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## The Impact of the Nurse Practitioner in Pre-Admission Testing: A Comparative Review

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THE IMPACT OF THE NURSE PRACTITIONER IN

DNP Final Project Report

The Impact of the Nurse Practitioner in Pre-admission Testing: A Comparative Review

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Fall 2018

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### Dedication

I would like to take this moment to dedicate my work and DNP project to my mother, and my two children. While they always speak of how I inspire them, the truth is they are in fact the source of my inspiration and my desire to better myself. I hope my testimony demonstrates to my children hard work, and diligence, goes a long way, and it's never too late to make an impact to the world. My mother, without whom this absolutely would not be possible, is my everything. My daughter and son, who have lived through my fluctuating range of emotions during this journey, have never wavered from offering their unconditional love. This is for my grandmother as well, who helped to clear my mind with our morning talks while walking the dogs. This is for my grandfather, who has always been proud of me even when I wasn't proud of myself. This is also for my best friend Shamika Adams, who has stuck with me during my long hiatus over the last few years, always offering support and encouragement.

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THE IMPACT OF THE NURSE PRACTITIONER IN

Introduction to Final DNP Project

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## **Abstract**

PURPOSE: The purpose of this study was to compare the efficiency of pre-admission testing (PAT) surgical clinic pre and post implementation of the APRN for patient assessment.

Cancellation and delay occurrences for scheduled surgeries will be compared during two time periods on patients on the surgical schedule at Norton Women and Children's Hospital (NWC).

METHODS: This study was a single-center, pre and post implementation retrospective comparative study of the impact of the NP led PAT unit at Norton Women and Children's Hospital (NWC) in terms of delay and cancellation rates for day-of-surgery. The sample consisted of 411 patients for the pre-implementation period, February and March 2016, and 202 patients for the post-implementation period, February and March 2018.

RESULTS: Of the 411 pre-implementation charts, 225 resulted in delayed surgeries and 19 resulted in canceled surgeries. Of the 202 post-implementation charts, 109 resulted in delayed surgeries and 8 resulted in canceled surgeries.

CONCLUSION: Cancellation and delay rates of surgeries were not significantly decreased with the presence of the APRN across broad categories. However, when categories specifically under the influence of the NP were extracted there was a statistically significant reduction in delays.

An incidental finding showed that the reason codes for delays and cancellations weighed heavily on the surgeon being late to the facility, as opposed to various other reasons, which negated the positive impact of the NP on total delay and cancellation rates.

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## **Introduction**

Surgical services are complex units that differ in many aspects from other hospital units. There are surgeries that are scheduled far in advance, and there are surgeries that are same day add-ons. There are many different entities involved with the surgical process other than the patient, and they include anesthesiologists, surgeons and nurses. The entire process must be orchestrated so that all the pieces fall in place. And with all the unpredictability and unavoidable factors that can interfere with a patient's successful surgery, there is much emphasis on making sure everything that can go smoothly, does go smoothly. Delay and cancellation issues occasionally can be modifiable factors, yet they are also some of the costliest to a healthcare organization when they are not corrected. Scheduled surgeries that get canceled or start late are inconvenient to staff, financially burdensome and can negatively impact patient satisfaction. To understand and modify delay and cancellation factors may help surgical systems and improve patient satisfaction

## **Background**

One way of ensuring a smooth perioperative experience is to optimize the patient for surgery prior to the scheduled surgery. About a week prior to surgery, patients can be seen ahead of time in the pre-admission testing unit (PAT). During their visit, history and physical information is taken, medications are reviewed, lab tests ordered and the need for specialty clearances is determined. The direction and depth of the work-up requires some protocol as well as critical thinking. Utilizing the skills of a nurse practitioner (NP) within the PAT unit of the surgical department, provides the patient the advantage of receiving expert care as evidenced in the rigorous curriculum required of the NP. A recent study in found that, "These providers have been shown to improve access to care, decrease wait times, promote wellness and preventative

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care, provide continuity of care, foster interprofessional collaboration, improve follow-up, and decrease costs and readmission rates” (Johal and Dodd, 2017, p. 177).

Major efficiency barriers in many surgical units include delays with the pre-operative assessment, lab work review, and time to enter health and physical data into the system (Barnett, 2005). In pre-admission settings without a NP lead, the PAT registered nurses are responsible for determining which patients may require a more intense pre-operative work-up, which have been cleared for surgery from specialists, anesthesiologist or physician consults, or which need specific additional labs. At times, that nurse may have to pause during the assessment to retrieve a physician to consult on a patient while the patient is waiting, factoring into potential delays in the volume and efficiency of the pre-admission testing schedule, and low patient satisfaction scores. This can also lead to cascading episodes of time delays, which are costly to the facility.

By improving efficiency and increasing productivity, operational costs could be reduced as well (Bornstein, Choi, Gerstle, & Langer, 2004). When surgery is efficient, it allows the ability for surgical volumes to increase, and revenue to go up. One study found that NPs within surgical services helped to increase surgical volumes, and decrease wait times (Bohm et al, 2010). Another study at the University of Pennsylvania Hospital, demonstrated the ways in which the implementation of a NP in the pre-admission testing, and pre-operative assessment process improved time efficiency by eliminating multiple department visits for patients to conduct pre-operative tests and lab work (Swan, 1994).

The positives of the NP within PAT can be further compounded when considering patient satisfaction, because it has long been demonstrated NP practice is based on a holistic manner rather than from a biomedical approach, which defines the core of physician training (Johal and Dodd, 2017). NPs are inherently able to utilize psychosocial support techniques, interpret lab

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values, and obtain valuable history and patient information that is pertinent to the upcoming surgery, and immediate post-op period of the patient (Barnett, 2005). However, the concept of the NP functioning in a complete pre-operative assessment role is still rather new, since these functions are more commonly performed by anesthesiologists, surgical residents and registered nurses.

The early steps of Lippitt's Phases of Change theory are applicable and were inspirational with this study. The first phase involves diagnosing the problem, which in this case, was to cut down on unnecessary and modifiable factors that cause delays and cancellations in surgery. The implementation of any process that streamlines and optimizes patient safety and time management during the perioperative experience, is an asset to the patient and the healthcare organization. With the delays and cancellations that plague surgery, there is an evident need to make a change in the process of patient optimization to decrease these occurrences within any modifiable factors. Once a need for change is acknowledged, we can start assessing the motivation and the need for change. Evidence-based data speaks for itself and is one of the motivators for this research. With the third phase, we are impelled to assess the change agent's motivation and resources. This is where the argument comes in for the impact of the NP in all the change, and where does that role take the change agent in terms of benefits of cost-savings and productivity?

### **Purpose**

The purpose of this project was to evaluate the impact of the NP in a pre-admission testing setting on surgical delay cancellation rates. A secondary objective was to examine reasons for delays or cancellations between the two time points. Currently, Norton Healthcare utilizes the NP in the PAT setting in all adult surgical facilities.

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## **Methods**

A retrospective, comparative chart review was conducted on surgical patients of Norton Women's and Children's Hospital during the months of February and March 2016, and February and March 2018. Norton Women and Children's Hospital (NWC) has a designated NP within PAT that oversees the assessment and history/physical portion of the pre-admission testing of patient that are having surgery. This process takes place prior to the patient's surgery, ideally about 5 to 7 days prior. This has not always been the case, and for some period of time there was no NP in this type of role.

During the months of February and March 2016, there was no NP assigned to do pre-admission testing assessments within the PAT unit. During the months of February and March 2018, a NP was assigned full-time to do pre-admission testing assessments on patients within the PAT unit prior to surgery. The results were then reviewed to see if there was a statistical significance in the delay and cancellation rates of surgery both pre and post implementation of the NP.

## **Objective**

The objective of this study, a comparative chart review of the pre- and post-implementation addition of a NP in the PAT setting at the model site, was to determine:

1. Surgical delay rates
2. Surgical cancellation rates/reasons

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## **Setting**

The retrospective, comparative chart review was held at Norton Women's and Children's Hospital PAT Unit. The PAT is a unit that sees patients prior to the scheduled surgery date for pre-operative history, physical and assessment.

## **Sample**

All patients presenting to the PAT with a non-emergent, scheduled surgery February-March 2016 and February-March 2018 were eligible.

Exclusion criteria included patients who were admitted (in-patients) prior to surgery, patients receiving emergency surgery, patients under the age of 18 at the time of pre-admission testing and females who were pregnant at the time of pre-admission testing and/or surgery.

## **Procedure/Data Collection**

Approvals from the University of Kentucky Institutional Review Board (IRB) and the Norton Healthcare Office of Research and Administration (NHORA) were obtained prior to the collection of data for this project. Once approval was received, a report was generated from the electronic medical record of patient charts that fit the criteria and collected from Decision Support/IT/Clinical Effectiveness.

All subjects that met the criteria were clearly defined by MRN number, and delay codes and cancellation reasons were provided. Electronic data was stored on a password protected, secured server. This information was obtained with a waiver of documentation for informed consent, prior to the comparative chart review being conducted.

## **Measures**

Data extracted from the EMR included scheduled surgery date and time, time of actual surgery start and delay type and reason, if applicable. Surgeries were considered delayed if the

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start time of surgery was after the scheduled time. Reasons for delay were classified as NP direct impact (ex. additional labs required, incomplete or no consent), nurse (ex. did not get pre-op, room not ready), surgeon (ex. surgeon late to the facility, previous case ran over), anesthesia (ex. anesthesia late to facility, additional labs, tests required), patient (ex. late, waiting for family) or hospital (ex. equipment not available, blood delay).

### **Data analysis**

Frequency distributions were used to summarize surgical delays and cancellations for the two study periods. The chi-square test of association of Fisher's Exact test, as appropriate, were used to examine differences in rates of delay or cancellations, as well as reasons (if applicable), before and after implementation of the NP in the pre-admission testing unit. Data analysis was conducted using SAS, version 9.4 with an alpha level of .05 throughout.

### **Results**

A total of 613 patient charts were reviewed: 411 charts from February and March 2016, which was prior to the NP implementation in PAT, and 202 charts from February and March 2018, which was after the NP implementation into PAT. There was no difference in the rate of delayed surgeries (55% versus 54%,  $p = .85$ , respectively; see Table 1) or cancellations over time (5% versus 4%,  $p = .84$ , respectively).

Reasons were provided for 225 and 109 delayed surgeries during the pre- and post-implementation periods. There was a significant difference in the reason for the delay between the two evaluation periods ( $p < .001$ ; see Table 2). In comparing reasons attributed to NP direct impact versus all others, there was a significant decrease ( $p = .003$ ). In the pre-implementation period, 21% of delays/cancellations were due to components of NP direct access, compared to 8% in the post-implementation period.

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### **Discussion**

In conclusion, this project displays a positive impact with a pre-admission testing work-up facilitated under the direct supervision of the Nurse Practitioner. While the original focus of the project was expected to show a decrease in overall delays due to the presence of the NP, the large amount of surgeon related delays negated the positive impact of the NP handling this process before surgery. With further analysis, the reasons for delays that are attributed to the PAT work up by the NP have indeed significantly decreased, only further demonstrating the importance of the NP in this role to improve the surgical process for not only the patient, but for the entire surgical team and the healthcare facility. Norton Healthcare in conjunction with University of Kentucky have made a significant leap of faith by sponsoring and supporting the advancement of baccalaureate-prepared registered nurses in their pursuit of the Doctor of Nursing Practice (DNP) degree. A benefit of having these doctorally prepared nurse practitioners within the system, is the ability to assign them into roles that they may not typically hold in a traditional sense. This displays confidence in their qualifications and extensive education to practice successfully in these roles, with the adaption of the DNP essentials into their practice. Implementation of the NP in the role of PAT assessment deserves strong consideration, within all surgical facilities of Norton Healthcare.

### **Limitations**

Several limitations were identified in the overall structure of this study. The study was retrospective in nature, which did not allow for any potential intervention to be tested in real time. There also was no way to verify the validity of the report, or cancellation or delay codes, as they are manually entered by staff at the time of chart verification. This allowed for the possibility of time reporting errors that were difficult to assess. This study focused on one

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facility during two different time periods. While there was an attempt by the researcher to have a similar sample size by choosing the same time frame (February and March) of different years, one sample size proved to be twice as large as the other.

Another limitation of this study was that actual cost-savings and patient satisfaction were not explored. Cost-savings can be assumed with any reduction in delay or cancellation of surgery, however how much that amounts to is unclear with the limitations and time restraints of this study. Also, cost savings could vary based on the level of service and facility. Patient and staff satisfaction were also not explored. The importance of patient satisfaction and staff and physician satisfaction cannot be diminished and would prove to be beneficial in the decision-making aspect of expanding this model.

### **Recommendations for future studies**

Recommendations for future studies include further investigations of other facilities in how they utilize the NP in the pre-assessment role. Also, the impact on the surgical resident in terms of adding time to their exposure in the OR, increasing their time for actual rounding on patients, or by lessening their administrative duties of completing the H&P for the patient would be worth studying.

A broader study, that includes multiple facilities, would generate data that would help increase sample size and generalization of the information that is being compared. It would also be beneficial to identify specific nurse practitioner interventions that are beneficial and cost-saving.

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## Tables

**Table 1. Comparison of delay and cancellation rates over time**

	Pre-implementation ( <i>n</i> = 411) Percent	Post-implementation ( <i>n</i> = 202) Percent	<i>p</i>
Delay	54.7%	54.0%	.85 <sup>a</sup>
Cancellation	4.6%	4.0%	.84 <sup>b</sup>

<sup>a</sup> *p* from chi-square test of association

<sup>b</sup> *p* from Fisher's Exact test

**Table 2. Reasons for delayed or canceled surgeries before and after NP-implementation**

	Pre-implementation Percent	Post-implementation Percent	<i>p</i>
Reason			<.001
Anesthesia	9.3%	5.5%	
Hospital	4.0%	2.8%	
Nurse	8.0%	1.8%	
Patient	5.3%	3.7%	
Surgeon	52.0%	78.0%	
NP direct impact	21.3%	8.3%	

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**Table 3. Table of delay type-broad categories**

<b>Delay Type</b>	<b>Pre-implementation 2016 n (%)</b>	<b>Post-implementation 2016 n (%)</b>	<b>Total</b>
<b>Anesthesia</b>	18 (8.45)	5 (5.00)	23
<b>Facility</b>	18 (8.45)	5 (5.00)	23
<b>First case late</b>	25 (11.74)	6 (6.00)	31
<b>Patient</b>	17 (7.98)	5 (5.00)	22
<b>Physician/surgeon</b>	113 (53.05)	76 (76.00)	189
<b>Staff</b>	22 (10.33)	3 (3.00)	25
<b>Total</b>	213	100	313

**Table 4. Table of delays-sub categories**

<b>Delay Reason-Sub Categories</b>	<b>Time Frame</b>		
	<b>Pre- implementation 2016</b>	<b>Post implementation 2018</b>	<b>Total</b>
<b>Abnormal Lab Values</b>	2 0.94	0 0.00	2
<b>Anesthesia-Additional Labs, Tests, etc.</b>	2	0	2

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	0.94	0.00	
<b>Anesthesia-Block/Epidural in Holding Area</b>	2 0.94	0 0.00	2
<b>Anesthesia-Difficult Block/Spinal</b>	0 0.00	1 1.00	1
<b>Anesthesia-Equipment/Set Up</b>	1 0.47	0 0.00	1
<b>Anesthesia-IV Access</b>	1 0.47	2 2.00	3
<b>Anesthesia-Insufficient Coverage</b>	2 0.94	0 0.00	2
<b>Anesthesia-Late to OR-Faculty</b>	3 1.41	1 1.00	4
<b>Anesthesia-Late to OR-Provider</b>	2 0.94	0 0.00	2
<b>Anesthesia-Pre-Op Needed Longer To Work</b>	0 0.00	1 1.00	1
<b>Anesthesia-Pre-Op Visit</b>	2 0.94	1 1.00	3
<b>Anesthesia-With Another Patient</b>	3 1.41	0 0.00	3
<b>Equipment-Not Available (Comment Required)</b>	3 1.41	0 0.00	3
<b>First Case Late</b>	22 10.33	4 4.00	26

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<b>Hospital-Blood Delay</b>	0 0.00	1 1.00	1
<b>Hospital-Case Added To Room</b>	3 1.41	1 1.00	4
<b>Hospital-Delay in a Radiology Dept</b>	1 0.47	0 0.00	1
<b>Hospital-No Bed Available-Post-Op</b>	1 0.47	0 0.00	1
<b>Hospital-Transport Not Available</b>	1 0.47	0 0.00	1
<b>Instrument/Implant-Not Available (Comment Re</b>	0 0.00	1 1.00	1
<b>NULL</b>	2 0.94	1 1.00	3
<b>Nurse-Did Not Get Pre-Op</b>	1 0.47	0 0.00	1
<b>Nurse-Not Available</b>	3 1.41	1 1.00	4
<b>Nurse-O.R. Suite Did Not Send For Patient</b>	0 0.00	1 1.00	1
<b>Nurse-Patient Not Ready-Day Surgery</b>	12 5.63	3 3.00	15
<b>Nurse-Room Set-up</b>	13 6.10	0 0.00	13
<b>Patient-Delay-Talk to Surgeon</b>	2	0	2

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	0.94	0.00	
<b>Patient-Late Arriving to Hospital</b>	6 2.82	4 4.00	10
<b>Patient-Left Area</b>	2 0.94	0 0.00	2
<b>Patient-Wait For Family Members/Parents</b>	2 0.94	0 0.00	2
<b>Surgeon-Additional Labs, X-Rays, etc. needed</b>	1 0.47	0 0.00	1
<b>Surgeon-Change Order Of Cases</b>	2 0.94	0 0.00	2
<b>Surgeon-Incomplete Or No Consent</b>	3 1.41	0 0.00	3
<b>Surgeon-Incomplete Scheduled Information</b>	1 0.47	0 0.00	1
<b>Surgeon-Late to OR-Faculty</b>	55 25.82	31 31.00	86
<b>Surgeon-Late to OR-Resident</b>	1 0.47	4 4.00	5
<b>Surgeon-No H&amp;P on Chart</b>	4 1.88	1 1.00	5
<b>Surgeon-Previous Case Ran Over</b>	43 20.19	38 38.00	81
<b>Surgeon-Pt Not Marked</b>	1 0.47	0 0.00	1

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<b>Surgeon-Took Longer Than Posted</b>	1 0.47	0 0.00	1
<b>Surgeon-Unscheduled Procedure Added to Case</b>	1 0.47	2 2.00	3
<b>Surgeon-With Another Patient</b>	3 1.41	1 1.00	4
<b>Surgeon-Work-up on Arrival</b>	3 1.41	0 0.00	3
<b>Total</b>	213	100	313

**Table 5. Delays with NP impact category delineated**

<b>Table of Delays with NP Impact Category Delineated</b>			
<b>Reason</b>	<b>Time Frame</b>		
<b>Frequency Col Pct</b>	<b>Pre- implementation 2016</b>	<b>Post implementation 2018</b>	<b>Total</b>
<b>Anesthesia</b>	21 9.33	6 5.50	27
<b>Hospital</b>	9 4.00	3 2.75	12
<b>NP direct impact</b>	48 21.33	9 8.26	57
<b>Nurse</b>	18 8.00	2 1.83	20
<b>Patient</b>	12 5.33	4 3.67	16
<b>Surgeon late</b>	61 27.11	38 34.86	99
<b>Surgeon other</b>	56 24.89	47 43.12	103
<b>Total</b>	225	109	334
<b>Frequency Missing = 277</b>			

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