

Nurse Practitioners in Orthopaedic Surgical Settings

A Review of the Literature

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PURPOSE: The purpose of this article was to conduct an extensive literature review of nurse practitioners (NPs) in orthopaedic surgical settings to delineate whether a need exists for NPs in these settings.

BACKGROUND: Due to physician shortages and changes in healthcare, patients are experiencing difficulty accessing orthopaedic surgeons. To meet this need, NPs are becoming an essential part of the multidisciplinary orthopaedic team in Level 1 trauma hospitals.

RESULTS: Nurse practitioners are qualified and competent to work in a variety of orthopaedic settings including pre-operative clinics, primary care orthopaedic clinics, and pre/postoperative care within the hospital. The benefits of NPs in orthopaedic surgical settings includes increased access to care, improved team communication, decreased length of stay, improved quality of care, and improved patient satisfaction. Moreover, NPs meet patient needs while surgeons are operating, and have a positive impact on resident surgeon education.

CONCLUSION: A need exists for NPs in orthopaedic surgical settings to both improve access to healthcare for patients and reduce the burden on orthopaedic surgeons.

In North America, nurse practitioners (NPs) have historically been educated and employed in primary care roles (Benham & Geier, 2014; Hiza et al., 2015; McDonnell et al., 2015). However, changes in the healthcare system, increasing complexities in patient populations, and a reduction in resident physicians specializing in orthopaedics have resulted in the implementation of NPs in specialty roles (Sebach, Rockelli, Reddish, Jarosinski, & Dolan, 2015). According to the literature, there is an increasing need for practitioners in nontraditional specialties such as orthopaedic surgery; however, the number of NPs currently employed in orthopaedics is much lower than in primary care (Benham & Geier, 2014; Dower & Christian, 2009; Ho & Wilson, 2010; Holleman, Johnson & Frim, 2010; Horn, Badowski, & Klingele, 2014; Lucas, 2009; Sebach et al., 2015; Ward et al., 2008). Although the literature supports NPs in both primary and specialty cares (Sangster-Gormley & Canitz, 2014), this article focuses on NPs specifically in orthopaedic and surgical settings.

This article first outlines the literature findings inclusive of the relevance of orthopaedics, a brief background of NPs in primary care and existing orthopaedic settings, the logistics of NPs in orthopaedics, the benefits and challenges of NPs in orthopaedics, and future recommendations. The purpose of this literature review is to examine the benefits and barriers to implementing NPs in orthopaedic specialty settings, and help advance NP practice by creating awareness of future opportunities in orthopaedic surgery.

Literature Review Methodology

For the literature search, both Medline with full text and Cumulative Index to Nursing and Allied Health Literature complete were searched. Databases from two disciplines were used to increase the depth of the overall information in the review. The key words “nurse practitioner” and “orthopaedic” and “surgery” were searched, which yielded 21 articles. Articles were excluded if they were not peer reviewed, were older than 2003, and did not focus on NPs in either inpatient surgical or inpatient/outpatient orthopaedic settings. After a title and abstract review, nine articles were included in the literature review.

Literature Review Findings

RELEVANCE OF ORTHOPAEDICS TO CURRENT PRACTICE

Orthopaedics accounts for a large component of the acute and chronic conditions seen in both primary care

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and hospital settings. Musculoskeletal conditions account for more disability, pain, and costs to the Canadian and U.S. healthcare systems than any other conditions (Haralson & Zuckerman, 2009; MacKay, Canizares, Davis, & Badley, 2010). Benham and Geier (2014) elaborate that musculoskeletal disorders are common, comprising up to two thirds of the outpatient office visits. Specifically, chronic orthopaedic conditions such as osteoarthritis, osteoporosis, spinal conditions, and repetitive stress injuries (which are both costly and debilitating) make up 20%–60% of primary care visits in Canada and the United States alike (Benham & Geier, 2014; Haralson & Zuckerman, 2009; MacKay et al., 2010). The amount of chronic orthopaedic conditions (such as fractures secondary to osteoporosis and obesity) is only expected to increase, as the current baby boomer population ages (Benham & Geier, 2014; Haralson & Zuckerman, 2009; MacKay et al., 2010). Moreover, while musculoskeletal conditions are often not life threatening, nearly 50% of the population will be affected by some type of orthopaedic condition at some point in their life, which accounts for an uneven share of disability and healthcare spending (United States Bone and Joint Initiative, 2011). The United States Bone and Joint Initiative (2011) expands that 50% of women and 25% of men older than 50 years will have an osteoporosis-related fracture in their lifetime, and that hip fractures specifically are associated with chronic pain, reduced mobility, increased dependence, and a 20% mortality rate in the first year following injury. As evidenced, a need exists for increased funding for healthcare providers working to serve this demographic.

NURSE PRACTITIONERS IN PRIMARY CARE

Over the past few decades, shortages in general practitioners and the changing climate of healthcare have led patients scrambling to find primary care providers (PCPs) (Hiza et al., 2015; McDonnell et al., 2015). The issue is anticipated to become worse as there is a projected shortage of approximately 45,000 PCPs by 2020 (United States Bone and Joint Initiative, 2011). In response to these shortages, over 60 countries are continuing to develop advanced nursing roles, including an increased acceptance and adoption of NPs in primary care (McDonnell et al., 2015; Schober & Affara, 2006). Although the NP role and scope of practice varies among countries, the rising demand for and shortage of PCPs and rising cost of healthcare remain prevalent issues and driving forces for the remodeling of clinical teams to include NPs worldwide (McDonnell et al., 2015). Most NPs are educated to work in primary care settings; however, with ongoing remodeling in healthcare and growing complexities within the healthcare system, NPs are also being utilized in nontraditional specialty settings (Sebach et al., 2015).

Although incorporating NPs into these nontraditional roles was initially a cost-effective answer to specialist shortages (Hiza et al., 2015), a number of studies support that there are many benefits for patients, such as increased quality of care, improved communication, improved healthcare access, and ultimately increased patient satisfaction with care (Hiza et al., 2015; Horn et al.,

2014; McDonnell et al., 2015; Nyberg, Waswick, Wynn, & Keuter, 2007; Pezzi et al., 2009; Phillips, Green, Fryer, & Dovey, 2001). The quality of NP care is supported by Dower and Christian (2009), whose findings in surgical practice mirrored the robust research in primary care: the care provided by NPs is equivalent to the care provided by physicians. Ultimately, NPs in both primary and specialty roles contribute to the provision of patient-centered cost-effective healthcare (Hiza et al., 2015).

NURSE PRACTITIONERS IN ORTHOPAEDICS

The literature clearly identifies that a need exists for NPs in orthopaedic settings (Benham & Geier, 2014; Dower & Christian, 2009; Ho & Wilson, 2010; Horn et al., 2014; Lucas, 2009; Sebach et al., 2015; Ward et al., 2008). Across North America, patients are experiencing significant difficulty accessing physicians in specialties including gastroenterology, dermatology, and orthopaedics (Dower & Christian, 2009). Lack of specialty access is in part, as Lucas (2009) explains, due to changes in the healthcare system beginning in the early nineties. These changes included legislature that reduced the number of hours residents were allowed to work, which forced hospitals to investigate ways to provide the same service to patients with fewer medical staff (Benham & Geier, 2014; Lucas, 2009).

In addition to reduced resident hours, there was and continues to be a decreased supply of orthopaedic surgeons to meet the demands of the population, especially in pediatrics (Milbrandt, 2006). The rate of new orthopaedic surgeons is outpaced by the rate of retirement, and residents are choosing other subspecialties, which results in fewer orthopaedic surgeons and decreased access to orthopaedic care (American Academy of Orthopaedic Surgeons, 2008). Because of this imbalance in supply and demand, patients are facing above average wait times for orthopaedic care (Ho & Wilson, 2010).

Although these healthcare changes have had some negative impacts on patient care, they have also helped pave the way for new models of care, and advanced specialty nursing positions in specialty settings (Dower & Christian, 2009; Lucas, 2009). Because of physician shortages, in the past 10 years American NPs have become an essential part of multidisciplinary orthopaedic teams, particularly in Level 1 trauma hospitals (Horn et al., 2014). The goal of the orthopaedic NP is “to provide care for common chronic musculoskeletal problems and stable injuries in either primary or specialty care, thus improving access to care for patients and reducing the burden on orthopaedic surgeons” (Benham & Geier, 2014, p. 605). Nurse practitioners are being integrated into both outpatient and inpatient orthopaedic settings.

In outpatient orthopaedic clinics, NPs are instrumental as they improve primary care access, decrease wait times, reduce surgical cancellation rates, and increase the overall quality of patient care (Dower & Christian, 2009; Horn et al., 2014; Sebach et al., 2015). Benham and Geier (2014) add that when properly educated to differentiate acute orthopaedic emergencies from nonacute musculoskeletal problems, NPs are effective at improving access to care.

In inpatient settings, Lucas (2009) reports that orthopaedic specialist NPs are as accurate (as residents) in taking medical, surgical, and social histories, providing physical examinations, and ordering examinations when needed. More importantly, the majority of inpatient medical concerns can be addressed by the NP, and a plan of care can be initiated without the need to consult another service such as a hospitalist, which was common practice before NPs were on orthopaedic teams (Holleman et al., 2010; Horn et al., 2014). An example of a successful interdisciplinary provider team is seen in the Kaiser orthopaedic department in California, where NPs are considered active clinical partners and professional colleagues (Dower & Christian, 2009). Horn et al. (2014) agree that NPs are very valuable to the team, particularly in regard to simple procedures and independent clinical care. Ultimately, an appropriate solution to the higher demand for adult and pediatric orthopaedic services is the use of NPs who are “capable of providing care equivalent to an orthopaedic surgeon for many of the [nonsurgical] problems encountered” (Ward et al., 2008, p. 798).

LOGISTICS OF NURSE PRACTITIONERS ON ORTHOPAEDIC TEAMS

NP Models of Care

There were essentially three different models of care for NPs in surgical/orthopaedic settings identified in the literature. The first model was very collaborative and involved the NP functioning more as a physician extender (Dower & Christian, 2009). In this model the NP would see patients alongside the surgeon and then provide nonsurgical care, so the surgeon could see a higher volume of surgical patients (Dower & Christian, 2009; Ward et al., 2008). This model was only used in two studies; this is likely because the NPs were underutilized in the model of care as there was little autonomy in practice.

In the second model of care, NPs functioned more independently and cared for less complex patients (Dower & Christian, 2009; Horn et al., 2014; Ward et al., 2008). Dower and Christian (2009) explained that NPs autonomously carried a patient load for continuity of care, and either worked under several physicians or partnered with one surgeon and handled most needs without supervision (Dower & Christian, 2009; Horn et al., 2014). The benefit of this model was that it allowed the surgeon to see more complex patients, which increased the rate that new patients were seen and reduced surgical wait times; as a result this model was found to benefit patients and the healthcare system alike (Horn et al., 2014).

In the third model of care, NPs worked as part of the team and functioned in a role very similar to a senior resident (Ward et al., 2008). Nurse practitioners worked together with an interdisciplinary team of physicians and physician assistants (PAs) and evenly distributed the patient caseload (Dower & Christian, 2009). Dower and Christian (2009) described a successful example of this model in gastroenterology, where NPs worked collaboratively on the team and functioned much like medical fellows or junior attending physicians; in this

settings the NPs had a broad scope of competence to evaluate and treat patients through a collaborative approach. Although this model functioned well, there were challenges to implementation as each profession must know each other's strengths and limitations, be willing to work collaboratively, and must communicate effectively to function efficiently (Dower & Christian, 2009).

Regardless of the model of care used to integrate NPs, the team functioned most optimally when there was mutual trust between disciplines (Dower & Christian, 2009). This meant that specialists were confident in NP skills and had knowledge of their limitations, and NPs knew when complex cases were out of their scope, and to involve the specialist (Dower & Christian, 2009).

Clinics

Although the majority of the studies focused on the NP role in inpatient orthopaedics, a benefit was seen with NPs working as part of the orthopaedic team in outpatient clinics (Ho & Wilson, 2010; Horn et al., 2014; Lucas, 2009). Nurse practitioner roles in the clinic varied among the studies. First, Lucas (2009) discussed how NPs are uniquely qualified to work in preoperative assessment (POA) clinics, which function to assess and provide education to patients prior to elective orthopaedic surgical procedures. In the POA clinic, NPs provided holistic patient assessments, assessed for social issues that may delay discharge, led clinical coordination with the orthopaedic team, and provided pre-/postoperative education to support patients prior to surgery (Lucas, 2009). Specific NP duties in POA clinics included history taking, ordering examinations/laboratory tests, interpretation of results, and physical examination (Lucas, 2009). Sebach et al. (2015) stated that integrating NPs into orthopaedic POAs “improved patient outcomes, increased access to care, and reduced health care spending” (p. 876).

Alternatively, a couple studies discussed inpatient orthopaedic NPs working 1 day a week in primary care orthopaedic clinics (Ho & Wilson, 2010; Horn et al., 2014). In this circumstance, NPs would see new and existing patients with conditions including stable casted fractures, in-toeing, and for postoperative wound assessment (Ho & Wilson, 2010; Horn et al., 2014). In all studies reviewed, NPs functioned efficiently in an outpatient clinical setting (Ho & Wilson, 2010; Horn et al., 2014; Lucas, 2009; Sebach et al., 2015).

Preoperative Care

The majority of studies stated a significant component of the NP role in orthopaedics included assessment, examination, and care for preoperative patients in the hospital (Dower & Christian, 2009; Hiza et al., 2015; Ho & Wilson, 2010; Horn et al., 2014; Johnson, 2011; Sebach et al., 2015). Nurse practitioners would assess and treat patients in the emergency department (ED) and manage admission notes and paperwork (Ho & Wilson, 2010). Dower and Christian (2009) reported similar roles, where NPs would “perform nonsurgical orthopaedic services, including seeing patients, injecting joints, setting broken bones, and assessing the severity of strains and sprains on hips, shoulders, and knees” (p. 7).

Another important role was evaluating patient need for surgery (Dower & Christian, 2009; Johnson, 2011; Sebach et al., 2015). In collaboration with surgeons, physicians, and anesthesiologists, NPs would perform POA of patients, determine the extent of diseases, and evaluate patients' cardiovascular status to determine whether they were in optimal medical condition for surgery (Johnson, 2011). Johnson (2011) stated that NPs made recommendations to reduce perioperative risk, which was then communicated to the orthopaedic team (Johnson, 2011). Sebach et al. (2015) agreed that NPs were qualified to conduct thorough POAs, to properly manage patients' medical conditions, and to recognize and reduce actual or potential perioperative complications (Sebach et al., 2015).

Nurse practitioners also allowed the orthopaedic team another care pathway by seeing patients who required initial reduction of fractures that could be operated on later. These patients were seen by NPs promptly in the ED and were discharged home until they could be operated on; this improved patient access to care and decreased length of stay (Hiza et al., 2015). Moreover, when properly trained NPs can successfully reduce fractures, Ho and Wilson (2010) found that "fracture reductions and casting performed by NPs was just as acceptable as residents with no statistical difference on interventions used or outcomes" (p. 245).

Finally, Ho and Wilson (2010) discussed the role of NPs taking call. On-call duties were shared and alternated between residents and NPs, with NPs being available weekdays, and residents on call evenings and weekends (Ho & Wilson, 2010). On-call duties included initial evaluation of all orthopaedic patients, including reduction of fractures (Ho & Wilson, 2010). The literature supported that NPs are qualified, independent, advanced practitioners, who are appropriate to provide preoperative care as part of an orthopaedic team (Dower & Christian, 2009; Hiza et al., 2015; Ho & Wilson, 2010; Horn et al., 2014; Johnson, 2011; Sebach et al., 2015).

Postoperative Care

Nurse practitioner duties regarding postoperative care were similar across all studies. Nurse practitioner roles on the unit were similar to those of a senior resident; roles included daily floor work such as independent rounding on postoperative patients, coordination of care, and documentation (Hiza et al., 2015; Ho & Wilson, 2010). Horn et al. (2014) reported similar duties, where the NPs collaborated with physicians and performed complex dressing changes and procedures such as casting, and removing drains and surgical pins (Horn et al., 2014). Finally, NPs were responsible for coordinating discharge protocols and education for all hospitalized orthopaedic patients (Hiza et al., 2015; Ho & Wilson, 2010; Horn et al., 2014).

BENEFITS OF NURSE PRACTITIONERS

Increased Access to Care

Nurse practitioners in specialty settings helped increase patient access to care (Dower & Christian, 2009; Hiza

et al., 2015; Horn et al., 2014). Horn et al. (2014) described this in an orthopaedic ward that adopted a 1:1 NP and surgeon model; prior to implementing this care model, patients were waiting higher than the state average amount of time for initial office visits prior to elective surgery. Implementing this model increased the volume of patients being seen in the office, and resulted in an 18% increase in surgical procedures in 1 year (Horn et al., 2014). Hiza et al. (2015) supported this, stating NPs increased access by providing availability to patients in clinics and orthopaedic wards, and were able to care for patients' immediate needs.

Although a different surgical setting, the response to NPs in inpatient gastroenterology was so positive that the department head reported the whole service ran more efficiently, and estimated patient wait times were reduced from 6 to 3 months, a 50% reduction (Dower & Christian, 2009). Moreover, in busy level I trauma hospitals, the 1:1 NP/surgeon model had become the practice standard, which every attending in the orthopaedic department followed, as it increased access to care, improved hospital revenue, and improved patient and family satisfaction, while reducing readmission rates (Horn et al., 2014). Overall, NPs in orthopaedic specialty settings resulted in an increase in patient access to care and surgical procedures (Dower & Christian, 2009; Hiza et al., 2015; Horn et al., 2014).

Improved Communication

Nurse practitioners in specialty orthopaedic settings led to improved communication among healthcare teams and with patients (Dower & Christian, 2009; Hiza et al., 2015; Horn et al., 2014; McDonnell et al., 2015; Newhouse et al., 2011; Nyberg et al., 2007; Pezzi et al., 2009; Sebach et al., 2015). Hiza et al. (2015) reported that the best time to communicate with interdisciplinary team members is when they are available weekdays (on average 9 a.m. to 5 p.m.), which coincides with peak operative hours of surgeons and residents. Before the addition of NPs, communication related to discharge planning, physical therapy, and social services was often delayed until after operating hours (Hiza et al., 2015). A full-time NP working during these times improved patients' experience by improving access to a provider during operative hours; this led to better overall communication with the orthopaedic and interdisciplinary teams (Hiza et al., 2015; Nyberg et al., 2007; Pezzi et al., 2009; Sebach et al., 2015). Dower and Christian (2009) agreed that a team care delivery model (of NPs and surgeons) should be widely adopted. Nurse practitioners liaise with care providers, and "helped to improve coordination, significantly reduced wait times, increased access to care, and helped specialists tend to more complicated cases, which ultimately expanded specialist practice to meet the increasing population needs" (Dower & Christian, 2009, p. 6).

Patients also reported improved communication when NPs were a part of the orthopaedic team (Hiza et al., 2015; McDonnell et al., 2015). An integral part of the NP role is patient education about discharge teaching and postoperative care (Horn et al., 2014). Patients reported better communication, continuity of care, and a

more positive overall experience of hospital care with NPs in specialty/surgical settings (Hiza et al., 2015; McDonnell et al., 2015; Newhouse et al., 2011). Nurse practitioners enhanced communication within the interdisciplinary team, which further improved patient care (Hiza et al., 2015; Horn et al., 2014; McDonnell et al., 2015; Sebach et al., 2015).

Decreased Length of Stay

An emerging theme in the literature was that the addition of NPs to surgical settings reduced the overall patient length of stay (LOS) (Cowan, Shapiro, Hays, & Afifi, 2006; Hiza et al., 2015; Holleman et al., 2010; Horn et al., 2014; Lome, Stalnaker, Carlson, Kline, & Sise, 2010; Lucas, 2009; McDonnell et al., 2015; Newhouse et al., 2011; Williamson, Twelvetree, Thompson, & Beaver, 2012). First, NPs improved patient health outcomes postoperatively, resulting in earlier discharge and thus a decreased LOS (McDonnell et al., 2015; Newhouse et al., 2011). Second, NP roles in surgical settings led to enhanced detection of patient decline, therefore reducing complications, which might increase LOS (McDonnell et al., 2015; Williamson et al., 2012). Finally, NPs helped to reduce LOS for patients requiring more extensive coordination and communication with the interdisciplinary team prior to discharge (Hiza et al., 2015; McDonnell et al., 2015; Williamson et al., 2012). As a result, LOS was reduced in elderly patients, and patients requiring inpatient rehabilitation, intravenous therapy, or home wound management (Hiza et al., 2015).

The literature also supported that, through a decreased LOS, a financial benefit was seen for hospitals and surgeons (Cowan et al., 2006; Horn et al., 2014; Sebach et al., 2015). First, a team approach with physicians and NPs resulted in more effective coordination and communication among the team, which decreased LOS and in turn improved hospital profit (Cowan et al., 2006; Horn et al., 2014; Sebach et al., 2015). For example, Hiza et al. (2015) projected that through decreased LOS, based on an average rate of \$2,000 per night in the hospital, in 1 year the health authority saved \$1.1 million by hiring NPs. This is supported by McDonnell et al. (2015), who found NPs improved health outcomes and reduced LOS in both a cost-effective and timely manner. Third, surgeons reported a financial benefit after hiring NPs; when patients were discharged in a comprehensive and timely manner, surgeons were able to increase their surgical volume, productivity, and overall revenue (Horn et al., 2014).

Improved Quality of Care

There was a positive correlation in the literature that NPs in orthopaedic/surgical settings helped improve the quality of care patients received (Dower & Christian, 2009; Horn et al., 2014; McDonnell et al., 2015; Phillips et al., 2001). In a literature review of NP and PA practice by Dower and Christian (2009), participants reported NPs to be an integral part of specialty and surgical practice as they reduced the number of patients awaiting care, which improved the overall quality of care received. Horn et al. (2014) similarly found that NPs in

orthopaedics improved patient care over and above the normal resident-driven care previously in place. It is important to note that NPs are not intended to be a replacement for residents, but rather to work collaboratively with residents to bring expertise and knowledge, which are essential for delivering quality and holistic patient care (McDonnell et al., 2015). Therefore, patients receive a higher level of care when NPs and physicians collaborate to develop a combined model of care, and share patient workload through a team-based approach that takes advantage of both respective professions (Horn et al., 2014; McDonnell et al., 2015; Phillips et al., 2001).

The literature also found that the clinical decisions and care provided by NPs were comparable to physicians (Horn et al., 2014; McDonnell et al., 2015). This demonstrates that NPs are safe practitioners who make clinical decisions comparable to and not below their physician colleagues. Ultimately, NPs providing care that is traditionally performed by residents in acute surgical (orthopaedic) settings had a positive impact on the quality of patient care (Ho & Wilson, 2010; McDonnell et al., 2015).

Increased Patient Satisfaction

Nurse practitioners in specialty surgical settings were either comparable to physicians or led to improved patient satisfaction with care (Coddington & Sands, 2008; Griffith & Melby, 2006; Horn et al., 2014; Laurant et al., 2004; McDonnell et al., 2015). Findings in a systematic review of NPs in various medical surgical settings found that, when comparing NP and physician care, there was a high level of evidence to support comparable levels of patient satisfaction (Newhouse et al., 2011). However, Horn et al. (2014) found that an NP/surgeon model enhanced patient satisfaction due to improved communication, better accessibility of the NP, and a sense of continuity, as NPs in this study were seen in both the hospital and clinic settings. In fact, patients reported seeing the same NP helped build trust and the sense that there was a commitment to their personal medical issues (Horn et al., 2014). This supports that a full-time NP in orthopaedics increases patient satisfaction.

Furthermore, NPs had a positive impact on patient outcomes and safety, which improved overall patient satisfaction with the care received (Griffiths et al., 2008; McDonnell et al., 2015). In the ED where NPs saw patients preoperatively, NPs were found to reduce orthopaedic patient wait times, which improved both outcomes and overall satisfaction (Coddington & Sands, 2008; Griffith & Melby, 2006; Laurant et al., 2004; McDonnell et al., 2015). Most findings supported that NP roles in specialty settings have a positive impact on patients' health outcomes and therefore patient experiences or satisfaction with healthcare (McDonnell et al., 2015).

Positive Effect on Resident Education

Orthopaedic units in Level 1 trauma centers are academic centers that rely heavily on residents (Hiza et al., 2015; Pezzi et al., 2009). In addition to the positive impact on patients' experiences of healthcare (Horn et al.,

2014), hiring NPs has demonstrated a positive effect on resident education (Hiza et al., 2015; Pezzi et al., 2009). Hiza et al. (2015) state that, because of the high number of residents in teaching hospitals, settings such as orthopaedics see a benefit from hiring an advanced practice nurse such as an NP. As experienced healthcare providers, NPs serve as mentors to junior residents in appropriate care and management of floor patients (Hiza et al., 2015). Moreover, for orthopaedic surgeons, “balancing maximal resident education with a commitment to patient care remains a concern in the current era” (Ho & Wilson, 2010, p. 247). Nurse practitioners allow orthopaedic surgeons to maximize resident education in the operating room, while still delivering quality patient care on the unit. Overall, NPs add value to orthopaedic and surgical services, as they advance resident education by allowing residents the time to become more involved in surgical and clinical cases (Hiza et al., 2015; Horn et al., 2014; Lome et al., 2010).

CHALLENGES OF IMPLEMENTING NURSE PRACTITIONERS IN SPECIALTY SETTINGS

There were a few challenges identified in the literature regarding the implementation of NPs in specialty settings. The three main barriers identified were misuse of NPs, initial reluctance of specialists to work with NPs, and lack of continuity when regular NPs were not hired (Dower & Christian, 2009; Horn et al., 2014; McDonnell et al., 2015).

Dower and Christian (2009) reported that the biggest barrier in their study was specialists excessively or inappropriately using NPs. This took place in the form of providing NPs insufficient training, lack of support, or irresponsibly pushing NPs to work outside their professional limits and scope; both examples resulted in decreased quality of care (Dower & Christian, 2009). Another example of misuse was discussed by Horn et al. (2014) where NPs were initially underutilized—such as being assigned clerical work, or designated tasks that were below their scope. However, once NPs became more experienced in their setting, they advocated to work to their full scope and potential, and became a very successful part of the team (Horn et al., 2014).

Another challenge was discussed by Dower and Christian (2009) with specialists reluctance to accept NPs, due to lack of knowledge of the NP scope, role, and competence. These physicians reported that their uncertainty resolved once they worked with competent and appropriately trained NPs, and saw the benefit to patients and providers alike (Dower & Christian, 2009). Finally, Horn et al. (2014) discussed a barrier identified by patients when being seen by multiple NPs. Having a different NP every day in the hospital or clinic led to discontinuity of care, and was confusing for patients and caregivers (Horn et al., 2014). These examples help support the need for full-time positions and advanced orientation by orthopaedic surgeons so that NPs can practice to the full extent of their scope.

NP Orthopaedic Education

In addition to some of the challenges identified earlier, a theme emerged in the literature regarding the

inconsistency and informality of NP specialty orthopaedic education (Benham & Geier, 2014; Dower & Christian, 2009; Ho & Wilson, 2010; Lucas, 2009; Ward et al., 2008). Although these findings were from a study of orthopaedic NPs in primary care, Benham and Geier (2014) found that many primary care physicians and NPs were inadequately prepared to properly manage and care for musculoskeletal issues and conditions. Moreover, many NPs reported feeling underprepared to competently assess and manage these conditions, because of limited time spent on education of musculoskeletal content in their NP curriculum (Benham & Geier, 2014). A bigger challenge identified was that post-master’s education in medical specialties (including orthopaedics) is not offered to NPs (Dower & Christian, 2009). The lack of master’s and postmaster’s education in orthopaedics places NPs in a disadvantageous position to specialize.

In addition, Lucas (2009) reported that NPs expressed difficulty in accessing appropriate and relevant orthopaedic education for their specialty roles. As a result, the few NPs currently practicing in orthopaedic specialties have received their training on the job through physician mentorship and supervision, and not through a formal training program (Benham & Geier, 2014; Dower & Christian, 2009). On-the-job mentorship or residency ranged dramatically; studies described residencies from 3 months to upward of a year before NPs achieved the perceived level of competency required to practice independently (Dower & Christian, 2009; Ho & Wilson, 2010; Ward, 2008). As evidenced, the level of training deemed necessary for an NP to practice in orthopaedics was very inconsistent.

Regardless of the length of residency, the underlying question is: why does not a formal NP specialty training program exist in orthopaedics? Dower and Christian (2009) discussed the conflict in formal specialty training for NPs; from one perspective there is a concern that encouraging the movement of NPs into specialties may contribute to a further reduction in primary care access. However, they also report a “lack of standardization of specialty training may impede NP mobility, which decreases access to care by perpetuating an insufficient supply of providers working in specialties” (Dower & Christian, 2009, p. 9). Regardless of the argument, the general consensus in the literature is that there are many benefits seen to adding NPs into orthopaedic surgical settings, and post-master’s specialty education in orthopaedics would help formalize this role, and increase the likelihood that NPs will be hired into these positions (Benham & Geier, 2014; Dower & Christian, 2009; Ho & Wilson, 2010; Lucas, 2009; Ward et al., 2008).

FUTURE RECOMMENDATIONS

The literature supports the integration of NPs into orthopaedic settings. However, the formal educational framework does not exist to support the transition of NPs into specialty orthopaedic practice. Dower and Christian (2009) discussed that several surgeons and specialists reported interest in postgraduate specialty training programs to standardize NP education and

help ease hiring. This illustrates that specialists are eager to hire NPs into orthopaedic and other specialty roles; however, formal training would help support this process, and ensure the NPs are adequately prepared. Funding and advocacy for the creation of these educational programs would help advance opportunities for NPs in specialty settings.

In addition, this review revealed a lack of research on NPs in specifically orthopaedic surgical settings. Although research exists on the NPs in primary care orthopaedics, intensive care unit, neurosurgery, and general surgery, there is scant literature on the impact of NPs in orthopaedic surgery (Hiza et al., 2015; Ho & Wilson, 2010; Holleman et al., 2010; Horn et al., 2014; Lucas, 2009; McDonnell et al., 2015). A supply-and-demand imbalance in orthopaedic care exists, and as discussed in this literature review, NPs are qualified to fill this gap. Thus, more robust research could increase physician, public, and health authority awareness on the benefits of NPs in orthopaedics surgical settings, and ultimately improve the care that is delivered to this important demographic.

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CALENDAR

Upcoming Events

Regional Offerings

February 9, 2019—**NAON Orthopaedic Nursing Review Course**. Medical University of South Carolina - MUSC Campus, Bio-engineering Building Rm. 112 (BE 112), 169 Ashley Avenue, Charleston, South Carolina 29425.

February 14, 2019—**For the Love of Orthopaedics**. Comfort Suites, 1951 Bond Street, Green Bay, WI. <http://www.orthonurse.org/page/event-calendar>.

National Offerings

March 13-14, 2019—**AAOS/NAON Nursing and Allied Health Courses, Las Vegas, NV**. <http://www.orthonurse.org/aaos>.

May 18-21, 2019—**NAON Congress**. Hyatt Regency Atlanta, Atlanta, Georgia. <http://www.orthonurse.org/congressinfo2019>.