

**Screening Veterans for Postoperative Urinary Retention Using the Modified International  
Prostate Symptom Screening Tool**

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### **Abstract**

A modified validated screening tool, the International Prostate Symptoms Score (IPSS), was created to analyze the prevalence rate of postoperative urinary retention (POUR) in Veterans undergoing a general surgery procedure at Veterans Affairs Portland Health Care Systems. The rate of POUR in two months was 8.5%. A veteran's IPSS score was correlated with higher IPSS categories—moderate and severe ( $p<0.001$ ), increased age ( $p<0.001$ ), male gender ( $p=0.015$ ), use of an alpha-adrenergic antagonist prior to surgery ( $p=0.023$ ), a diagnosis of benign prostatic hyperplasia ( $p<0.001$ ), and a diagnosis of a urinary or prostate infection 30 days prior to surgery ( $p=0.025$ ), postoperative complications ( $p=0.041$ ), and postoperative urinary complications ( $p=0.007$ ). The rate of POUR was correlated with higher IPSS scores ( $p=0.013$ ), higher IPSS categories ( $p=0.001$ ), postoperative complications ( $p<0.001$ ), and postoperative urinary complications ( $p<0.001$ ). The data reinforces findings in the literature regarding the rates and risk factors for developing the condition. Screening veterans for POUR is essential in recognizing those at risk for developing POUR, and understanding a veteran's risk for developing it can help direct future interventions.

# **Screening Veterans for Postoperative Urinary Retention Using the Modified International Prostate Symptom Screening Tool**

## **Introduction**

### **Problem Description**

Postoperative urinary retention (POUR) is the inability to urinate after a surgical procedure despite having a full bladder (Agrawal et al., 2019). It is a postoperative complication typically relieved by urethral catheterization (Agrawal et al., 2019; Jackson et al., 2019). The prevalence of POUR has a range of 5-70%. The wide range is due to a lack of a standardized definition that accounts for procedure-and patient-specific differences (i.e., type of surgery, anesthetic used, length of surgery, age, gender, pre-existing neurological and urinary conditions, and diabetes mellitus[DM]) (Agrawal et al., 2019; Jackson et al., 2019; Scott et al., 2018). In the Veterans Health Administration (VHA), the prevalence of POUR is 23% (Mull et al., 2018). It is often underestimated and causes significant patient discomfort postoperatively, including unplanned hospital admissions or discharge with a urinary catheter, increasing the risk for infection (Agrawal et al., 2019; Jackson et al., 2019; Scott et al., 2018). If left untreated, distention of the bladder can potentially cause acute kidney injury, detrusor muscle damage, and urinary tract infections (UTI) (Agrawal et al., 2019). Early identification of those at risk preoperatively is necessary for improving patient outcomes.

### **Available Knowledge**

Currently, there is no agreement on the diagnosis and management of POUR (Kim et al., 2015). The majority of prevailing research focuses on identifying those at risk for developing the condition. There is a wide variability in the diagnosis and treatment, and it is challenging to recommend definite guidelines. The diagnosis and treatment tend to be facility and provider-dependent. Patients should be provided education preoperatively on the risks and treatment of developing POUR (Agrawal et al., 2019). A bladder volume greater than 270 milliliters (ml), four

to six hours after surgery, is a risk factor for developing POUR and typically requires urinary catheterization (Agrawal et al., 2019). Urinary catheterization-associated UTIs are a common nosocomial infection. UTI incidence increases by 5-7% each day a catheter is in place (Agrawal et al., 2019). The type of surgery increases a patient's risk of developing the condition. The surgical services at the highest risk for developing POUR include joint arthroplasty (10.7-84%), anorectal (1-52%), hernia repair (5.9-38%), and gynecological (4-15%) (Jackson et al., 2019). Increased age is also a significant risk factor ( $p=0.018$ ) (Scott et al., 2018). Studies have reported an increased risk after age 56 ( $p=0.002$ ) and age 40 ( $p<0.001$ ) (Kim et al., 2015; Scott et al., 2018). As age advances, the risk of catheterization increases. Male gender also increases the risk ( $p=0.018$ ) (Kim et al., 2015). Research suggests that 80% of patients who develop the condition have some prior voiding difficulty (Agrawal et al., 2019). A patient having a history of lower urinary tract symptoms increases the likelihood of developing POUR (OR 2.83) (Scott et al., 2018). Research concluded that a patient with a preoperative post-void residual greater than 10 ml and a history of urologic disease or symptoms is associated with the condition ( $p<0.001$ ) (Pivec et al., 2021). The administration of alpha-adrenergic antagonists can reduce the rate (OR 0.35 at 95% CI) (Agrawal et al., 2019; Jackson et al., 2019). Having the patient void before surgery has also shown to be beneficial (OR 0.35 at 95% CI) (Buchko et al., 2013; Kim et al., 2015).

Surgical centers have either employed a validated screening tool or designed a tool to predict the risk of developing POUR based on accepted risk factors. The most widely used screening tool is the International Prostate Symptoms Score (IPSS), presented in Appendix A. The American Urological Association developed the IPSS, which can be administered to male and female patients since they experience similar urinary symptoms. The IPSS is a preoperative questionnaire administered by either a healthcare professional or self-administered, containing questions about the patient's urinary symptoms in the past month (Santini et al., 2019). It is a highly predictive and straightforward tool for evaluating high-risk individual urinary outcomes

after surgery (Fazeli et al., 2015; Kieffer & Kane, 2012; Santini et al., 2019). In one study, the majority of those who scored moderate (63% of patients) or severe (83.3% of patients) on the IPSS developed the condition (Kieffer & Kane, 2012). Established risk factors can be used to stratify a patient's risk of developing POUR, including gender, age, medical comorbidities, type of surgery, length of surgery, and type of anesthesia (Agrawal et al., 2019; Kim et al., 2015; Pivec et al., 2021). These risk factors do not quantify the patient's preoperative urinary function (Pivec et al., 2021). To capture those higher at risk of developing the condition, the IPSS should also incorporate other set risk factors, including age, gender, type of surgery, and type of anesthesia (Fazeli et al., 2015). The IPSS and established patient risk factors help providers determine high-risk patients for developing POUR and guide management decisions.

Once patients have been screened with preoperative tools and identified as high risk, surgical centers develop standardized protocols. Following these protocols can support decision-making, leading to fewer urinary catheterizations and a shorter length of stay (Buchko et al., 2013). There is no agreed-upon protocol to prevent the condition. Using the IPSS can help determine a patient's risk of developing the condition. An increased IPSS score was associated with an increased rate of POUR ( $p=0.025$ ;  $p=0.002$ ) (Fazeli et al., 2015; Kieffer & Kane, 2012). The higher a patient scores on the IPSS, the more likely the patient will require catheterization postoperatively (moderate  $p=0.59$ ; severe  $p<0.001$ ) (Santini et al., 2019). The IPSS can be used to improve patient outcomes perioperatively.

## **Rationale**

The project utilized the Model for Improvement (MFI), developed by the Institute for Healthcare Improvement (IHI). The model utilizes improvement science, which "emphasizes innovative, rapid-cycle testing in the field, and spread in order to generate learning about what changes, in which context, produce improvements" (Institute for Healthcare and Improvement [IHI], 2021, para. 2). The IHI's MFI supports the success in achieving the project's aim by implementing an interdisciplinary model that incorporates definite aims and measurements that

supports small, rapid-cycle testing of changes to occur by applying the Plan-Do-Study-Act (PDSA). The PDSA cycle permits testing a change on a small scale, learning from each test, and further improving the change through additional PDSA cycles (IHI, 2021). The Veterans Affairs Portland Health Care Systems (VAPORHCS) currently does not have a standard practice or protocol for screening it. By initiating a POUR screening process, we will fill this gap and achieve the aim of identifying those veterans at risk.

### **Specific Aims**

From December 2021 to March 2022, VAPORHCS will institute a screening protocol for veterans at risk of developing POUR by administering a modified IPSS. Preoperative screening for POUR via the modified IPSS will occur in all general surgery (GS) veterans for two months.

## **Methods**

### **Context**

VHA divides the nation into 19 geographical regions termed Veterans Integrated Service Networks (VISN). VAPORHCS is located in VISN 20—Northwest Network. VISN 20 encompasses five Veterans Affairs hospitals, 51 outpatient clinics, three vet centers, 17 counseling centers, community living centers, and domiciliary in Alaska, Washington, Oregon, most of Idaho, one county in Montana, and one county in California. VISN 20 covers 135 counties and includes 23% of the landmass and 17% of the United States population. VISN 20 serves over 1.1 million veterans annually, with VISN 20 seeing the most significant increase in total and new veterans served (United States Department of Veteran Affairs [US Department of VA], 2021). VISN 20 has a solid veteran-focused culture with an emphasis on continuous improvement. The VISN receives national accolades for supporting quality improvement goals. The VISN believes in developing staff to implement quality improvement projects to improve practices shared across the VISN (US Department of VA, 2021).

VAPORHCS is a 227-bed facility that serves more than 95,000 veterans annually from Oregon and Southwest Washington (US Department of VA, 2020b). VAPORHCS conducts



hundreds of surgical procedures monthly from twelve specialties (US Department of VA, 2020a). Like the VISN, leadership in the operative care department (OCD) supports quality improvement projects and this project. Leadership in OCD provided support and resources in project planning.

### **Intervention**

The IPSS is a validated and reproducible screening tool for POUR. The IPSS incorporates questions about urinary symptoms and quality of life. Before implementation, the chief of GS, Karen L. Kwong MD, FACS, approved the project. Before implementation, informal interviews with key stakeholders (i.e., nursing, anesthesia, surgeons, and management) were also conducted to appraise the necessity and value of screening veterans preoperatively for POUR. Also, prior to implementation, the doctor of nursing (DNP) student first trialed the IPSS by asking veterans the IPSS questions prior to surgery. After trialing the IPSS, the DNP student considered both Veteran and OCD staff feedback to modify the IPSS tool to facilitate understanding. Refer to appendix B for the modified IPSS. In preparation for the veteran's scheduled surgery, the DNP student introduced the IPSS tool to the veteran and answered any questions by a preoperative phone call. If the veteran agreed, the DNP student administered the modified IPSS via the telephone. Preoperative phone calls were confined to only Veterans planning GS procedures for two months to capture 50 Veterans undergoing a GS procedure. The project utilized four PDSA cycles—at week two, week four, month two, and month three. During implementation, veteran IPSS data was gathered for analysis. Prospective chart reviews for veteran demographics, POUR prevalence, and postoperative complications after discharge occurred monthly. Data was provided to OCD and the chair of GS to determine any education or interventions beneficial for VAPORHCS veterans.

### **Measures**

The primary outcome measure for this project is the modified IPSS score preoperatively between January-March 2022. A secondary outcome measure is whether the veteran

developed POUR postoperatively. Process measures include IPSS scoring (i.e., low risk 1-8, medium risk 9-20, and high risk 21-35) and veteran demographics (i.e., age, gender, medical comorbidities, anesthesia type, and postoperative complications). Balancing measures included: having the DNP student screen veterans preoperatively may increase the burden on the DNP student and system. It can increase workload, leading to increased veteran and DNP student frustration. In order to assess that data is complete weekly, the DNP student acquired the GS schedule from the chief of GS. Preoperative phone calls occurred on 100% of veterans from January-March 2022. Postoperative prospective chart reviews transpired on 100% of veterans to assess for veteran demographics and any postoperative complications.

### **Analysis**

The improvement project occurred over three months, between December-March 2022. The data collected during months one, two, and three was analyzed. Analysis of veteran IPSS scores occurred utilizing SPSS statistical software. Verification of accurate statistical analysis ensued via Preventative Medicine and Community Health employees at the Centers of Disease Control and Prevention. Data was further stratified (i.e., gender, age, comorbidities, type of anesthesia, and postoperative complications). No veteran identifiers were collected. Oregon Health and Science University's (OHSU) encrypted cloud service stored the spreadsheet data.

### **Ethical Considerations**

Staff at VHAPORHCS OCD were informed of the project. Prior to implementation, consent was granted by the chief of GS. Participation by veterans was solely voluntary. Veterans were informed that the IPSS questionnaire is a quality improvement project and allowed questions before administration. No veteran identifiers were documented. The participating clinical site permitted the project—by signing a letter of support. The proposal was submitted to the VAPORHCS Institutional Review Board (IRB) and OHSU's IRB (Study #00023284); both deemed the proposal not a research study.

## Results

The project coincided with the SARS-CoV-2 (COVID-19) pandemic, including the Delta and Omicron variants that overwhelmed healthcare systems in 2021 (Kaye et al., 2021). As a result, surgery centers nationwide canceled and postponed elective and non-emergent surgeries during COVID-19 surges, allowing for the redistribution of staff and healthcare resources to care for patients with COVID-19 (Nepogodiev et al., 2022). VHAPORHCS canceled all elective and non-emergent surgeries during the Delta and Omicron variant surges, and OCD staff made up the majority of the labor pool, being employed in more critical roles. The project was to include all ambulatory surgeries in the outpatient surgery unit (OSU) over three months. The intent was to have the nurse in the preoperative holding area administer the IPSS to every patient. However, the project was delayed with the low surgery census and staff deployed to the labor pool. In the Fall of 2021, this proposal was redesigned with COVID-19 cases stabilizing and surgeries starting again. OCD staff had a staffing shortage and were already asked to take on more daily responsibilities. Management advised and guided the DNP student to take on the project solo. Management also suggested that only GS veterans be included. GS veterans were determined by a previous student who analyzed the rates of urinary complications via surgery specialty, with urology, GS, and neurosurgery having the highest complications.

### ***PDSA Cycle One and Two***

The DNP student trialed the IPSS on 10 Veterans for the first two weeks. The IPSS was administered to males and females aged between 42 and 81 and varying surgical specialties. After administering the IPSS, informal interviews with the Veterans occurred to evaluate their understanding of IPSS questions. In weeks three and four, the DNP student requested OCD staff to look at the IPSS and provide feedback on the screening tool. From Veterans and OCD staff feedback, the IPSS was modified to ease the understanding of questions. The phrasing of

IPSS questions were simplified, and the frequency was revised to a percentage of how frequently symptoms occurred.

### ***PDSA Cycle Three and Four***

During months two and three, the DNP student provided preoperative phone calls administering the modified IPSS. During this period, 52 veterans were included. One hundred percent of veterans agreed to answer the IPSS questionnaire. The average age of participants was 66; 48 (92.3%) were male, and four (7.7%) were female. Four participants (7.7%) had their surgery canceled by testing positive for COVID-19, and one participant was anuric and on dialysis. The average IPSS score was 12. Twenty veterans scored mild (38.5%), 20 also scored moderate (38.5%), and 12 with a severe score (23.1%). The project also investigated veteran characteristics that could put a Veteran at risk for developing POUR. Thirty-two point seven percent of veterans were on an alpha-adrenergic antagonist prior to surgery, 23.1% were diagnosed with benign prostatic hyperplasia (BPH), 32.7% with DM, 1.9% with spine or pelvic trauma, 1.9% had a UTI or prostate infection 30 days preceding surgery. Prior to surgery, no patients experienced a cystocele, stroke, or multiple sclerosis. Chart reviews concluded that 7 (14.9%) of veterans encountered postoperative complications, and 10.6% experienced urinary complications. The overall POUR rate was four Veterans or 8.5%. It was diagnosed via a prospective chart review with charted urinary retention that required intermittent straight catheterization or an indwelling catheter within seven days after the surgical procedure. The Veteran's IPSS score was statistically correlated with IPSS categories ( $p<0.001$ ), age ( $p<0.001$ ), gender ( $p=0.015$ ), alpha-adrenergic antagonist use prior to surgery ( $p=0.023$ ), BPH diagnosis ( $p<0.001$ ), a diagnosis of UTI or prostate infection 30 days preceding surgery ( $p=0.025$ ), postoperative complications ( $p=0.041$ ), and postoperative urinary complications ( $p=0.007$ ). The rate of POUR was statistically correlated with IPSS scores ( $p=0.013$ ), IPSS categories ( $p=0.001$ ), postoperative complications ( $p<0.001$ ), and postoperative urinary complications ( $p<0.001$ ).

## Discussion

The overall rate of POUR was 8.5% in Veterans undergoing GS procedures in January and February of 2022. A modified IPSS was utilized to correlate a veteran's risk of developing the condition. The results from this project are comparable to the results encountered in the literature. A veteran's IPSS was statistically correlated with the IPSS category, increased age, male gender, the use of an alpha-adrenergic antagonist prior to surgery, BPH diagnosis, and a UTI or prostate infection 30 days prior to surgery, postoperative complications, and postoperatively urinary complications. The rate of POUR was statistically correlated with higher IPSS scores and categories, postoperative complications, and postoperative urinary complications (Agrawal et al., 2019; Chang et al., 2021; Fazeli et al., 2015; Jackson et al., 2019; Kieffer & Kane, 2012; Kim et al., 2015; Mason et al., 2016; Pivec et al., 2021; Santini et al., 2019; Scott et al., 2018; Sirisreetreerux et al., 2021; Wu et al., 2012).

The project's PDSA cycles demonstrated that simplifying the IPSS questionnaire aided understanding and satisfaction with the tool. Staff satisfaction was also increased by having the DNP student exclusively take on the project, permitting OCD staff to concentrate on what they do best, taking care of veterans. The results indicated that GS veterans who developed POUR had identical risk factors established in the literature—male, increased age, symptoms of lower urinary tract problems (BPH, UTI, prostate infection), and a diagnosis of DM. The project results also revealed that the prevalence rates are unknown without a standardized approach for POUR; leading to poorer outcomes (i.e., increased hospital admission, longer stay in the post-anesthesia care unit [PACU], urinary catheterization, unnecessary emergency room visits, and decreased nursing and provider satisfaction). VAPORHCS should implement a standardized protocol for POUR by administering the IPSS. Those veterans scoring moderate and severe should be provided education. OCD may also include using alpha-adrenergic antagonists preoperatively, early mobilization after surgery, and bladder ultrasound in PACU to help guide decisions on catheterization.

Limitations of the project include that it transpired during the COVID-19 pandemic. There was limited operative room capacity and a backlog of delayed surgeries during this time. In February 2022, over 1,000 veterans were still waiting on their original surgery to be rescheduled (B. Witke, personal communication, February 28, 2022). Only one surgery specialty was included, making it difficult to generalize findings to other specialties. Also, this project only had one individual providing preoperative phone calls to administer the modified IPSS and perform prospective chart reviews. The DNP student was not present daily and relied on an established surgery schedule, and the DNP student may have missed any add-on surgeries. Also, an OSU nurse was involved in a simultaneous project on the effect of discharging a veteran home with an indwelling catheter and returning to urology at a later date versus "filling and pulling" the catheter in PACU, which may have reduced the pool of eligible candidates.

### **Conclusion**

The IPSS can assess a veteran's risk for developing POUR. The IPSS captured 8.5% of veterans at risk for developing the condition, with statistical correlations of risk factors established for IPSS scores and those who developed POUR. Understanding a veteran's risk allows the clinician to be better prepared to educate and intervene—preserving healthcare costs, reducing the length of stay, and decreasing the veteran's discomfort and anxiety. Implementing a quality improvement project during a pandemic was challenging. It is necessary to be flexible and determine what can be done for improvement while not adding to an already heavy workflow. Had this project not occurred during a pandemic, it would be beneficial to have the tool added to the preoperative screening, nurse practitioners (NP) conduct prior to surgery. The NP is already screening for postoperative nausea, vomiting, and obstructive sleep apnea through valid questionnaires. The IPSS results would be available on the preoperative screening form and visible to clinicians during the perioperative process. Additional surgical services should be included in future interventions.

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### Appendix A: International Prostate Symptoms Score Questionnaire

Question	Not at All	Less than 1 in 5	Less than ½ the time	About ½ the time	More than ½ the time	Almost Always	Score
<b>Incomplete Emptying</b> Over the past month, how often have you had the sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
<b>Frequency</b> Over the past month, how often, have you had to urinate again less than 2 hours after you finished urinating?	0	1	2	3	4	5	
<b>Intermittency</b> Over the past month, often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
<b>Urgency</b> Over the past month, how difficulty have you found it to postpone urination?	0	1	2	3	4	5	
<b>Weak Stream</b> Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
<b>Straining</b> Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	
<b>Nocturia</b> Over the past month, how many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	
<b>Total</b>							

(Santini et al., 2019)

## Appendix B: Modified International Prostate Symptoms Score Questionnaire

**Instructions:** Please mark the patient's response to how often, from 0-100% of the time, the following urinary symptoms occurred in the past month.

	0%	1-19%	20-49%	50%	51-79%	80-100%
<b>Incomplete Emptying</b> Over the past month, how often have you had the sensation of <u>not</u> being able to empty your bladder completely after you finish urinating?						
<b>Frequency</b> Over the past month, how often had you have to urinate again, less than 2 hours after you previously urinated?						
<b>Intermittency</b> Over the past month, how often have you found you stopped and started again several times while you were urinating?						
<b>Urgency</b> Over the past month, how difficult have you found it to postpone urination?						
<b>Weak Stream</b> Over the past month, how often have you had a weak urinary stream?						
<b>Straining</b> Over the past month, how often have you had to push or strain to begin urinating?						
	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Nocturia</b> Over the past month, how many times did you typically get up during the night to urinate?						

**Chart Review:**

<b>Patient's Age</b>	
<b>Patient's Gender</b>	
<b>Was patient on an alpha-adrenergic antagonist prior to surgery?</b>	<input type="checkbox"/> Yes
	<input type="checkbox"/> No
<b>Surgery</b>	
<b>Surgery Length</b>	
<b>Anesthesia Type</b>	
<b>Comorbidities</b>	<input type="checkbox"/> BPH
	<input type="checkbox"/> Cystocele
	<input type="checkbox"/> Diabetes Mellitus
	<input type="checkbox"/> CVA
	<input type="checkbox"/> MS
	<input type="checkbox"/> Trauma to spine/pelvis
	<input type="checkbox"/> Infection (prostate/UTI)
<b>Any complications postoperatively?</b>	<input type="checkbox"/> Yes
	<input type="checkbox"/> No

**Notes:**

### Appendix C: Data

#### Descriptive Data

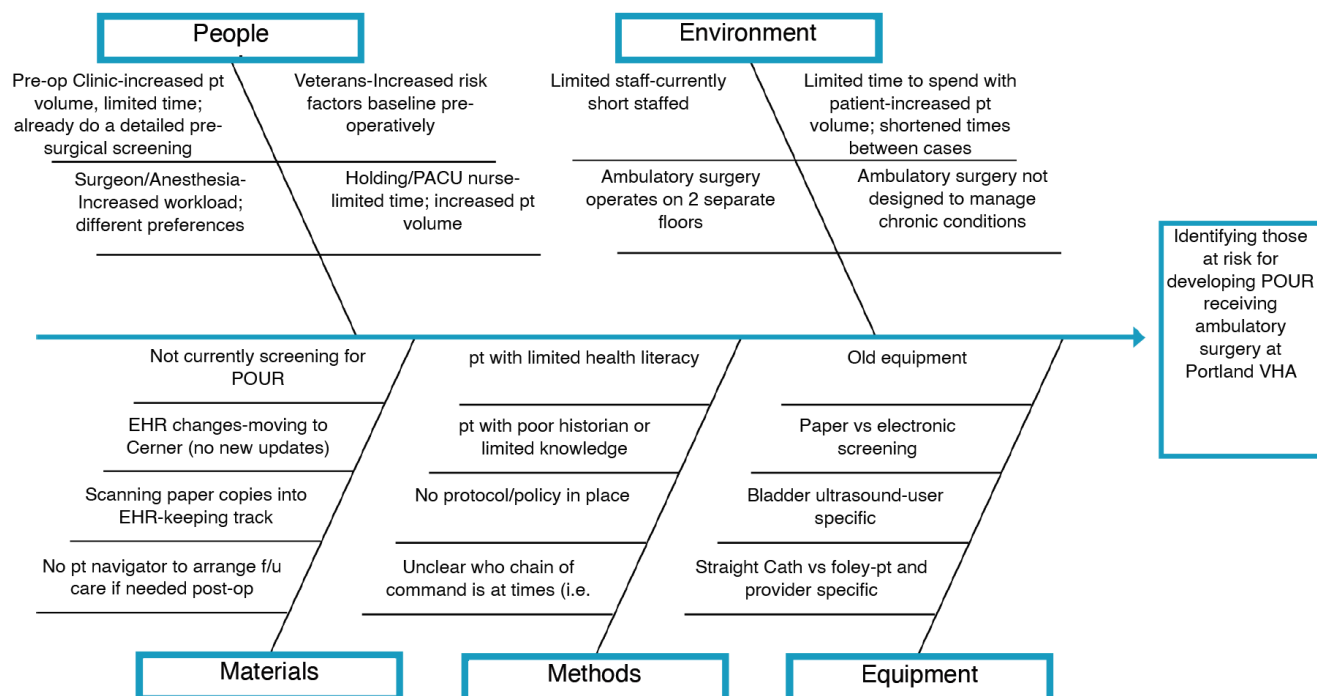
	Totals	Mean	Standard Deviation	Variance	Min.	Max.
<b>IPSS Score</b>		11.7885	8.74998	76.562	0	34
<b>IPSS Category</b>	<b>Mild</b> 20/52 (38.5%)		0.77674	0.63		
	<b>Moderate</b> 20/52 (38.5%)					
	<b>Severe</b> 12/52 (23.1%)					
<b>Age</b>	<b>&lt;50</b> 7/52 (13.5%)	66.2692	12.18986	148.593	30	92
	<b>51-60</b> 4/52 (7.7%)					
	<b>61-70</b> 18/52 (34.6%)					
	<b>&gt;71</b> 23/52 (44.2%)					
<b>Gender</b>	<b>Male</b> 48/52 (92.3%)		0.26907	0.072		
	<b>Female</b> 4/52 (7.7%)					
<b>Alpha-Adrenergic Antagonist</b>	<b>No</b> 35/52 (67.3%)		0.47367	0.224		
	<b>Yes</b> 17/52 (32.7%)					
<b>BPH</b>	<b>No</b> 40/52 (79.9%)		0.42544	0.181		
	<b>Yes</b> 12/52 (23.1%)					
<b>Cystocele</b>	<b>No</b> 52/52 (100%)					
	<b>Yes</b> 0/52 (0%)					
<b>DM</b>	<b>No</b> 35/52 (79.9%)		1.3269	0.47367		
	<b>Yes</b> 17/52 (32.7%)					
<b>CVA</b>	<b>No</b> 52/52 (100%)					
	<b>Yes</b> 0/52 (0%)					
<b>MS</b>	<b>No</b> 52/52 (100%)					
	<b>Yes</b> 0/52 (0%)					

	Totals	Mean	Standard Deviation	Variance	Min.	Max.
Trauma	No 51/52 (98.1%)		1.0192	0.13868		
	Yes 1/52 (1.9%)					
Infection	No 51/52 (98.1%)		1.0192	0.13868		
	Yes 1/52 (1.9%)					
Post-Op Complications	No 40/47 (85.1%)		0.35987	0.130		
	Yes 7/47 (14.9%)					
Urinary Post-Op Complications	No 42/47 (89.4%)		0.31166	0.097		
	Yes 5/47 (10.6%)					
POUR	No 43/47 (91.5%)		0.28206	0.080		
	Yes 4/47 (8.5%)					

**Bivariate Data:**

	<b>Pearson's Correlation</b>	<b>P- Value</b>	<b>Paired T Score</b>	<b>P- Value</b>
<b>IPSS Score + IPSS Category</b>	0.892	<0.001	8.890	<0.001
<b>IPSS Score + Age</b>	0.579	<0.001	-38.948	<0.001
<b>IPSS Score + Gender</b>	-0.334	0.015	8.734	<0.001
<b>IPSS Score + Alpha Adrenergic Antagonist</b>	0.315	0.023	8.759	<0.001
<b>IPSS Score + BPH</b>	0.588	<0.001	8.949	<0.001
<b>IPSS Score + DM</b>	0.154	0.275	8.682	<0.001
<b>IPSS Score + Trauma</b>	-0.013	0.929	8.872	<0.001
<b>IPSS Score + Infection</b>	0.310	0.025	8.918	<0.001
<b>IPSS Score + Post-Op Complications</b>	0.299	0.041	8.978	<0.001
<b>IPSS Score + Urinary Post-Op Complications</b>	0.390	0.007	9.030	<0.001
<b>IPSS Score + POUR</b>	0.361	0.013	9.027	<0.001
<b>POUR + IPSS Category</b>	0.452	0.001	-7.827	<0.001
<b>POUR + Age</b>	0.152	0.307	-38.969	<0.001
<b>POUR + Gender</b>	-0.064	0.668	0.814	0.420
<b>POUR + Alpha Adrenergic Antagonist</b>	0.246	0.095	-3.803	<0.001
<b>POUR +BPH</b>	0.192	0.197	-2.195	0.033
<b>POUR + DM</b>	0.103	0.492	-3.301	0.002
<b>POUR + Trauma</b>	-0.045	0.764	1.353	0.183
<b>POUR + Infection</b>	-0.045	0.764	1.353	0.183
<b>POUR + Post-Op Complications</b>	0.729	<0.001	-1.771	0.083
<b>POUR + Urinary Post-Op Complications</b>	0.884	<0.001	-1.00	0.323

## Appendix D: Cause and Effect Diagram





## Appendix E: Project Timeline

## Proposed Project Time line

[illegible]

### Actual Project Timeline

[illegible]



## Appendix F: Letter of Support

### Letter of Support from Clinical Agency

Date: 05/24/2021

Dear To Whom to May Concern,

This letter confirms that I, Megan Pollard, allow Nicole Miller (OHSU Doctor of Nursing Practice Student) access to complete his/her DNP Final Project at our clinical site. The project will take place from approximately July 2021 to October 2021.

This letter summarizes the core elements of the project proposal, already reviewed by the DNP Project Preceptor and clinical liaison (if applicable):

- **Project Site(s):** VA Portland Operative Services  
3170 SW US Veterans Hospital Rd  
Portland, OR 97239

**Project Plan:** The prevalence of POUR ranges from 5-70% due to a lack of a standardized definition (Agrawal et al., 2019). In the VHA, for outpatient surgery, the prevalence of POUR is estimated to be 23% (Mull et al., 2018). POUR is often underestimated and causes significant patient discomfort. Early identification of those at risk preoperatively is necessary for improving patient outcomes (Agrawal et al., 2019). One way of identifying those at risk for POUR is by administering a standardized, validated tool such as the International Prostate Symptom Score (IPSS) questionnaire. This project will use the IPSS to identify veterans at risk for developing POUR. The IHI's model for improvement will be used for testing change with PDSA cycles. Other theories/frameworks that are important in nurse-driven protocols include Lewin's Change Theory, Transformative Learning Theory, Watson's Caring Theory, Kolcaba's Theory of Comfort, and Peplau's Nurse-Patient Relationship Theory. The goal is to initiate the IPSS screening tool during the preoperative (holding process) starting in August 2021. Screening with IPSS will occur for 3 months. Pre and post-intervention interviews with key stakeholders will occur, and staff will be introduced to the screening tool before implementation. The IPSS form will be collected, and data will be analyzed based on set outcome measures. Data analyzed include IPSS score, whether the patient developed POUR, and patient demographics (age, sex, medical comorbidities, surgical service, anesthesia type, and postoperative complications). No patient identifiers will be included. Data will be kept in a spreadsheet in OHSU's encrypted cloud service, BOX. Run charts of the data will be analyzed at months 1, 2, and 3.

Agrawal, K., Majhi, S., & Garg, R. (2019). Post-operative urinary retention: Review of literature. *World Journal of Anesthesiology*, 8(1), 12. <https://doi.org/10.5313/wja.v8.i1.1>

Mull, H. J., Itani, K. M. F., Chams, M. P., Pizer, S. D., Rivard, P. E., Hawn, M. T., & Rosen, A. K. (2018). The nature and severity of adverse events in select outpatient surgical procedures in the veterans health administration. *Qual Manag Health Care*, 27(3), 136-144. <https://doi.org/10.1097/QMH.0000000000000177>

During the project implementation and evaluation, Nicole Miller will provide regular updates and communicate any necessary changes to the DNP Project Preceptor.

Our organization looks forward to working with this student to complete their DNP project. If we have any concerns related to this project, we will contact Nicole Miller and Dr. Benjamin Schultze (student's DNP Project Chairperson).

Regards,

MEGAN POLLARD  
DNP Project Preceptor

M. Pollard  
Signature

PERIOP. ASSISTANT MANAGER  
Job Title

6/1/2021  
Date Signed

**Appendix G: Veterans Affairs Portland Health Care System—Institutional Review Board****Approval**

VA Portland Health Care System (VAPORHCS)  
Institutional Review Board (IRB)

**CHECKLIST: QUALITY ASSURANCE OR IMPROVEMENT (QA/QI) OR RESEARCH?**

☒ **Not Research.** The ACOS/R&D has determined that based on the responses above and the proposed project description approval by an IRB or other review committee is not needed. The project is considered to be non-research VHA operations activity. If the results of this project are presented or published they cannot be presented as research, nor does it have research approval.

☐ **Research Project.** As designed this project requires review by an IRB or other appropriate review committee *prior* to initiation. Please refer to the VAPORHCS R&D [website](#) for guidance.

☐ Additional information is needed to make a determination. See comments below.

ACOS/R&D or IRB Analyst Comments:

VAPORHCS ACOS/R&D Signature: DAVID M COHEN  
386526

Digitally signed by DAVID M  
COHEN 386526  
Date: 2021.06.11 15:45:33 -07'00'  
Date:

## Appendix H: Oregon Health and Sciences University—Institutional Review Board

### Approval



## IRB MEMO

Research Integrity Office

3181 SW Sam Jackson Park Road - L106RI  
Portland, OR 97239-3098  
(503)494-7887 irb@ohsu.edu

### NOT HUMAN RESEARCH

July 19, 2021

Dear Investigator:

On 7/19/2021, the IRB reviewed the following submission:

Title of Study:	Postoperative Urinary Retention in Veterans and Use of the International Prostate Symptom Score Questionnaire at Portland VA Surgical Center
Investigator:	<a href="#">Nicole Miller</a>
IRB ID:	STUDY00023284
Funding:	None

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

Certain changes to the research plan may affect this determination. Contact the IRB Office if your project changes and you have questions regarding the need for IRB oversight.

If this project involves the collection, use, or disclosure of Protected Health Information (PHI), you must comply with all applicable requirements under HIPAA. See the [HIPAA and Research website](#) and the [Information Privacy and Security website](#) for more information.

Sincerely,

The OHSU IRB Office