A Competency-Based Checklist to Facilitate Transition for Novice Cardiology Nurse

Practitioners

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Abstract

The first year of practice represents a vulnerable period of transition for any nurse practitioner (NP), particularly those entering specialty practice. A search of the literature revealed a gap in the evidence regarding the development of onboarding programs for NPs in outpatient cardiology practice. For a hospital-owned, outpatient cardiology practice in a medium-sized Midwestern city, a quality improvement (QI) study of a competency-based cardiology onboarding program was deemed crucial in ensuring a healthy transition as well as retention. The study framework was based on Meleis' Transition Theory and the Plan-Do-Study-Act (PDSA) Model for QI. A competency checklist based on the American College of Cardiology (ACC) competency statements for advanced practice providers served as the role supplementation intervention (independent variable). A pretest, posttest design using a convenience sample of one novice NP and a validated instrument, the Nurse Practitioner Role transition Scale (NPRTS), would measure NP role transition as a proxy for role insufficiency (dependent variable). The NPRTS was measured at baseline and six week intervals over the first six months of practice following the PDSA format. The study found support for the checklist in enhancing the turnover experience as evidenced by an 18 point, or 18.85%, increase in the total NPRTS score during this interval. Assessment of balancing measures did not demonstrate a decrease in the preceptor productivity during implementations. Additional study with a larger population is needed to further validate these findings. The project not only demonstrates support for the onboarding checklist to improve transition, but also to more clearly define the role and expectations for NPs as part of a patient-centered, interprofessional cardiovascular team.

Keywords: nurse practitioner, onboarding, transition, competency, cardiology

Dedication

This project is dedicated to my husband Mark and children Connor and Hannah. I would not be where I am today without your love and support.

I would also like to thank my parents, Robert and Sharon Bucheit, who encouraged me to pursue my dreams.

Acknowledgements

Executive Summary

As a prequel to the passage of the 2010 Affordable Care Act (ACA), the Institute of Medicine (IOM) formed a partnership with the Robert Wood Johnson Foundation (RWJF) in 2008 to examine the state of the nursing profession and its readiness to make manifest its capacity to lead a major redesign of a system in which the ubiquity of chronic disease had become the norm. In its landmark 2011 publication entitled *The Future of Nursing: Leading Change, Advancing Health,* the IOM identified nurses in advanced practice nurses (APNs) as uniquely qualified to lead a complete redesign of the healthcare system via a novel lens of value-based care.

Background

Turnover among nurses at all levels of preparation remains a costly challenge to healthcare organizations, as well as to the nursing profession. According to Anderson (2012), the rate of NP turnover has been estimated at greater than twice that of physicians (12.6% versus 6%). Not only does a vacant NP position present a loss of more than $1500 dollars per day to a practice, the overall loss of an NP to a practice may range from $128,000 to over $200,000 (Gilliand, 2019). For novice NPs, acculturation to the role often presents a challenging paradox as the formerly expert registered nurse (RN) must regress to the novice stage (Brown & Olshansky, 1997). Specialty practices such as cardiology are embracing the role of the NP, but may be ill-equipped to provide an adequate onboarding experience. Feelings of inadequacy, ambiguity, and disconnectedness resulting from an unclear vision for the NP role in day-to-day practice may result in a dysfunctional transition and turnover (Goldschmidt et al., 2011; Olshansky, 2011).

Statement of the Problem

As aforementioned, the transition from expert registered nurse (RN) to novice NP can be stressful with profound implications for role assimilation, job satisfaction, and retention, but also patient outcomes due to unreconciled factors such as lack of access to timely care (Robeano & Taylor, 2019). Early intervention in the form of a robust, competency-guided onboarding process can significantly impact the novice NP's successful integration into a new care team. A review of the existing literature reveals ample evidence in regards to onboarding of NPs in primary care, but there is very little to guide the development of similar processes for specialty practice, with no identifiable sources at this juncture for outpatient cardiology. Furthermore, competencies specific to NPs in outpatient cardiology roles do not currently exist.

Many health systems, particularly in the more conservative Midwest, have been slow to embrace advanced practice nurses. Residency programs have been established primarily for NPs in primary care. For specialty practices, formal frameworks for orientation or competency are often lacking, which is frustrating for new NPs and preceptors alike. Given that the cardiology practice where this project was implemented recruited a new NP with the plan to expand the total advanced practice provider (APP) cohort by at least two to three additional NPs, the development of a formal orientation program with competency checklist specific to cardiology is crucial to ensuring a healthy transition as well as retention. The quality improvement initiative will be guided by the following study question: For NPs entering cardiology practice, does a formal, competency-based orientation framework positively affect transition (role confidence and job satisfaction) over the first six months of practice?

Setting

The doctor of nursing practice (DNP) project was undertaken at a hospital-based,

outpatient cardiovascular practice in a medium-sized, mostly urban Midwestern city. The

provider mix consists of cardiologists (general cardiology, interventional cardiology, and

electrophysiology) and NPs. The NPs are mostly responsible for providing outpatient visits

Monday through Friday, but also cover evening answering service call and weekend rounding at

the hospital.

Aims of the Project

The primary aim of the project was to facilitate the transition of the novice NP through

the development of an evidence-based, competency-guided orientation checklist. Secondary

goals include improving interprofessional teamwork and patient satisfaction via more clearly

delineated expectations of NP cardiology providers.

The American College of Cardiology (ACC) has not promulgated a set of competencies

for APPs in the specialty. In 2015, an ACC working group issued a policy statement reinforcing

its commitment to team-based care. Furthermore it addressed a glaring need to develop an

evidence-based curriculum and competency statements for APPs as fellowship training and other

requirements for physicians were well established to include a series of official statements

known as the Core Cardiovascular Training Statement (COCATS). The COCATS transcend the

minimal requirements for physician entry to practice with an ever-increasing focus on

competencies and learning outcomes which in turn defines "the entrustable professional

activities of the cardiology profession" (Brush et al., 2015, p. 2121). The ACC released its first

statement regarding competencies for advanced practice providers in March 2020 which was an

exciting first step toward developing a COCATS-like framework for NP practice within the interprofessional team, as well as certification.

The project will focus on role integration across three primary domains at the micro, meso, and macro levels of the cardiology practice, as well as the overarching organization:

1. Patient focused: caring and compassion, holism, evidence-based guidelines, and clinical skills.

2. Team focused: interprofessional collaboration.

3. System focused: leadership, NP role development, community service.

The competency checklist was underpinned by the March 2020 ACC competency statements. These statements were mapped for congruency against those identified by the National Organization of Nurse Practitioner Faculties (NONPF) as integral to NP practice: scientific foundation, leadership, quality, practice inquiry, technology and information literacy, policy, health system delivery, ethics, and independent practice (Scott and Thompson, 2019, pp. 82-83). Meleis' Transitions Theory, as well as the works of Benner and Shuler were adapted to serve as a theoretical foundation for the project.

Relevance to Nursing Practice

As previously stated, the profession has been issued a challenge to serve at the forefront as the entire system continues to undergo the redesign set forth by the ACA. With the turn toward value-based reimbursements, healthcare systems can no longer afford 'business as usual' approaches rooted in the medical model. Through promotion of the NP role, patients will not only demonstrate higher levels of health and function, but the overall healthcare system will benefit from lower costs. However, NPs must be supported along this journey, particularly upon

entry into practice when they are most vulnerable (Brown & Olshansky, 1997). The planned

project is relevant to nursing in that it proposes to narrow an evident gap in the current evidence

regarding the novice NP transition into the outpatient cardiology. A competency-based

framework was developed with the goals of nurturing confidence and role attainment within the

context of an interdisciplinary team, providing evidence-based, patient-centered care, and

serving as a leader both in the cardiology practice and across the overarching health system at

large (Astin et al., 2015).

Anticipated Facilitators and Barriers

Anticipated facilitators for the project include administrative (at the practice and system

levels), NP, and medical director recognition of need, as well as an anticipated low cost for

implementation. Another positive is the overall commitment of the BACS support staff to

promoting patient-focused care.

A lack of physician buy-in for the project was projected to pose a formidable barrier for

the project. The physician providers are time-strapped and reconciling with a series of their own

transitions (e.g. recent adoption of a new electronic health record (EHR), physician turnover,

reimbursement changes for 2020). Thus, they may be unwilling to provide input or actively

precept an orientee. Time constraints and the breadth of knowledge addressed in the ACC

competencies may be too vast to address in one project. Other barriers potential barriers included

regulatory factors, technological limitations of the health system EHR to track outcomes, and a

lack of adequate space for preceptor-orientee learning activities.

Conclusion

As turnover rates among novice NPs in the first year of practice continue to

remain high, the need for formalized support during this period of vulnerability becomes

glaringly apparent. The long-awaited release of the ACC's competency statements for NPs will

serve as a framework not only for an orientation program at the cardiology practice, but also to

more clearly define the role and expectations for NPs as part of a patient-centered,

interprofessional team.

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Turnover among nurses at all levels of preparation remains a costly challenge to

healthcare organizations, as well as to the nursing profession. According to Anderson (2012), the

rate of NP turnover has been estimated at greater than twice that of physicians (12.6% versus

6%). Not only does a vacant NP position present a loss of more than $1500 dollars per day to a

practice, the overall loss of an NP to a practice may range from $128,000 to over $200,000 per

vacated NP position (Gilliand, 2019). For novice NPs, acculturation to the role often presents a

challenging paradox as the formerly expert registered nurse (RN) is forced to revisit the

discomforts of the novice stage (Brown & Olshansky, 1997). As the NP role continues to expand

from its origins in the primary care setting to specialty practices such as cardiology, many are

looking to it as a solution to alleviating the shortages of qualified providers across all areas of the

healthcare sector (Finneran and Kreye, 2019; Goldschmidt et al., 2011). However, these

specialties may be ill-equipped to provide an adequate onboarding experience. Feelings of

inadequacy, ambiguity, and disconnectedness stemming from an unclear vision for the NP role in

day-to-day practice may result in a dysfunctional transition, leading to turnover (Goldschmidt et

al., 2011; Olshansky, 2011).

In its landmark 2011 publication entitled *The Future of Nursing: Leading Change,*

Advancing Health, the IOM identified nurses in advanced practice roles, in particular nurse

practitioners (NPs), as uniquely qualified to lead a complete redesign of the healthcare system

underpinned by the tenets of value-based care. In order to assure the readiness of this cadre of

professionals, the IOM emphasized the need to support novice NPs via the establishment of NP-

specific post-graduate residency and fellowship programs (2011). In its 2015 follow-up report,

the IOM noted very little progress in this regard despite evidence in support of these programs as influential in improving skills related to communication and organization, as well as in decreasing turnover (Institute of Medicine, 2016). Funding remains a primary challenge as the sustainability of many programs rely on Health Resources and Services Administration (HRSA) grants versus the direct funding afforded to medical residents by Medicare (Norwick, 2016; Institute of Medicine, 2011).

Statement of the Problem

The transition from expert registered nurse (RN) to novice NP can be stressful with profound implications for positive role assimilation, job satisfaction, and retention which may negatively affect patient access to timely care (Robeano & Taylor, 2019). Evidence suggests that early intervention in the form of a robust, competency-guided onboarding process may significantly impact the novice NP's successful integration into a new care team. A review of the existing literature reveals expanding evidence regarding onboarding of NPs in primary care, but there is very little to guide the development of similar processes for those entering specialty practice, with no identifiable sources at this juncture for outpatient cardiology. Furthermore, competencies specific to NPs in outpatient cardiology roles were only recently published in the past eight months.

Many health systems, particularly those in the more conservative Midwest, have been slow to embrace APNs. NP residency and fellowship programs have become more ubiquitous for NPs in primary care, but in specialty practices, formal frameworks for orientation or competency assessment are often lacking, which may unintentionally contribute to impairments in NP role attainment, development, and longevity.

A hospital-based, outpatient cardiology practice in a medium-sized Midwestern city was planning to recruit several more NPs in the upcoming year. To the frustration of preceptors and new recruits alike, the practice has never developed a formal onboarding process. This has created tensions among the NP staff and physician providers whose expectations for the new NP have been ambiguous. This role ambiguity has been cited by several former NPs as a primary factor in their decision to leave the practice. A formal onboarding program guided by a competency checklist specific to cardiology was identified as crucial to ensuring a healthy transition as well as positive patient outcomes, and retention.

Purpose

The primary aim of the project was to facilitate the transition of the novice cardiology NP through the development of an evidence-based, competency-guided onboarding checklist. Secondary goals for future study included the enhancement of interprofessional teamwork and patient satisfaction via more clearly delineated expectations of NP cardiology providers.

The American College of Cardiology (ACC) recently promulgated a set of competencies for advanced practice providers (APPs) in the specialty. Given the aging of the cardiologist provider workforce and the realities of value-based care, the ACC has deepened its commitment to team-based care. In 2015, a multi-disciplinary working group issued a policy statement reinforcing this position. Furthermore, the statement included language to address the glaring need for both an evidence-based curriculum and competency statements for APPs, mirroring   expectations for physicians such as those set forth in the series of official statements known as the Core Cardiovascular Training Statement (COCATS). The COCATS transcend the minimal requirements for physician entry to practice with an ever-increasing focus on competencies and learning outcomes which in turn define "the entrustable professional activities

of the cardiology profession" (Brush et al., 2015, p. 2121). This novel APP competency

statement document not only represents an exciting first step toward improving the visibility and

legitimacy of the NP role in cardiology, but also developing a COCATS-like framework for

APPs within the interprofessional team and a future pathway to specialty certification.

Congruence with organizational strategic plan

The competency checklist is reflective of the overall mission and strategic plan of the

healthcare organization and cardiology practice in which the project was implemented. It

demonstrates congruence across the three following domains of focus:

1. Patient focus: caring and compassion, holism, evidence-based guidelines, and clinical

   skills.

2. Team focus: interprofessional collaboration.

3. System focus: leadership, NP role development, community service.

The competency checklist was underpinned by the recently released document by Rodgers et al.

(2020) entitled *2020 ACC Clinical Competencies for Nurse Practitioners and Physician

Assistants in Adult Cardiovascular Medicine*. These statements were mapped for harmony

against those identified by the National Organization of Nurse Practitioner Faculties (NONPF) as

integral to NP practice: scientific foundation, leadership, quality, practice inquiry, technology

and information literacy, policy, health system delivery, ethics, and independent practice (Scott

and Thompson, 2019, pp. 82-83). Meleis' Transitions Theory served as the theoretical

foundation for the project with the Plan-Do-Study-Act (PDSA) framework for the QI

component.

Relevance to Nursing Practice

As previously stated, the profession was issued a weighty challenge to serve at the forefront as the entire concept of health care delivery within the US continues to undergo the redesign set forth by the ACA. NPs along with other nurses at advanced levels of preparation were called upon to bolster their unique contributions as a caring science with the negotiation tactics and data-driven business savvy often associated with the spheres of administration and business (Anen & McElroy, 2017). With the turn toward value-based reimbursements, healthcare systems can no longer afford 'business as usual' approaches rooted in the medical model. Through promotion of the NP role, patients will not only demonstrate higher levels of health and function, but the overall healthcare system has the potential to benefit from lower costs. NPs must be supported along this journey, particularly upon entry into practice when they are most vulnerable (Brown & Olshansky, 1997). The project demonstrates relevance to nursing in its proposal to narrow a clear gap in the current body of nursing science regarding the novice NP transition into outpatient cardiology. A competency-based framework was developed with the goals of nurturing role attainment within the context of an interdisciplinary team. Other prospective benefits included an early acculturation of novice NPs to leadership activities such as QI to the benefit of patients, the practice, and the organization at large (Astin et al., 2015).

Facilitators and Barriers

Anticipated facilitators for the project included recognition of need at the administrative (practice and organizational), NP, and medical director levels, as well as an estimated low cost for implementation. Another positive was the overall commitment of the cardiology practice staff toward the promotion of patient-focused care.

A lack of cohesive physician buy-in for the project was expected, however, to serve as a formidable barrier for the project. The physician providers are time-strapped as they too grapple

with change. In the past year, they have been reconciling with a series of their own transitions

(e.g. recent adoption of a new electronic health record (EHR), physician turnover, reimbursement

changes for 2020, and a major pandemic). Thus, concern was present that they, as a collective,

might be unwilling to provide input or actively precept an orientee. Also time constraints and the

breadth of knowledge addressed in the ACC competencies might be too vast to address in one

project. Preceptor productivity might decrease, resulting in lower revenues (Norwick, 2016).

Other prospective barriers included regulatory factors, technological limitations of the health

system EHR to track outcomes, and a lack of adequate space for preceptor-orientee learning

activities.

It was purported that these barriers would likely be compounded as implementation was

to take place on the precipice of a global pandemic: the coronavirus disease 2019 (COVID-19).

The disease culminated in a massive shift in priorities, as well as an increasing reliance on NPs

in the inpatient setting. Flexibility in the plan and timeline expectations became paramount

during this time of uncertainty.

Literature Review

A dearth of evidence existed in the literature as to the transition experience for novice

NPs in specialty practice beyond completion of a formal educational program. Interest has

increased over the past two decades sparked in part by the expanding role of NPs in the US

healthcare system in the wake of the IOM report, but also as a response to reports of role

ambiguity resulting in high rates of dissatisfaction and turnover.

Brown and Olshansky (1997) were the first team to formally examine the transition

experience as crucial to healthy role attainment and ultimately patient outcomes. In their seminal

work entitled *From Limbo to Legitimacy: A Theoretical Model of the Transition to the Primary Care Nurse Practitioner Role*, the authors posit that novice primary care NPs may be ill prepared to navigate the oft hostile environments into which they are released post-graduation (Brown & Olshansky, 1997). One decade prior, Benner alluded to transition in her conceptualization of professional development in nursing as a continuum from novice to expert, but Brown and Olshansky credit the work of medical researchers (Newton, 1997; Williamson, Glenn, Spencer, and Reid, 1998; Wolliscroft, Palchik, Dielman, and Stross, 1985) with identifying the positive impacts of mentoring, as well as formalized NP residency and fellowship programs, in easing transition to practice for medical and dental providers. The development of the Limbo to Legitimacy model and the subsequent longitudinal exploratory study undertaken by Brown and Olshansky (1997), not only established support for their concerns regarding the vulnerability of novice primary care NPs to unhealthy transition, but also recommendations for further study of this phenomenon.

Summary of the Literature Search

A simultaneous search was undertaken using CINAHL, MEDLINE, and PubMed via EBSCO Host to assess the quantity and quality of available evidence applicable to the research question. Limiters were set to restrict the results to articles from peer-reviewed journals, published in English between January 1, 2010 and March 1, 2020. The following keywords and Boolean operators were used: nurse practitioner or advanced practice nurse or APN or NP and transition to practice and cardiology. The initial search yielded one result. After excluding cardiology from the search, 125 articles resulted. A search of the "gray" literature resulted in one additional source. Review of the individual results revealed ten duplicates, resulting in 115 articles for further screening. The abstracts, text, and reference lists from each article were

assessed against the inclusion criteria after which 98 were rejected and twelve retained (see

Appendix A for a schematic of the literature search). Given the variation in the NP role and

educational paths, as well as licensure and regulation, studies conducted outside of the US

healthcare system were excluded. Studies in the inpatient or academic setting were not eligible

for inclusion, nor were the findings derived from literature reviews, editorials, opinion pieces,

letters, poster abstracts, and conference proceedings. Further scrutiny of the remaining articles

(primarily a hand search of the reference lists) revealed the presence of the seminal article by

Brown and Olshansky (1997) that has served as a touchstone for the others. Comparative, mixed

method, and descriptive studies were included with the glaring absence of any higher level

evidence from randomized controlled trials (RCTs).

Support for the Statement of the Issue

The evidence presented in the selected journal articles can be divided into two broad

categories involving:

1. A description of the NP role transition experience to include perceptions, facilitators, and
    barriers (role insufficiency versus mastery).
2. Interventions to facilitate transition (role supplementation).

Description of role transition. A description of the NP role transition experience,

particularly the intrinsic and extrinsic factors that facilitate or impede the journey toward healthy

role attainment, was the primary aim of four of the 12 studies. A descriptive cross-sectional

approach was employed by one additional study to describe the transition experience as well as

the effects of a formal intervention on transition (Barnes, 2015). Web-based surveys were the

primary means to collect demographic data and measure variables such as NP role transition via

validated instruments (particularly role perception and preparedness), stress, job satisfaction, and

turnover intent. Several common themes emerge across studies. In the domain of role perception

and readiness for practice, it was noted by all five research teams that novice NPs

overwhelmingly felt unprepared for autonomous practice. Hart and Bowen (2016) in a survey of

698 NPs who graduated between 2006 and 2011, noted that up to 50% of novice NPs felt

unprepared for practice upon employment in their first position as NP. There were statistically

significant differences noted in the preparedness cluster between NPs in the first year of practice

and others with more experience on the question regarding "overall feelings of preparedness"

($F_{3561} = 86.67$, $p < .00$) (Hart & Bowen, 2017, p. 548). Faraz (2017) found support for individual

characteristics of the novice (e.g. education and prior experience) and role acquisition (e.g. self-

confidence and perceived competence) in influencing the transition experience, whereas others

found prior RN experience as having either a neutral or negative effect on progression (Barnes,

2015; Brom, Melnyk, Szalacha, & Graham, 2016).

Stress was complicit as a negative influence for the transition experience, particularly as applied

to perceptions of competence, and the ability to meet the expectations of colleagues and the

organization regarding efficiency in completion of patient visits and EHR notes (Brom et al.,

2016; Faraz, 2017; Hart & Bowen, 2016; Szanton, Mihaly, & Becker, 2010). Brom et al. (2016)

noted mean stress levels among novice NPs to be higher than those of more experienced

practitioners on a 10 point Likert scale (6.53, $SD = 2.1$). Role ambiguity, as well as a lack of

feedback and collegial support, were noted as the primary drivers of stress during the transition

period (Brom et al., 2016; Faraz, 2017; Szanton et al., 2010).

　　Job satisfaction was directly measured using the Misener Nurse Practitioner Satisfaction

Scale (MNPJSS) in two of the studies. The MNPJSS is a 44 item, Likert-type survey across six

subscales measuring the primary factors contributing to job satisfaction on a scale of 1 (very

dissatisfied) to 6 (very satisfied) (Faraz, 2017). The scale has an overall reliability of 0.96 with

reliability across subscales gauged at 0.79 to 0.94 (Faraz, 2017). Higher scores are indicative of

higher levels of job satisfaction with total scores ranging "from 0 to 264; however, it is more

commonly reported as an overall average" (Brom, 2016, p. 271). Faraz (2017) and Brom et al.

(2016) measured similar, above average mean MNPJSS score 4.43 ± 0.77 and 4.23 ± 0.74

respectively. The elements most detrimental to job satisfaction included a lack of

interprofessional collegiality and lack of opportunities for professional growth (Brom et al.

2016), although the authors did note that there are likely regional variations due to differences in

practice opportunities and scope-of-practice regulations.

      The final theme, turnover intention, was addressed by four of the five studies. Brom et al.

(2016) noted role perception and job satisfaction as the two primary correlates with the novice

NP's intention to stay. Nonetheless, approximately 40% of survey respondents noted some

degree of intention to leave their current position (Brom et al., 2016). Faraz (2017) identified

autonomy as most influential factor in turnover intention ($\beta = -0.63$, t = -10.54, $p < 0.001$)),

while self- and perceived confidence were also implicit in enhancing intentions to stay ($\beta = -$

0.29, t + -3.95, $p < 0.001$). Barnes (2015) and Szanton et al. (2010) did not directly address

turnover intention, but did note a role for the organization in promoting a healthy transition

experience to increase retention.

      These studies note the importance of the transition experience in reducing stress,

improving satisfaction, and decreasing turnover intention. As previously discussed, Faraz (2017)

noted autonomy as the most statistically significant factor in the transition process. However, the

journey toward autonomy is less clear-cut. Intrinsic factors such as anxiety, loss of previous

relationships, uncertainty, lack of confidence, and ambiguity may serve as formidable

impediments to the novice NP's transition toward autonomous practice. Equally daunting are the extrinsic factors such as collegial relationships and the oft unrealistic organizational expectations for expert-level practice and patient volumes almost immediately post-graduation (Faraz, 2017).

Interventions to facilitate transition. The remaining studies explore the efficacy of various interventions to include formal onboarding programs, residencies or fellowships, mentoring initiatives, or educational offerings in enhancing the transition experience.

Two teams assessed the effects of a formal onboarding process on NP transition. Barnes (2015) used the Nurse Practitioner Role Transition Scale (NPRTS) as part of a descriptive cross-sectional approach to examine the effect of a formal onboarding program on novice NP transition during the first employment post-graduation. The intervention demonstrated statistically significant support for a formal onboarding program as the sole facilitating factor in NP transition ($r = 0.29$, $p < 0.001$). Conversely, Woolforde (2010) adopted an observational approach to evaluate established onboarding processes, particularly gaps in the current process affecting teamwork, job satisfaction, and patient outcomes. No data was presented (although platforms were in place for the collection and analysis of data). Statements from NP participants were overwhelmingly positive regarding preparation to embark upon the transition process.

The effects of NP residency or fellowship programs were the primary focus of the works of four teams. Bryant and Parker (2019) utilized a descriptive approach to study the effects of a fellowship program on three variables to include job satisfaction (measured via MNPJSS), confidence, and retention. Their findings did not reach statistical significance, but did demonstrate support for the fellowship model for increasing levels of job satisfaction, retention, and optimal patient care (Bryant & Parker, 2019). Cappiello, Simmonds, and Bamrick (2019) employed a descriptive survey to gather data describing the general characteristics of post-

graduate training programs (PTPs) such as residencies and fellowships in primary care settings,

particularly federally qualified healthcare centers (FQHCs). A secondary aim of the study was to

determine each center's progress toward the IOM's recommendations for universal integration of

PTPs into the onboarding process. Despite a low participation rate (42%), the authors found

sufficient evidence to conclude that PTPs are being universally adopted among primary clinics,

thus meeting the IOM's recommendations (Cappiello et al., 2019). Scholtz, King, and Kolb

(2014) also employed a descriptive approach to assess the effects of an APRN fellowship

program on five specific domains: role transition, clinical practice effectiveness, quality and

patient safety, competency, and growth of opportunities from local and national perspectives.

They found a positive effect for the intervention on interprofessional collaboration and turnover

($< 2\%$). The study by Sargent and Olmedo (2013), on the other hand, served as a needs

assessment to inform the application of a residency framework in an outpatient setting. The

researchers sought to identify which skills in particular pose the biggest challenge to novice NPs,

as well as factors related to clinical confidence and preparedness for practice (Sargent &

Olmedo, 2013). Additional NP preceptors vs. physician preceptors and more didactic and forum

discussion content regarding complex patients and ethical decision making were deemed most

important by respondents.

Hill and Sawatzky (2011) explored the effects of mentoring on job satisfaction, retention,

and patient outcomes via a descriptive approach. Several themes echoed across their findings.

The mentoring process facilitates socialization into the NP role via positive role-modeling. Not

only does this promote self-efficacy, but also empowers well-informed novice NPs to more

effectively (and readily) meet the demands of the practice and overarching organization (Hill &

Sawatzky, 2011). Mentoring can assist in diffusing the amalgam of internal, external, and

personal stressors that perpetuate role confusion and drive maladaptation to the NP role and

turnover (Hill & Sawatzky). In their conclusion, the authors offer a modicum of hope, stating "as

stressful and exhausting as the role transition can be, novice NPs are able to find joy as they

grow in the NP role" (Hill & Sawatzky, 2011, p. 167).

Thompson (2019) tested the effectiveness of an evidence-based educational intervention

delivered via webinar in positively affecting NP role transition as measured by the revised

NPRTS (modified to 16 items) in a pre-test, post-test fashion. Although improvements were not

noted across all aspects of the NPRTS post-intervention, the webinar demonstrated

improvements in mean scores on questions of comfort level with patients, skills to cope with role

transition, and less additional time to complete responsibilities in the clinical setting (Thompson,

2019). The mean NPRTS score was 54.72 (95% CI, $SD = 6.7$) pre-intervention and 54.0667

post-intervention out of a maximum 80 points, failing to reach statistical significance ($p =$

0.616). Age did demonstrate a positive correlation with higher NPRTS scores which suggests

that greater maturity and life experience may enhance coping ability during the transition

experience (Thompson, 2019). Previous RN experience, however, was not found to be a

statistically significant facilitator in NP role transition ($p = 0.731$) (Thompson, 2019). The author

expressed concern for bias in that the webinar may have heightened the participants' awareness

regarding transition, leading them to be more self-critical in their assessments (Thompson,

2019).

In sum, the overall perception from the evidence is that formal programs have the

potential to positively ease the transition process. The research teams shared a common call for

more studies adequately powered to demonstrate statistically significant effects. Inadequate

funding and organizational support remain primary barriers to research on this scale.

Gaps Identified in the Literature

Gaps in the current evidence were identified across all studies included for review. Over half recommended a patent need for further study of how formal programs can be optimized to facilitate the transition experience for novice NPs (Bryant and Parker, 2019; Hill & Sawatzky, 2011; Sargent, 2013, Scholtz et al., 2014; Szanton et al., 2010; and Thompson, 2019). Cappiello et al. (2019) and Woolforde (2012) noted that insufficient evidence exists as to how transition to practice programs can be standardized across various departments and specialties, as well as scaled up to meet the needs of larger entities.

Although not among the primary themes, Hart and Bowen (2016) noted a concern that plagued the consciences of some participants "that they were participating outside of their competence level when practicing in a specialty area, which differed from their educational preparation" (p. 549). This informed the authors' recommendation for additional study to identify the needs of novice NPs in specialty practice, as well as to assist in the development of evidence-based recommendations to guide NP mentors (both NP and non-NP) and transition to practice (Hart & Bowen, 2016).

Brom et al. (2016) noted inadequate evidence regarding the role of organizational leadership in creating a milieu for positive novice NP role transition, while Faraz (2017) identified barriers to independent practice, both regulatory and cultural, as particularly detrimental to the autonomy of novice NPs. Barnes (2015) recommended further study to generate additional data regarding the additional factors (91%) that impact the transition experience, culminating in well designed, evidence-based interventions to support novice NPs at the most vulnerable period of their fledgling careers.

As Szanton et al. (2010) conclude, the novice NP is ultimately responsible for the success or failure of his or her transition experience. However, with proper support rooted in the best evidence, the novice NP transition can be a time of growth instead of paralysis.

Conceptual and Theoretical Frameworks

One would not expect an architect to forgo steel girders in plans for a building; likewise, nurse researchers must also consider a theoretical framework to provide structure and direction for a project's design as it unfurls from concept to actuality. As Bonnel and Smith (2018) note, theories "provide the boundaries for the clinical project and close the concepts involved, and they provide the overall consistency needed for the project" (p. 92). For this proposed DNP project, two distinct, yet interrelated frameworks- Meleis' middle range transitions theory and the PDSA model, will serve to frame the concept of transition, as well as lend structure to the purpose of the project as a QI initiative.

Meleis Transitions Theory

Transition is triggered by change and marks "a passage from one fairly stable state to another fairly stable state" (Meleis, 2010, p. 11). It is the uncomfortable and often disquieting dimension of the change process which can either culminate in empowerment and self-growth, or defeat and anguish. Transitions in role offer a particularly profound challenge to self-identity as they "require a person to incorporate new knowledge, alter his behavior, and thus change his definition of himself in his social context (Meleis, 2010, p. 15). Throughout its long history, nursing has played a central role in assisting individuals, families, and communities to navigate the demands of transition, prompting Meleis to deem transitions as "central to the mission of nursing" (Im, 2014, p. 253). As aforementioned, the role transition from NP student to provider

can be stressful with profound uncertainties regarding role mastery, satisfaction, and retention, as well as patient outcomes.

For a novice NP, conditions exist within the new work setting, both personal (within the NP) and environmental (within the organization) that may serve as facilitators or barriers toward successful transition, e.g. role attainment (Barnes, 2015). Meleis' early work in transitions theory centered on the impacts of two primary concepts: role insufficiency and role supplementation, on role attainment and psychosocial function (see Appendix B). Role insufficiency is a state that develops from the gain or loss of a role and is often reflective of inadequate preparation prior to the transition experience. For novice NPs, role insufficiency may result from a multitude of factors such as poor role definition, unclear expectations, and a lack of social and experiential knowledge in the new environment. Reconciling with the transition from providing patient care to prescribing can be particularly stressful as the expert nurse suddenly must question every decision. As Poronsky (2013) notes, inadequate preparation for this new reality upon graduation breeds unawareness, which may lead to a longer and more distressing period of adjustment. Role supplementation describes the interventions, both preventive and therapeutic, used by a nurse to facilitate positive role transitions. By easing the novice NP's transition, the experienced NP preceptor may also experience a transition of his or her own – from expert to mentor (Dracup & Bryan-Brown, 2004).

Meleis theory, thus, provided a fitting theoretical basis for the DNP project as well as assisted in defining the variables for study. The Nurse Practitioner Role Transition Scale (NPRTS) (mean Cronbach alpha 0.90 across all 3 domains) was adapted to measure role insufficiency, the dependent variable, at baseline and several points throughout the intervention period (Strange, 2015). A role supplementation intervention in the form of an onboarding

program based on the American College of Cardiology (ACC) competency statements for

advanced practice providers, the independent variable, provided a structure to define the goals

for the transition experience.

PDSA for QI

QI not only represents a crucial skill for nurses in advanced practice (e.g. DNP essential

II), but an opportunity "to bring stakeholders together to systematically review processes and

practices, and ultimately improve patient outcomes" at the practice level (King, Gerard, & Rapp,

2019, p. 333). There are many tools available to assess the effects of QI, varying in applicability

according to purpose and scale. The PDSA model is most applicable to the DNP project as the

scale was quite small.

The PDSA cycle begins with the identification of a problem in the clinical setting and a

proposed solution (plan). The intervention is implemented for a brief amount of time and a small

cohort of participants (do). Outcomes are measured and evaluated (study), and adjustments are

made to the plan as needed (act). The cycle is repeated until it is deemed fit for roll-out on a

larger scale within the system (King, Gerard, & Rapp, 2019) (see Appendix C). For the project,

the plan was to employ a competency-based onboarding framework with the upcoming hire of a

novice NP. Outcomes were measured at baseline then every six weeks for the first six months

during the onboarding process using the NPRTS and competency checklist. The plan was

adjusted between cycles based on changes in NPRTS scores and other data.

Fifty key competencies have been highlighted in the competency document and termed

the Key 50. It was suggested that the novice NP candidate make a reasonable effort to

demonstrate rudimentary competency in these 50 key areas prior to being released to

autonomous practice. The Key 50 competencies address areas such as anatomy and physiology, assessment, and technology use, as well as the ability to acknowledge patient instability or the need for colleague assistance. In addition, several elements within the Key 50 address behavioral competencies such as the ability to work with patients, families, and colleagues in a respectful manner.

If the novice NP meets the expectations as set forth by the checklist as well as preceptor at six months, he or she will then be released to autonomously manage a panel of patients in concert with the collaborating provider and care team. Review of competencies will then be made at the one year mark and annually to assess progress toward milestones, as well as overall professional development in relationship to the ACC standards.

As aforementioned, evidence is limited, but the team of Garcia, Watt, Falder-Saeed, Lewis, and Patton (2017) successfully implemented a QI project for onboarding APNs in the clinical nurse specialists (CNS) role. The project integrated core competencies from the National Association of Clinical Nurse Specialists. A competency checklist, needs assessment template, and professional evaluation goal sheet were developed and revised throughout the PDSA process with positive results to include successful orientation of three new CNSs.

Both models were invaluable in guiding all aspects of the competency-based onboarding program for novice NPs in cardiology. Meleis' concepts regarding transition defined the variables, particularly the effect of transition on the role attainment experience for novice NPs, as well as the potential interventions toward positive outcomes. Furthermore, by assisting in this transition, the preceptor role models two vital behaviors: caring for one another to the betterment of the profession and utilizing QI to the betterment of patient outcomes.

Methodology

Needs Assessment.

The need for a formal, evidence-based onboarding program was based on the past onboarding experiences of the primary investigator (PI), as well as those of peer NPs. The frustrations regarding a lack of clearly defined role expectations expressed by NPs who left the practice in the past four years also served to highlight a glaring need for a formal onboarding structure, as well as a pathway for ongoing professional development.

Project Design.

The project design was a non-randomized, pretest-posttest study utilizing a convenience sample of NPs newly hired to the outpatient cardiology practice with the aim of finding evidence in support of the following practice question: For novice nurse practitioners entering outpatient cardiology practice, does an evidence-based competency checklist have a positive impact on transition over the initial six months of practice? The overarching aim was to generate evidence favorable for the use of the competency-based onboarding program in enhancing transition as evidenced by an overall improvement in transition scores from baseline to six months of practice.

Setting

The project was implemented at a hospital-based, outpatient cardiovascular practice in a medium-sized Midwestern city. The provider mix in the practice consists of cardiologists (general cardiology, interventional cardiology, and electrophysiology) and NPs. The NPs, previous to COVID-19, were mostly responsible for providing outpatient visits Monday through Friday, with the additional responsibility of covering answering service call (one evening per

week) and assistance with Saturday morning rounds at the hospital. Duties were expanded in early June to include approximately two weeks of hospital rounding Monday-Friday within a five week block.

Although the primary focus of the project was on the outpatient setting, the novice NP was paired with the preceptor, who also served as primary investigator (PI), for these inpatient weeks with the assistance of other NPs or physician providers as required. For the purposes of this study, the preceptor is referred to as preceptor/PI.

Participants

The target population for the study consisted of novice NPs transitioning to practice in the outpatient cardiology setting. A convenience sample of participants was to be recruited upon hire to the novice NP role in the cardiology practice. Participation was voluntary with the option to withdraw from the study at any time. Informed consent was to be obtained from each participant prior to the issuance of any project instruments or materials. Each participant was assigned a participant number upon enrollment to maintain anonymity. All documents including the participant list and consent forms were maintained throughout the course of the project in a locked cabinet to which only the preceptor/PI had access. The paper documents will be destroyed using the healthcare organization's secure document shredding service for protected health information (PHI) upon projected completion of the project June 1, 2021.

Tools for Evaluation

The Nurse Practitioner Role Transition Scale (NPRTS) 2015 was adapted to measure transition as a proxy for outcomes related to role insufficiency, the dependent variable. The

survey, as developed by Cusson and Strange (2008), was revised by Strange (2015) to consist of

a 31-item, 5-point Likert scale evaluating transition against four primary concepts:

1. Developing comfort and building competence

2. Understanding of the role by others

3. Collegial support

4. Confidence in the role

Content validity and reliability of the scale were validated by Strange (2015) using a variety of

statistical measures of internal consistency. Scores range from 31 to 155 with low scores

indicative of impaired transition (i.e. role insufficiency) and higher scores a healthier transition

(i.e. role sufficiency or mastery) (Hines, 2018; Strange, 2015). Demographic data was collected

at baseline and several open-ended questions were added at the end of the survey form to

promote self-reflection on the part of the novice NP (see Appendices D and E). Permission was

granted from the primary author, Dr. Strange, to use the scale in the cardiology setting

(Appendix F).

The competency checklist was based upon the ACC's 2020 competency statements. The

document was originally planned for release March 27, 2020 during a special cardiovascular

team section meeting at the ACC's annual meeting in Chicago. Unfortunately, given rising

threats posed by the COVID-19 virus, the conference was cancelled and the competency

statement was released online via the Journal of the American College of Cardiology (JACC)

website. As anticipated, the competency document closely mirrors the organization's COCATS,

the primary instrument to guide physician transition from fellowship to practice. Like COCATS,

the NP competencies are stratified across six core categories: Medical knowledge, patient care

and procedural skills, systems-based practice, practice-based learning and improvement,

professionalism, and interpersonal and communication skills (Rodgers et al., 2020). The

document not only provides a transparent and comprehensive set of the expectations for NPs as

part of a high-performing CV team, but also an overview of the milestones for achievement. The

imperative of lifelong learning underpins the competency plan. Although the depth and breadth

of the statement may be intimidating at first glance to a novice NP entering cardiology practice,

the milestones, most of which defer mastery to 24 or 36 months post entry to practice, may serve

to diffuse some of the anxieties posed by the internal (and often external) unrealistic expectation

to learn everything at once. Permission was granted from JACC's publisher, Elsevier (see

Appendix G) to adapt the competency statements for the purposes of this project (see Appendix

G).

The checklist also addresses the essential elements reflective of the Consensus Model for

APRN regulation: Licensure, Accreditation, Certification, and Education (LACE) (American

Nurses Credentialing Center, n.d.). The NP candidate must meet the educational, certification,

and licensure requirements for the NP role as defined by state and federal regulations, as well as

organizational policy. The candidate must also meet the requirements set forth by the practice for

safety, privacy, and EHR use. Unfortunately, the novice NP's access to the provider-level EHR

package during the initial stages of the project was hampered by a lengthy administrative delay

in the credentialing process.

Fifty competencies were identified by the preceptor/PI as crucial to progression to more

autonomous practice. The competencies were labeled as the Key 50 and placed into a separate

grid for ease of tracking during the onboarding process (the grid was printed from the main

document and maintained at the front of the onboarding manual as a rapid reference). Although

the attainment of these Key 50 competencies was not mandatory for full credentialing or release

to autonomous practice by the organization, progress was tracked as a means to direct the novice

NP's learning to those activities deemed necessary to overcome any emerging signs of role

insufficiency, as well as expand the overall knowledge base (see Appendix H).

The preceptor/PI drew on her experiential knowledge as a cardiovascular nurse and NP,

as well as the challenges faced during her own transition to practice, in identifying which

competencies were paramount to successfully navigate the demands of early NP practice in a

safe, efficient manner. Expectations specific to this cardiology practice site included the ability

to perform thorough follow up and acute care visits, as well as unscheduled encounters for

implanted cardiac device or percutaneous procedure wound site complications. Documentation

of the encounter, ordering and review of lab and other diagnostic testing, integration of results

into a comprehensive plan, and timely follow up were highlighted as components of these overall

processes. Emphasis was also placed on identifying clinical issues that warrant collaboration

with the physician provider, as well as the prompt recognition of patient instability.

Project Plan

Description of the intervention. After obtaining informed consent, the onboarding

binder containing the competency checklist (with an explanatory narrative) was issued to the sole

new NP hire two weeks prior to the anticipated start date by the preceptor/PI. The baseline

NPRTS and demographic survey were administered on the first day of hire. The competency

checklist and onboarding manual were thoroughly reviewed and items already met through

previous experience or the organization's hiring process (e.g. introductions, issuance of laptop

computer) were noted. A calendar highlighting the tentative clinical plan, as well as PDSA

schedule, were also reviewed. The baseline data from the survey instruments were entered into

the Google Sheets spreadsheet and reviewed with the novice NP.

Twelve novel self-directed learning packets (SDLPs) created by the preceptor/PI were also added to the onboarding manual on the first day of implementation with the intent of providing evidence-based learning experiences in support of the competencies. Items in the SDLPs included an overview of the competencies addressed (particularly the Key 50), learning objectives, didactic content- a reading assignment and an online learning module derived from evidence-based sources, a peer-reviewed journal search, suggested web-based apps as guideline resource, and a practical exercise or skill demonstration. A copy of the text entitled *Current Diagnosis and Treatment: Cardiology (5th Ed.)* by Crawford (2017) was given to the novice NP as a concise, evidence-based reference tool, as well as a recognition of the candidate's commitment and accomplishments thus far in the transition process. Each packet culminated in a ten-item exam consisting of both short-answer and multiple choice questions with answer key to assess the NP's knowledge attainment (see Appendix I). The scores for the SDLP tests were to be utilized solely as a tool to enhance the novice NP's learning and skill in identifying a wide variety of evidence-based resources.

During the first week, the dyad was assigned to hospital duty which was a departure from the original outpatient-focused plan. The novice NP, although familiar with the hospital setting, shadowed the preceptor/PI for the entirety of that week. Upon returning to the office setting in week 2, the novice NP was given the preliminary SDLP on hypertension management. The novice NP continued to shadow the preceptor/PI with discussions pre- and post- patient encounters. In week 3, the preceptor-PI asked focused questions to the novice NP in regards to differential diagnoses, selection of diagnostic testing, and potential therapies/interventions. An introduction to medication selection with an emphasis on compelling indications, evidence-based guidelines, and cost was introduced.

By week four, the novice NP was encouraged to learn the documentation process for an ambulatory visit. The novice NP had previous expert-level competence in both the ambulatory and inpatient components of the electronic health record (EHR) (Cerner PowerChart™) for nursing. A review of the requirements for a payer-acceptable, provider-level office visit note were reviewed and the novice NP began documenting all visits. At week six, the novice NP was charged with conducting every third visit including completion of the note, placing orders for testing, and submitting charges. At week eight, the responsibility was increased to every other visit with plans to conduct visits with the preceptor/PI outside of the room in the following week.

As the project progressed through the twelfth week, the novice NP was given more autonomy in terms of the formulation of the patient management plan to include responsibility for the review of all associated diagnostic testing, discussion of plan with the respective physician provider, and patient phone follow up. At this juncture, the novice NP was conducting most visits with the preceptor outside of the exam room. The organization remained steadfast in its denial of the request for provider-level EHR access, thus the dyad continued to share one computer.

Full credentialing was complete at the end of the 18th week which allowed the novice NP the opportunity to conduct visits more independently, as well as build a panel of patients. During the final six weeks of the implementation phase, the preceptor/PI worked in parallel. The novice NP conducted all aspects of the visit independently with assistance of the preceptor/PI as needed. The novice NP was integrated into the answering service call rotation and conducted Saturday morning rounds on her own.

Data collection. The competency checklist and NPRTS results were collected and scored at each designated measurement interval by the preceptor/PI. The demographic survey, included

with the baseline NPRTS, was utilized to assess characteristics of the participant population to include age, gender, race, educational history, NP program (and format), years in clinical practice as an RN, clinical setting of RN practice, and time from graduation from the NP program to date of hire (Thompson, 2019). An opportunity for self-reflection was provided at the end of each NPRTS survey. The data, numeric and narrative, were organized in respective spreadsheets in Google Sheets. The preceptor/PI was solely responsible for data input, analysis, and maintenance (to include confidentiality). The novice NP was responsible for reviewing the competency checklist and keeping all documentation organized and up to date in the onboarding binder.

Outcomes analysis. Outcomes regarding adequacy of transition were derived from NPRTS scores. The preceptor/PI employed descriptive statistics to determine if a difference existed between NPRTS scores from baseline to the final measurement interval, as well as in the intervals between the six PDSA points throughout the process (Thompson, 2019). Total and mean scores were calculated for each measurement interval. Variations in scores between each interval, as well as from baseline to the final interval, were also computed. Data analysis was performed using the statistical tools in Google Sheets.

NPRSTS scores and progress toward the Key 50 competencies were reviewed every six weeks with the novice NP. The original plan included display of data via a graphic chart in a common area for all providers to review, but it was felt that this might hinder efforts to protect the participant's (novice NP's) anonymity. Results at the end of each PDSA cycle to include a synopsis of the candidate's successes, as well as any areas of emerging role insufficiency were shared between the preceptor/PI-novice NP dyad only. The onboarding plan was updated as needed based on findings at the end of each PDSA cycle (or as dictated by time or changes to the

office schedule during the COVID-19 crisis). Outside input from the key stakeholders during the course of the project was integrated, as appropriate, into the plan.

The analysis plan included balancing measures to ascertain whether the new onboarding process exerted an impact, either positive or negative, on other clinic processes or outcomes, primary of which was NP productivity (Institute for Healthcare Improvement, 2020). A comparison of the number of patients per month seen by the preceptor/PI pre-intervention with those during the intervention phase was chosen as the primary balancing measure to determine if a structured onboarding process would negatively impact the preceptor's productivity. Similar numbers were also tracked for the same time period across all NP schedules in the practice as a secondary measure to determine if the project (with a preceptor-preceptee dyad) placed an undue strain on the other NP providers.

Initially, the plan was to look at monthly visit numbers over the three month period pre- and post- implementation (March-May 2020 and June-August 2020 respectively). The COVID-19 pandemic rapidly emerged during the pre-implementation period, and in response, the organization issued several mandates limiting outpatient visits to those with acute needs. Likewise, visit numbers were also limited as many, despite feeling acutely ill (e.g. recurrence of atrial fibrillation, chest pain), chose to defer care out of fear of contracting the virus. Cardiology was one of the last entities to receive training for the telehealth platform, further hindering capacity for routine follow up encounters. Concern emerged that these numbers would not accurately reflect the practice's patient usual load. Thus, visit numbers from the 3 month period prior to COVID-19 (December 2019-February 2020) were also included in the final analysis.

Resource utilization. During the planning phase, it was projected that the study would require little, if any, expenditure in terms of human or material resources. Google Sheets and its

statistical tools were available free of charge with the creation of an online account. Many free

resources for cardiology practice development were found to be available from professional

organizations such as the ACC, the Heart Rhythm Society (HRS), and the Preventive

Cardiovascular Nurses Association (PCNA). The healthcare organization's online medical

library also provided access to an expansive array of cardiology texts and journals.

Expenditures during the study totaled $41.85, mostly for supplies to create the

onboarding binders. A lock to secure the paper copies of study documents (e.g. the participant

list, consents, and instruments) was also purchased by the preceptor/PI. The cardiology reference

text was purchased utilizing continuing education funds from the practice.

Time was quickly recognized as the scarcest commodity as the project progressed from

the initial planning phases to implementation as opportunities to complete the necessary

measures and review results became more fleeting. Frequent, if not daily, changes in the

workways of the practice as the pandemic continued to unfold presented a significant challenge

not only to staying on track during the PDSA cycles, but also keeping abreast of the rapidly

shifting NP role within the cardiology practice.

Timeline for completion. Following DNP project proposal endorsement, the roll out

date was set for June 1, 2020. The implementation phase of the project continued to November

13, 2020, the terminus of the 24 week PDSA cycle. The project remained on time despite several

alterations in the onboarding schedule and curriculum to accommodate inpatient rounding,

alleviating prior concern that the COVID-19 crisis might delay progress.

Institutional review board approval. Applications for institutional review board (IRB)

appraisal were submitted to the boards of the two institutions overseeing the project: the health

system in which the practice site was located and the educational institution. 'Exempt from further review' status was initially granted from the health system's IRB on May 29, 2020. However, upon the recommendation of the Goshen College IRB, the application was re-submitted with approval to undertake the study granted on July 17, 2020 under the Office for Human Research Protections (OHRP) Category 7 (OHRP Approved Federal-wide Assurance Number: FWA00009238). The educational institution granted IRB approval on June 26, 2020 (tracking number 024-1920) (see Appendix J).

Evaluation

Data Analysis

Data was derived from several sources to include the baseline demographic form, the NPRTS instrument (both Likert-type data and narrative statements), and the competency checklist. The preceptor/PI was charged with the principal responsibility for data collection at baseline and at the following intervals: six, 12, 18, and 24 weeks, as well as input into the Google Sheets spreadsheet.

An inadvertent deviation from the original plan for the first week was made due to the rapidly evolving plan for all providers in the practice in response to the COVID-19 crisis. The preceptor/PI and novice NP were reassigned to week-long inpatient rounding. Thus, the first day lunch with peer NPs from the practice was deferred to the following week and focus shifted to addressing the few competencies related to inpatient duties such as changing the EHR to the hospital view and team communication platforms (e.g. morning huddle, secure texting vs. paging).

The data collection plan remained on track, however, throughout the course of the project. The novice NP was given the NPRTS on Friday morning of the last day of the QI period

and was timely in its completion. The PI entered the data over the weekend and performed

analysis of the scores to include individual survey items and overall score. Areas of emerging

role insufficiency were identified from both the NPRTS scores and narrative statements. The PI

and novice NP discussed the findings early in the week in order to make any necessary

alterations to the onboarding plan, as well as to anticipate any learning opportunities (e.g.

complete an office visit for hospital follow up, participate in a dobutamine stress echo).

Likewise, areas of strength, as well as signs of positive role assimilation, were also highlighted.

The pan continued over the course of four PDSA cycles.

The original analysis plan had included the use of paired *t*-tests, to determine if a

statistically significant ($p < 0.05$) difference existed between NPRTS scores from baseline to the

6 month (24 week) measurement interval, as well as between the six PDSA points throughout the

process (Thompson, 2019). The tests were to be computed using a higher-level statistical

software package such as Jeffreys' Amazing Statistics program (JASP) (Microsoft Windows

version 0.11.1). However, given the extremely low sample size of n = 1, it was deemed that

descriptive statistics would suffice in measuring alterations in NPRTS scores from baseline to

the final collection point interval, as well as between the six PDSA points throughout the

process. Quantitative data was analyzed using the statistical package included with Google

Sheets to compute total scores, mean scores, mode, and percent change in NPRTS scores.

Similar computations were undertaken in the analysis of the balancing measures. Demographic

characteristics were entered into a separate spreadsheet and responses were coded when

appropriate. Narrative statements were also entered verbatim into a separate sheet and analyzed

as clarifying factors only.

The results at the terminus of each six week PDSA cycle were shared exclusively between the preceptor/PI and novice NP in order to maintain anonymity. Nonetheless, input from key stakeholders was welcomed and integrated as appropriate, into the onboarding plan.

Key Findings

NPRTS scores. The project evolved over four and one half months and included four PDSA cycles. Analysis of the data demonstrates an improvement in transition from baseline to final collection point (Figure 1). Benner was instrumental in defining the experiences of nurses as their careers unfold over time, suggesting that a competent nurse "is typified by the nurse who has been on the job in the same or similar situations two to three years" (Brown & Olshansky, 1997, p. 47). However, given the complexity of the NP transition amidst the resource-strapped milieu of the modern healthcare system in which time is amongst the rarest of commodities, this model may be insufficient on its own to define this experience. Expectations for a swift transition upon hire have become the norm as many practices struggle to meet consumer demands for access and minimize financial drains due to provider shortages. On this unique transition journey- a snapshot in the overall career trajectory, the novice NP progresses through four stages as defined by Brown and Olshansky as components of the Limbo to Legitimacy model (1997, p. 48):

1. Laying the foundation: The interval between completing the formal educational program and beginning employment during which the graduate NP prepares for and completes the certification examination.

2. Launching: The novice NP begins employment in the new role. The novice NP may feel like an imposter as past identities and relationships change; overwhelm and anxiety may set in (Poronsky, 2013).

3. Meeting the challenge: Confidence begins to develop while anxiety and role

    ambiguity start to lessen.

4. Broadening the perspective: A sense of legitimacy begins to develop, indicative of

    healthy role transition (Poronsky, 2013; Brown & Olshansky, 1997).
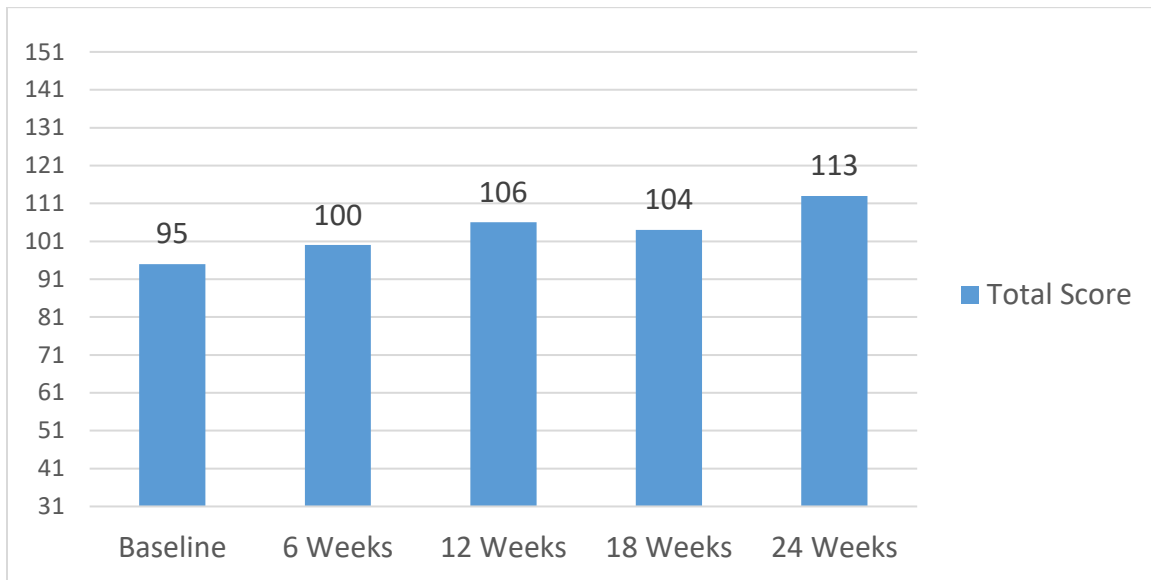
Figure 1. Total NPRTS scores from baseline to 24 weeks. NPRTS = Nurse Practitioner
Role Transition Scale.
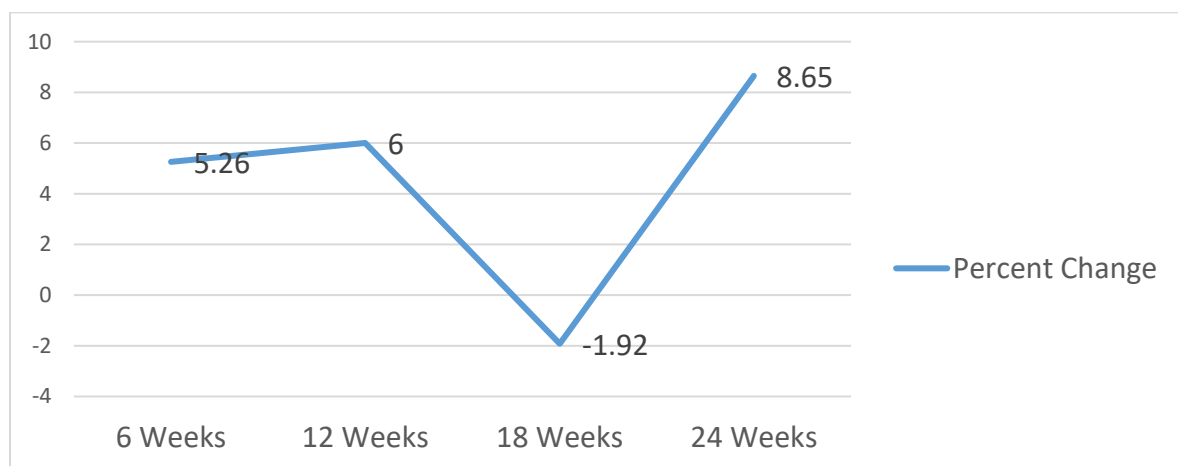
Figure 2. Percent change in NPRTS scores between PDSA cycles. NPRTS = Nurse
Practitioner Role Transition Scale.

Baseline: Launching. The project was implemented as planned on the novice NP's first official day of hire. The candidate was given the onboarding manual two weeks prior to the start date and was well prepared on the first day. The demographic survey revealed that the novice NP had completed a Master of Science in Nursing with a focus on the family nurse practitioner role from a traditional university (i.e. "brick and mortar") program. The candidate was an experienced RN having spent the previous four years in the employ of the cardiology practice. Prior to this, the novice NP had practiced as a staff RN on the telemetry floor of the affiliated hospital and identified cardiology as a unique area of interest and expertise (see Appendix K).

The baseline NPRTS revealed a total score of 95 out of 155 points (mean score 3.06±1.12 points) which was indicative of an adequate level of comfort and confidence with the role (Hines, 2018; Strange, 2015). There were firm responses to four items on the survey (either 5 (strongly agree) or 1 (strongly disagree) depending on the context). The novice NP noted strong agreement with items 13 and 14 which relate to the approachability of the practice supervisor and the mentor (preceptor). The novice NP also felt strongly that the practice framework for NPs was more firmly rooted in a nursing versus a medical model (items 23 and 24). Scores were more moderate for the domains of developing comfort and building competence (items 1, 28, and 31), understanding of the NP role by others (items 5, 6, 9, and 23), and collegial support (item 4). The novice NP felt equally confident in the strength of relationships with physician providers and the ability to communicate with them (domain of communications and relations, items 26 and 27). Confidence in the role, particularly in terms of time management, was less robust as evidenced by the response to item 28 "I felt I needed extra time to complete my responsibilities" (Strange, 2015, p. 39).

Narrative statements from the baseline NPRTS survey echo this mixture of enthusiasm tempered with concern for the capacity to fulfill the demands of the role in the allotted amount of time. The newly expanded hospital role for NPs in the practice also raised concern as the expectations were not clearly defined. The novice NP conveys positivity in stating "I am seeing a wide variety of patients" and is eagerly anticipating receiving provider-level access to the EHR. These statements are consistent with the findings of Poronsky (2013) in which novice NPs in the more immediate phase of the transition often note "feelings of self-doubt, apprehension, and emotional turmoil" when faced with the new and often disconcerting demands as health care provider (p.353).

At baseline, five of the 50 Key competencies had already been met. These included participating in activities to promote a safe environment for patients and others (#2), demonstrating mutual respect and empathy (#6), obtaining specialty certification (#7), demonstrating high ethical standards (#9), and providing emotional support for patients and caregivers (#11) (Rodgers et al., 2020).

6 weeks: Encountering the challenge. At six weeks, the NPRTS score increased by five points or 5.26% to a total score of 100 (mean score 3.23±1.02 points). Upon closer analysis of the individual items, there was evidence, albeit minor, of emerging role insufficiency, particularly in the domains of collegial support and communications and relations. The responses indicate feelings of a decreased level of collegial support and increasing isolation (items 18 and 19). The novice NP also indicated stronger agreement that the NP role was being viewed as a substitute for a resident (item 15) which likely reflects the conflict among the physician peers at this time in regards to the NP role in the hospital setting. The preceptor shared similar concerns and it was difficult to develop a routine during hospital weeks as expectations varied greatly

based on which physician providers were present. Concern about COVID-19 exposure was

heightened during this period and case numbers were once again increasing.

These small setbacks were tempered by gains in other areas. In the domain of developing

comfort and competence, the novice NP indicated an increased level of comfort with the degree

of educational preparation in managing patients and the ability to cope with the transition from

RN to NP (items 2, 3, 10, and 22). The novice NP also acknowledged a greater appreciation for

the role in the public's view (understanding of role, item 8).

Narrative statements from this cycle reiterate the desire to gain provider-level computer

access, as well as more experience in developing plans for patients primarily in the outpatient

setting. Upon further discussion regarding the computer access, the novice NP stated that she

viewed computer access as a key to more autonomous practice, providing a greater opportunity

to visit with patients independently in the office. The novice NP also expressed concern that

"slowness" with documentation was decreasing the preceptor's efficiency with a full schedule of

visits.

To overcome this insufficiency, the preceptor/PI provided several role supplementation

interventions with the aim of providing a sense of routine and structure. These were based on the

preceptor/PI's prior experience with past orientees. The novice NP was assigned primary

responsibility for two to three patients per day (e.g. documentation, orders, review of plan with

physician) by the preceptor/PI. This afforded the novice NP a sense of consistency and autonomy

during these oft long days when preceptor and preceptee were learning side by side.

Fourteen additional Key 50 competencies were met during this QI cycle. These included

demonstration of effective communication with team members and patients (# 1, #5, and #10),

identification of knowledge gaps and the evidence-based resources to bridge them (#4), basic

anatomy of the heart and CV system (#12), performance of a basic CV exam (# 16), and

assessing and developing a plan of care for hypertension (#18, #19, #20, and #28). Competencies

regarding the management of vascular access and cardiac device implantation sites were met as

well (#23, #26, #39, #41) (Rodgers et al., 2020).

Twelve weeks: Meeting the challenge. The gains made in the initial six weeks held

steadfast in this second PDSA cycle. The total NPRTS score increased an additional 6 points to

106 (mean score 3.42±0.85 points), which represented a 6% increase from the last measurement

period and 11.6% overall from baseline. Role sufficiency in the domain of developing comfort

and competence remained evident as scores related to ease of transition and coping ability

increased by one point (items 21 and 22) respectively. But the novice NP also indicated

frustration in this domain as evidenced by a trend toward agreement with the statement "I was

doing more than one person's work" (item 17) (Strange, 2015, p.39). The novice NP's responses

also suggested increased feelings of invisibility and strain in the relationships with the physician

providers (items 25 and 26). These responses are suggestive of burgeoning role insufficiency in

the domains of collegial support and communications and relations.

Narrative statements from this cycle suggest that although the novice NP was feeling

more confident in making independent decisions regarding patient care, the lack of day-to-day

structure was frustrating, mostly due to lack of computer access and inconsistent answers from

management regarding a timeline for the credentialing process.

Role supplementation during this cycle focused on interventions as directed by the

preceptor/PI to increase the novice NP's role in documentation and decision making (utilizing

the preceptor's computer). The preceptor also advocated for the preceptee via multiple discussions and emails with administration to determine the status of credentialing.

Ten additional Key 50 competencies were met during this cycle. Competencies include performing a complete office visit (#15), assessment and management of patients with possible ST-elevation myocardial infarction (STEMI) (#24,), lifestyle therapies for patients with heart disease post-MI or otherwise (#27, #29), rudimentary assessment and management of heart failure (#31, #32), anatomy of the cardiac conduction system (#34), indications for and dosing of anticoagulants and prophylactic antibiotics (#35, #43), and management of patients post cardiac ablation (#40).

Eighteen weeks: Lost in transition? This period continued to be marked by unsuccessful negotiations to gain computer access for the novice NP. However, by the end of this PDSA cycle, credentialing was complete and the novice NP was given provider-level EHR access as well scheduling privileges. The ongoing frustration regarding these perceived barriers to autonomy may have been reflected in the 1.9% drop in total NPRTS score this cycle to 104 points (mean score 3.35±0.88 points). The novice NP indicated feeling less like a substitute for a resident (understanding of role, item 15) and less inclined to agree that NPs in the practice were doing the work of more than one person (developing comfort and confidence, item 17). Surprisingly, the novice NP expressed a decreased level of comfort in managing patients (developing comfort and competence, item 10), but continued to gain a sense of competence in regards to time and patient management (developing comfort and competence, item 3). The novice NP indicated that the preceptor was less accessible (collegial support, item 14), as well as concern for the ability to apply theory to practice (developing comfort and competence, item 16).

The novice NP's delight with having been granted EHR privileges was echoed throughout the narrative statements: "things are going well now that I have my computer access." The novice NP also expressed fear of becoming overwhelmed "now that I am closer to being on my own." The novice NP stated that time management would be crucial now that a schedule was possible.

The NPRTS data and narrative statements served to expand the preceptor's understanding of the impact of credentialing on the novice NP's sense of autonomy, as well as legitimacy and worth as a member of the provider team. Role supplementation in the wake of this cycle focused on supporting autonomy, while minimizing overwhelm. The preceptor/PI assisted the novice NP to configure the EHR to enhance ease of use (the preceptor/PI contacted a consultant from information systems (IS)) to assist. The preceptor/PI also assisted the novice NP in creating auto-replace text and templates for the various office note elements such as review of systems and physical exam. The novice NP was also encouraged to maintain a feasible schedule, gradually increasing the number of office visits with the goal of a full schedule by the end of the year.

During this QI cycle, four additional Key 50 competencies were met. These included use of a basic formulary of common CV medications (#13), recognition of angina (#25), recognition of complications post cardiac ablation (#36), and prescribing of anticoagulation for patients with valvular disease (#42).

Twenty-four weeks: Broadening the perspective. This final cycle in the project witnessed not only an improvement from the last period, but also the largest net gain. The total NPRTS score increased 8.7% to 113 points (mean 3.65±1.11 points). Improvements were noted across all four NPRTS domains. Scores indicated increased confidence in managing patients as

an NP provider (developing comfort and competence, items 10 and 12). The novice NP felt more

comfortable in how others- peers, co-workers, and patients viewed the new role (understanding

of role and collegial support, items 4 through 9 and 15). The novice NP also indicated an

increased accessibility on the part of the supervisor and preceptor, an improvement in the domain

of communications and relations (items 13 and 14). Improvements were not noted in the areas of

isolation and isolation (items 18 and 25) (see Appendix L).

The narrative data from this cycle was quite brief. The novice NP expressed an overall

sense of satisfaction and confidence with the more autonomous role. Plans for further

development included more educational content focused on cardiovascular disease management

and prevention, as well as developing a routine for daily practice.

After reviewing the qualitative and narrative data from this cycle, there were no specific

areas of role insufficiency. It was clear, however, that the preceptor and novice, now more

experienced, NP would continue to work together as a team, leaning on each other for support.

At the terminus of this cycle, only two additional competencies were fully met: the full

use of the EHR system to manage patient care (#3) and the management of patients in

decompensated heart failure (#33) (Rodgers et al., 2020). Number 37, the recognition of

abnormal/normal EKGs was only partially met by the end of the 24th week (Rodgers et al.,

2020). The novice NP demonstrated skill in identifying abnormal rhythms from12-lead

EKGs, monitor strips, and device electrograms, but continued to experience difficulty with

ischemic changes and bundle branch blocks.

Balancing measures. The analysis of the effects of the onboarding program on

preceptor/PI productivity was undertaken utilizing Cerner PowerChart™ over three distinct,

three month periods: pre- COVID (December 2019-February 2020, pre-implementation at the

onset of COVID (March-May 2020), and post-implementation (June-August 2020). The numbers

were generated using a hand tally of all outpatient visits per NP provider. Time spent supervising

nuclear stress testing was excluded from the count since they do not constitute an individual

outpatient encounter and nuclear medicine services are billed under the auspices of the hospital,

not the cardiology practice.
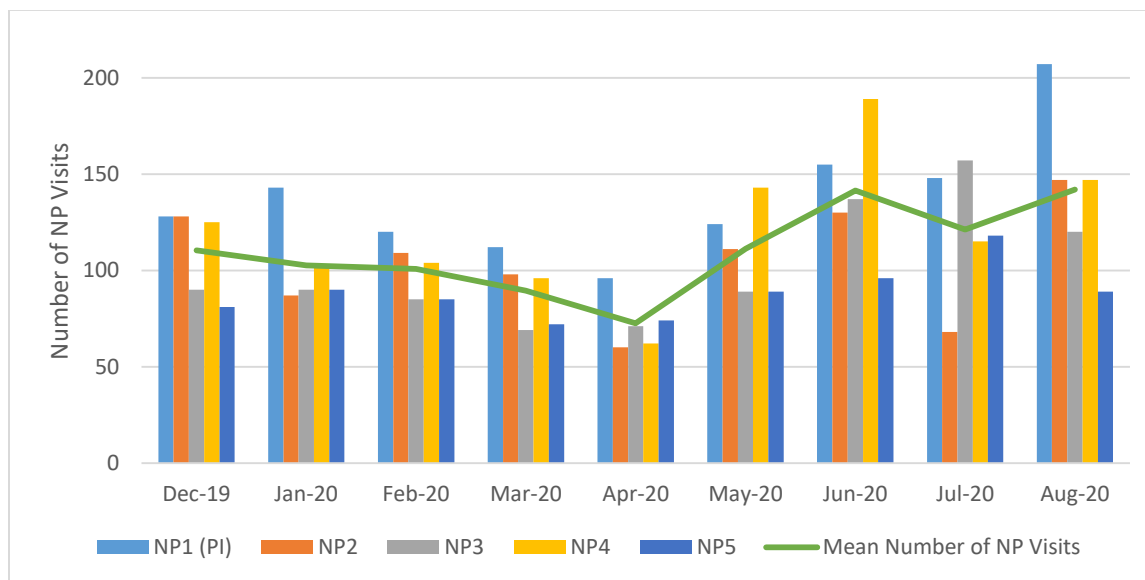
Figure 3. Balancing measures: Number of NP visits per month pre- to post-project
implementation. NP = nurse practitioner. PI = preceptor/ PI. NP1-NP5 = five NPs
employed in the practice.

Primary measure. Analysis of the data demonstrates an increase in the numbers of visits

per month for the preceptor/PI from pre- to post-implementation. The data suggests that the

emergence of the COVID-19 did play a role in the decrease in office visits as the preceptor/PI's

visits dropped by 15.1%. April 2020 showed the lowest tally of patients overall at 96 patient

visits. Post-implementation June 1, there was a marked growth in monthly visits with a 53.61%

increase in visits from June 1 through the end of August.
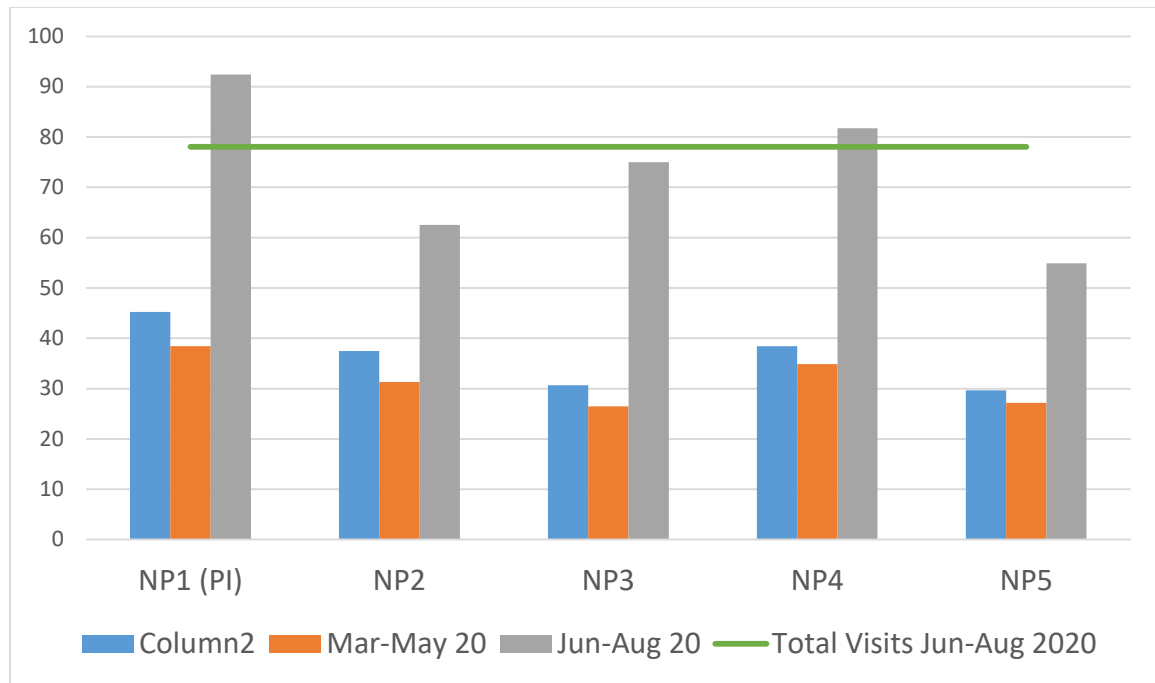
Figure 4. Percent of filled office visits per NP pre-post implementation. NP = nurse practitioner

Secondary measure. The preceptor/PI's monthly office visits remained above the mean

number of visits for all NP providers pre- and post-implementation. During the implementation

period only one provider (NP4) had more visits than the preceptor/PI for the month of June (34

more) and only one (NP3) for the month of July (9 more). This is attributable in part due to the

re-opening of office schedules to routine follow up visits as well as patient confidence in

returning to healthcare settings. Another more powerful factor was the decrease in the

availability of NP visit slots from 864 per month pre-implementation to 312 post, an overall

decrease of 36.1% due to the increase in inpatient rounding days. NP4 was also reassigned to

cover an outreach site following the departure of a physician provider, thus increasing the visit

numbers as the sole provider at that site (see Appendix M). The primary preceptor/PI's office

visit slots were 92.39% filled during the implementation period versus 75% for NP3 and 81.7%

for NP4 (and 78.05% office-wide).

Discussion

Major Findings and Outcomes

Overall, the novice NP demonstrated a positive movement toward healthy transition with an 18.9%, or 18 point, increase in NPRTS score from baseline (mean 104±6.84 points). Most of the role insufficiencies identified along the course of the onboarding program were improved with appropriate role supplementation, as well as completion of the formal credentialing process.

Progress toward role mastery or sufficiency was noted in following areas:

1. Confidence in educational preparation

2. Comfort in role.

3. Sense of confidence RN vs. NP.

4. Competence in managing a patient caseload.

5. Skill in dealing with role transition.

6. Appreciation for view of the NP role on the part of colleagues, patients, and the public.

The role supplementation interventions that appear to have the most weight in improving transition scores include those directed at increasing autonomy and decision making capacity. These include assigning a small cadre of patients each day for which the novice NP was responsible. The number of patients was increased gradually as the novice NP's skill and comfort with decision-making grew over time. The preceptor/PI served as a resource, offering a rationale for disagreement with the novice NP's plan as appropriate. Frustrations regarding lack of access to the provider-level EHR package underpinned the novice NP's desire for more

autonomy. Once the access was granted, the novice NP was not only at a point mentally, but also clinically, to accept a panel of patients.

However, despite efforts at fostering autonomy, regression, or role insufficiency, was were noted as persistent factors in the following domains:

1. Sense of isolation.

2. Sense of invisibility.

3. Relationship with physician colleagues.

In regards to the onboarding checklist, the novice NP demonstrated rudimentary knowledge or skill in 44 of the Key 50 competencies by the end of the 24th week. Competencies regarding pericardial, valvular, and peripheral vascular disorders were not met. The two competencies regarding preoperative cardiac clearance (#14 and #22) were discussed, but the novice NP was not afforded the opportunity to complete any requests, mostly due to time constraints. These competencies, as well as those regarding stress testing were addressed in cycles following the analysis period.

Limitations

Sample size. Although the participant demonstrated an increase in NPRTS scores from baseline to four months, it is difficult to formulate any generalizations regarding the impact of the competency checklist on novice NP transition without an adequately powered sample representative of a wider population of novice NPs. Practices in the region do not hire a sufficient number of NPs to make this feasible.

During the implementation phase, the novice NP noted consistent agreement (4 out of 5) with NPRTS item #1, "My workday was just how I imagined it would be when I was a student"

Strange, 2015, p. 39). The novice NP's experience as an RN in the cardiology practice may have

served as an immersive experience not only into the culture of the practice, but the NP role prior

to the transition. This may have enhanced the novice NP's need for autonomy earlier in the

transition process than another similarly prepared NP without this advantage (Strange, 2015, p.

39).

Thus, to garner greater statistical support, it would be necessary to introduce the project

on a larger scale, possibly in concert with the ACC's APRN working group or the American

Association of Nurse Practitioners' cardiology specialty group. Nevertheless, as a QI project, the

onboarding program and checklist would be applicable for roll-out at the other cardiology

practice within the organization.

Breadth and depth of competency checklist. The checklist in its entirety is

overwhelming to use for the purposes of onboarding. The Key 50 document aids in sharpening

focus on what needs to be accomplished during the initial six month period of transition. Given

the threat of provider exposure, particularly in the inpatient setting, the physicians made the

decision to change the overall practice paradigm from a balance of inpatient and outpatient care

to a schedule placing two physicians and two NPs in the hospital for week-long duty. This has

highlighted major limitations in the onboarding checklist, particularly the Key 50 competencies,

in preparing the novice NP for the inpatient aspects of cardiology care. The novice NP was hired

with an expectation to practice in a mostly ambulatory setting. This hospital role also represented

a simultaneous transition experience for the preceptor/PI, challenging her to reconcile her own

learning needs with those of her preceptee. Therefore, these two factors may have had an

unintended impact on the novice NP's experience.

Administrative delays. The lengthy credentialing process may place an undue impediment on transition which may decrease the flexibility, autonomy, and individual progression for new NPs at all levels of experience, onboarding into the organization. As noted during the final analysis, the novice NP's sense of identity and autonomy were strongly tied to gaining provider-level EHR access. The delay in access limited the novice NP's ability to conduct office visits and order tests, medications, and other therapies in an efficient, autonomous manner. The novice NP was not fully credentialed until September 27, 2020, almost four months post-hire. Not only did this hamper the ability of the onboarding dyad to stay on time with visits (the preceptor/PI was not able conduct a patient visit simultaneous to one of the novice NP's visits as they needed to share a laptop and only one sign-on per provider is allowed in the system. The preceptor/PI was not able to work on messages or review test results while the novice NP was conducting the visit which necessitated that the preceptor/PI spend additional time after hours to complete these tasks. The preceptor/PI and office manager expressed these concerns to higher levels of administration via multiple phone calls and emails, but no progress was made.

COVID-19. The project was implemented within a milieu marked by constant change due to the COVID-19 pandemic. Fornell (2020) characterizes this period as the "most devastating 6 months in modern healthcare" (para. 9). The pandemic forced all stakeholders-patients, physicians, NPs, allied professionals, policy makers, and payers to urgently and thoughtfully tap creativity to provide care in novel and "unprecedented ways" (Diez-Sampedro, Gonzalez, Delgado, Flowers, Maltseva, & Olenick, 2020, p. 1). The health system, as well as the cardiology practice were not immune to these challenges. Personal protective equipment (PPE) was almost non-existent and quickly re-distributed to the inpatient and primary care settings.

During the first five weeks of emergency precautions, office visits were limited to acute visits only. Providers were quickly charged with embracing telehealth as an alternative for routine, in-office, follow up care. For the onboarding program in a fledgling state, this marked change necessitated a revision to include competencies addressing telehealth and wearable technologies.

Time. As projected in the planning phase of the project, time became a scarce resource during the implementation and analysis phases. The constant change to provider expectations and schedules, compounded by concerns regarding the impact on patient care, resulted in less time for onboarding activities. A new collaborating physician began employment during the implementation period, further placing constraints on the preceptor/PI's time as it was necessary to learn his practice preferences and offer assistance with the EHR, orders, and hospital rounding.

Implications for the Healthcare Organization and Practice Site

The findings from the project support the onboarding checklist, as well as a structured onboarding process, as potentially useful in improving the transition experience for NPs hiring into the cardiology practice, as well as into other specialty practices within the organization. Administrative support in the form of access to data would be instrumental in tracking data regarding hiring and retention rates of NPs, as well as the effect of an increased NP workforce in improving patient access to timely care. Open dialogue with all stakeholders in the NP credentialing process is also imperative to streamlining the process to improve the quality and efficiency of the onboarding process.

Implications for Practice Change, Future Research, and Health Policy Change

In 2015, the American Association of Colleges of Nursing (AACN) issued a white paper updating its requirements for DNP projects challenging faculty and students alike to look beyond the project as a mere scholarly exercise within the confines of an academic program, but to the future as a viable plan for improving outcomes or influencing policy. As Ketron (2019) notes, DNP students must consider project sustainability, or the "long-term value and benefit of the quality improvement (QI) of patient care" (p. 93). Sustainability refers to the final step in knowledge translation in which a new process or change moves beyond the novel to an everyday practice (Moran, Burson, & Conrad, 2017).

For this project, lack of time and the unrelenting demands placed on the cardiology practice (and the healthcare system as a whole) by COVID-19 have presented barriers to the novice nurse practitioner (NP) transition process. Thus, it is difficult to fathom how far the DNP project has aided the investigator in utilizing higher level skills to find support, albeit on a very small scale, for the competency checklist to positively affect the transition experience of a novice NP in a specialty with a particularly high learning curve. Nonetheless, the NPRTS and competency checklist will continue to be utilized to monitor for emerging areas of role insufficiency as the novice NP continues along her journey over the first year of practice, and possibly beyond.

A lasting legacy in terms of an impactful and sustainable project would provide a sense of satisfaction that the challenges faced along the way were worth the effort. As noted in the analysis of the data derived from NPRTS scores, the novice NP expressed increasing agreement with the statement (item 15), "I felt that my NP role was seen as a substitute for a resident" at weeks 12 and 24 (Strange, 2015, p. 39). It will be crucial to include inpatient competencies in

future iterations of the checklist in order to maintain the NP role firmly rooted within a nursing

paradigm, at the top of the license, and not as mere substitute for a resident or scribe.

Further exploration of the phenomena of isolation and invisibility in the novice NP

transition experience is warranted as they may have an impact on healthy role attainment. As

Maclellan, Levett-Jones, & Higgins (2016) noted, the transition from the RN to NP role may

signify a marked shift in the power dynamic among former colleagues, resulting in power

struggles culminating in "overt and covert expressions of hostility and opposition, of supportive

relationships and friendships lost and of adversaries instead of allies" (p. 4). Studies with

adequately powered samples would be necessary to lend additional support for the ubiquity of

these phenomena. A qualitative approach may be particularly useful in identifying common

themes which in turn may assist in the development of role supplementation interventions to

prevent maladaptation.

Conclusion

As turnover rates among novice NPs in the first year of practice continue to remain high,

it has become glaringly evident that formalized onboarding programs, rooted in nursing science

and framed by clear expectations, are paramount to facilitating the transition experience for

novice cardiology NPs during this period of significant vulnerability. The long-awaited release

of the ACC's competency statements for APPs signaled a significant step forward to establishing

a framework, not only for an onboarding program in an outpatient cardiology practice, but also

to more clearly define the role expectations for all NP providers as part of a patient-centered,

interprofessional cardiovascular team.

More work is needed on a larger scale to further refine the checklist, as well as other

factors that influence the novice NP transition experience. This poses an exciting challenge for

the future as the unique contributions of NPs to nursing science, as well cardiology, continue to

be made manifest on a global scale.

Plan for Dissemination

Although this document represents a culmination of many hours of work, it is

underpinned by the expectation and hope that it will continue to thrive and flourish beyond the

final defense. One of the most important ways that the DNP graduate can assure the legacy of his

or her work is to engage in processes that allow for the sharing of knowledge among nursing

peers and across diverse groups of stakeholders; from allied professionals, to policy makers, our

patients, and the public at large. From inception to analysis, the DNP project becomes a living,

breathing companion in the day-to-day life of those directing, as well as experiencing, it.

Dissemination of findings is imperative to bringing individual vision, and the evidence behind it,

into the consciousness of others. As McBride (2020) states, dissemination is "vital to impression

formation . . . Once your work is mentioned in print, what you do becomes visible to others, and

that visibility lends credence to your viewpoint on the home front" (p. 135). Not only does this

aid in fostering support for nurse-led initiatives, but may also serve in making manifest the oft

insensible contributions of the profession itself, which nursing has been less apt to do (McBride,

2020).

Fellow nurse practitioners (NPs) in the cardiology practice, as well as a DNP-prepared

friend and mentor were influential in keeping the preceptor/PI accountable and on-track with the

onboarding project. The practice mentor was also invaluable in lending perspectives on how the

project might influence the NP role, in particular how the data collected may be applied in improving NP transition across other specialties.

The plan for dissemination is threefold. First, a poster outlining the project in its proposed form was submitted to the planning committee at the Indiana chapter of the American College of Cardiology (ACC) Annual Meeting on September 26, 2020. The abstract was initially accepted for presentation at the national ACC meeting in March, but COVID-19 forced cancellation of the meeting. The presentation included a digital poster, as well as a five minute slide presentation with audio narrative. Second, an overview of the project and findings will be presented to provider peers and administrative leadership at the next quarterly meeting scheduled for January, 21, 2021. Third, a manuscript will be prepared for submission to the Journal of the American Association of Nurse Practitioners (JAANP), a scholarly, peer-reviewed journal for advanced practice nurses that supports the mission and values of the American Association of Nurse Practitioners (AANP). Given the overarching aims of the project, this journal provides an appropriate forum and audience. JAANP's dedication to "advanced education, lifelong learning, and the continued evolution of advanced practice nursing" is reflective of the nursing profession as well as the Essentials for Doctoral Education for Advanced Nursing Practice (Moran, Burson, & Conrad, 2017). Unlike other NP-focused publications, the journal welcomes manuscripts outlining quality improvement (QI) initiatives that have a high likelihood for implementation in other settings.

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Appendix A

Framework for Literature Search

Records identified through database searching: Keywords: Nurse Practitioner OR Advanced Practice Nurse OR APN OR NP AND transition to practice Years: 1/1/2010-3/1/2020 Databases: CINAHL, MEDLINE, PubMed (n=125)	Additional records identified through other sources (e.g. the gray literature): (n=1)

Records after duplicates removed (n = 115)

Records screened: (n= 115)	Records excluded: (n=98)

Full-text articles assessed for eligibility*: (n=11)	Full-text articles excluded, with reasons: (n=100)

Studies included in qualitative synthesis: (n= 4) with 3 qualitative and 1 mixed methods	Studies included in quantitative synthesis (meta-analysis) (n=8)

Included in review

(n=12)

Appendix B

Meleis Transitions Theory
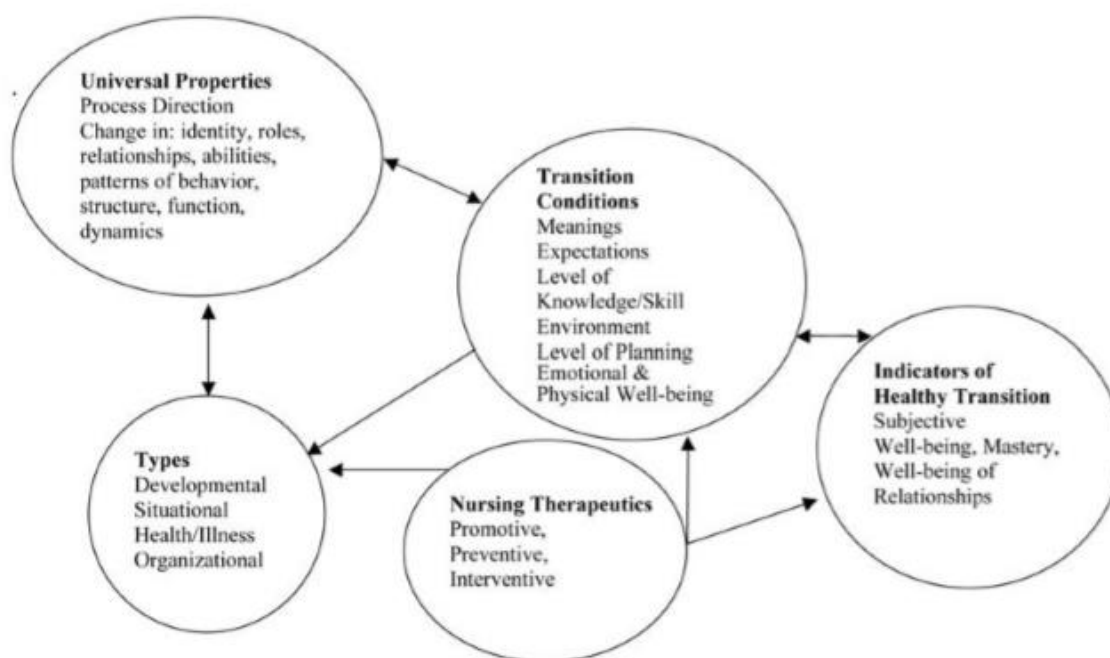
From *Transition Theory: Middle Range and Situation-Specific Theories in Nursing Research and Practice* (p.47), by A. Meleis, 2010, New York, NY: Springer Publishing. Copyright 2009 by Springer Publishing. Reprinted with permission.

Appendix C

PDSA Model
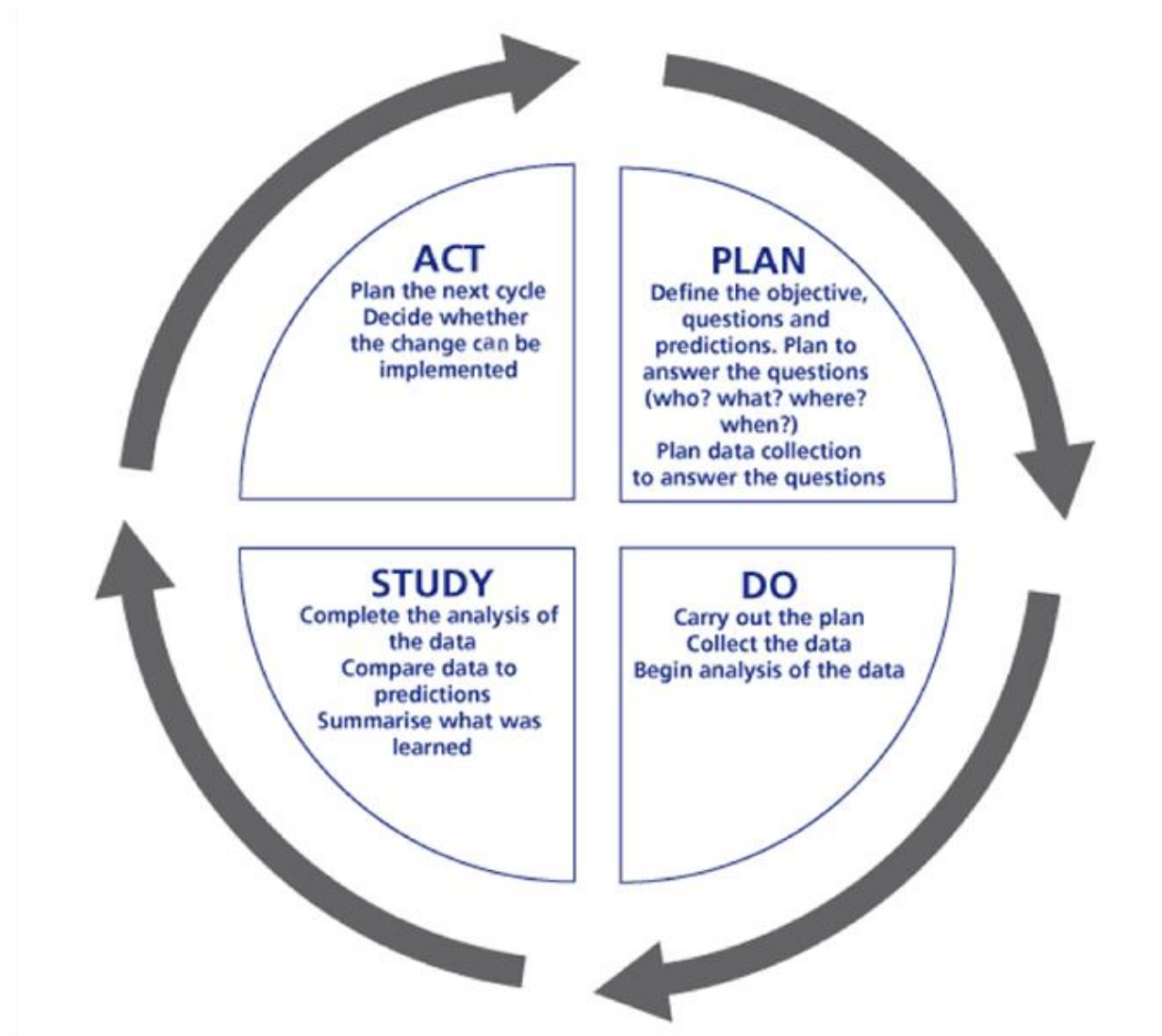
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Appendix D

Nurse Practitioner Role Transition Scale 2015

Item

1. My workday was just how I imagined it would be when I was a student

2. My education prepared me to effectively manage my patients

3. I was comfortable in my role

4. I was treated as a professional by my colleagues

5. My nurse practitioner role was very well understood by my physician colleagues

6. My nurse practitioner role was very well understood by my nurse colleagues

7. My nurse practitioner role was very well understood by my patients/families

8. My nurse practitioner role was very well understood by the public

9. My nurse practitioner role was very well understood by management

10. I was very comfortable managing my patients

11. I felt anxious about the integration of theory into my practice

12. I felt very competent managing my patient case load

13. My supervisor was very available/approachable

14. My mentor was very available/approachable

15. I felt that my nurse practitioner role was seen as a substitute for a resident

16. I had trouble applying the theory to practice when I was under stress

17. I felt that I was doing more than one person's work

18. I felt that I was isolated

19. I felt that I got very little support

20. I felt less confident than I did before becoming a nurse practitioner

21. I felt it was easy to transition from nurse to nurse practitioner

22. I felt I had the skills to deal with the role transition

23. I felt I developed my nurse practitioner role within a nursing framework

24. I felt I developed my nurse practitioner role within a medical framework

25. I felt that I was an invisible provider on the healthcare team

26. I felt that I had a poor relationship with the MDs

27. I felt anxious in my communications with other health care providers

28. I felt that I needed extra time to complete my responsibilities

29. I was able to navigate the health care system to develop my new role

30. I had a clear understanding of third party reimbursement

31. My nurse practitioner program prepared me for a smooth role transition

Likert Scale 1-6

1 = Strongly Disagree

2 = Disagree

3 = Neutral (neither disagree or agree)

4 = Agree

5 = Strongly Agree

6 = Prefer Not to Respond

Adapted from "The Development and Psychometric Testing of the Nurse Practitioner Role Transition Scale" by S. Strange, 2015, Published doctoral dissertation. *Retrieved from https://opencommons.uconn.edu/dissertations/661/.* Used with permission from the author.

Narrative

What I feel is going well with my transition experience.

What I feel is not going well for me.

I need more support from my preceptor on_____.

I need more support from my colleagues on_____.

I need more support from the organization on _____

I would like to learn more about _____.

Appendix E

Demographic Data

Name: _____

Basic Information

Age: _____

How would you describe your gender?

☐ Male

☐ Female ☐ Other: _____

☐ Prefer not to respond

Are you of Hispanic, Latinx, or Spanish origin? ☐ Yes ☐ No ☐ Prefer not to respond.

How would you describe your race? ☐ American Indian or Alaskan Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

Certification, Licensure, & Practice Information

Which degree did you earn during your initial nurse practitioner education?

☐ Master's Degree

☐ Doctor of Nursing Practice (DNP)

☐ Other _____

What type of program did you attend for your initial nurse practitioner education?

☐On-Site

☐ Online

☐ Hybrid or Other _____

☐ Full time   ☐ Part-time

Did your clinical experience during your NP program include a specialty rotation in outpatient cardiology?

☐ Yes

☐ No

Did you participate in a post-graduation residency or fellowship program for novice NPs in cardiology?

☐ Yes

☐ No

If no, did you complete one in another specialty?

☐ Yes Specialty: _____

Location: _____

☐ No

Which of the following best describes your current NP certification(s)?

☐ Family Nurse Practitioner

☐ Adult-Gerontology Nurse Practitioner

☐ Acute Care   ☐ Other _____

How many years have been in clinical practice as a nurse practitioner?

☐ Entry to practice/1st position

☐ ≤ 1 year ☐ 1-2 years ☐ 2-5 years ☐ 5-10 years ☐ ≥ 10 years

In which state(s) are you currently licensed in as a nurse practitioner? _____

In which state(s) are you currently practicing as a nurse practitioner? _____

In which specialties have you practiced as an NP? _____

Prior Nursing Experience

How many years of experience did you have as a registered nurse (RN)? _____

What initial degree did you earn at entry to practice?

☐ Diploma

☐ Associate (ASN/ADN)

☐ Bachelor of Science (BSN)

☐ Master of Science (MSN)

☐ Doctor of Nursing Practice (DNP)

☐ Other _____

What was your primary specialty as an RN? _____

Did you attain specialty RN certifications? ☐ Yes ☐ No

If so, which? _____

Other Information that may be helpful:

Appendix F

Permission to Use NPRTS

Permission to use NPRTS Trash x

Patti Gasper <plgasper@goshen.edu>   Mon, Oct 19, 1:10 PM
to sally.strange

Dear Dr. Strange,

I am a nurse practitioner and student in the Doctor of Nursing Practice (DNP) program at Goshen College in Goshen, Indiana. I am writing to request permission to use the Nurse Practitioner Role Transition Scale version 3 (NPRTS v.3) in my project entitled *A Competency-Based Checklist to Facilitate Transition for Novice Cardiology Nurse Practitioners*. My project is being overseen by Dr. Ruth Stoltzfus, dean of nursing at Goshen College and Dr. Audrey Meyers, professor of nursing at Eastern Mennonite University.

The role of nurse practitioners has widely expanded over the past two decades. In specialty practices, organizations may be ill-equipped to provide a structured onboarding experience for novice nurse practitioners. In my individual adult cardiology practice, this has culminated in a role confusion and turnover. The American College of Cardiology recently promulgated a set of competencies for nurse practitioners and physician assistants, but there is little evidence in the literature as how to best integrate these statements into an onboarding checklist. The aim of my project is to utilize the NPRTS v.3 to measure the effect of a competency checklist based on these statements on the transition experience of new nurse practitioners in my cardiology practice.

I do not plan to alter your instrument in any way. I will utilize the scores to identify emerging areas of role insufficiency in order to adapt the onboarding program/experience to the individual learner as part of a quality improvement (QI) project. The instrument will be administered at baseline and at six week intervals for the first six months post-hire. In addition to utilizing the instrument, I also request permission to reproduce the NPRTS v.3 in the appendix of my final document. The project paper will be published in the Goshen College institutional repository. I request to utilize your instrument under the following conditions:

1. I will utilize the instrument for the purposes of my QI study and will not sell or use it for any other purposes.
2. I will include a statement of attribution and copyright (if applicable) on all copies of the instrument. If you have a specific statement of attribution that you would prefer for me to include, please provide it in your response.
3. At your request, I will send a copy of my completed study to you or provide a link to the final manuscript.

If you do not control the copyright for the NPRTS, I would appreciate any information you can provide concerning the proper contact(s).

If these are acceptable terms and conditions, please reply to me at plgasper@goshen.edu.

Thank you for your time and consideration.

Sincerely,

Patricia Gasper
29255 Summerfield Lane
Elkhart, IN 46517
574-333-8287

Strange, Sally   Oct 19, 2020, 1:41 PM
to me

HI – Thanks for reaching out. Your project sounds very interesting. I appreciate the level of detail you have provided.
I do control all use and copyright of the final NPRTS V3 from the dissertation manuscript you reviewed. I've attached a copy of the scale for your use along with an appropriate citation.
The new scale title is Nurse Practitioner Role Transition (NPRTS) 2015.

Wishing you the best with your work. Let me know if you have any questions.
Sally

Sally Strange, PhD, RN
Director of Human Centered Care, Hartford Region
Hartford HealthCare
Experience, Engagement, and Organizational Development
80 Seymour Street Hartford, CT 06102
P: 860-972-3203
C: 860-729-1085
E: Sally.Strange@hhchealth.org

Hartford
HealthCare

Patti Gasper <plgasper@goshen.edu>   Oct 23, 2020, 11:15 AM
to Sally

Dear Dr. Strange,

Thank you very much for taking the time to respond to my request (as well as your encouragement). I will share my results with you once the project is complete.

Patricia Gasper
plgasper@goshen.edu

Appendix G

Permission to Use Competency Checklist

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Appendix H

Evidence Based Onboarding and Competency Checklist for Cardiology NP

Nurse Practitioner Onboarding Checklist for Cardiology Practice

Name: _____

Date of hire: _____

1st Day of Employment: _____

Part I: General

Licensing and Credentialing	Date Completed
Complete organization-wide Advanced Practice Provider (APP) onboarding paperwork	
Attend Organization-wide APP orientation program	
HIPPA and corporate compliance training completed	
ID card and HID access card	
Copy of current curriculum vitae (CV)	
Indiana state RN license	
Copies of degrees from college/university: BSN, MSN and/or DNP	
Board certification certificate from accredited credentialing body	
Collaborative practice agreement (signed)	
Indiana state prescriptive authority for APRN	
Indiana controlled substances registration (CSR)	

DEA certificate	
NPI number	
CMS (Medicare) credentialing	
Indiana Medicaid credentialing	
Private payer credentialing	
Hospital credentialing- privileges granted	
Signed contract	
Baseline demographic data and nurse practitioner transition role transition scale (NPRTS) forms	
EHR and Informatics	
Laptop issued with requisite password(s) (informatics to assist with setting up desktop and printers (EHR, Outlook, Intranet, VPN, Duo); case and charging cord available	
Cerner training (ambulatory module)	
Cerner training (inpatient module)	
Access granted to other applicable programs if applicable (e.g. Medilynx/Preventice, Medtronic Carelink, Merlin, PaceArt)	
Day 1 Cardiology Practice Specific Orientation	
Morning:	
Meet with office manager	
Meet with medical director	
Meet with preceptor mentor. **Name:**_____	
Office tour with introductions to staff	
Shadow preceptor for morning clinic if applicable.	
Welcome lunch with NP colleagues	
Afternoon:	
Overview of onboarding plan per preceptor	
Review results of baseline nurse practitioner transition role transition scale (NPRTS)	
Review competency checklist and milestones for achievement	

Review self-directed learning (SDL) packet	
Locate online resources in the organization's medical library (e.g. UpToDate, Clinical Key, CINAHL) and how to request copies of journal articles.	
Review plan for performance review at 6 week intervals, as well as 6 months and 1 year.	
Review expectations and opportunities for professional development, lifelong learning, and QI.	
Consider membership enrollment in American College of Cardiology (ACC) and Preventive Cardiovascular Nurses Association (PCNA)	
Hospital tour	
Answering service call orientation	
Review expectations and resources for answering service call.	
Review call schedule and online access via Google Calendar.	
Review proper documentation of answering service calls in EHR.	
Added to call rotation **date:**_____	
Hospital Rounding Orientation	
Review expectations for assistance with Saturday rounding at hospital.	
Assign to participating in rounding with preceptor **date(s):**_____	
_____	
_____	
Review call schedule and online access via Outlook and Google Calendar	
Review use of Discern Analytics to change to inpatient mode in Cerner	
Review documentation and note types for progress notes, discharge, H&P in Cerner	

Date	PDSA Interval	NPRTS Score	Change in Score	Key 50 Competencies Met (# out of 50, cumulative)
	Baseline			
	6 weeks			
	12 weeks			
	18 weeks			
	24 weeks			
	30 weeks			
	6 months			
	1 year			

Competency checklist received and reviewed:

New hire: _____ Date: _____

Preceptor: _____ Date: _____

_____ NP has met the minimal competencies and credentialing requirements to assume management of a panel of patients in the practice with additional supervision and interdisciplinary collaboration as required by the organization, as well as state and federal statutes. He/she will assume responsibility for the development of further knowledge and skill in regards to the specialty of cardiology.

Preceptor: _____ Date: _____

Part II: Safety and Quality Competencies

Method of Instruction (MOI) Key: P = Procedure/Protocol Review E = Education session S = SDL Packet C = Clinical Practice D = Demonstration	Method of Evaluation (MOE) Key: O = Observation RD = Return Demonstration T = Written Test V = Verbal Review	MOI (Use Instruction Key at left)	Evaluation Summary			MOE (Use Evaluation Key at left)	Comments
			Competent **Yes No**	**Initial**	**Date**		

A. Safety and Infection Control							
Locates emergency equipment							
Activates a code blue							
Demonstrates proper hand hygiene							
Demonstrates proper needle/sharps disposal							
Demonstrates proper waste disposal							
Locates and demonstrates proper use of cleaning supplies							
Maintains a clean and organized environment							
Locates fire extinguishers							
Locates fire alarms in office							
Demonstrates understanding of radiation safety practices in nuclear lab							
Demonstrates understanding of patient safety in treadmill stress testing lab							
Promotes a culture of safety							

Locates incident reporting link in intranet							
Locates adverse drug reaction reporting link in intranet							
B. Equipment							
Operates and maintains laptop computer according to informatics security policies							
Demonstrates proper operation of :							
Automated BP system							
AED							
Transport defibrillator (biphasic in nuclear lab)							
12-lead EKG machine							
Hand-held Doppler							
Thermometer							
Device programmers (to include paper re-loading):							
Biotronik							
Boston Scientific (standard programmer and S-ICD tablets)							
Medtronic							
St. Jude							
C. Communication and Documentation							
Locates and reviews patient schedule							
Demonstrates proper navigation of personal and pool message box							
Demonstrates proper documentation of patient messages							
Demonstrates proper ordering of diagnostic and lab tests							
Demonstrates proper documentation of diagnostic testing review							
Demonstrates proper phone etiquette							
Demonstrates proper communication via patient portal.							
Verbalizes proper use of Doc Halo and paging systems							
Completes forms accurately and in a timely fashion (e.g. cardiac clearance requests, FMLA paperwork, work excuses)							
Demonstrates knowledge of appropriate use criteria (AUC) when ordering tests or procedures							
Demonstrates proper use of CPT coding							

Demonstrates proper knowledge of assigning evaluation and management (E&M) codes for office visits.						
D. Quality Improvement (QI)						
Identifies and participates in QI initiatives.						
Delegates responsibilities to team members based on role and competencies.						
Demonstrates a commitment to inter-professional, team-based care.						
Demonstrates a commitment to customer service.						
Participates in monthly NP meetings						
Demonstrates awareness of opportunities for NP involvement in the practice as well as organization.						
Attends at least one continuing education activity annually.						

Part III: Key 50 Competencies for Novice Cardiology Nurse Practitioners

No.	Competency	Subcategory	Met	Unmet
1.	Maintain continuity of care with efficient and effective handoffs throughout transitions of care.	A		
2.	Participate in activities to promote a safe environment for patients, families, and healthcare professionals.	A		
3.	Use information technology to support patient care decisions and patient education.	A		
4.	Identify personal knowledge gaps and seek educational training opportunities to improve knowledge, skills, and performance.	A		
5.	Solicit and incorporate feedback from patients, colleagues, and healthcare professionals to improve clinical performance.	A		
6.	Demonstrate mutual respect, consideration, and empathy for patients, families, and the healthcare team.	A		
7.	Attain and maintain nurse practitioner certification per respective credentialing organizations.	A		
8.	Appropriately seek and integrate advice from consultants in a timely manner.	A		
9.	Demonstrate high ethical standards in personal and professional conduct.	A		
10.	Communicate with patients, families, and healthcare professionals in an effective, timely, and culturally-competent manner.	A		
11.	Provide emotional support to patients, families, and caregivers.	A		
12.	The normal anatomy and physiology/biology of the CV system to include heart, arteries, and veins.	B		
13.	A basic formulary of commonly used cardiovascular medications to manage CV disease as well as DM, HTN, HLD.	B		
14.	Evidence-based recommendations and screening tools for pre-operative clearance for surgery.	B		
15.	Perform a cardiovascular office visit (follow-up, acute).	B		
16.	Perform a basic comprehensive CV history and exam.	B		
17.	Identify patients with acute cardiovascular disorders or high-risk conditions who require immediate treatment, specialty consultation, and/or hospitalization.	B		

18.	Obtain an accurate blood pressure in the clinical setting.	B		
19.	Obtain a history and physical examination for patients with elevated blood pressure and hypertension. *Document a history of female- specific disorders such as pregnancy-induced HTN, pre- and full eclampsia, and gestational diabetes on HTN.	B		
20.	Initiate and monitor diagnostic testing indicated for patients with elevated blood pressure and hypertension to include 24 hour ambulatory monitoring.	B		
21.	Develop, implement, manage, and evaluate a plan of care for patients with hypertensive urgency and emergency.	B		
22.	Complete and document a pre-surgical clearance for non-cardiac surgeries.	B		
23.	Risk factors, signs, and symptoms associated with access site bleeding in patients with acute coronary syndromes, as well as those associated with vascular closure devices (e.g. AngioSeal, Perclose).	C		
24.	Symptoms, physical findings, ECG patterns, and biomarker findings in patients with STEMI.	C		
25.	Recognize and manage angina.	C		
26.	Prevent, identify, and initiate therapies in a bleeding emergency or a vascular access site complication.	C		
27.	Facilitate timely referral to cardiac rehabilitation following acute coronary syndromes.	C		
28.	Cardiovascular risks of nonsteroidal anti-inflammatory drug use in patients with ischemic heart disease and recommendations for musculoskeletal pain management.	D		
29.	Lifestyle interventions for management of patients with stable ischemic heart disease and variant angina with and without revascularization.	D		
30.	Recognize symptoms and ECG changes suggestive of ischemic heart disease and variant angina.	D		
31.	History and physical examination findings and their limitations in the evaluation of patients with heart failure.	E		
32.	Nutritional and fluid recommendations and importance of daily weight for patients with heart failure.	E		
33.	Obtain clinical history and physical examination to determine functional capacity and volume status in patients with new-onset, chronic, and acutely decompensated heart failure.	E		

34.	The anatomy and physiology of the cardiac conduction system and autonomic nervous system.	F		
35.	Anticoagulation and bridging in patients with atrial arrhythmias.	F		
36.	Post-procedure complications of catheter ablation in patients with atrial fibrillation, atrial flutter, supraventricular tachycardia, and ventricular tachycardia.	F		
37.	Recognize normal/abnormal 12-lead ECGs and rhythm strips.	F		
38.	Participate in advanced cardiac life support, emergent defibrillation, transcutaneous pacing, and cardioversion.	F		
39.	Provide perioperative education and post-op wound care to patients receiving cardiac implantable electronic devices.	F		
40.	Manage patients following catheter ablation of atrial fibrillation and atrial flutter, supraventricular tachycardias, and ventricular arrhythmias.	F		
41.	Recognize cardiac device system infection.	F		
42.	Antithrombotic therapy for patients with valvular heart disease or prosthetic heart valves.	G		
43.	Antibiotics for infective endocarditis prophylaxis in patients with valvular heart disease.	G		
44.	Common cardiac arrhythmias in patients with valvular heart disease and treatment strategies.	G		
45.	Recognize and manage cardiac arrhythmias and perioperative complications in patients with valvular heart disease.	G		
46.	Identify complications of pericardiocentesis or surgical interventions.	H		
47.	Normal anatomy and physiology of the vascular system to include great vessels.	I		
48.	Clinical manifestations of PV disorders to include stroke and acute aortic syndromes (dissection, intramural hematoma, and penetrating ulcer).	I		
49.	Perform a comprehensive history and physical examination of the peripheral circulation to include a cardiac risk assessment.	I		
50.	Evaluate and manage arterial, venous, and neurotrophic leg ulcers.	I		

Part IV: Practice Competencies for Cardiology Nurse Practitioner Providers

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<mark>*Key 50 competency that must be demonstrated prior to being released to individual patient panel in italics.*</mark>			**Competent** **Yes No**	**Initial**	**Date**		**12**	**24**	**36**

A. American College of Cardiology Core Competencies for NP Practice in Cardiology									
Systems-Based Practice									
Identify cost, resource utilization, and value when caring for patients with cardiovascular (CV)							x		
Identify and address socioeconomic barriers impacting cardiovascular care and refer to other team members as needed.							x		
<mark>*Maintain continuity of care with efficient and effective handoffs throughout transitions of care. (1)*</mark>							x		
Collaborate in screening patients for investigational therapies and clinical trials, as applicable.									x
Participate in practice-based and regional systems of care for urgent and emergent cardiovascular conditions.								x	
Refer patients who are facing advanced and end-stage cardiovascular disease to appropriate specialists.								x	

Collaborate with all team members to reduce preventable hospitalizations for patients with cardiovascular disease.						x		
Collaborate with healthcare professionals in other disciplines to optimize the care of patients with complex and multisystem disease.						x		
Use information technology and informatics literacy to enhance professional practice.						x		
Contribute to the design and implementation of information systems to enhance safety, quality, and cost effectiveness.								x
Advocate for quality patient care and assist patients and families in dealing with system complexities and limited resources.						x		
Promote patient and family access to community resources and interdisciplinary care services/providers to enhance effective self-care behaviors and promote well-being							x	
Participate in activities to promote a safe environment for patients, families, and healthcare professionals. (2)						x		
Identify barriers to learning and prioritize education for patients with cardiovascular disease.						x		
Develop, implement, and evaluate individualized, patient-centered educational strategies.						x		
Use information technology to support patient care decisions and patient education. (3)						x		
Educate healthcare professionals about diagnosis and management of patients with a condition in one's area of expertise.								x
Practice-Based Learning and Improvement								
Identify personal knowledge gaps and seek educational training opportunities to improve knowledge, skills, and performance. (4)						x		
Utilize clinical practice guidelines, appropriate use criteria, and point-of-care tools to improve clinical decision-making.							x	
Conduct literature searches, interpret findings, and apply evidence-based results to clinical care.							x	

Participate in clinical conferences and team-based meetings to enhance communication and care of patients with cardiovascular disease.								X	
Solicit and incorporate feedback from patients, colleagues, and healthcare professionals to improve clinical performance. (5)							X		
Use practice data to assess appropriateness, quality, and safety of cardiovascular care.									X
Participate in practice-based continuous quality improvement and safety initiatives.									X
Develop the practice of lifelong learning, including regular review of journals and practice guidelines, appropriate use criteria, consensus statements, and participation in scientific and continuing professional education meetings.								X	
Promote the nurse practitioner or physician assistant profession by participation in interprofessional education and research									X
Professionalism									
Demonstrate mutual respect, consideration, and empathy for patients, families, and the healthcare team. (6)							X		
Practice within organization bylaws and state and federal regulations governing nurse practitioner practice.							X		
Practice within the scope of personal expertise, training, and technical skills.							X		
Attain and maintain nurse practitioner certification per respective credentialing organizations. (7)							X		
Appropriately seek and integrate advice from consultants in a timely manner. (8)							X		
Demonstrate critical reasoning skills to promote optimal outcomes for patients with cardiovascular disease.								X	
Identify, disclose, and manage relationships with industry and other entities to minimize bias and undue influence on clinical decision-making.							X		

Demonstrate high ethical standards in personal and professional conduct. (9)							x	
Assume responsibility and follow through on professional commitments and obligations in a timely fashion.							x	
Identify potential for impaired professional performance in oneself and colleagues and take action to mitigate in order to ensure a culture of safety.							x	
Attend to one's own health, well-being, and abilities in order to maximize personal and professional performance.							x	
Interpersonal and Communication Skills								
Assess for and manage human responses exhibited by individuals with cardiovascular disease (e.g., depression, spiritual distress, nonadherence, decisional conflict).							x	
Communicate with patients, families, and healthcare professionals in an effective, timely, and culturally-competent manner. (10)							x	
Engage patients in shared decision-making based upon balanced presentations of risks, benefits, and alternatives, factoring in patients' values and preferences.								x
Utilize the concepts of motivational interviewing when counseling patients.								x
Review medical records, complete documentation, and communicate diagnostic findings and management strategies to patients and collaborating healthcare professionals in a timely manner.							x	
Respectfully participate in interdisciplinary care teams and consider opposing viewpoints for management.								x
Discuss sensitive/difficult topics, including end-of-life care and/or palliative care within the confines of the patient's belief system.								x
Provide emotional support to patients, families, and caregivers.(11)							x	

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Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			**Competent** **Yes No**	**Initial**	**Date**		**12**	**24**	**36**
B. Outpatient and Preventive CV Care Competencies									
The NP will demonstrate <u>knowledge</u> of:									
The normal anatomy and physiology/biology of the CV system to include heart, arteries, and veins. (12)						x			
Basic epidemiology and variations of CV disease across diverse patient populations in the US and world-wide (age, gender, ethnic variations).								x	
The basic pathophysiology and differential diagnoses of chest pain, palpitations, fatigue, lightheadedness, syncope, dyspnea, and peripheral edema.						x			
The effects of comorbidities and lifestyle factors to include, but not limited to: diabetes (DM), hypertension (HTN), hyperlipidemia (HLD), obesity, sleep apnea, anxiety/depression, psychological stress, diet, alcohol, and tobacco use on the development of CV disease.						x			

The basic distinguishing characteristics of the CV system upon physical exam to include, but not limited to, heart murmurs and sounds, vascular bruits, and peripheral pulses.							**x**	
Guideline and evidence-based risk stratification tools and primary and secondary prevention of CV disease.							**x**	
Diagnostic testing to aid diagnosis and guide management of CV and related disorders. *Noninvasive diagnostic studies and indications for vascular screening for carotid artery disease, abdominal aortic aneurysm, and peripheral artery disease. Laboratory testing Imaging Stress testing *Invasive							**x**	
Guideline and evidence-based interventions to prevent and manage CV disease. * *A basic formulary of commonly used cardiovascular medications to manage CV disease as well as DM, HTN, HLD. (13)* *Awareness of genetic and racial/ethnic variations in response to commonly used CV medications. * Cardiovascular toxicity, drug interactions, and side effects of the major classes of medications used for common non-cardiac conditions.							**x**	
Guideline and evidence-based interventions to manage lifestyle-related factors to include strategies for behavioral change.						**x**		
Evidence-based recommendations and screening tools for pre-operative clearance for surgery. (14) *The common cardiovascular complications of non-cardiac surgery* * *The common complications of cardiac surgery and procedures.*						**x**		
The principles of and indications for palliative care in patients with heart disease.						**x**		
The NP will demonstrate the <u>skill</u> to:								
Perform a cardiovascular office visit (follow-up, acute). (15)						**x**		

Perform a basic comprehensive CV history and exam. (16)										
Perform a comprehensive CV assessment to include the recognition and documentation of the distinguishing characteristics of heart murmurs and sounds, vascular bruits, and peripheral pulses.								X		
Distinguish causes of chest pain, palpitations, fatigue, lightheadedness, syncope, dyspnea, and edema through patient history, physical examination findings, and appropriate testing.									X	
Utilize diagnostic testing for initial diagnosis and follow-up care of patients with cardiovascular disease. *Integrate clinical information and test results (to include stress testing, echo, and other imaging) to assess risk, establish diagnosis, formulate treatment, and manage follow-up for patients with cardiovascular disease. *Monitor for and manage adverse effects, intolerance, or nonadherence to cardiovascular treatment. *Identify patients with acute cardiovascular disorders or high-risk conditions who require immediate treatment, specialty consultation, and/or hospitalization. (17)									X	
Counsel patients about cardiovascular disease prevention strategies to include lifestyle changes; diet, exercise, stress management, tobacco, drug, alcohol cessation with respect to differences in age, gender, culture, and health literacy level.								X		
Lipid Management										
Develop, implement, manage, and evaluate an evidence-based, age-appropriate plan of care for patients with lipid disorders. * Recognize genetic, medication, or disease conditions that may cause lipid disorders. * Calculate global atherosclerotic cardiovascular disease risk for primary prevention and plan an appropriate treatment plan based on risk level. * Initiate and manage pharmacological and nonpharmacological interventions for patients with lipid disorders.									X	

* Order and assess laboratory testing at various stages of lipid management. * Assess and manage statin-associated muscle symptoms.									
Hypertension Management									
Obtain an accurate blood pressure in the clinical setting. (18)							**x**		
Obtain a history and physical examination for patients with elevated blood pressure and hypertension. (19) *Document a history of female- specific disorders such as pregnancy-induced HTN, pre- and full eclampsia, and gestational diabetes on HTN.*							**x**		
Initiate and monitor diagnostic testing indicated for patients with elevated blood pressure and hypertension to include 24 hour ambulatory monitoring. (20)								**x**	
Recognize and initiate evaluation of secondary causes of hypertension.								**x**	
Develop, implement, manage, and evaluate a plan of care for patients with elevated blood pressure and hypertension. * Select antihypertensive drugs based on comorbidities, age, gender, or ethnic background. * Recognize adverse effects of antihypertensive medications. * Educate patients and their families on the technique of performing home blood pressure monitoring and target goals.								**x**	
Develop, implement, manage, and evaluate a plan of care for patients with hypertensive urgency and emergency. (21)							**x**		
Complete and document a pre-surgical clearance for non-cardiac surgeries. (22)							**x**		
Counsel patients and families appropriately as to the role of palliative and hospice care.							**x**		

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Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			**Competent Yes No**	**Initial**	**Date**			**12**	**24**	**36**

C. Acute Coronary Syndromes Competencies										
The NP will demonstrate <u>knowledge</u> of:										
Epidemiology, etiology, pathogenesis, and natural history of acute coronary syndromes, including the roles of plaque rupture, erosion, platelet activation, vasospasm, and thrombosis.								x		
Typical and atypical presentations of angina, including disorders that can simulate or mask acute coronary syndromes.								x		
Prognostic features for patients with acute coronary syndromes and corresponding management strategies. * Risks, benefits, indications, and timing for diagnostic coronary angiography. * Revascularization strategies for patients with acute coronary syndromes. * Pharmacotherapy for the management of patients with acute coronary syndromes.									x	

* Secondary prevention strategies for patients with acute coronary syndromes.									
Complications associated with contrast agents.							**x**		
Risk factors, signs, and symptoms associated with access site bleeding in patients with acute coronary syndromes, as well as those associated with vascular closure devices (e.g. AngioSeal, Perclose). (23)							**x**		
ST Elevation Myocardial Infarction (STEMI)									
Symptoms, physical findings, ECG patterns, and biomarker findings in patients with STEMI. (24)							**x**		
Arrhythmia and conduction complications associated with STEMI.							**x**		
Clinical findings and complications of right ventricular infarction and supplemental ECG leads to obtain in patients suspected of having right ventricular dysfunction.								**x**	
Indications and contraindications of reperfusion therapies in patients with STEMI. * Indications, contraindications, and risks of primary percutaneous coronary intervention as initial reperfusion strategy vs. drug strategies. * Indications, contraindications, and risks for P2Y12 receptor inhibitors in patients with STEMI.								**x**	
Non–ST-Elevation Acute Coronary Syndromes (NSTE–ACS)									
Differential diagnosis, clinical presentation, ECG changes, and imaging and biomarker features for diagnosis and risk stratification of patients with NSTE-ACS and other non-ischemic causes of myocardial injury.							**x**		
Risks, benefits, and importance of timing of an invasive versus noninvasive strategy for the management of patients with NSTE-ACS.								**x**	
Indications, contraindications, and risks for P2Y12 receptor inhibitors and glycoprotein IIb/IIIa inhibitors in patients with NSTE-ACS.								**x**	

The NP will demonstrate the <u>skill</u> to:								
Obtain a history and physical examination as clinically indicated in patients with suspected acute coronary syndromes.							**x**	
Recognize and manage angina. (25)							**x**	
Recognize ECG changes suggestive of myocardial ischemia and/or infarction.							**x**	
Recognize cardiac biomarker abnormalities to aid in the diagnosis of acute coronary syndromes.							**x**	
Initiate and manage dual antiplatelet therapy and/or anticoagulants in patients with acute coronary syndromes.								**x**
Identify and initiate management for hemodynamic instability/compromise in patients with acute coronary syndromes.							**x**	
Identify and participate in the management of arrhythmias and conduction disturbances in patients with acute coronary syndromes.							**x**	
Determine a noninvasive versus invasive treatment strategy for patients with acute coronary syndromes...								**x**
Skill to interpret coronary angiography report findings for patients with acute coronary syndromes.								**x**
Prevent, identify, and initiate therapies in a bleeding emergency or a vascular access site complication. (26)							**x**	
Prevent and manage complications associated with contrast agents.							**x**	
Facilitate timely referral to cardiac rehabilitation following acute coronary syndromes. (27)							**x**	

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Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			**Competent** Yes No	**Initial**	**Date**		12	24	36

D. Stable Ischemic Heart Disease Competencies									
The NP will demonstrate <u>knowledge</u> of:									
Stable IHD, Variant angina, post-MI, post-PCI, post-CABG									
The epidemiology and pathophysiology of coronary artery disease to include factors related to coronary blood flow and myocardial O2 consumption...							x		
Differential diagnosis and clinical features of patients with typical angina, variant angina, and non-cardiac chest discomfort. *ECG features associated with myocardial ischemia and baseline. *ECG abnormalities that may impact exercise ECG interpretation. *Diagnostic criteria of stable versus unstable angina pectoris. Functional classes *Causes of angina pectoris not related to coronary artery disease.						x		x	

Diagnostic testing to aid diagnosis and guide management of angina.
*Noninvasive diagnostic studies
    Laboratory testing
    Imaging
    Stress testing
								x	

*Invasive									
Medical, interventional, and surgical management strategies for patients with stable ischemic heart disease and variant angina. *Indications for and contraindications to medications for management of patients with stable ischemic heart disease and variant angina. * Implications of ventricular systolic and diastolic function								x	
Cardiovascular risks of nonsteroidal anti-inflammatory drug use in patients with ischemic heart disease and recommendations for musculoskeletal pain management. (28)							x		
Lifestyle interventions for management of patients with stable ischemic heart disease and variant angina with and without revascularization. (29)							x		
The NP will demonstrate the skill to:									
Obtain a problem-focused history and physical examination in patients with coronary artery disease and variant angina.							x		
Distinguish stable from unstable coronary syndromes. ** Recognize symptoms and ECG changes suggestive of ischemic heart disease and variant angina. (30)*								x	
Select the appropriate noninvasive or invasive diagnostic study for patients with known or suspected coronary artery disease.								x	
Select evidence-based pharmacological therapy for patients with stable ischemic heart disease.								x	
Recognize signs and symptoms of ventricular systolic and diastolic dysfunction.								x	
Recommend lifestyle and psychosocial interventions for patients with stable coronary artery disease, addressing non-adherence, if it arises, in a sensitive manner.							x		

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Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			**Competent** **Yes No**	**Initial**	**Date**		**12**	**24**	**36**

E. Heart Failure Competencies									
The NP will demonstrate **knowledge** of:									
Basic pathophysiology, stages/NYHA functional classes, and natural history of heart failure (HF) to include the role of neurohormonal activation and left ventricular remodeling in heart failure progression.								x	
Basic epidemiology and variations of HF across diverse patient populations in the US and world-wide (age, gender, ethnic variations).								x	
Differential diagnoses of symptoms commonly associated with heart failure.								x	
Effects of comorbidities and lifestyle factors to include drug and alcohol on the development of HF.								x	
History and physical examination findings and their limitations in the evaluation of patients with heart failure. (31) ** Objective and subjective methods to assess volume status in patients with heart failure.*							x		

Objective and subjective methods to assess volume status in patients with heart failure.									

Diagnostic testing to aid diagnosis and guide management of HF, pulmonary HTN, and their negative sequelae.
*Noninvasive diagnostic studies
   Laboratory testing
   Imaging
*Invasive
   Indications for right and left heart catheterization.
   Indications for pulmonary artery pressure monitoring devices (e.g. CardioMEMS).
								x	

Guideline and evidence-based management strategies and corresponding contraindications for patients with heart failure, including pharmacotherapy and interventional options with considerations for:
*Systolic vs. diastolic components.
*Pregnancy and chemotherapy.
*Advanced or end-stage HF
   Referral to heart failure clinics for advanced therapies, including mechanical circulatory support and/or heart transplant (St. Vincent's Hospital, Indianapolis; University of Michigan).
   Referral for palliative or hospice care.
Indications for, contraindications to, pharmacology, and adverse effects of drugs used to treat patients with heart failure.
									x

Effect of arrhythmias on HF status. * Indications for implantable devices in HF.								x	
Transitional and outpatient strategies to avoid preventable hospitalizations in patients recently discharged with heart failure.								x	
Nutritional and fluid recommendations and importance of daily weight for patients with heart failure. (32)							x		
Patient management strategies with advanced management strategies: *Post–heart transplantation.									x

* Post-implant of mechanical circulatory support in patients with heart failure (e.g. LVAD).									
Know the indications for genetic testing and counseling in patients with inherited cardiomyopathy syndromes.								x	
The NP will demonstrate <u>skill</u> to:									
Obtain clinical history and physical examination to determine functional capacity and volume status in patients with new-onset, chronic, and acutely decompensated heart failure. (33)							x		
Order and interpret laboratory testing and imaging studies for HF.							x		
Utilize and titrate guideline-directed medication therapy for HF.								x	
Develop a patient-centered, life-style-based plan of care and teaching plan for HF.								x	
Utilize findings from implantable hemodynamic monitoring (e.g., pulmonary artery pressure monitoring systems) or thoracic impedance monitoring via pacemaker or ICD (e.g. Optivol, CorVue), including changes in volume status.								x	
Recognize cardiac arrhythmias and initiate treatment and/or referral for patients with heart failure.							x		
Assess biological, psychosocial, and cultural factors that influence learning of patients with heart failure.							x		
In concert with advanced HF center: *Assess and manage patients in refractory HF requiring intravenous inotropic support. * Assess and manage patients with a heart transplant. * Assess and manage patients with mechanical circulatory support.									x
Refer for palliative or hospice care with refractory HF.							x		

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F. Electrophysiology Competencies									
The NP will demonstrate knowledge of:									
The anatomy and physiology of the cardiac conduction system and autonomic nervous system. (34)							x		

Pathophysiology, epidemiology, differential diagnosis, and management of electrophysiological (EP) disorders:
    Atrial fibrillation, atrial flutter, and atrial tachycardia.
    AV nodal re-entrant tachycardia and accessory pathways
    Ventricular arrhythmias
    Cardiac conduction disturbances.
    Syncope.
    Dysautonomia (e.g. POTS, neurocardiogenic syncope).
*Female-specific differences in arrhythmia risk and presentation, and management, as well as the management of arrhythmias in pregnancy and women of childbearing age.
* Risk of arrhythmias and sudden death in patients with congenital or acquired structural heart disease.
								x	

Diagnostic testing to aid diagnosis and guide management of arrhythmias and related disorders.
*Noninvasive diagnostic studies and indications for arrhythmias and conduction system disorders.
    Remote monitoring (e.g. Holter, MCOT, wearable)
    Laboratory testing
    Imaging
*Invasive
    EP studies (invasive and non-invasive)
    Tilt testing								

Guideline and evidence-based indications, risks, benefits, optimal timing, and surveillance of interventions to prevent and manage EP disorders:
*Arrhythmias
    Pharmacological and electrical cardioversion.
    Anticoagulation and bridging in patients with atrial arrhythmias.(35)
    Left atrial appendage occlusion/exclusion devices and procedures for patients at risk for bleeding with oral anticoagulants.
    Ablation.
    Defibrillator implant (transvenous vs. subcutaneous)
*Conduction system disorders
    Pacemakers, resynchronization devices, and loop recorders.
    Indications and possible complications of device extraction.
*Pharmacology, indications, contraindications, and side effects of antiarrhythmic medications.
    Common medications that may cause QT prolongation.
							x	

The psychosocial impact of cardiac device therapies.								x	
Impact of lifestyle factors to include sleep apnea on the development and prevalence of arrhythmias and best practices for counseling.							x		
Post-procedure complications of catheter ablation in patients with atrial fibrillation, atrial flutter, supraventricular tachycardia, and ventricular tachycardia. (36)							x		

The NP will demonstrate the <u>skill</u> to:									
Evaluate and manage patients with palpitations or syncope.								x	
Recognize normal/abnormal 12-lead ECGs and rhythm strips.(37)							x		
Evaluate and manage atrial arrhythmias, including rate control, rhythm control strategies, and anticoagulation. *Risk stratify patients with atrial fibrillation and flutter for embolic stroke. *Risk stratify patients for potential bleeding risk on anticoagulation. *Provide information regarding devices that serve as alternatives to oral anticoagulation (e.g. Watchman, AtriClip).								x	
Evaluate and medically manage patients with tachy- and bradyarrhythmias								x	
Participate in advanced cardiac life support, emergent defibrillation, transcutaneous pacing, and cardioversion. (38)							x		
Recognize and manage patients with dysautonomia: postural orthostatic tachycardia syndrome, inappropriate sinus tachycardia, and neurocardiogenic syncope.								x	
Interrogate, troubleshoot, program, and monitor performance of implanted cardiac devices.								x	
Recognize type of implanted device, lead location, and lead condition based on chest x-ray findings; recognize which are safe or conditional for MRI.									x
Provide perioperative education and post-op wound care to patients receiving cardiac implantable electronic devices. (39)							x		
Manage patients following catheter ablation of atrial fibrillation and atrial flutter, supraventricular tachycardias, and ventricular arrhythmias. (40)							x		
Identify needs of individuals and families with inherited arrhythmia disorders.									x
Recognize cardiac device system infection. (41)							x		
Skill to identify needs of patients at end of life (e.g. disable shock therapies).								x	

Method of Instruction (MOI) Key: P = Procedure/Protocol Review E = Education session S = SDL Packet C = Clinical Practice D = Demonstration	Method of Evaluation (MOE) Key: O = Observation RD = Return Demonstration T = Written Test V = Verbal Review	MOI (Use Instruction Key at left)	Evaluation Summary			MOE (Use Evaluation Key at left)	Milestones (months)		
Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			Competent Yes No	Initial	Date		12	24	36

G. Valvular Heart Disease Competencies									
The NP will demonstrate knowledge of:									
Anatomy and physiology of the valvular structures of the heart.							x		

Basic pathophysiology and differential diagnoses of valvular heart diseases (VHD), particularly:
    Primary versus secondary mitral regurgitation.
    Bicuspid aortic valve and associated aortopathy.
								x	

Effects of comorbidities and lifestyle factors on VHD.									
Indications for surveillance imaging in patients with stable valvular heart disease.								x	

Diagnostic testing to aid diagnosis and guide management of VHD and related disorders.
*Noninvasive diagnostic studies
    Laboratory testing
    Imaging
    Stress testing
								x	

*Invasive Right and left heart catheterization.									
Indications for referral of patients with advanced or complex valvular heart disease to a multidisciplinary heart team.								x	
Guideline and evidence-based indications, risks, and benefits of interventions to prevent and manage VHD. *Awareness of genetic and racial/ethnic variations in VHD to include gender or pregnancy-related variations. * Catheter- and surgical-based *Antithrombotic therapy for patients with valvular heart disease or prosthetic heart valves. (42)* *Antibiotics for infective endocarditis prophylaxis in patients with valvular heart disease. (43)*								x	
Lifestyle and behavioral change interventions to manage VHD and associated comorbidities.							x		
Common cardiac arrhythmias in patients with valvular heart disease and treatment strategies. (44)							x		
The NP will demonstrate the <u>skill</u> to:									
Evaluate and collaboratively manage patients with valvular heart disease.								x	
Manage patients with valvular heart disease with complex comorbid conditions.								x	
Recognize and manage cardiac arrhythmias and perioperative complications in patients with valvular heart disease. (45)							x		

Method of Instruction (MOI) Key:	Method of Evaluation (MOE) Key:	MOI (Use Instruction Key at left)	Evaluation Summary			MOE (Use Evaluation Key at left)	Milestones (months)		
P = Procedure/Protocol Review E = Education session S = SDL Packet C = Clinical Practice D = Demonstration	O = Observation RD = Return Demonstration T = Written Test V = Verbal Review								
Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			Competent Yes No	Initial	Date		12	24	36

H. Pericardial Competencies									
The NP will demonstrate knowledge of:									
Normal anatomy and physiology of the pericardium.							x		
Basic pathophysiology, differential diagnosis, and natural history of pericarditis, pericardial effusion/ tamponade, and constrictive pericarditis.								x	
Symptoms, physical findings, and evaluation of acute pericarditis, pericardial effusion/ tamponade, and constrictive pericarditis.							x		
Basic distinguishing characteristics of pericardial disorders upon physical exam to include friction rubs, muffled heart tones, JVD.								x	
Diagnostic testing, imaging and hemodynamic characteristics that are useful in distinguishing restrictive cardiomyopathy from constrictive pericarditis. *Noninvasive testing. *Invasive testing								x	
Guideline and evidence-based indications and contraindications to interventions to manage pericardial disorders. *Pharmacological agents for acute and relapsing pericarditis.								x	

*Pericardiocentesis. *Surgical interventions.								
The NP will demonstrate the <u>skill</u> to:								
Identify physical findings of pericardial effusion, tamponade, and chronic pericarditis upon exam.							x	
Manage and refine the therapeutic plan of care of patients with pericardial disease based on laboratory and diagnostic test results.							x	
Identify complications of pericardiocentesis or surgical interventions. (46)						x		

Method of Instruction (MOI) Key:	Method of Evaluation (MOE) Key:	MOI (Use Instruction Key at left)	Evaluation Summary			MOE (Use Evaluation Key at left)	Milestones (months)		
P = Procedure/Protocol Review **E** = Education session **S** = SDL Packet **C** = Clinical Practice **D** = Demonstration	**O** = Observation **RD** = Return Demonstration **T** = Written Test **V** = Verbal Review								
Key 50 competency that must be demonstrated prior to being released to manage individual patient panel in italics.			**Competent** **Yes No**	**Initial**	**Date**		**12**	**24**	**36**

I. Vascular Competencies									
The NP will demonstrate the <u>knowledge</u> of:									
Normal anatomy and physiology of the vascular system to include great vessels. (47)							x		
Basic pathophysiology, natural history, clinical manifestations, differential diagnosis of aortic, carotid, renal, mesenteric, and extremity peripheral vascular diseases (PVD).								x	
Basic distinguishing characteristics of the vascular system upon physical exam.							x		
Clinical manifestations of PV disorders to include stroke and acute aortic syndromes (dissection, intramural hematoma, and penetrating ulcer). (48)							x		
Causes, pathophysiology, and natural history of coagulopathies that increase patient risk for deep vein thrombosis and pulmonary emboli.								x	
Guideline and evidence-based indications, risks, and benefits of diagnostic testing to aid diagnosis and guide management of (PVD).								x	

*Non-invasive
  Lab tests
  Genetic testing with suspected familial PV disorders (e.g. Marfan) or thrombophilia.
  Duplex ultrasonography
  Computed tomographic angiography, magnetic resonance angiography.
   Critical limb ischemia testing.
*Invasive
  Catheter-based angiography or venography									

Guideline and evidence-based indications, risks, benefits, and potential complications of interventions to manage PVD: Indications to refer patients with vascular disease for medical, surgical, and endovascular therapies. *Endovascular *Surgical Pharmacology, indications, contraindications, and expected outcomes of antithrombotic medications in patients with peripheral artery disease.								X	
Differentiating features of arterial, venous, and neurotrophic leg ulcers.								X	
Causes, physical findings, and treatment of lymphedema.								X	
The NP will demonstrate the <u>skill</u> to:									
Perform a comprehensive history and physical examination of the peripheral circulation to include a cardiac risk assessment.(49)							X		

Utilize screening and diagnostic testing for initial diagnosis and follow-up care of patients with cardiovascular disease:
  *Manage patients with extracranial carotid and vertebral artery disease.
  *Identify patients at risk for abdominal and thoracic aortic aneurysms.
  * Evaluate patients with thoracic and abdominal aortic aneurysms and refer for surgical or endovascular intervention.
								X	

* Initiate management of patients with suspected acute aortic syndromes and coordinate care to ensure medical stability.
  * Manage patients with chronic aortic syndromes.
  * Evaluate and manage patients with upper and lower extremity peripheral artery disease.
  * Perform and interpret findings of physical examination for detection of acute and chronic arterial compression syndromes.									

Counsel patients regarding PVD prevention strategies to include diet, exercise and tobacco cessation (e.g. an exercise program for patients with intermittent claudication due to peripheral artery disease).								x	

Evaluate and manage patients with venous diseases:
  *Venous thromboembolism.
   Evaluate for risk of familial thrombophilia.
   Refer to hematology for additional testing.
  *Venous insufficiency
									x

Evaluate and manage arterial, venous, and neurotrophic leg ulcers. (50)									x
Evaluate and manage patients with lymphedema									x
Evaluate and manage patients with inherited and acquired forms of vasculitis.									x

Note: From

Halperin, J., Williams, E., Fuster, V., Cho, N., Iobst, W., Mukherjee, D., Vaishnava, P., . . . Williams, J. (2015). ACC 2015 core cardiovascular training

statement (COCATS 4) (revision of COCATS3). *Journal of the American College of Cardiology, 65*(17), 1721-1773.

Rodgers, G., Linderbaum, J., Pearson, D., Fernandes, S., Housholder-Hughes, S., Mendes, L., Berg, N., . . . Zado, E. (2020, March). 2020 ACC clinical

competencies for nurse practitioners and physician assistants in adult cardiovascular medicine. *Journal of the American College of Cardiology.*

Retrieved from http://www.onlinejacc.org/content/early/2020/03/18/j.jacc.2020.01.005

Appendix I

Self-Directed Learning Packet

Self-Directed Learning Packet: Module II (Weeks 4-5)

Hypertension Management for the Nurse Practitioner

Competencies addressed:

Section B: Outpatient and Preventive CV Care Competencies

Hypertension Management

Key 50: #s 12, 17, 18, 19, 20

Objectives:

1. The learner will demonstrate knowledge of the pathophysiologic processes related to hypertension (HTN).

2. The learner will demonstrate knowledge of the risk and lifestyle factors associated with HTN.

3. The learner will demonstrate knowledge of the current evidence-based guidelines regarding HTN management.

4. The learner will demonstrate knowledge of a basic formulary for pharmacologic-based therapies for HTN.

5. The learner will demonstrate knowledge of lifestyle changes to improve HTN.

6. The learner will demonstrate knowledge regarding hypertensive emergencies as well as referral sources for resistant HTN.

7. The learner will demonstrate the appropriate measurement of blood pressure in the office.

☐ **Readings:**

Current Diagnosis and Treatment: Cardiology (5th Ed.) (2017): Chapter 2 Systemic Hypertension by W. Vongpatanasin (see PDF copy).

☐ **Web-based learning Activity:**

Dennison-Himmelfarb, C. (2017). New hypertension guidelines: Matching risks and therapies. *Preventive Cardiovascular Nurses Association*. Retrieved from https://pcna.net/online-course/new-hypertension-guidelines/ (use password *******).

☐ **Journal search:**

Using the online medical library or another reliable source, find an evidence-based journal article regarding the management of HTN preferably written by an NP to share with preceptor.

☐**Web-based App:**

American College of Cardiology Guideline Clinical App for BP

☐**Practicum:**

Demonstrate proper technique in assessing BP using American Heart Association guidelines.

https://www.heart.org/en/news/2018/10/05/how-many-at-home-checks-does-it-take-to-diagnose-high-blood-pressure

☐**Assessment of Knowledge:**

Complete written exam with 80% correct.

Score on knowledge assessment: _____

Notes:

Assessment of Knowledge for Module II: Hypertension Management for the NP

1. A 58 year-old man has refractory HTN of 155/70 despite drug therapy. Medications include HCTZ 25 mg daily, amlodipine 10 mg daily, Lisinopril 20 mg daily. His comorbidities include obesity (BMI 40) and diabetes. Besides additional changes to his medical therapy, what are the three most vital interventions that could assist in improving his HTN?
    a. _____
    b. _____
    c. _____
2. In the above patient, what would be the best medication to consider adding to his regimen?
    a. Bisoprolol
    b. Carvedilol
    c. Clonidine
    d. Spironolactone
    e. Hydralazine
3. A 55 year-old white man was newly diagnosed with HTN at his last office visit with the cardiologist where Lisinopril 20 mg once daily was prescribed. He was sent to you for follow up. His BP today is 150/80. He does not have any peripheral edema. What is the best treatment option aside from lifestyle measures?
    a. Increase Lisinopril to 40 mg then 80 mg.
    b. Add HCTZ 25 mg
    c. Add amlodipine 5 mg
    d. B or C
4. A 60 year-old man presents with symptoms suggestive of acute pulmonary edema. He has LVH on EKG and no ischemic changes. BP is 210/100. You advise ER. What would you anticipate as the management plan to include?
    a. IV diuretics
    b. IV diuretic + nitroprusside, aiming for a reduction of MAP -25% at 30 minutes
    c. IV diuretic + nicardipine, aiming for a reduction of MAP -25% at 30 minutes
    d. IV diuresis + nitroglycerine
5. Concerning the HTN autoregulation curve:
    a. The x-axis is pressure, the y-axis tissue flow
    b. In HTN, the curve is shifted to the right.
    c. The curve explains why patients with chronic HTN do not tolerate sudden drops in BP.
    d. The curve may shift back to the left with time, which explains that the symptoms and the slight creatinine rise sometimes seen upon initiation of BP meds improves with time.
    e. All of the above
6. A 52 year-old African-American man has persistent HTN despite regular visits to the clinic w/ today's reading 150/95. He is started on HCTZ. Which statement is incorrect?
    a. For better BP control and fewer metabolic effects, it is better to combine a thiazide with amiloride or triameterene.
    b. Renal function and potassium should be checked within 1 week.
    c. A 12.5 mg dose of HCTZ is usually effective as a starting point.

    d. Thiazide diuretic is initially effective through volume reduction, but is later effective via a decrease in vascular resistance.

7. In a patient with diabetes and *without* renal disease, which of the following is <u>incorrect</u>?
    a. ACEI or ARB is preferred as they reduce the risk of diabetic nephropathy
    b. ACEI is preferred to a thiazide diuretic, as the latter may worsen diabetic control. Yet both reduce CV and renal events to a similar degree (ALLTHAT trial)
    c. ACEI or ARB may reduce the incidence of diabetes in patients with prediabetes according to the NAVIGATOR trial, but not the DREAM trial.

8. Which statement is incorrect in regards to the use of β-blocker therapy for HTN:
    a. Have more LVH-reverting effects than losartan.
    b. Less effective in reducing central aortic pressure than ACEI, CCB, or diuretics.
    c. Associated with a higher risk of stroke and mortality than thiazides or CCBs.

9. A 68 year-old woman has been under your care for atrial fibrillation. Her BPs have been slowly increasing over the past few years and she is now hypertensive. She has also been experiencing occasional palpitations consistent with PACs. You add metoprolol XL given____:
    a. It is an inexpensive medication
    b. It has a low side effect profile.
    c. It does not affect renal function.
    d. A compelling indication with a comorbidity.

10. A 44 year old woman presents for BP management with today's readings 156/92 and 154/88 measured 15 minutes apart. Her BMI is 24. She tells you she has had HTN since her early 20s. She denies any history of pregnancy-related HTN or pre-eclampsia. What diagnosis would you consider in your differential?
    a. Fibromuscular dysplasia (FMD)
    b. Lupus
    c. Nothing, she probably is not adhering to your recommendations.
    d. Anxiety

Key:

1. Weight loss, Low sodium diet, Screen for sleep apnea and treat if applicable
2. D
3. D
4. A
5. E
6. C
7. A
8. A
9. D
10. A

Note: From "Practical cardiovascular medicine," by E. Hanna, 2017, pp. 467-469, Hoboken, NJ: Wiley Blackwell Publishing

Appendix J

Institutional Review Board Documents

May 29, 2020

Patricia Gasper RN

Beacon Medical Group

610 N. Michigan St., Ste. 400

South Bend, IN 46601

RE: Competency-based Onboarding Program for Nurse practitioners in Cardiology: A Doctor of Nursing Practice Proposal and Methodology

Dear Ms. Gasper:

I have reviewed your proposal for the quality improvement project **Competency-based Onboarding Program for Nurse practitioners in Cardiology** on May 21, 2020 and found it to be of minimal risk and eligible for exemption from IRB review.

You informed me you will be keeping your improvement activity within Beacon however, because it's for your DNP you may be making the results public with a poster or a published paper. Additionally**, i**n conversation, you have told me ALL data will be collected without personal identifiers. This would include the baseline demographic data, all self-reflection questions, the competency checklist, the NPRTS and PDSA surveys.

The research protocol meets the criteria for <u>EXEMPT</u> research studies involving human subjects as outlined below
Exempt Category 2:

> Research that only includes interactions involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

- The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.
- Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability; or be damaging to the subjects' financial standing, employability, or reputation.

This information will be provided to the IRB members at the next scheduled meeting.

Beacon Memorial Institutional Review Board is in compliance with the FDA and OHRP requirements for IRBs and operates in accordance with federal regulations and good clinical practice guidance from the United States Food and Drug Administration (FWA00005819; IORG 0002815; IRB 00003405).

Thank you for submitting this project for review. If you have any questions please email me at: IRBBeacon@beaconhealthsystem.org

Respectfully yours,

Darra Cover, RPh

Chairperson

Institutional Review Board

/bm

Memorial Institutional Review Board, 600 East Boulevard, Elkhart, Indiana 46514

GOSHEN COLLEGE

June 26, 2020

Patti Gasper

29255 Summer Field Ln

Elkhart, IN 46517

Dear Ms. Gasper,

I am pleased to inform you that the IRB has approved your project, "A Competency-Based Checklist to Facilitate Transition for Novice Cardiology Nurse Practitioners."

I have assigned the tracking number 024-1920 to your project. If you make any changes to your project as proposed you will need to communicate with me to secure approval for the changes. Please include the tracking number in all your communications with me so that I know we are communicating about the right project.

The approval remains in effect for one year. If you will need more time to complete your project, please contact me.

Thanks for your efforts and your engagement with research at Goshen College.

Sincerely,

Justin Heinzekehr IRB
Chair
justinbh@goshen.edu

574-535-7110

BEACON Board
HEALTH SYSTEM
46514

Institutional Review

600 East Boulevard, Elkhart, Indiana

Patricia Gasper RN

610 N. Michigan St., Ste. 400

South Bend, IN 46601

RE: Competency-based Onboarding Program for Nurse practitioners in Cardiology: A Doctor of Nursing Practice Proposal and Methodology

Dear Ms. Gasper:

Thank you for clarifying the details of your study. The information you recently provided changes the type of IRB review needed. Your study is NOT eligible for IRB exemption because you have indicated it will be impossible to anonymously collect data due to the small population (1 – 2) participants and the fact that you are most likely doing the precepting.

This study is a quality improvement initiative evaluating the use of an evidence-based competency checklist on the transition of novice nurse practitioners into patient care over the initial six months of a cardiac based DNP practice.

The expedited review of the above referenced protocol has been completed by me, the Beacon IRB Chairperson July 17, 2020. **The protocol has been approved based on OHRP category 7:**

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. **There will be no continuing review requirement (45 CFR 46.109). If the study scope, data collection or review process change, a protocol amendment should be submitted to the IRB for review.**

This information will be provided to the Beacon Institutional Review Board on August 5, 2020.

The Beacon Healthcare System Institutional Review Board complies with the FDA and OHRP requirements for IRBs (OHRP Approved Federalwide Assurance Number: FWA00009238).

Thank you for submitting this information to us. If you have any questions, please call me at (574)523-3437 or Betty McKinney at (574)296-6505.

Respectfully yours,

Darra Cover, RPh

Chairperson

Institutional Review Board

\bm

Appendix K

Demographic Data

Table 1

Baseline Demographics of the Population

Participant #1	
Age	30 years
Gender	Female
Race	White
Hispanic, Latinx, or Spanish origin (Y/N)	No
Degree attained for entry as nurse practitioner (NP)	MSN
Type of program	On-Site
Full/part time employment prior to hire as NP	Part-time
Cardiology rotation during clinical rotations (Y/N)	Yes
Participation in a cardiology fellowship (Y/N)	No
Participation in another type of fellowship (Y/N)	No
Type of NP certification(s)	FNP
Years in practice as NP or entry	Entry
State(s) NP of licensure	Indiana
State(s) where NP has practiced	Indiana
Past specialty or specialties	none
Years in practice as registered nurse (RN)	6 years
Entry degree	BSN
RN specialty or specialties	Cardiology
Specialty certification(s) as RN	No

Appendix L

Summary of NPRTS Scores

Table 2

Summary of NPRTS Scores

Item	Baseline	6 Weeks	12 Weeks	18 Weeks	24 Weeks
Cycle	6/1/2020	7/10/2020	8/21/2020	10/2/2020	11/13/2020
1. My workday was just how I imagined it would be when I was a student.	4	4	4	4	4
2. My education prepared me to effectively manage my patients.	3	4	4	4	4
3. I was comfortable in my role.	3	4	4	4	4
4. I was treated as a professional by my colleagues.	4	4	4	4	5
5. My nurse practitioner role was very well understood by my physician colleagues.	4	4	4	4	5
6. My nurse practitioner role was very well understood by my nurse colleagues.	4	4	4	4	5
7. My nurse practitioner role was very well understood by my patients/families.	4	4	4	4	5
8. My nurse practitioner role was very well understood by the public.	3	4	4	4	5
9. My nurse practitioner role was very well understood by management.	4	4	4	4	5
10. I was very comfortable managing my patients.	2	3	4	3	4
11. I felt anxious about the integration of theory into my practice.	3	3	3	4	3
12. I felt very competent managing my patient case load.	2	3	3	4	4
13. My supervisor was very available/approachable.	5	4	4	4	5
14. My mentor/preceptor was very available/approachable.	5	5	5	4	5

15. I felt that my nurse practitioner role was seen as a substitute for a resident.	3	2	3	2	3
16. I had trouble applying the theory to practice when I was under stress.	3	3	3	3	3
17. I felt that I was doing more than one person's work.	2	2	3	2	2
18. I felt that I was isolated.	1	2	2	2	2
19. I felt that I got very little support.	1	2	2	2	4
20. I felt less confident than I did before becoming a nurse practitioner.	3	2	2	2	4
21. I felt it was easy to transition from nurse to nurse practitioner.	3	3	4	4	4
22. I felt I had the skills to deal with the role transition.	3	4	4	4	3
23. I felt I developed my nurse practitioner role within a nursing framework.	4	4	4	4	2
24. I felt I developed my nurse practitioner role within a medical framework.	3	3	3	3	2
25. I felt that I was an invisible provider on the healthcare team.	1	1	2	2	2
26. I felt that I had a poor relationship with the MDs.	1	1	2	2	4
27. I felt anxious in my communications with other health care providers.	2	2	2	2	4
28. I felt that I needed extra time to complete my responsibilities.	4	4	4	4	3
29. I was able to navigate the health care system to develop my new role.	4	4	4	4	4
30. I had a clear understanding of third party reimbursement.	3	3	3	3	3
31. My nurse practitioner program prepared me for a smooth role transition.	4	4	4	4	4
Total Score	95	100	106	104	113

Mean Score	3.064516	3.225806	3.419355	3.354839	3.6451613
STD	1.12355	1.023383	0.847514	0.877435	1.1120068
Median	3	4	4	4	4
Mode	3	4	4	4	4

Table 3

Change in NPRTS Scores between 6 Week QI Cycles and from Baseline to 24 Weeks

Cycle	6/12/2020	7/10/2020	8/21/2020	10/2/2020	11/13/2020	Pre-Post
Change between cycles (points)	Baseline	+5	+6	-2	+9	+18
Change between cycles (%)	Baseline	5.26	6	-1.92	8.65	18.85

Appendix M

Summary of Balancing Measures

Table 4

Total NP Visits Pre- and Post-Implementation of Project

	NP1(PI)	NP2	NP3	NP4	NP5	Total NP visits/month
Pre-COVID						
Dec-19	128	128	90	125	81	552
Jan-20	143	87	90	103	90	513
Feb-20	120	109	85	104	85	503
Total	**391**	**324**	**265**	**332**	**256**	**1568**
Mean	130.333333	108	88.3333333	110.666667	85.333333	522.666667
Pre-Implementation						
Mar-20	112	98	69	96	72	447
Apr-20	96	60	71	62	74	363
May-20	124	111	89	143	89	556
Total	**332**	**269**	**229**	**301**	**235**	**1366**
Mean	110.666667	89.6666667	76.3333333	100.333333	78.333333	455.333333
Post-Implementation						
Jun-20	155	130	137	189	96	707
Jul-20	148	68	157	115	118	606
Aug-20	207	147	120	147	89	710
Total	**510**	**345**	**414**	**451**	**303**	**2023**

Table 5

Change in NP Visit Totals from Pre- to Post-Implementation of Project

	NP1(PI)	NP2	NP3	NP4	NP5	Total NP visits/month
Percent change overall from 1st to final 3 months	+30.43	+6.48	+56.23	+35.84	+18.36	+29.02

Note. PI = preceptor/PI