

Increasing Percutaneous Nephrostomy Procedures in the United States: Contemporary Trends from the National Inpatient Sample

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BACKGROUND

Diagnostic and interventional radiology services are frequently consulted for placement and management of percutaneous nephrostomy tubes for a wide range of indications including urinary obstruction and leakage, as well as to provide accesses for subsequent urologic procedures including nephrolithotomy and ureteral stenting.

While this procedure is commonly used. Little is understood about the extent of its utilization and trends.

OBJECTIVES

- Assess annual changes in utilization of nephrostomy interventions
- Describe trends by geographic regions and hospital settings
- Evaluate differences in trends of nephrostomy placement and exchange.
- Better understand the evolving role of radiology in the management of urinary conditions

METHODS

The National Inpatient Sample (NIS), an all-payer, discharge-level, administrative database, was queried for years between 2005 to 2019 using ICD-9 and ICD-10 codes consistent with placement and exchange of nephrostomy tubes.

Procedure	ICD-9	ICD10
Percutaneous nephrostomy placement	5503	OT9030Z, OT9130Z, OT9330Z, OT9430Z, OT9630Z, OT9730Z, OT9830Z,
Percutaneous nephrostomy exchange	5593	OT25X0Z, OT29X0Z

Relevant data including patient demographics, hospital setting, and hospital geographic region as defined by the US Census were reviewed.

National estimates were made using discharge weights provided in the database. Compound annual growth rate was used to quantify change over time. Linear regression was used to identify significant trends.

RESULTS

A total of 525,719 nephrostomy tube placements and 213,421 exchanges occurred during the study period.

Annual volume of nephrostomy tube placement increased by 91.8%, from 27074 to 51915 (CAGR = 4.76%). Annual volume of exchange increased by 214.0%, from 8057 to 25295 (CAGR = 8.51%). Significant linear trends were observed in both nephrostomy tube placement and exchange (P < 0.001, P < 0.001).

These trends persisted when analyzed across all geographic regions including Northeast, Midwest, South, and West (P < 0.001 for all regions). The greatest rate of increase was seen in the West region (CAGR = 7.08% for placement, CAGR = 9.65% for exchange).

Most placements and exchanges occurred in urban teaching hospitals (84.4% of placements and 87.1% of exchanges in 2019). The proportion of procedures done in the urban teaching hospitals have also increased during the study period

DISCUSSION

An increase in percutaneous nephrostomy procedures in the inpatient setting has occurred. A higher rate of increase in nephrostomy tube exchange when compared to placement suggests an increasing population of patients with indwelling nephrostomy tubes. These trends illustrate an increasing healthcare burden and highlights the footprint of radiology services in the treatment of urologic conditions, where there appears to be an increasing demand.

Takeaway:

Percutaneous nephrostomy placement and exchange procedures have increased in the past 15 years. Rate of increase of exchange outstripped that of placement.

ACKNOWLEDGEMENT

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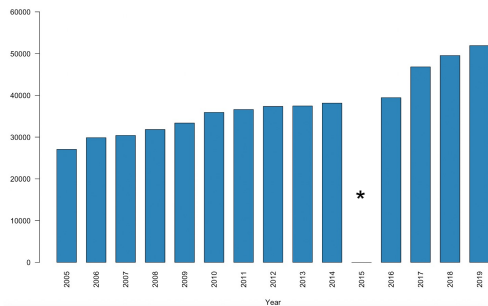


Figure 1) Number of percutaneous nephrostomy placements by year
* Data from 2015 were excluded given it included both ICD-9 and ICD-10

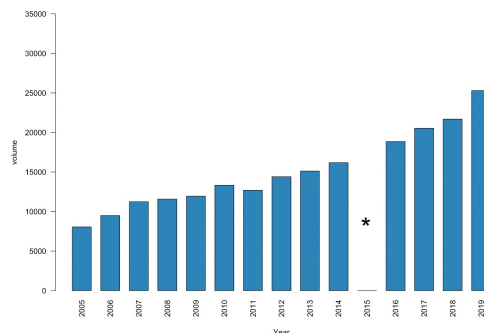


Figure 2) Number of percutaneous nephrostomy exchanges by year

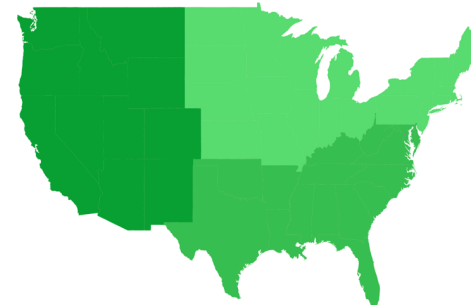


Figure 3a) percent change in percutaneous nephrostomy placement by region

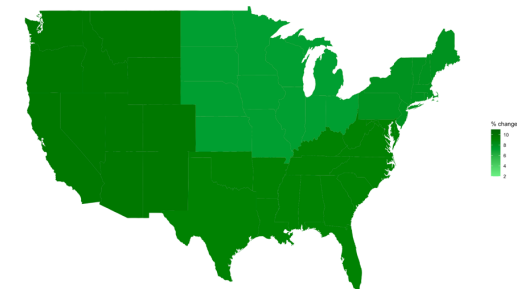


Figure 3b) percent change in percutaneous nephrostomy exchange by region