

# Reasons For Kidney Transplant Patients To Have Outpatient Urine Cultures In The First Year Post-transplant: An Analysis Of The USRDS

## BACKGROUND

- ❖ Urine cultures are frequently sent in the first year after kidney transplant.
- ❖ Tests may be ordered due to screening or due to concerns for infection.
- ❖ The reasons that testing is done post-transplant are not well understood.
- ❖ Understanding why clinicians order testing is key for implementing diagnostic stewardship.

## METHODS

- ❖ We used the United States Renal Data System, which combines Medicare billing data with UNOS transplant registry data.
- ❖ Institution and Physician Supplier billing files were used to identify outpatient urine cultures (HCPCS codes 87086 and 87088) for patients who underwent their first kidney transplant 2006-2013 with at least one year follow up with a functioning graft..
- ❖ We used ICD-9 codes from the same day as urine cultures to identify the reasons patients underwent outpatient urine culture testing.
- ❖ Mixed effects poisson models were used to test the hypothesis of center-to-center variation in test ordering between centers and quantify the proportion of testing variation contributed by center effect.
- ❖ All analyses done in Stata 16.0.

## RESULTS

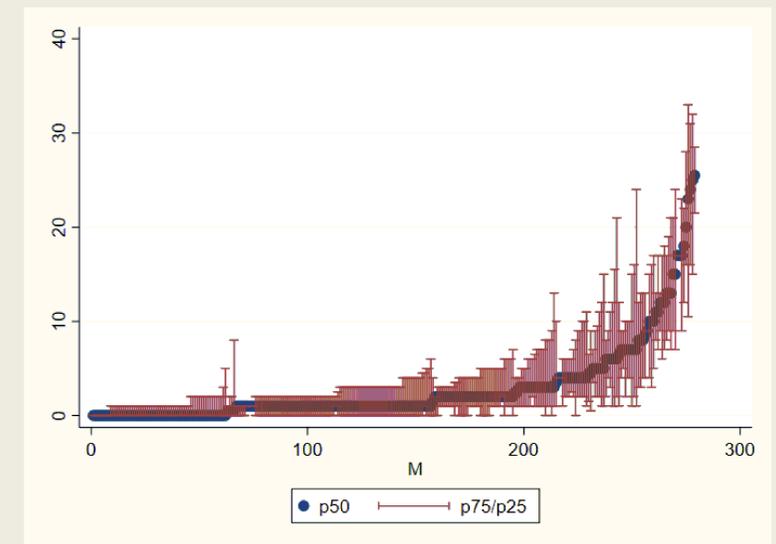
Table 1. ICD 9 codes associated with outpatient urine cultures, 2006-2014

Reason for Urine culture	ICD9	N (%)	Reason for Urine culture	ICD9	N (%)												
Suspected UTI	595.0, 595.3, 595.4, 597.0, 597.80, 597.81, 597.89, 599.0	183,002 (27.23%)	Sepsis	003.1, 020.2, 022.3, 038.0, 038.10, 038.11, 038.12, 038.19, 038.2, 038.3, 038.40, 038.41, 038.42, 038.43, 038.44, 038.49, 038.8, 038.9, 054.5	1,992 (0.30%)												
	Urinary symptoms			599.7, 599.70, 599.71, 599.72, 608.9, 625.9, 788.0, 788.1, 788.20, 788.21, 788.29, 788.30, 788.31, 788.32, 788.33, 788.34, 788.35, 788.36, 788.37, 788.38, 788.39, 788.41, 788.42, 788.43, 788.5, 788.61, 788.62, 788.63, 788.64, 788.65, 788.69, 788.7, 788.8, 788.91, 788.99		64,922 (9.66%)	Other bacterial infection	041.4	752 (0.11%)								
				Fever/Chills			780.6, 780.60, 780.61, 780.62, 780.63, 780.64, 780.65, 780.66, 778.4, 780.31, 780.32	11,674 (1.74%)	Nausea/vomiting	787.01, 787.02, 787.03, 787.04	7,578 (1.13%)						
							Pyelonephritis		590.00, 590.01, 590.10, 590.11, 590.2, 590.80, 590.81, 590.9	9,118 (1.36%)	Fatigue	78071, 78079	19,609 (2.92%)				
									Abdominal pain		789.00, 789.01, 789.02, 789.03, 789.04, 789.05, 789.06, 789.07, 789.09	15,084 (2.24%)	Altered mental status	780.01, 780.02, 780.09, 780.1, 780.2, 780.39, 780.4, 291.1, 292.81, 293, 293.1, 298.2	3,422 (0.51%)		
Abnormal labs		2886, 28860, 28862, 28866, 28869, 5849, 7910, 7944									32,725 (4.87%)		Pregnancy	*	1,012 (0.15%)		
		Pre-procedural											V7263, V7283, V7284	4,823 (0.72%)			

\* Over 50 pregnancy codes were used to identify pregnancy-related urine cultures.

- ❖ 76,983 patients met eligibility criteria and had at least one Medicare bill in each quarter of the first year post-transplant.
- ❖ 64,838 (84.2%) of patients underwent a total of 672,152 urine cultures in the first year post transplant.
- ❖ Most urine cultures were not associated with a diagnosis consistent with concern for infection (56.0%); 90.4% of these urine cultures were associated with generic post-transplant diagnosis codes (V42.0, V586.9)
- ❖ Significant center-to-center variation was seen in the number of urine cultures ordered per patient in the first year after transplant ( $p < 0.01$ ). 82.3% of the patient-to-patient variation in urine culture quantity was explained by transplant center effects.

Figure 1. Median and IQR of urine cultures ordered per patient at 279 U.S. transplant centers



## CONCLUSIONS

- Only a minority of urine cultures ordered in the first year after transplant 2006-2014 were associated with diagnosis codes suggesting a concern for infection.
- Over 50% of urine cultures were associated with codes suggested of post-transplant screening.
- Further studies should examine in further detail the reasons for center-to-center variation in urine culture ordering and the association with antibiotic ordering, to enable diagnostic stewardship.

## REFERENCES

- ❖ AB Massie, LM Kucirka, DL Segev. Big data in organ transplantation: registries and administrative claims. *Am J Transplant.* 2014 Aug;14(8):1723-30.
- ❖ Coussemant J, Scemla A, Abramowicz D, Nagler EV, Webster AC. Antibiotics for asymptomatic bacteriuria in kidney transplant recipients. *Cochrane Database Syst Rev.* 2018 Feb 1;2(2):CD011357.