

Trends in Medication Use after Kidney Transplant

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United States Renal Data System

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Outline

- **Immunosuppression**
- **Part D Coverage**
- **Part D Usage**
 - **Antihypertensive agents**
 - **Lipid-lowering agents**
 - **Anti-diabetic agents**
 - **Antiviral**
 - **Antibiotics**
- **Comparison with PORT data**

Trends in:

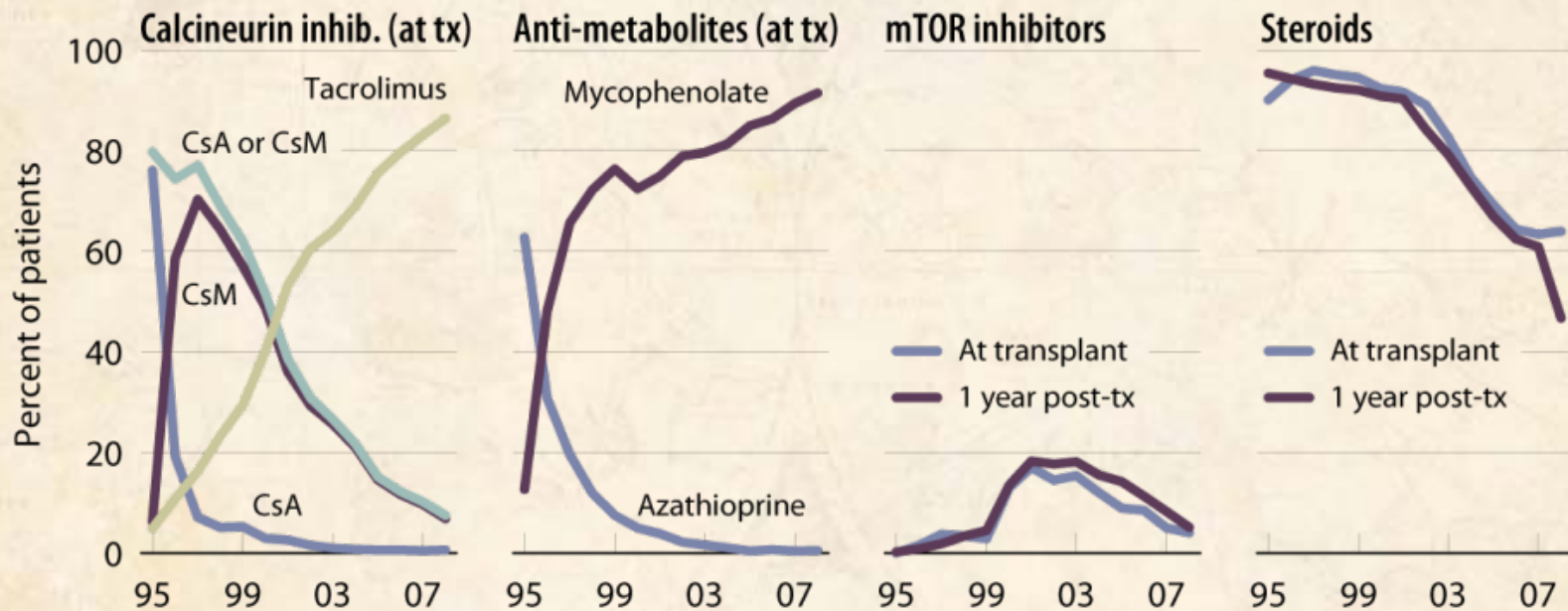
Immunosuppression

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Immunosuppression use

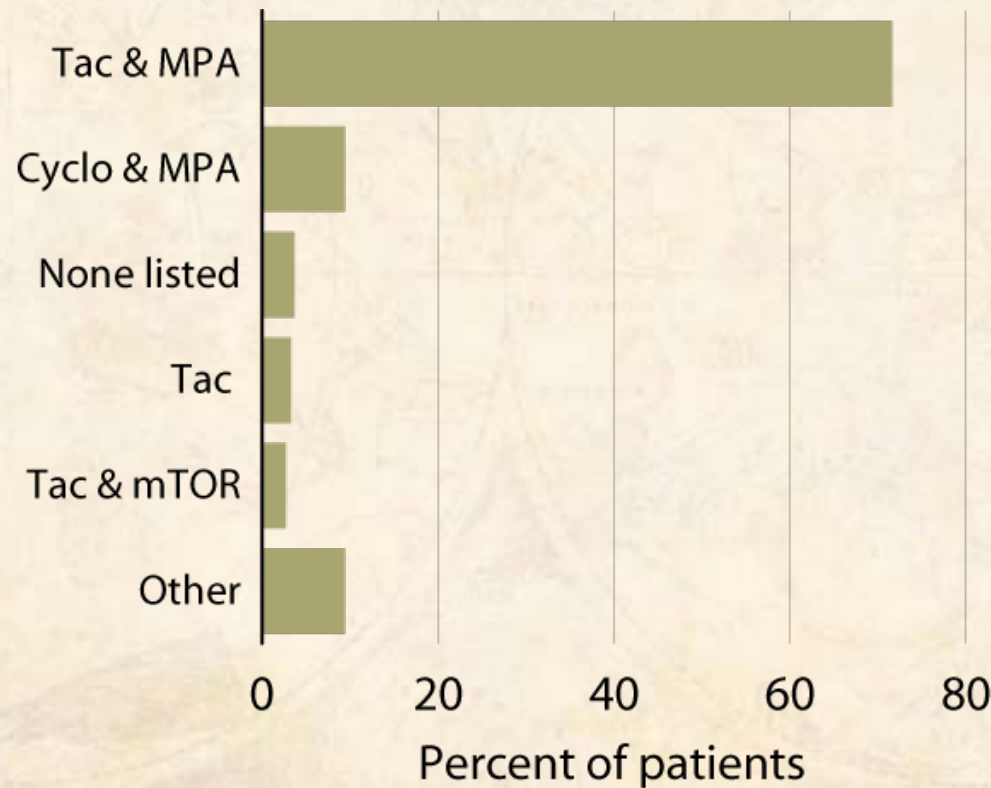
Figure 7.28 (Volume 2)



Patients age 18 & older receiving a first-time, kidney-only tx. CsA: cyclosporine A; CsM: cyclosporine microemulsion.

Most common immunosuppression regimens at time of transplant: 2005–2007

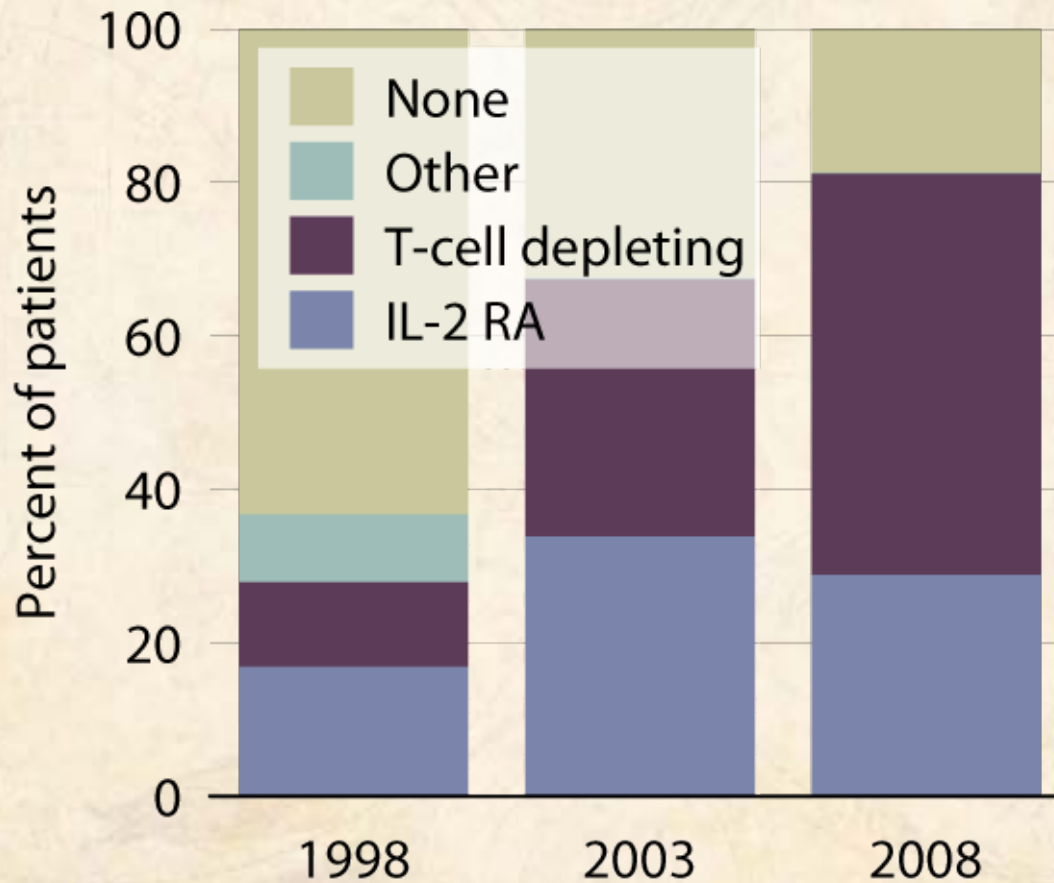
Figure 7.35 (Volume 2, 2009 ADR)



First-time, adult, kidney-only transplants 1995-2007. Immunosuppression as identified to OPTN. Cyclo includes CsA and CsM; mycophenolate (MPA) includes mycophenolate mofetil and mycophenolate sodium; Tac includes traditional and modified release formulations; mTOR inhibitor includes sirolimus and everolimus.

Induction antibody use

Figure 7.29 (Volume 2)



Patients age 18 & older receiving a first-time, kidney-only transplant.

Medicare Part D:

Coverage in Transplant

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Cohort Descriptions

Incident Transplants

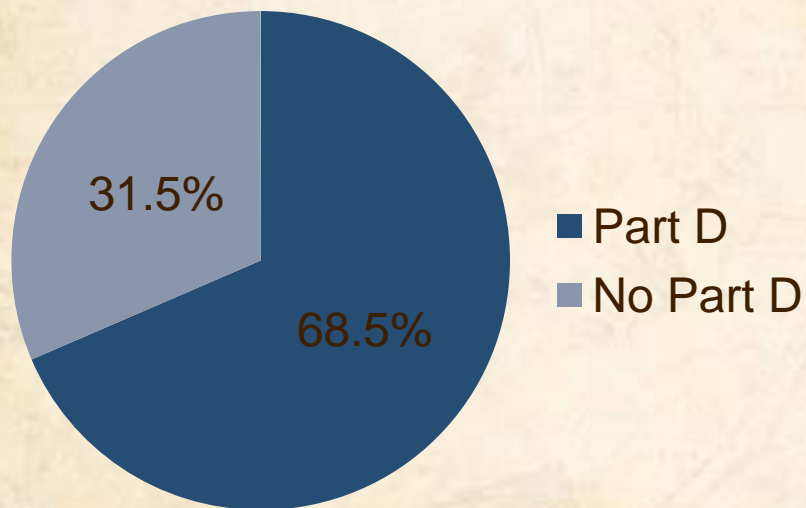
- Transplant Jan. – June 2007.
- Follow-up for max of 6 months post-transplant.
- Medicare Part A & B for 6 months prior to transplant.
- N=3,856.

Prevalent Transplants

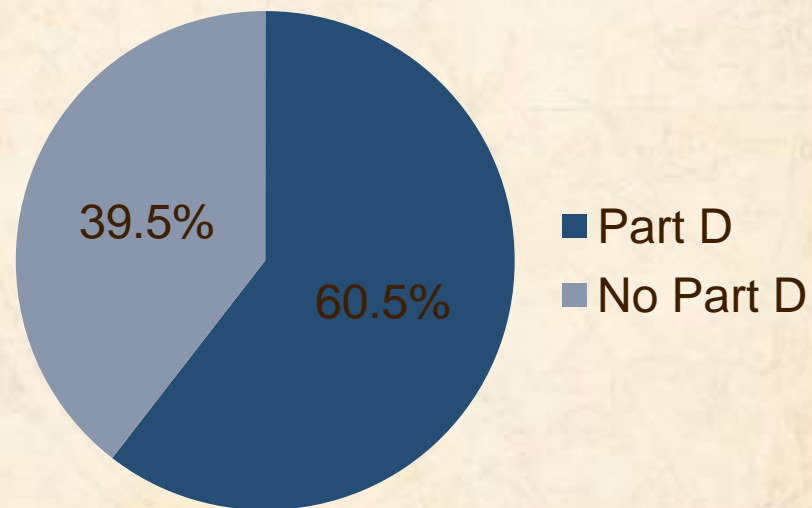
- Functioning graft on 1/1/2007.
- Follow-up through max of 12/31/2007.
- Medicare Part A & B from 7/1/2006-1/1/2007.
- N=52,472.

Part D Coverage in Incident and Prevalent Transplant Cohorts

Incident Cohort:

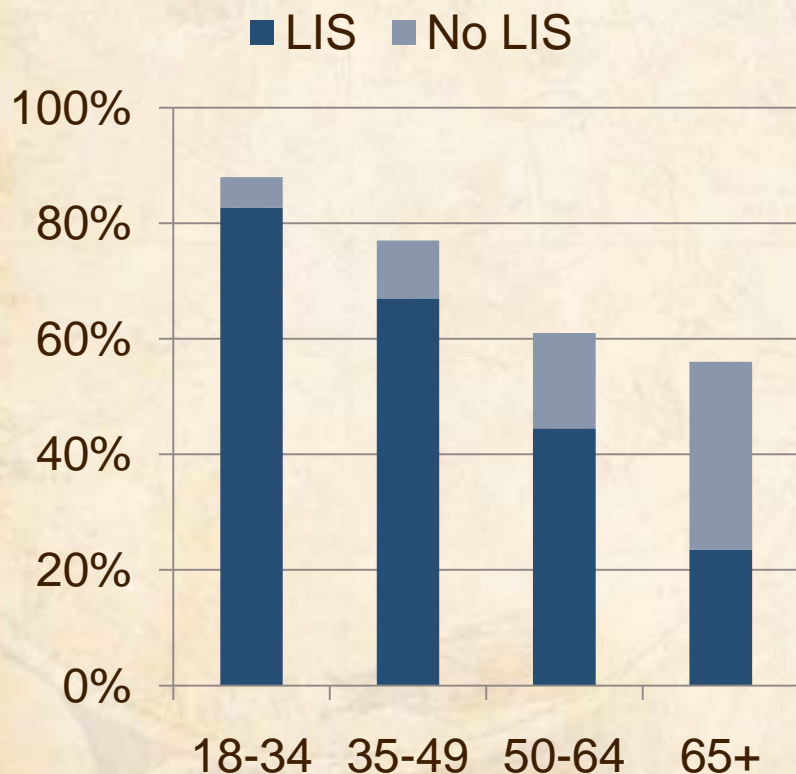


Prevalent Cohort:

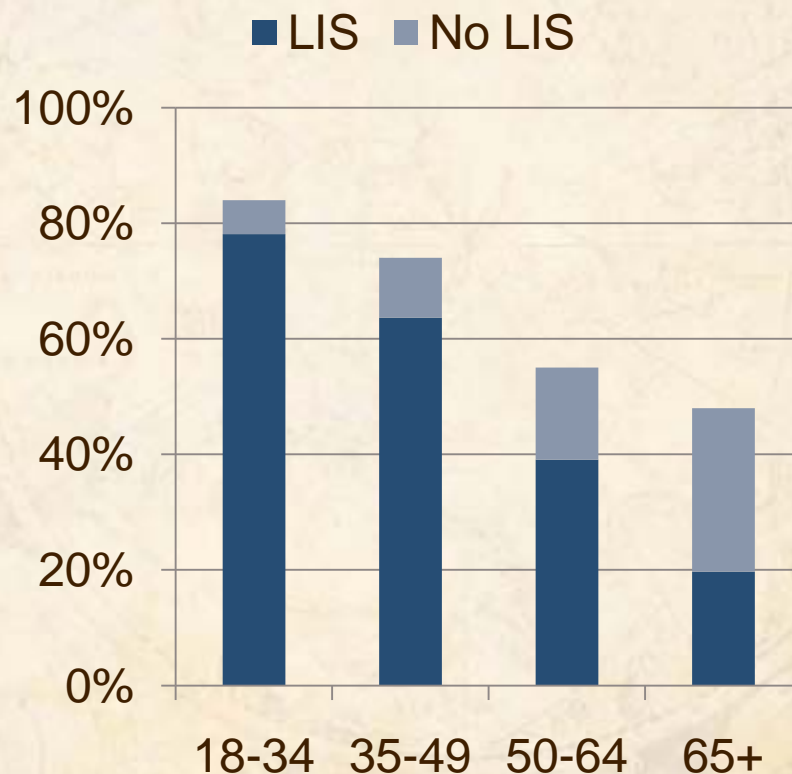


Part D Coverage by Age Group and Low Income Subsidy (LIS)

Incident Cohort:

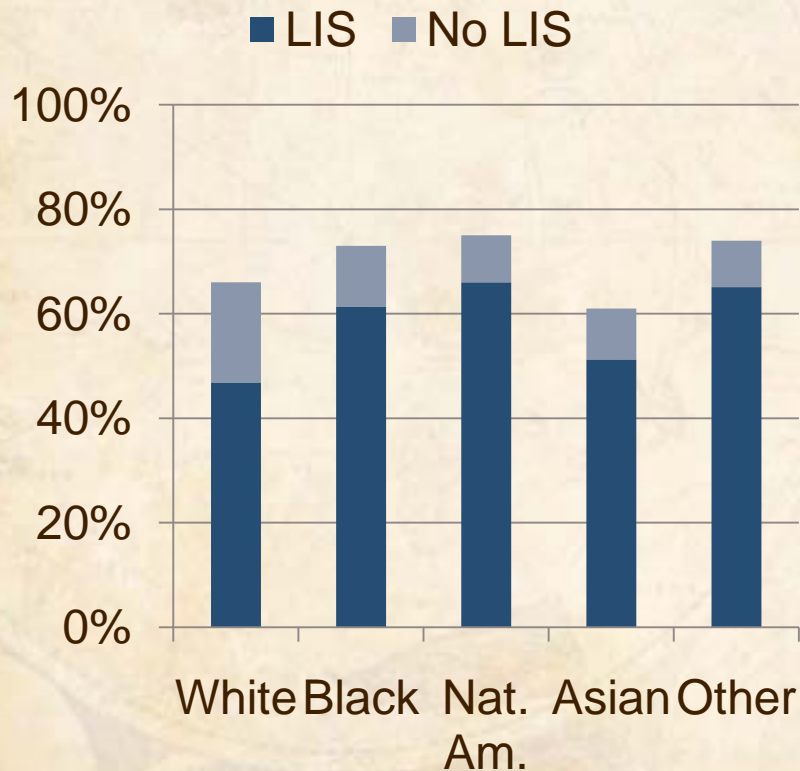


Prevalent Cohort:

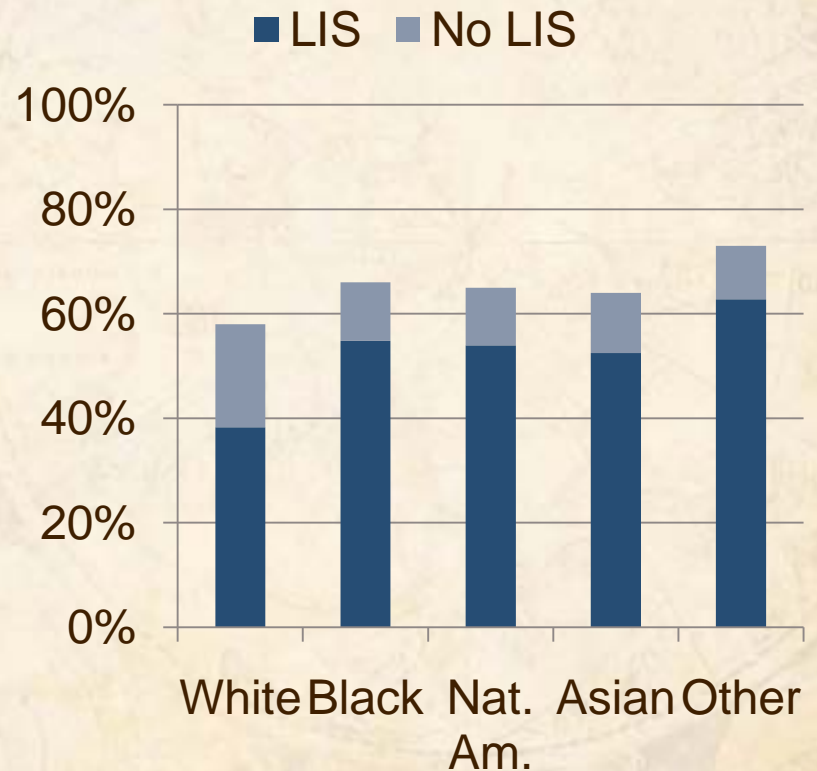


Part D Coverage by Race

Incident Cohort:



Prevalent Cohort:



Medicare Part D:

Cardiovascular Medications in Transplant Recipients

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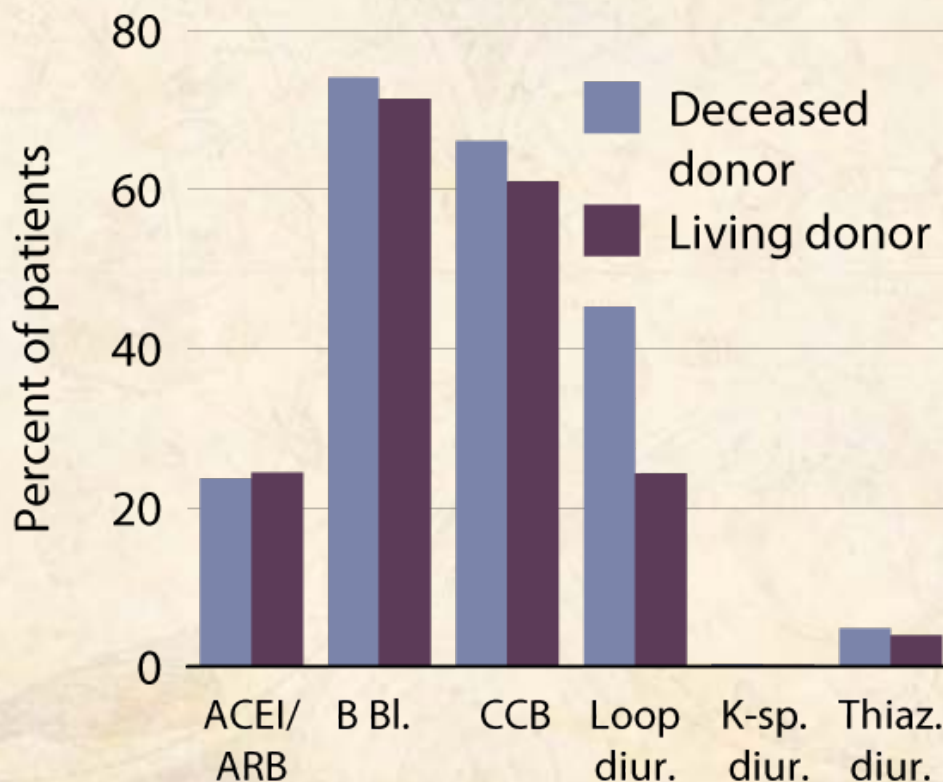
Guidelines Recommendations

KDOQI/KDIGO:

- BP should be $<130/<80$
- ACEI/ARB use:
 - KDOQI: CKD patients should be on an ACEI/ARB
 - Slow progression of disease
 - Reduce proteinuria
 - KDIGO: Unclear whether ACEI/ARB use in RTx recipients is beneficial in terms of slowing progression of renal disease.

Cardiovascular medication use in the first six months post-transplant, 2007 (Part D data)

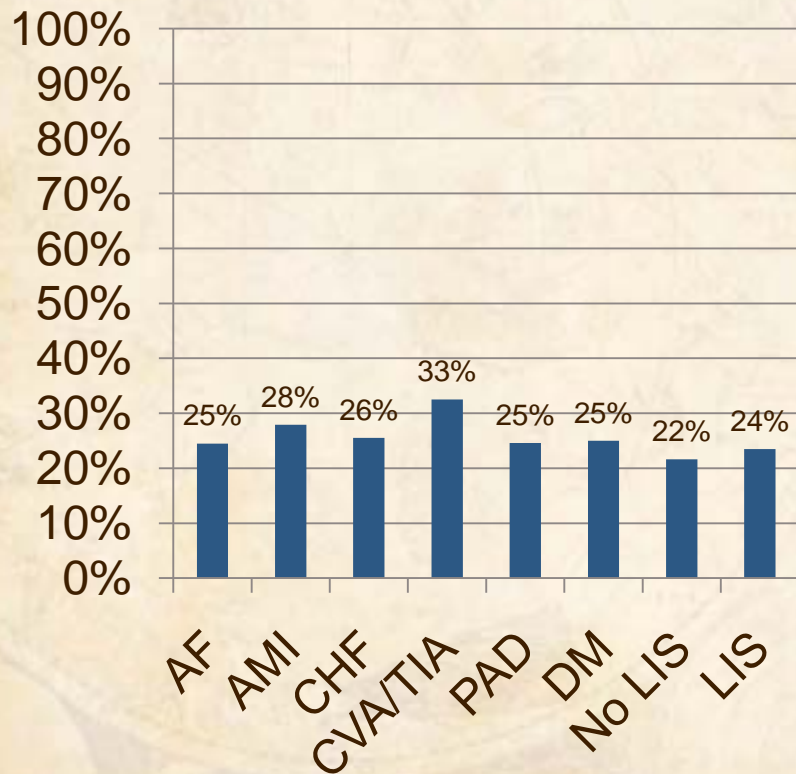
Figure 7.32 (Volume 2)



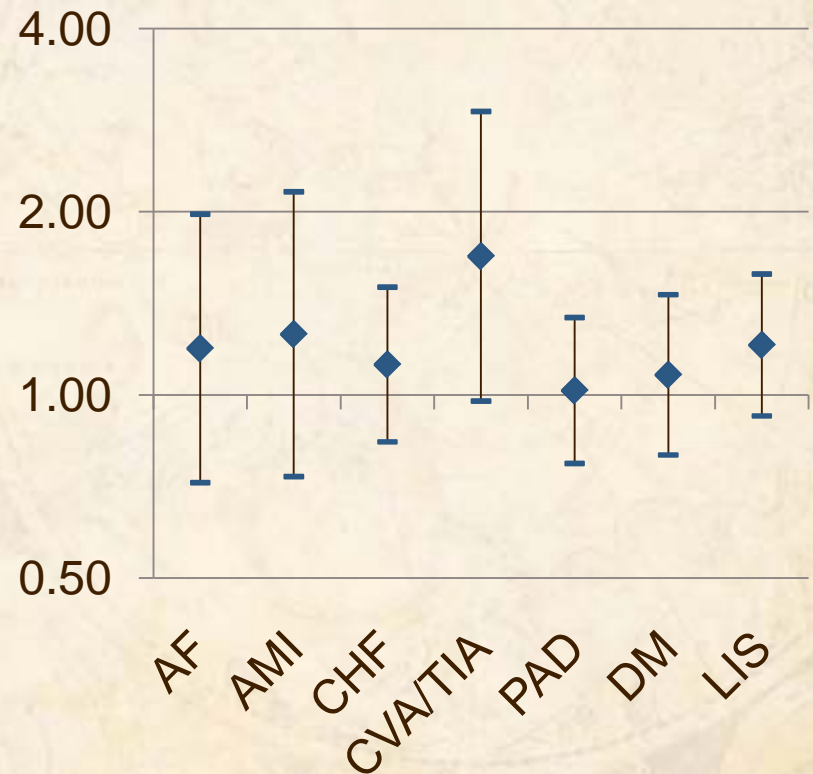
Patients age 18 & older receiving a first-time, kidney-only transplant.

ACEI/ARB Use by Prior Comorbidity, Incident Transplant Recipients

Proportions:



Adjusted* Odds Ratios:



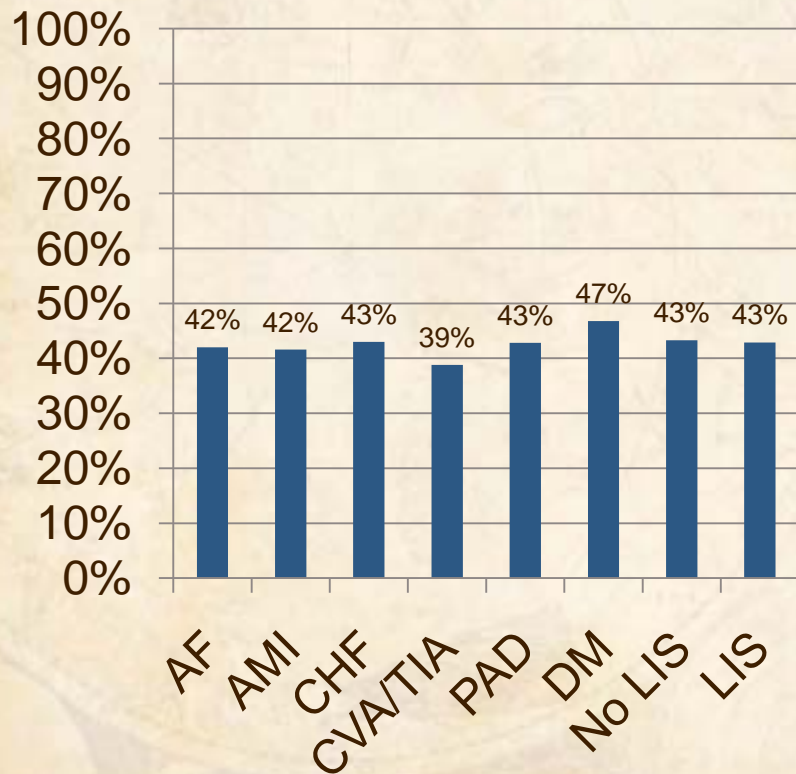
*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

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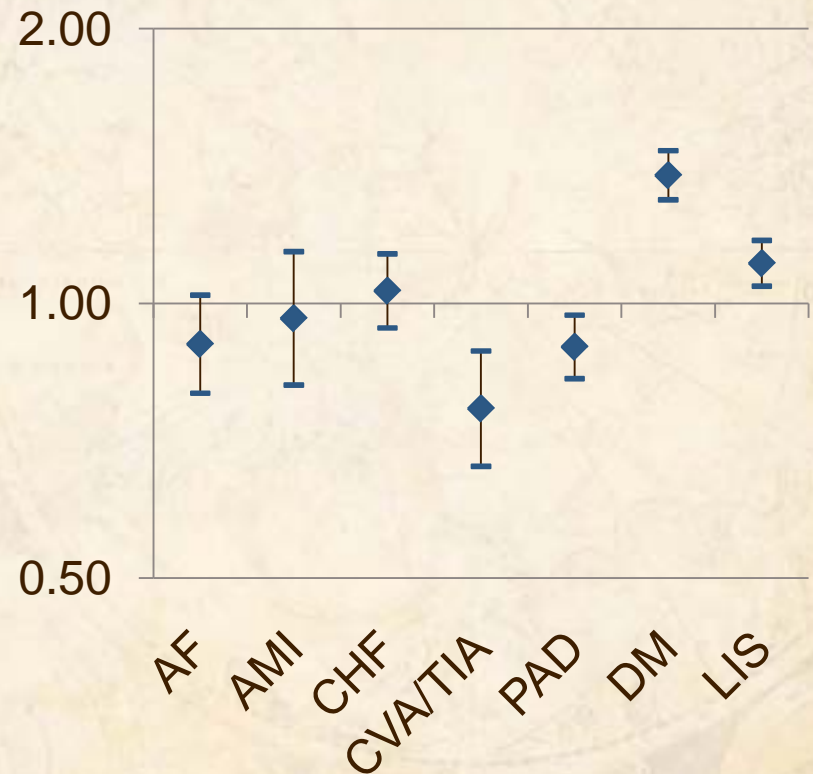
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ACEI/ARB Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted Odds Ratios:

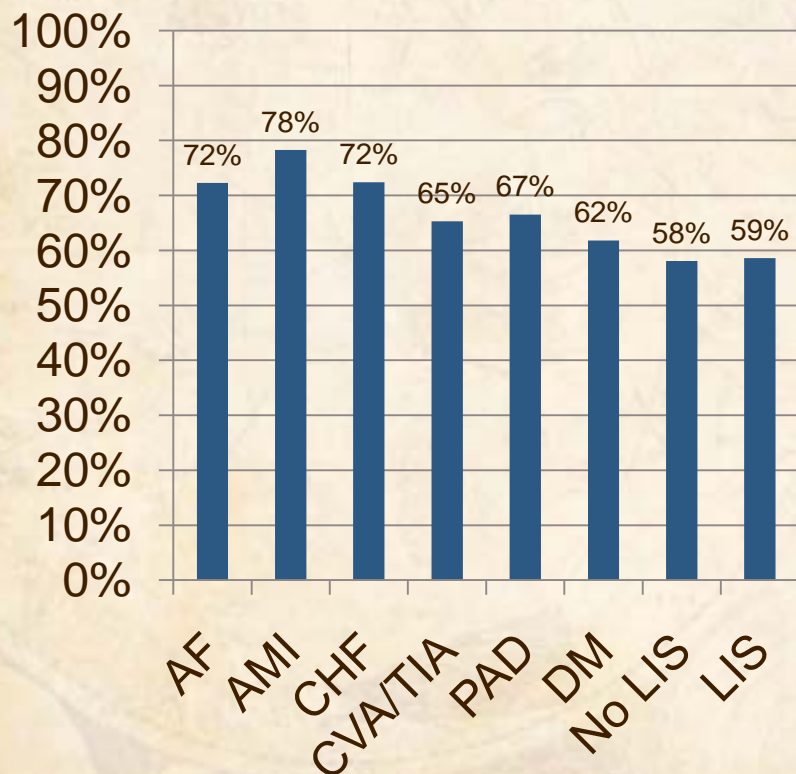


*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

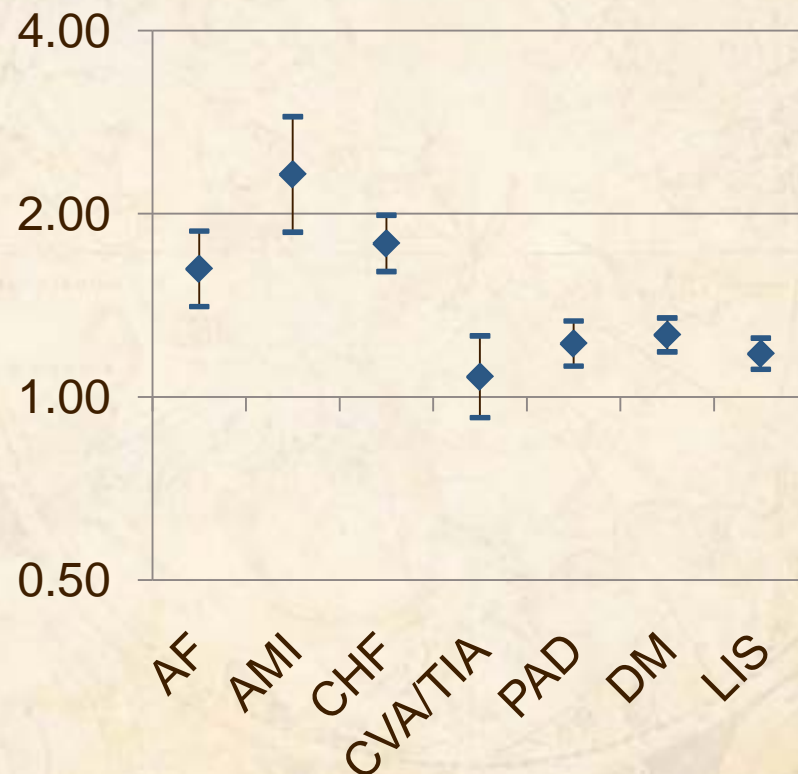
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Beta-blocker Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted* Odds Ratios:



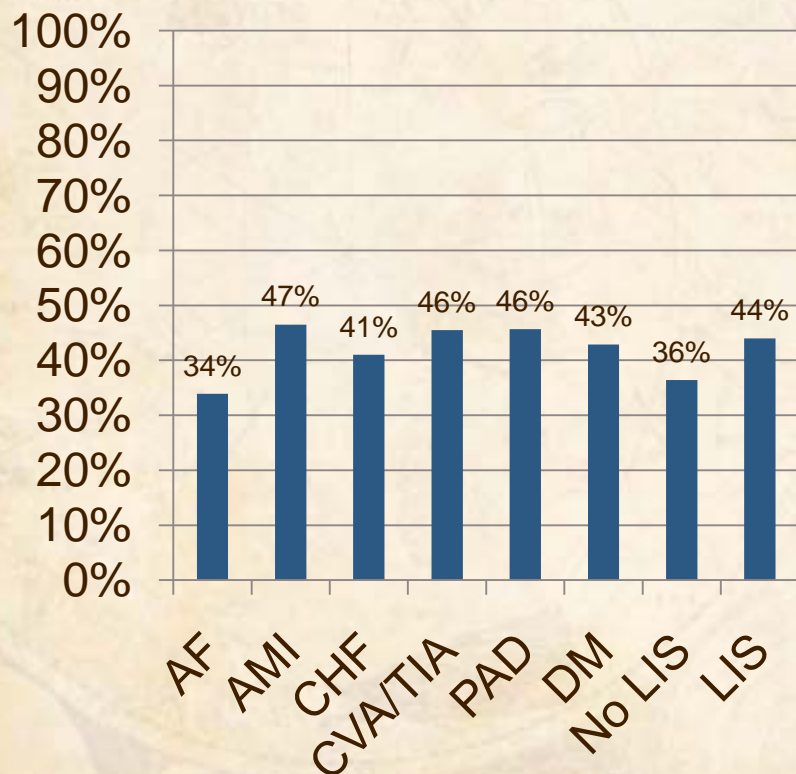
*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

ASN 2010

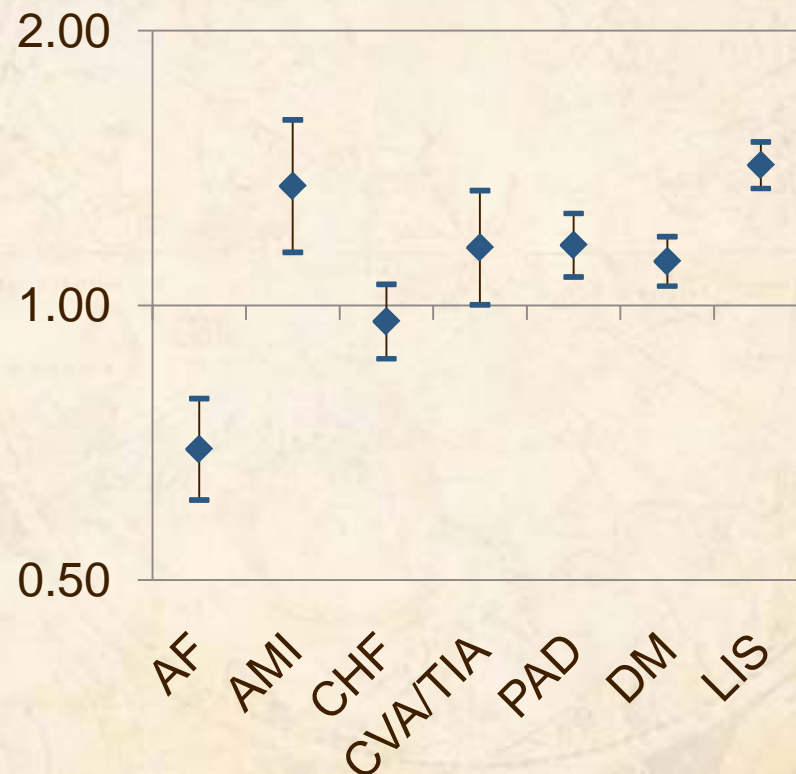
USRDS

Dihydropyridine CCB Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted* Odds Ratios:



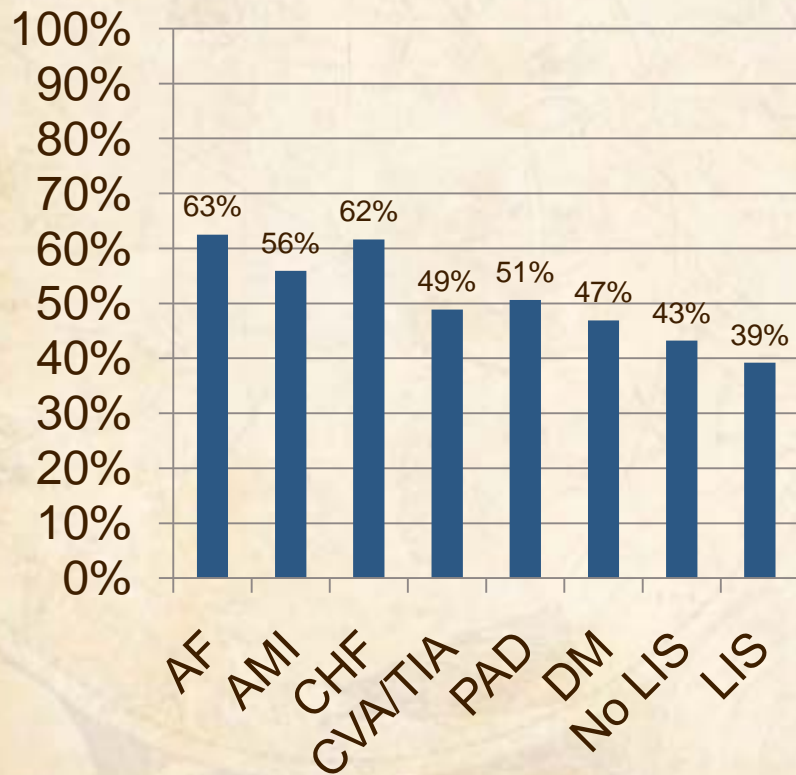
*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

ASN 2010

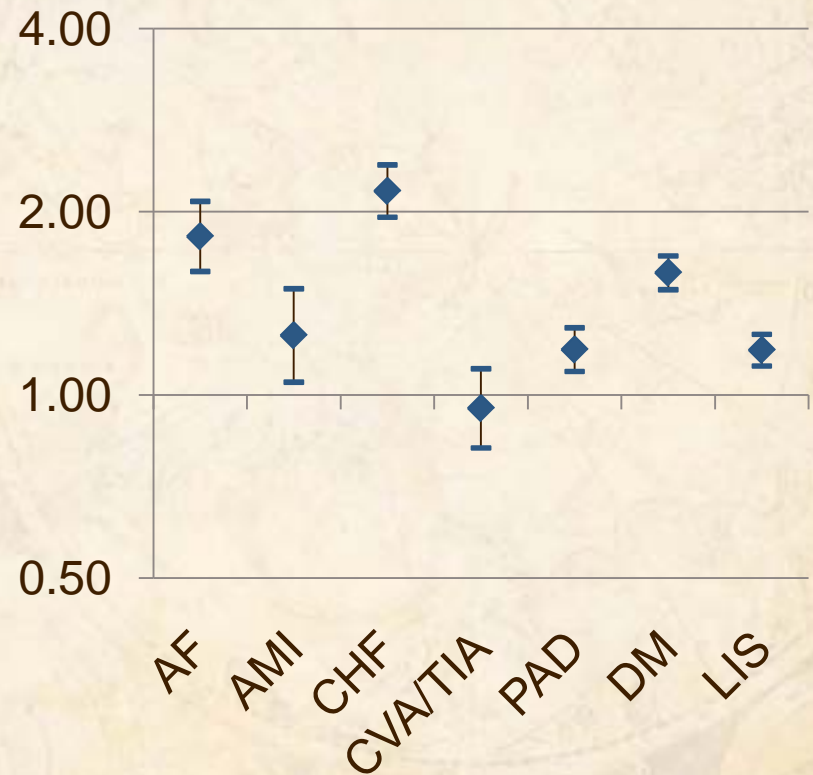
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Diuretic Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted* Odds Ratios:



*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

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Medicare Part D:

Lipid-Lowering Agents

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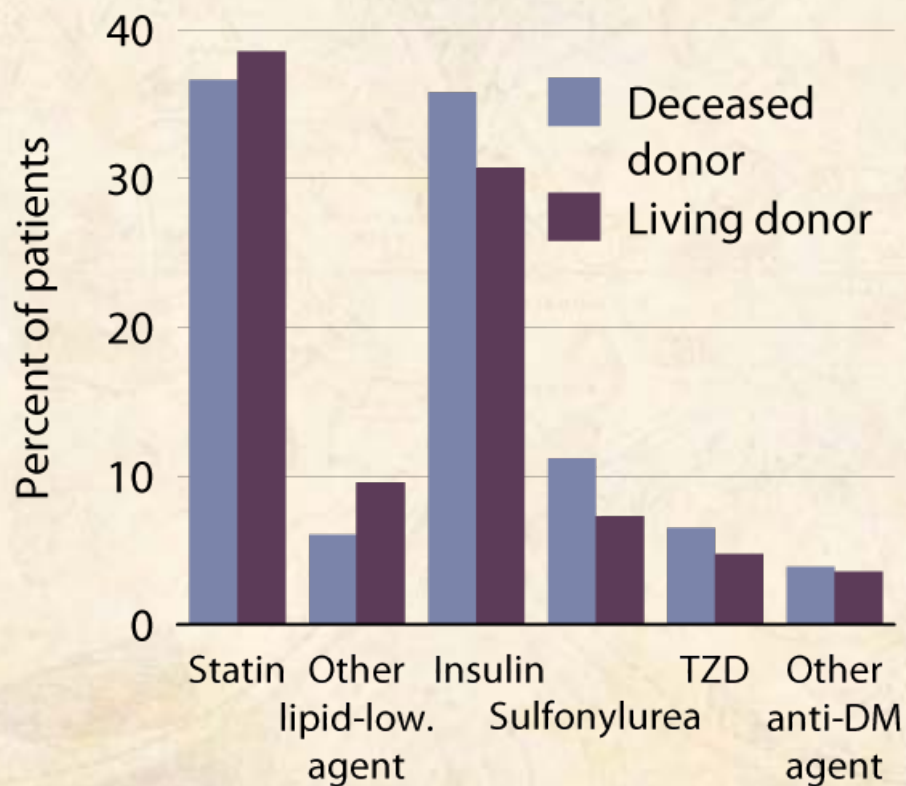
Guidelines

KDOQI/KDIGO

- **Adults: If LDL-C ≥ 100 mg/dL, treat to reduce LDL-C to < 100 mg/dL (based on KDOQI Guideline 4.2)**
- **Adults: If LDL-C < 100 mg/dL, fasting triglycerides ≥ 200 mg/dL, and non-HDL-C ≥ 130 mg/dL, treat to reduce non-HDL-C to < 130 mg/dL (based on KDOQI Guideline 4.3)**

Medications for lipid & diabetes control in the first six months post-transplant, 2007 (Part D data)

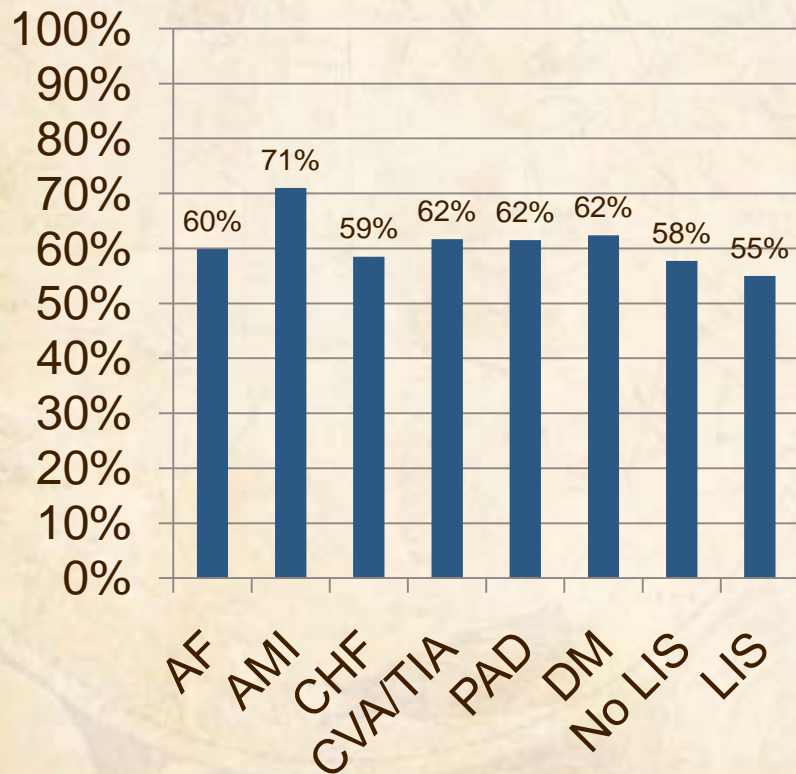
Figure 7.33 (Volume 2)



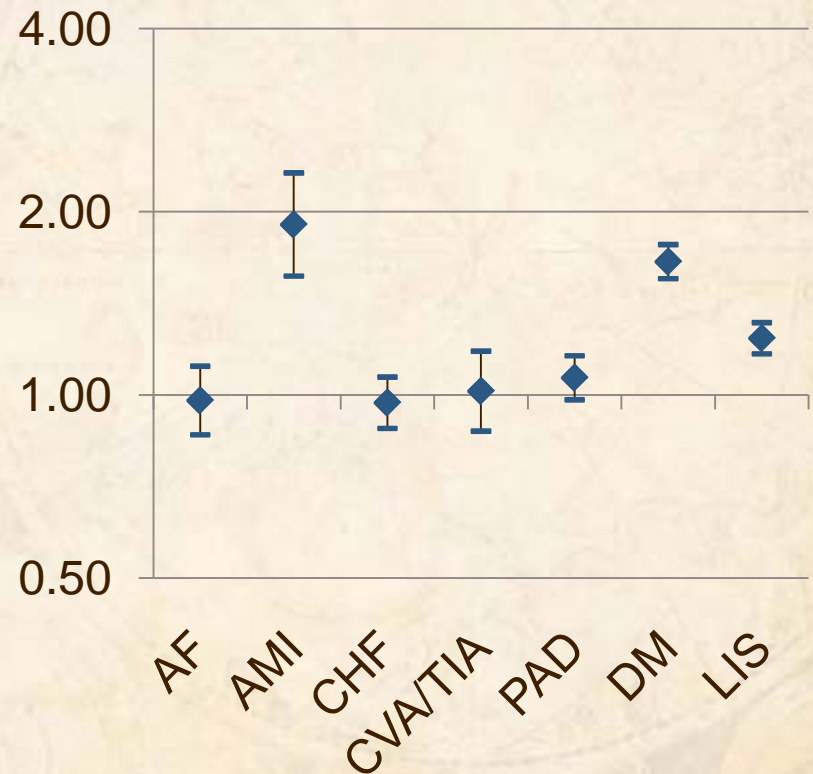
Patients age 18 & older receiving a first-time, kidney-only transplant.

LLA Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted* Odds Ratios:

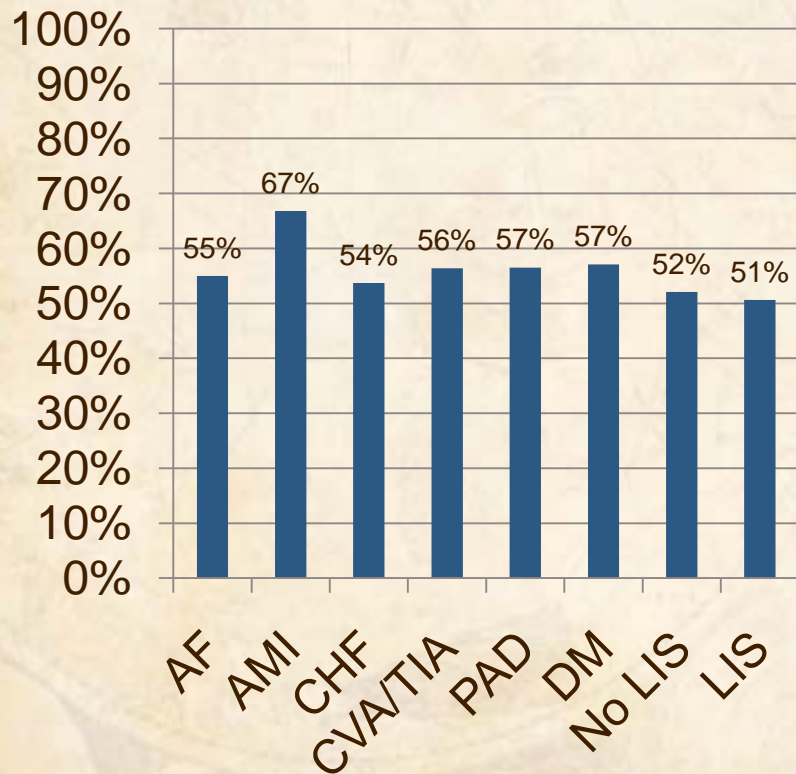


*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

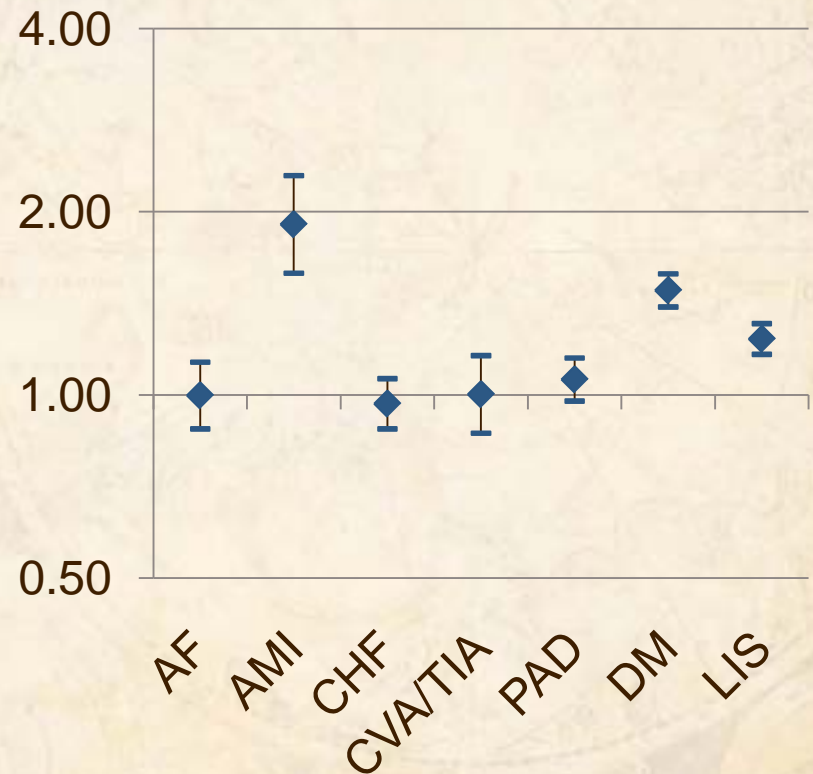
ASN 2010

Statin Use by Prior Comorbidity, Prevalent Transplant Recipients

Proportions:



Adjusted* Odds Ratios:



*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

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Medicare Part D:

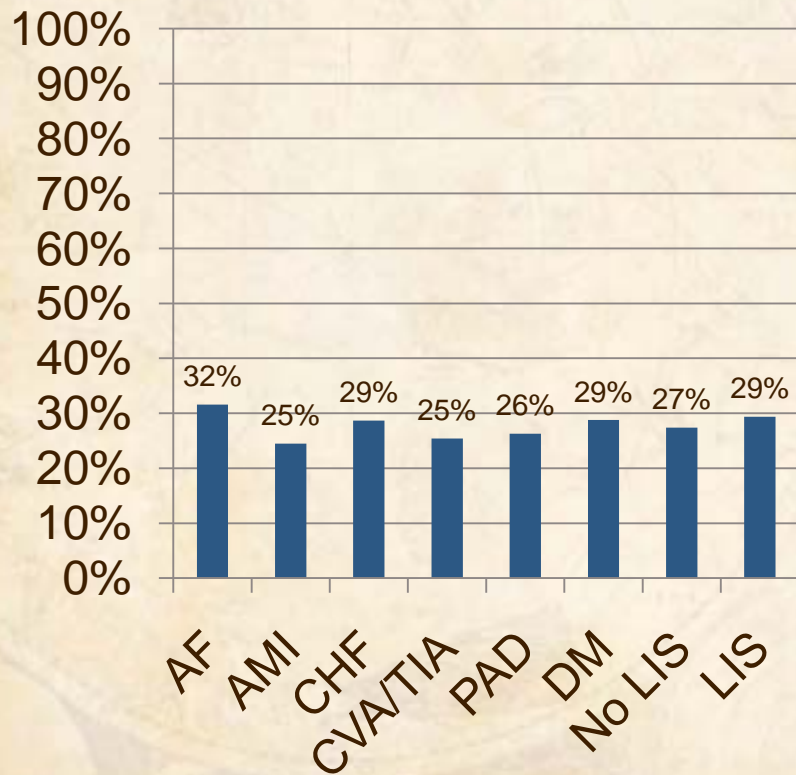
Anti-Diabetic Medications

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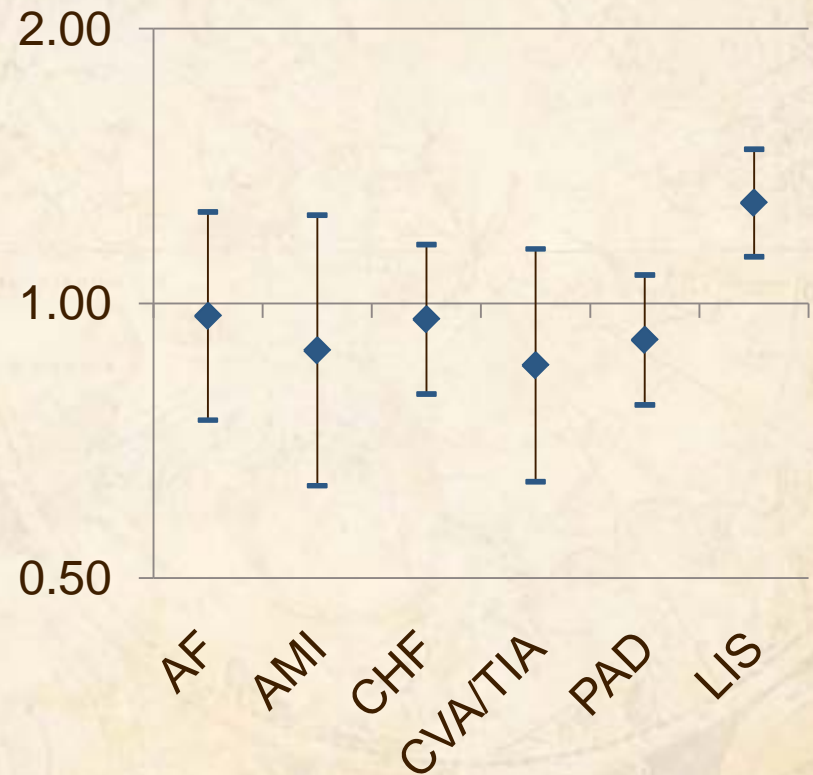
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Oral Hypoglycemic Use by Prior Comorbidity, Prevalent Transplant Recipients, known DM only

Proportions:



Adjusted* Odds Ratios:

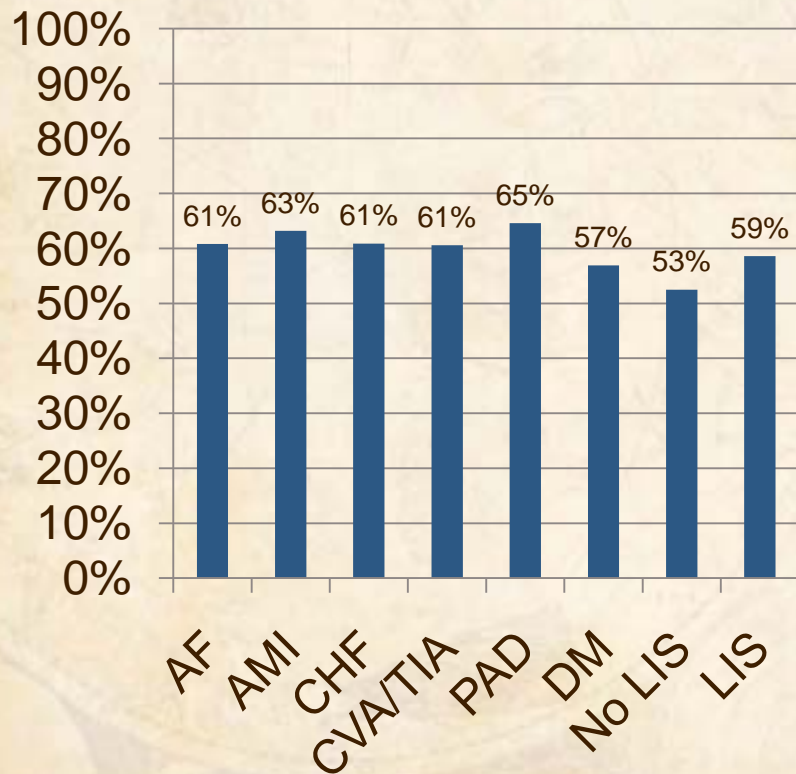


*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

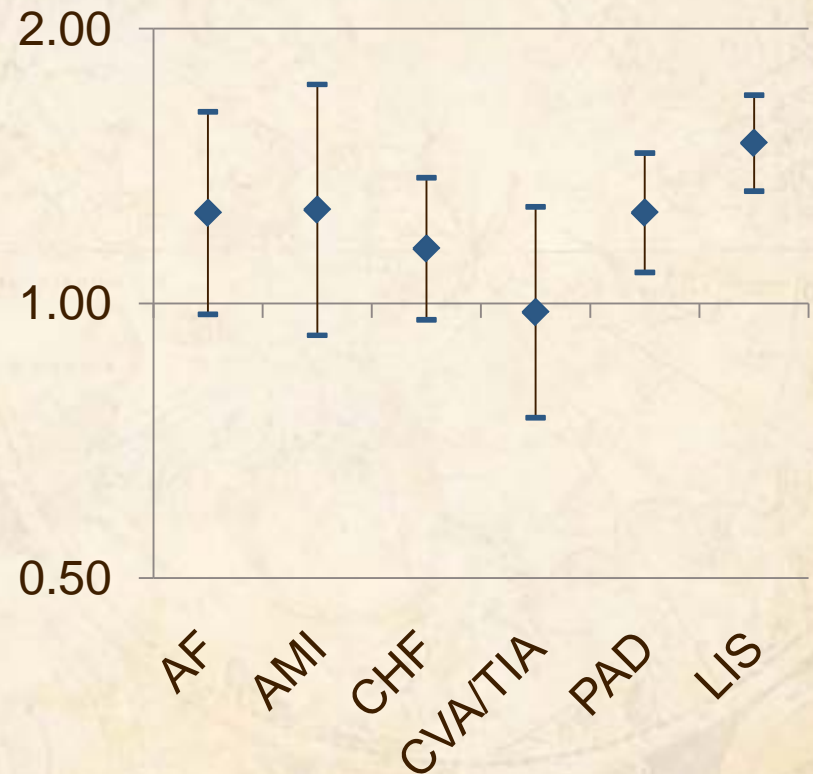
ASN 2010

Insulin Use by Prior Comorbidity, Prevalent Transplant Recipients, known DM only

Proportions:



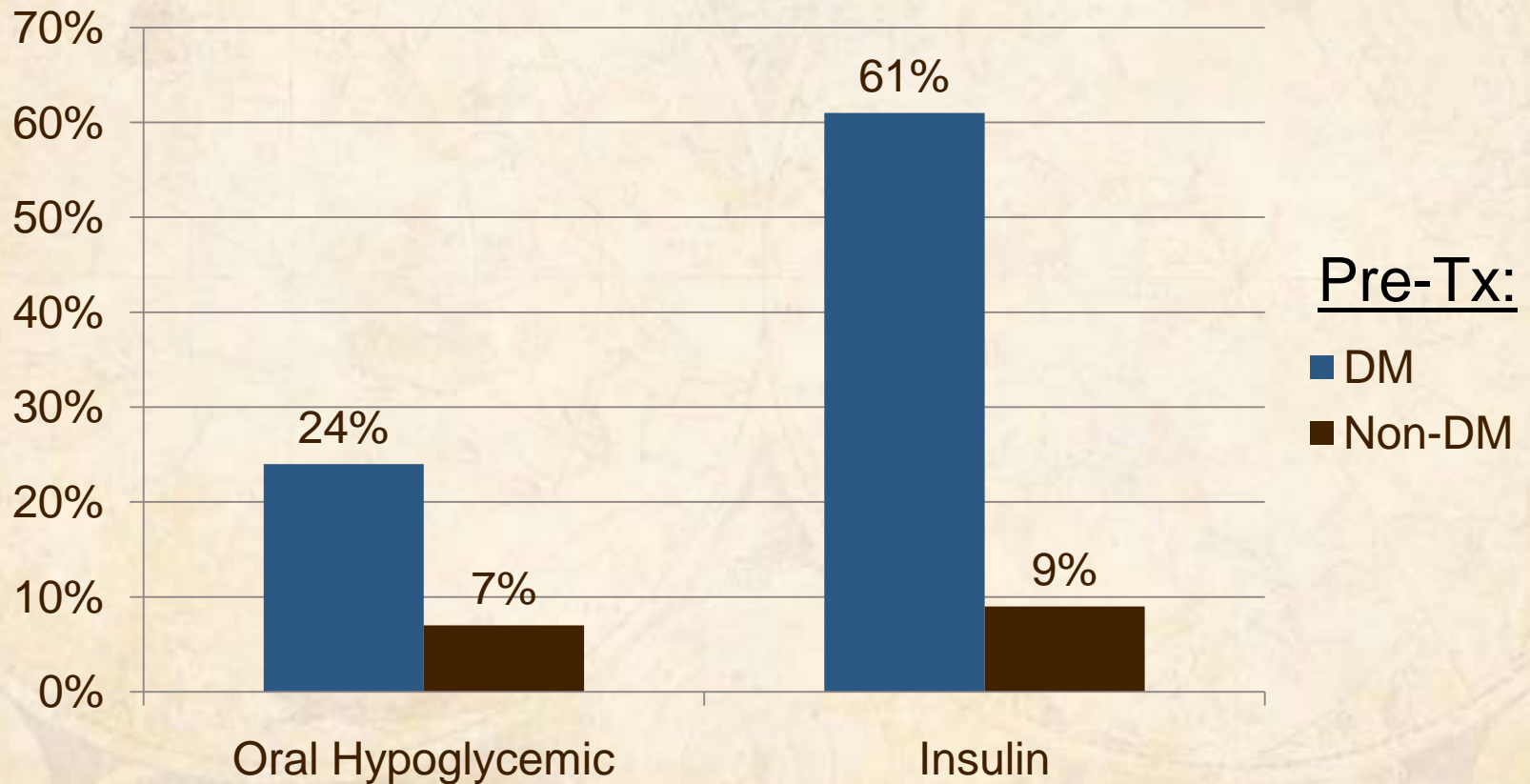
Adjusted* Odds Ratios:



*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

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Evidence of NODAT within the first 6 months post-transplant?



Medicare Part D:
Antivirals

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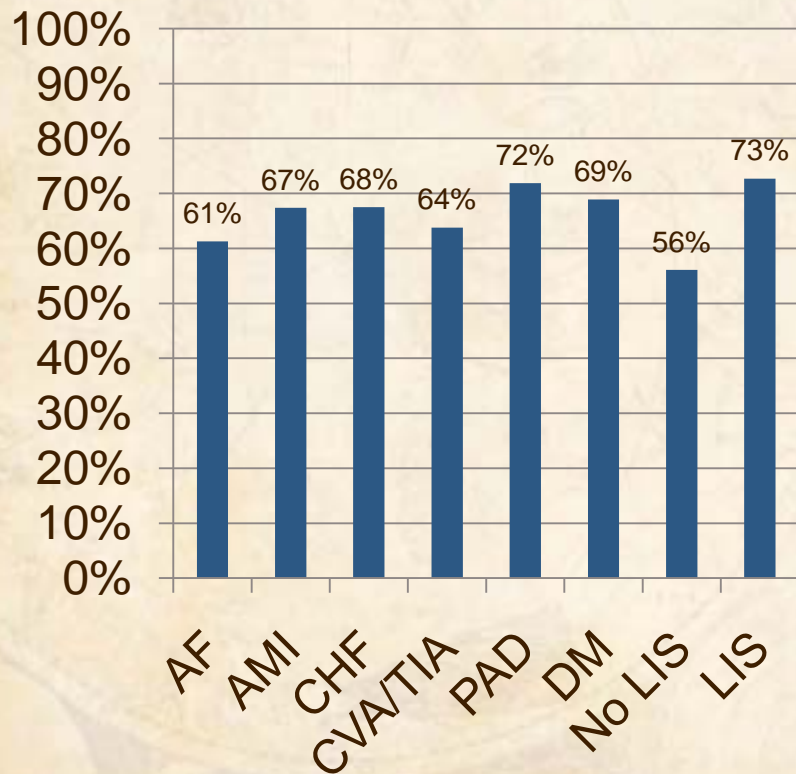
Guidelines:

KDIGO:

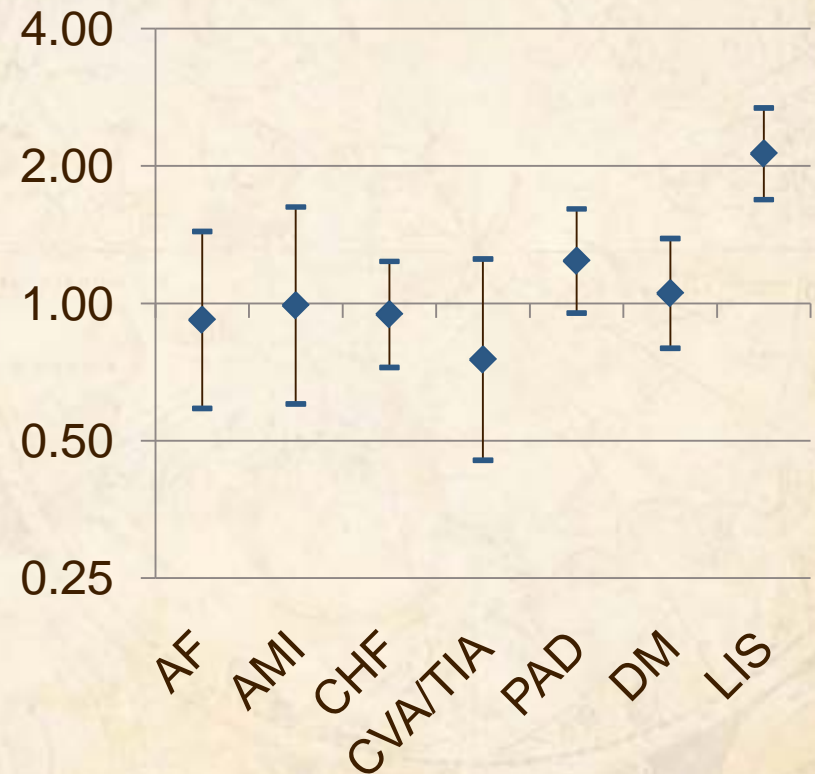
- **CMV prophylaxis: We recommend that KTRs (except when donor and recipient both have negative CMV serologies) receive chemoprophylaxis for CMV infection with oral ganciclovir or valganciclovir for at least 3 months after transplantation, and for 6 weeks after treatment with a T-cell–depleting antibody.**

Valganciclovir Use by Prior Comorbidity, Incident Transplant Recipients

Proportions:



Adjusted* Odds Ratios:

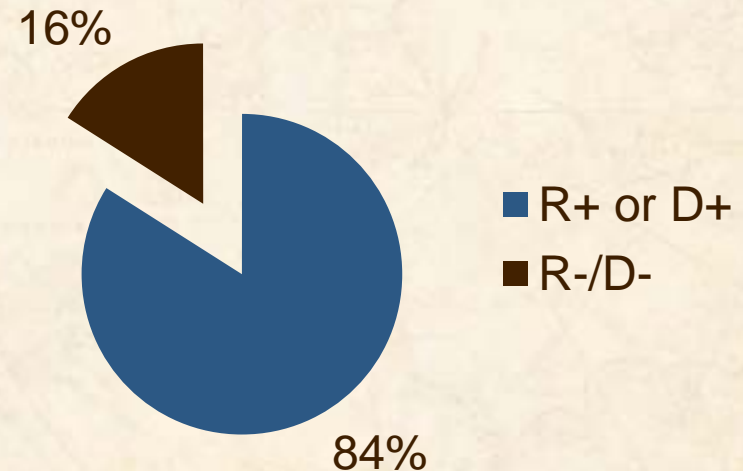


*Adjusted for: Age, Gender, Race, Ethnicity, Primary Cause of Kidney Disease, Duration of Renal Replacement Therapy, Network, & Follow-up Time Observed.

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Next Step: By Recipient and Donor CMV Serology

- In 2008, only 16% of transplant recipients had negative donor and recipient CMV serologies at the time of transplant.



Medicare Part D:

Antibiotics

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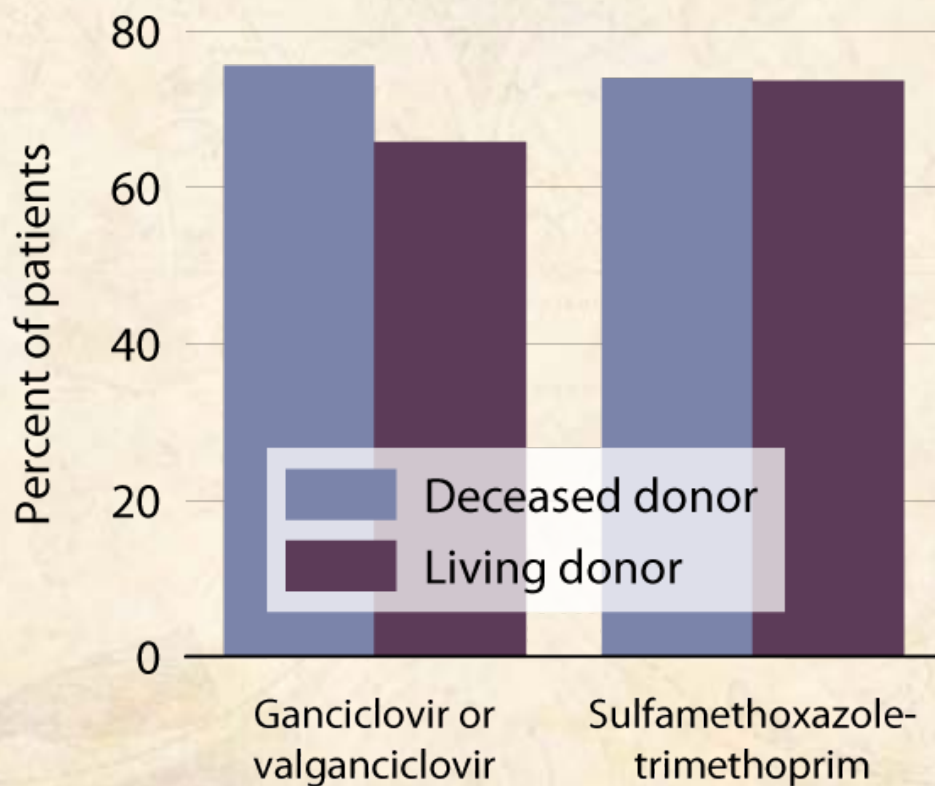
Guidelines:

KDIGO:14.1: URINARY TRACT INFECTION

- **14.1.1: We suggest that all KTRs receive UTI prophylaxis with daily trimethoprim–sulfamethoxazole for at least 6 months after transplantation.**

Antiviral & Antibiotic use in the first six months post-transplant, 2007 (Part D data)

Figure 7.30 (Volume 2)



Patients age 18 & older receiving a first-time, kidney-only transplant, 2007.

Comparative Data:

Patient Outcomes in Renal Transplantation (PORT) Study

PORT Data thanks to:

Helen Pilmore, MD (Auckland, NZ)

Bertram Kasiske, MD FACP

Ajay Israni, MD, MS

Melissa Skeans, MS

& The PORT Investigators

Participating Sites:

Vancouver

Leuven, Belgium
Paris, France
Vienna, Austria
Würzburg, Germany

Tokyo

Tenerife,
Spain

Minneapolis, MN (U of MN)
Minneapolis, MN (HCMC)
Madison, WI
Columbus, OH
St. Louis, MO
Birmingham, AL

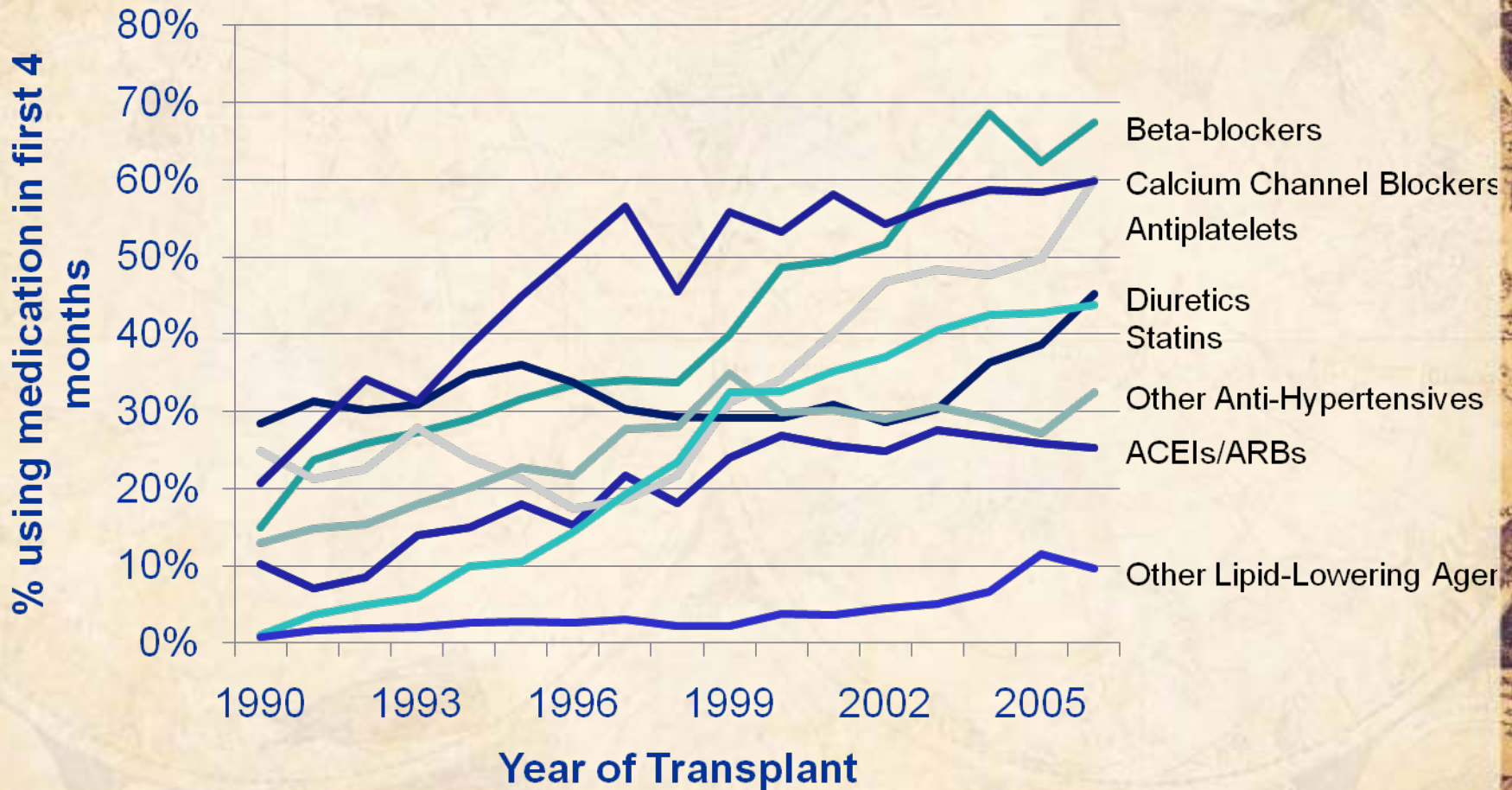
Auckland



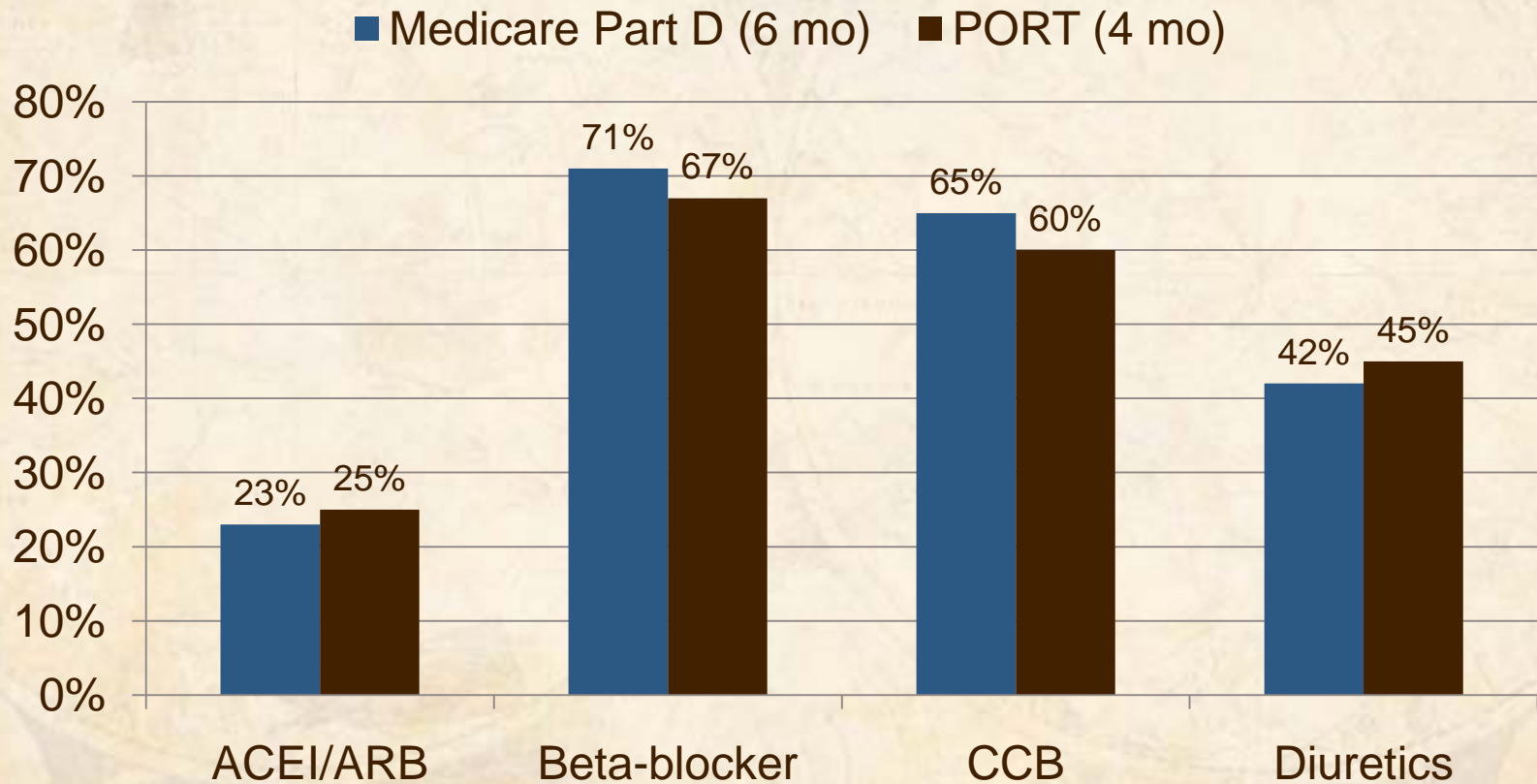
PORT Data & Methods

- The study population included all adult kidney transplant recipients with graft function 30 days post-transplant from a subset of the 14 participating transplant centers.
- Time trends were assessed for transplants occurring in 1990-2006.
- Recent use and odds of use by CVD risk group were assessed in the more recent patients, 2000-2007.
- 10 of 14 centers (N=15,410) provided data on use of various CVD agents, including:
 - Beta-blockers (8 centers), ACEIs/ARBs (9), calcium channel blockers (8), diuretics (8), other antihypertensive agents (8), antiplatelets (8), statins (10), and other lipid-lowering agents (9).
 - The population that survived 4 months was used to classify medication use in the first 4 months (N=14,236).
- Medication use was defined as using the medication at any time during each 30-day period post-transplant.

PORT: Medication Use During The First 4 Months Post-Transplant, By Year of Transplant.



Medicare Part D vs. PORT Results



Part D:

Cost Data

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Part D Medication Costs in the First 6 Months Post-Transplant

	No LIS		LIS	
	Costs per member per month	Out of pocket costs per user per month	Costs per member per month	Out of pocket costs per user per month
All Part D Medications	\$723.93	\$290.36	\$1,097.91	\$11.83
CVD Medications	\$71.32	\$33.66	\$72.11	\$2.06
Antidiabetic Medications	\$37.22	\$42.26	\$42.65	\$2.44
Antiviral Medication (Valganciclovir)	\$338.11	\$216.09	\$583.70	\$4.21



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