# A predictive model to help identify factors associated with submitting 24-hour urine collections

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Introduction

- 24-hour urine collection is an essential part of the metabolic evaluation for kidney stone prevention

- Barriers to 24-hour urine collection include:
  - Patient compliance with test completion
  - Inadequate/inappropriate collections that cannot be interpreted properly
  - Lack of insurance coverage of testing

- Our goal was to create a predictive model to identify high risk patients for poor 24-hour urine submission compliance

Methods

Table 1. Demographics
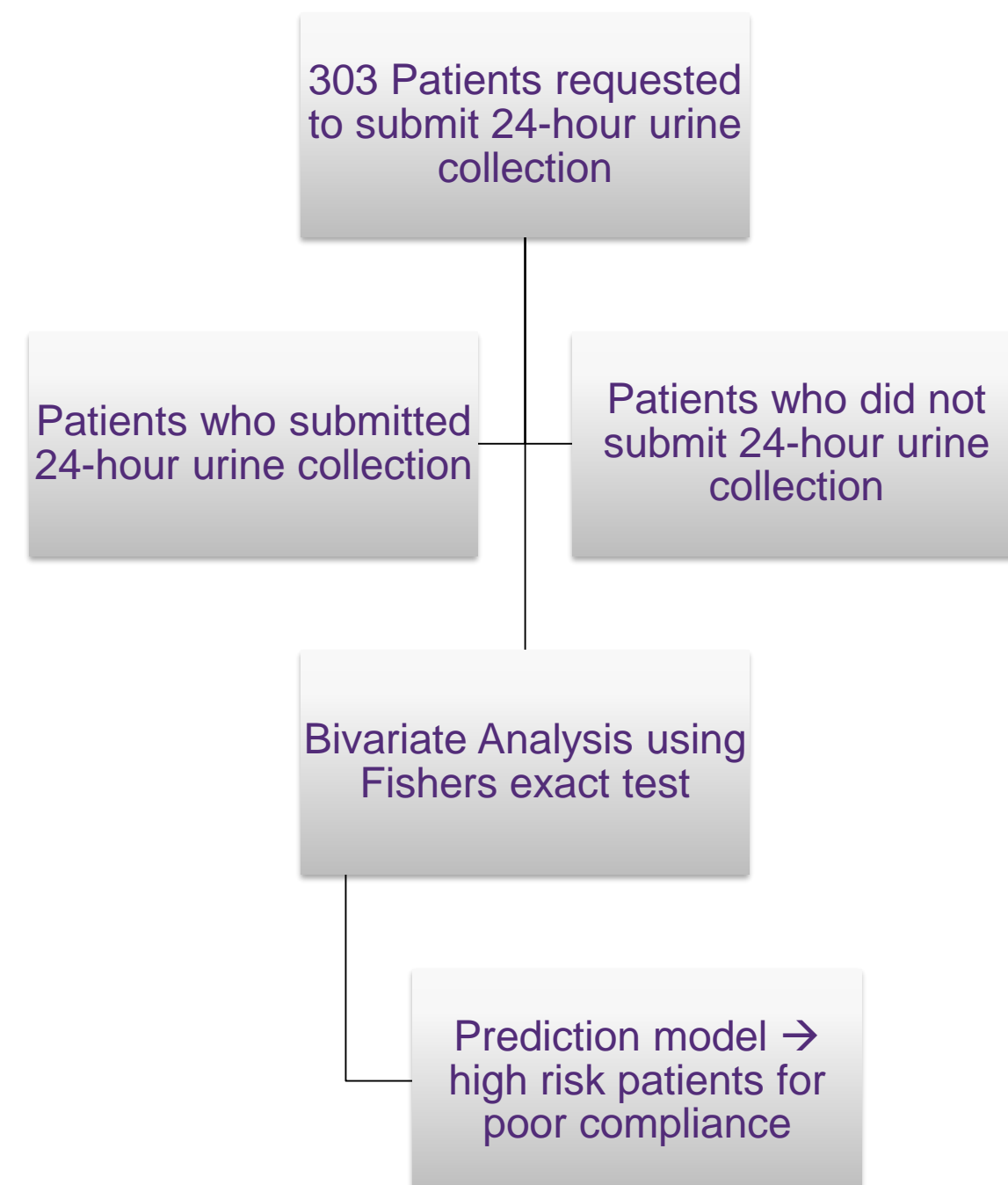
	24-Hour Urine	No 24-Hour Urine
Age	Mean = 51.6 years	Mean = 44.8 years
Gender	F = 59.2% M = 61.9%	F = 40.9% M = 38.1%
Race	Cauc = 68.1% AA = 60.0% Hisp = 47.9% Other = 59.3%	Cauc = 31.9% AA = 40.0% Hisp = 52.1% Other = 40.7%
BMI	Mean = 30.8	Mean = 30.1
Insurance Medicaid Private	 55.5% 62.9%	 44.5% 37.1%

Table 2. Compliance Data

	Yes – n (%)	No – n (%)
Initial 24-hour urine	183 (60.4%)	119 (39.4%)
Second 24-hour urine	68 (37.2%)	115 (62.8%)
Adequate Collection	79 (43.2%)	104 (56.8%)
Post op Imaging (+ 24-hour urine)	137 (74.9%)	46 (25.1%)
Post op Imaging (- 24-hour urine)	58 (48.3%)	62 (51.7%)

Table 3. Fisher's Exact Test

	Initial 24-hour urine collection completion % (N)		P-value
Age >50	71.4%	51.5%	<0.001
Metabolic Predisposition	70.6%	53.1%	0.003
No Surgery	97.7%	53.5%	<0.001

Table 4. Probability of completing 24-hour urine collection

	Surgery		No Surgery	
	Risk Factors	No Risk Factors	Risk Factors	No Risk Factors
Age ≤ 50	0.52 (0.40-0.64)	0.39 (0.30-0.48)	0.98 (0.85-1.0)	0.96 (0.78-0.99)
Age > 50	0.72 (0.62-0.81)	0.60 (0.49-0.70)	0.99 (0.93-1.0)	0.98 (0.89-1.0)

Results

Table 2. Compliance
- 183 (60.4%) patients submitted 24-Hour urine upon request
- 68 (37.2%) patients submitted 6 month follow up 24-Hour urine
- Only 43.2% of initial 24-Hour urine collections were adequate based on 24-hour creatinine clearance

Table 3. Patients more likely to submit 24-hour urine
- Age > 50 years
- Patients with a metabolic predisposition to kidney stones based on past medical history
- Patients who did not have surgery

Table 4. Probability of 24-hour urine completion
- All three variables were independent predictors on logistic regression
- Patients who undergo "Surgery" demonstrate poor 24-hour urine compliance

Conclusion

- Patients perceived surgery as definitive treatment for kidney stones
  - Increased risk for poor compliance
  - Potential increased risk for future recurrence
- Stresses the importance of counseling patients
  - Utility of metabolic work up for kidney stone prevention in those at high risk of recurrence
- Next step
  - Validate prediction model in a larger cohort at our institution and in other patient populations