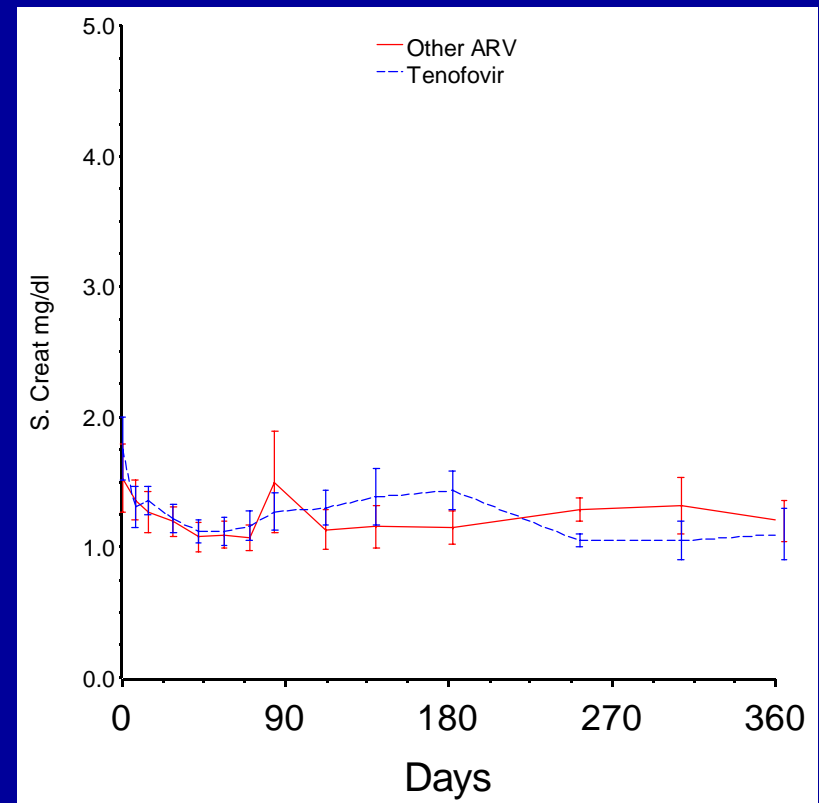


“TDF group” = time on TDF  
“Other ARV group” = time not on TDF

# Serum Creatinine After Liver Transplantation

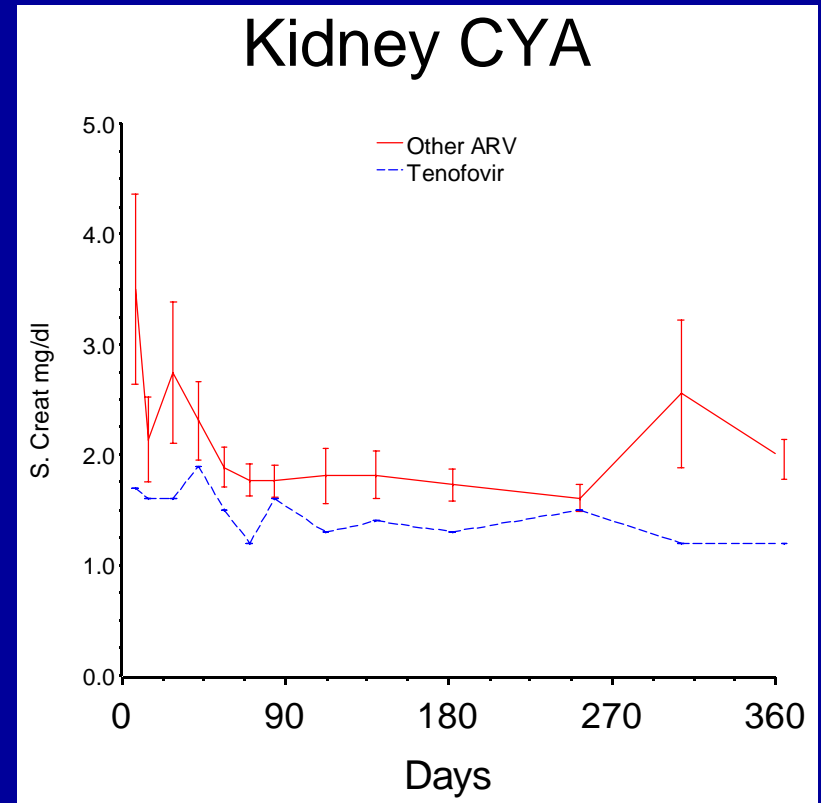
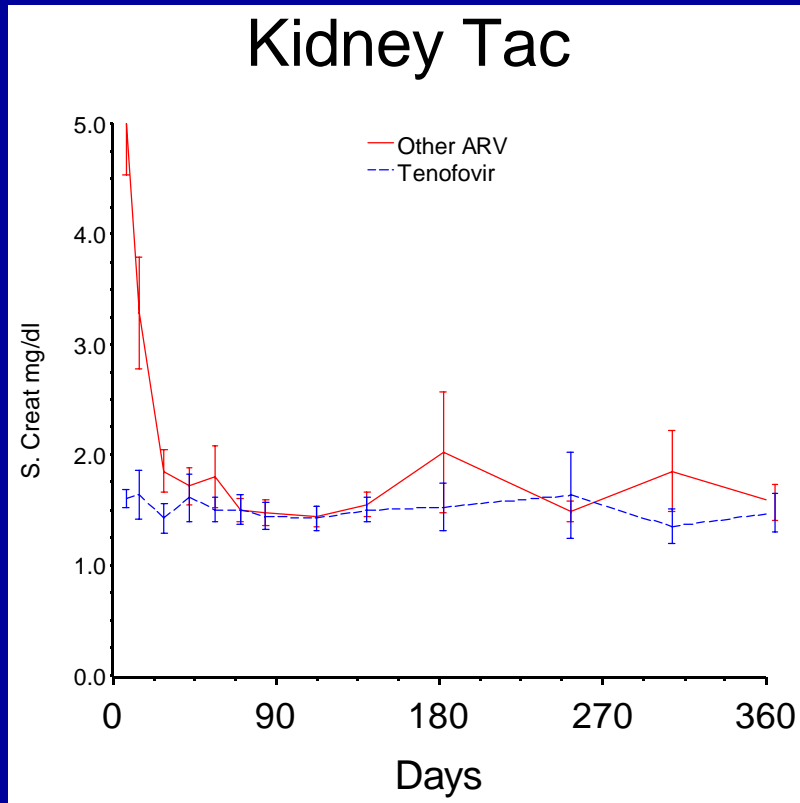


TDF initiated within 14 days  
post-transplant

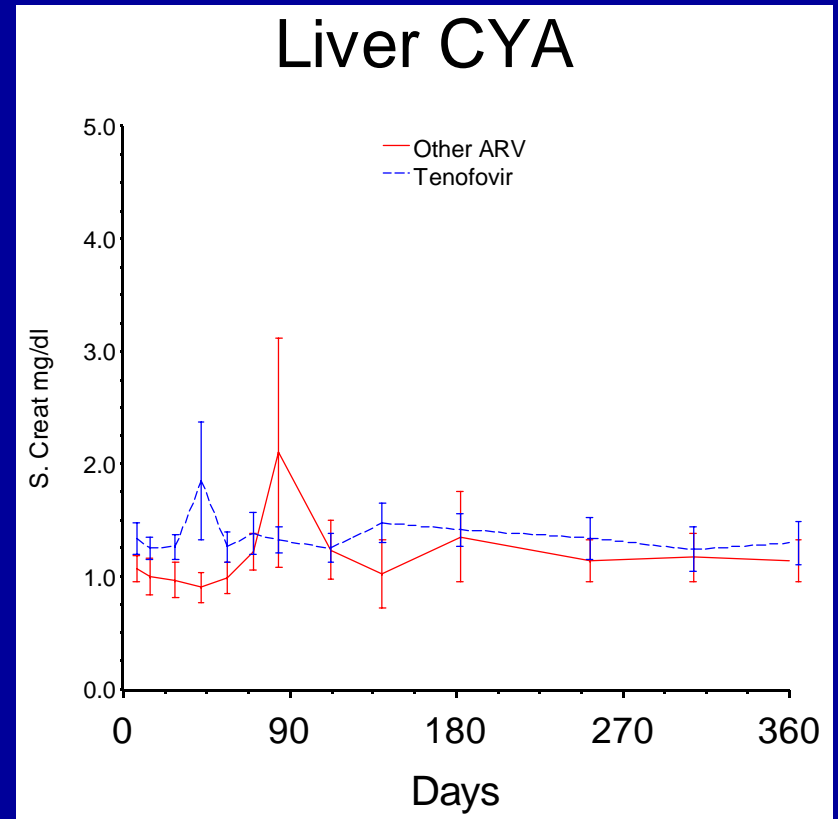
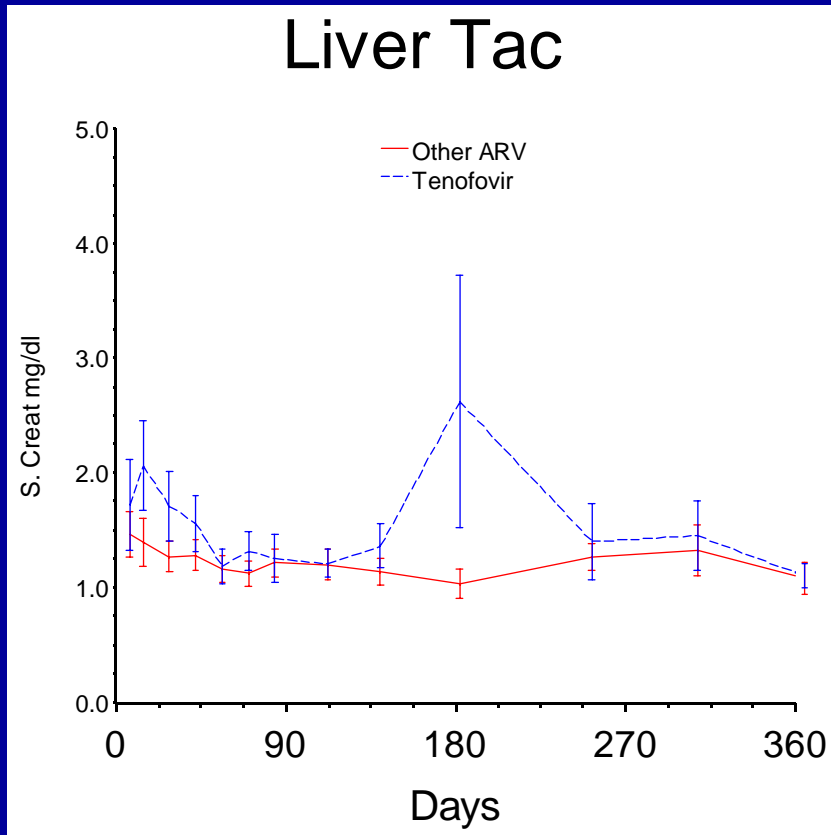


“TDF group” = time on TDF  
“Other ARV group” = time not on TDF

# Creatinine after Kidney Transplant by Calcineurin Inhibitor



# Creatinine after Liver Transplant by Calcineurin Inhibitor



# Limitations and Future Analytic Plans

- Size of cohort and duration of follow-up
- GFR better measure than serum creatinine
- Future linear regression models of post-transplant GFR will include potential confounders
  - Diabetes mellitus, HTN
  - Pre-existing renal function in liver recipients
  - Rejection
  - Other nephrotoxins

# Conclusions

- Tenofovir did not adversely affect renal function following liver +/- kidney transplantation during study period
  - Probably reflects careful selection of TDF recipients and monitoring of renal function by study clinicians
- Long term observation is required to establish safety of tenofovir in HIV-infected transplant recipients with various risk factors for renal insufficiency



# HIVTR Participants

- UCSF
- Beth Israel Deaconess
- Georgetown
- University of Pennsylvania
- University of Virginia
- Cedars-Sinai
- University of Maryland
- Drexel
- Tulane
- Emory
- Rush
- University of Pittsburgh
- Washington Hospital Center
- Mt. Sinai
- Columbia
- University of Chicago
- University of Cincinnati
- University of Miami
- Cleveland Clinic
- Johns Hopkins
- Northwestern
- The Emmes Corporation

# Tenofovir Discontinuation

	Continued	Discontinued
<b>Early Initiation Kidney</b>	<b>8</b>	<b>3</b>
<b>Late Initiation Kidney</b>	<b>3</b>	<b>2</b>
<b>Early Initiation Liver</b>	<b>24</b>	<b>7</b>
<b>Late Initiation Liver</b>	<b>7</b>	<b>2</b>