

AUA Consensus Statement on ADVANCED PRACTICE PROVIDERS



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Urological
Association**

Education & Research, Inc.

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Consensus Statement on Advanced Practice Providers

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Introduction and purpose

A workforce shortage of 65,000 physicians is projected for both primary care and specialty medicine by the year 2025.¹ Similarly, the supply of urologists per capita in the United States continues to decrease, a trend that started in 1991 and continues to accelerate. In 2009 there were only 3.18 urologists per 100,000 in the population, which is a 30-year low and amongst the most severe specialty medicine shortages. This is compounded by the fact that urology has the second oldest surgical subspecialty workforce with an average age of 52.5 years, of whom greater than 18% are age 65 years or older.²

In 2010, the Institute of Medicine (IOM) addressed the role of advanced practice providers and the impending physician workforce deficits within the document "The Future of Nursing: Leading Change, Advancing Health." The committee concluded in their report to Congress that the increase in primary care reimbursement in the Medicaid program should be extended for the services of advanced practice providers (APPs); that the Medicare program should be expanded, with encouragement to private insurance to reimburse the services of APPs within the applicable state scope of practice legislation; and that Congress should consider limiting federal funding for nursing education to only those states that have adopted National Council of State Boards of Nursing advanced practice registered nurse model rules and regulations.³ In response to the IOM report to Congress, the American Medical Association (AMA) acknowledged the workforce shortage of both nurses and physicians and endorsed a physician-led team approach to the provision of high-quality, value-based health care through "each team member playing the role they are trained and educated to play."⁴ However, recent data indicate that states with the least restrictive scope of practice laws have experienced the largest increase in the number of APPs that independently provide primary care and medication prescribing services for Medicare patients without physician supervision.⁵

The American Urological Association (AUA) endorses the use of APPs in the care of genitourinary disease through a formally defined, supervisory role with a board-certified urologist under the auspices of applicable state law.⁶ Based on an AUA Office of Education needs assessment survey in October-November 2012, nearly 8,000 APPs are working in urology practices/institutions in the United States, including 3,338 nurse practitioners (NPs), 4,002 physician assistants (PAs), and 411 clinical nurse specialists. The survey results showed that 65% of urologists were interested in the integration and utilization of advanced practice providers in their practice. In a more recent AUA survey on workforce and compensation trends in November 2013, 62% of urologists surveyed responded that they use an APP in their practice. According to the surveyed urologists, APPs account for 41% of an MD/DO full-time equivalent, of which 75% is ambulatory clinic-related, 14% inpatient, and 9% procedural.

The utilization of APPs was less in the youngest and oldest subgroups of urologists, and APP utilization was highest in urban urologists (68% urban, 58% suburban, and 51% rural) and in larger group sizes. Utilization also appears to be greater amongst academic and employed urologists in the middle years of their career.

The purpose of this document is to provide guidance for urologists on the integration of APPs into the urological care setting with a focus on the current state and federal regulatory environment, reimbursement considerations, core competency benchmarks for APPs, patient satisfaction with the APP-physician team approach, and proposed models of team-based integrative care.

Definitions

As of February 2014 the AUA recognizes advanced practice registered nurses (APRN) and PAs as “advanced practice providers (APPs)”. The term “allied health professional” includes nurses, medical technicians, and assistants. All must be working in urology based setting for at least one year to obtain these respective designations.

Defining the NP role

“APRN” is a term that covers four distinct roles: certified nurse practitioner, certified nurse midwife, clinical nurse specialist, and certified registered nurse anesthetist. The 2008 APRN regulatory model established these four categories and denotes advanced graduate nursing preparation specific to each of these roles. Within each of these roles exist population foci that guide individual roles.

Each APRN has obtained a Bachelor’s of Science in Nursing (BSN) prior to admission to a graduate program; some students may have additional undergraduate and graduate degrees. The student APRN then undergoes a broad-based education at the graduate level, sits for a national certification examination to assess competencies of their specific core and at least one population focus area (such as adult-geriatrics or pediatrics). After passing the certification examination, individuals are *licensed as independent practitioners subject to the specific regulation of a state board of nursing*. Licensing implies congruence between certification, licensure, and population focus; an APRN cannot be licensed only in a specialty area, such as urology, but must first be certified in one of the four generalist APRN categories. The academic degree granted is either a Master of Science in Nursing (MSN), a Master of Science (MS), or a Doctorate of Nursing Practice (DNP), depending on the individual program. Initial certification requires evidence of degree status and at least 500 hours of clinical practice, although these requirements vary depending on the specific certifying body. Recertification is required every five years with 150 CEUs; however, the initial certification examination does not have to be retaken unless the certification expires.

For the purposes of this consensus statement, the discussion will focus only on the NP role; descriptions of the other three roles can be found in Table 1. Quallich and colleagues established that among these four generalist categories, it is only NPs who are sustaining a specialty practice in urology.⁷ There are approximately 350 academic institutions (universities and colleges) with NP programs in the United States. NP training includes didactic classroom training followed by clinical rotations. The training is based in primary care, with additional education based on their specialty population focus. The education of the NP includes a graduate degree or postgraduate certificate that is awarded by an accredited academic institution and provides theoretical and evidence-based clinical knowledge. Specific classes within the NP curricula include advanced pathophysiology, advanced pharmacology, advanced health assessment, population-specific content, health promotion strategies, and basic research and statistics courses. In clinical practice

this represents a process for care that includes assessing health status, formulating a diagnosis, developing and implementing a treatment plan, and continuing follow-up and evaluation of the patient.

Table 1. Descriptions of generalist APRN roles

Certified Registered Nurse Anesthetist (CRNA): An APRN who provides the full spectrum of anesthesia and anesthesia-related care for individuals across the lifespan and through all levels of acuity. This care can be administered in diverse settings, including hospital operating rooms and pain management services. Some CRNAs specialize in particular settings or populations, such as pediatrics.

Certified Nurse Midwife (CNM): An APRN who provides the full range of women's primary reproductive health services focusing on gynecologic care, family planning services, childbirth, and newborn care. This role can include treating male partners for sexually transmitted infections. Their practice settings can be diverse and include homes, birthing centers, and hospitals.

Clinical nurse specialist (CNS): An APRN who integrates care, focusing on the interactions of patients, nurses, and systems. A continuous focus of this role is improvement of patient outcomes and nursing care with the goal of developing evidence-based practice to improve overall patient care within a system. Specific roles can include diagnosis and treatment of health and illness, health promotion, and risk factor prevention among families, groups, or communities.

NPs are members of a larger team that provides comprehensive health and medical care to specific populations or in specific care environments. This model of education emphasizes health education, promotion of optimal health, and the facilitation of patient participation in self-care. The NP provides care for patients across the health continuum and functions in diverse settings that can include geriatrics, women's health, pediatrics, and specialty practices. The role of the NP includes diagnosis and treatment of both acute and chronic conditions. This extends to comprehensive history and physical examination; preventative screening and health assessment; ordering and interpreting laboratory and imaging studies; and prescribing medication, physical and occupational therapy, and durable medical equipment. This role often includes health education and teaching individuals, families, groups, and other members of healthcare team. Many NPs practice in primary care settings, but others have roles within specialty and subspecialty practices.

Defining the PA role

The PA is a medical professional who is a graduate of an accredited PA program who is also nationally certified and state licensed to work with the *supervision of a physician*. PAs undergo training based on the medical model with a focus toward primary care, including courses in pathophysiology, pharmacology, physical diagnosis, laboratory science, and microbiology. Specific rotations in diverse environments such as family medicine, internal medicine, pediatrics,

general surgery, and obstetrics comprise clinical rotations for PAs and emphasize primary care, office practice, or long-term care facilities. Prior to admission to a PA program, students have various undergraduate and graduate degrees, with a minimum of two years of college courses in basic or behavioral sciences. The academic degree granted after completing a PA program is usually a master's degree, and they must pass a certification examination for licensure. Eligibility for certification involves evidence of degree status and 1,000-2,000 hours of clinical practice.

In clinical practice, the role of the PA is as part of a team practicing medicine with physician supervision, and is frequently described as delegated autonomy. The PA model of education emphasizes disease prevention, elimination of health disparities, and promotion of health and healthy behaviors. The PA provides care for patients across the health continuum, and functions in diverse settings that can include internal medicine subspecialties and acute care environments. This extends to comprehensive history and physical examination skills; preventative screening and health assessment; ordering and interpreting laboratory and imaging studies; prescribing medications; and assisting in surgery. Although PAs do not specifically specialize with a population focus within their training program, PAs have moved into specialty practices that include occupational medicine and surgical subspecialties such as urology, pain management, and pediatrics.

NP and PA Training

It becomes clear from the description of the NP and PA that while their training may be different, their roles after certification can be quite similar. NPs rarely undergo clinical rotations where they might have the opportunity to assist in surgery, but this is an option in many PA programs. One of the primary differences is that NPs specialize with a particular population focus prior to achieving their graduate degree, while PAs may move to specialize with a particular population post-graduation.

One of the most noticeable differences between NPs and PAs is the number of clinical practice hours required for certification. However, it is important to note that all advanced practice nurses have prior experience working as registered nurses, which accounts for the reduction in clinical practice hours required for certification.

Supervisory/collaborative model

The official position of the AUA is that APPs work in a closely and formally defined alliance with a urologist that serves in a supervisory role. This physician-led, team-based approach provides the highest quality urologic care.⁸ As the physician-led, team-based approach evolves, so do the definitions of supervisory and collaborative models of care between physicians and APPs.

The role of the APP in a urology practice is dependent on many factors, including academic versus private practice, large versus small group, APP experience, physician comfort level, and state laws. The supervisory/collaborative model in urology may be described as delegated autonomy. This autonomy process has a natural growth over time as the physician and the APP

become accustomed to working together, which leads the team to provide the highest level of quality urological care.

While PAs and NPs are trained differently, they function similarly in a urology practice. PAs are trained in the medical model by physicians, PAs, and other faculty members. PAs are educated at one of 160 accredited programs in the US, and PA training includes didactic classroom training followed by clinical rotations. The training is usually in primary care with additional education through residencies or postgraduate fellowship training. Board certification is required to practice as a PA; the certification is in primary care however specialty certification is in development. Recertification occurs every 10 years with yearly CME requirements. PAs are licensed by the State Board of Health and under the same jurisdiction as physicians.

In 1995, the AMA acknowledged the importance of requiring supervision while allowing physician flexibility in practice management. The AMA House of Delegates adopted the Guidelines for Physician/Physician Assistant Practice, which includes:

- The role of the PA in the delivery of care should be defined through mutually agreed upon guidelines that are developed by the physician and the PA and based on the physician's style of delegating.
- The physician must be available for consultation with the PA at all times either in person or through telecommunication systems or other means.
- The physician is responsible for clarifying and familiarizing the PA with his or her supervising methods and style of delegating patient care.

Although the physician is responsible for the overall care of the patient, the concepts of supervision and collaboration do not require that the supervising physician be present with the APP during APP-provided care. As the physician-APP relationship grows and evolves, the duties delegated to the APP are designed to deliver quality health care while reserving the physician to attend to more complex patient care suited to his or her level of expertise. A highly skilled APP will be eligible for this indirect supervision.

Supervision/collaboration is a process in which an APP works with one or more physicians to deliver healthcare services within the scope of the practitioner's expertise, with medical direction and appropriate supervision as provided for in jointly developed guidelines or other mechanisms as provided by the law of the state in which the services are performed. This requires that each party share responsibility for care. Supervision/collaboration is an interactive process involving trust, excellent communication, mutual goals, and common direction in practice. It is a dynamic process dependent upon skills and competencies of the APP and physician. An important component of collaboration requires professional relations that foster best patient outcomes and the optimal use of individual skills.

In most instances, prior urology experience will be limited, and for that reason sound problem solving and decision-making skills will mature with time. Delegated tasks must be mutually

understood and agreed upon. As such, ensuring that team members realize their potential for efficiency and high-quality care requires appropriate support, encouragement, and training tailored to the experience level of the APP. Newly graduating APPs and APPs new to urology will require strong physician-APP communication and a period of direct supervision and orientation. This team model is an efficient way to provide high-quality medical care.

Models of team-based integrative care are based on the needs of the particular practice. Examples can include: assisting in surgery, seeing postoperative patients, hospital consults, emergency room consults, and overflow office patients. This allows the physician to see more complex urologic patients. Outreach clinics can also be staffed by experienced APPs. Preoperative and postoperative educational classes that can be conducted by APPs can increase patient satisfaction and patient retention. In the hospital setting, consultations, history and physical examinations, and difficult bladder catheterizations also can be performed by APPs. In the clinic setting, certain procedures such as prostate ultrasound, urodynamics, cystoscopy, vasectomy, and stent removal have been performed by APPs; however this remains an area of controversy that requires further study. Factors such as APP education level, APP proficiency with procedures, state scope of practice laws, and the level of comfort for the supervisory/collaborative physician must be considered in order to maintain the highest quality and patient safety for urologic care.

State laws governing APP supervision can have subtle differences between states. States that have restrictive language regarding the physician's delegating authority are challenged and modified regularly. The purpose of these challenges is to improve the physician's ability to extend access to care through physician-APP teams. More and more states use language that defines supervision more broadly and look to repeal laws that requires physicians to be present at their practices for a set number of hours.

The most effective physician-APP team practices provide optimum patient care by designing a practice model in which the skills and abilities of each team member are used most efficiently. Ideally, physicians are not involved in care best provided by APPs and similarly, APPs do not undertake tasks best provided by physicians. Studies consistently find enhanced quality of care in settings that fully integrate physician-APP practice.

Core competencies

It is a goal of the AUA and of practicing urologists to develop a process by which a newly graduated APP would undergo a period of mentorship and training in order to cultivate a practitioner who is capable and willing to independently manage a wide variety of urologic conditions. The scenario is not dissimilar to the training and mentorship that goes into training a junior urology resident, who is groomed to be capable of indirect supervision for most encounters in the area of urologic health. The *Urology Milestone Project* describes several core competencies as well as progression in skills, independence, and capability that a developing resident must achieve to progress in their level of training.

As outlined in Table 2, the core competencies of the certified and licensed APP are not dissimilar to what is expected as urology residents progress throughout their training.⁹ As APPs progress through their skill levels (Table 2), decreasing levels of direct supervision are necessary,

commiserate to the individual’s demonstrated level of aptitude. This will obviously occur at different rates based on the complexity of the diagnosis that is being managed and specific clinical environment as well as the number of encounters and acuity of the patients that are seen along the way. Ultimately, the goal is that the APP will be fully capable of remote supervision for most complex diagnoses and management plans after an appropriate time of mentorship and experience.

Table 2. Comparison of core competencies guiding NP and PA education programs and ACGME/ABU competencies

Milestone Concepts	Resident Competency <ul style="list-style-type: none"> Adapted from “Urology Milestone Project” Document 	Nurse Practitioner Competency <ul style="list-style-type: none"> Adapted from NONPF core competencies, 2011 9 categories of competencies 	Physician Assistant Competency <ul style="list-style-type: none"> Adapted from AAPA/PAEA core competencies revised 2012 6 categories of competencies
Foundation in urologic/medical and scientific knowledge	Patient care, practice-based learning and improvement, medical knowledge	Scientific foundation	Medical knowledge, patient care
Leadership	Practice-based learning and improvement, interpersonal and communication skills, professionalism	Leadership	Professionalism, interpersonal and communication skills
Evidence-based practice	Practice-based learning and improvement	Quality, scientific foundation	Patient care, practice-based learning
Quality improvement and research	Practice-based learning and improvement	Practice inquiry	Systems-based practice, practice-based learning
Use of technology in patient care	Systems-based practice	Technology and information literacy	Systems-based practice
Healthcare policy, regulation	Systems-based practice	Policy	Professionalism, systems-based practice
Organizational practice/ resource allocation	Systems-based practice, professionalism, interpersonal and communication skills	Health delivery system, quality, ethics, health delivery system	Interpersonal and communication skills, systems-based practice, professionalism
Role as part of healthcare delivery team	Systems-based practice, practice-based learning and improvement, professionalism,	Independent practice, healthcare delivery system	Systems-based practice, professionalism

	interpersonal and communication skills		
Patient care/ professional ethics	Professionalism, Interpersonal and communication skills	Ethics, quality	Professionalism, patient care
Scope of practice	Professionalism	Independent practice	Medical knowledge, professionalism
Procedural competencies	Patient care	Independent practice, scientific foundation	Professionalism, medical knowledge, practice-based learning

Note: Competencies not incorporated in this chart are related to resident surgical skills/training.

Although the training and clinical experience of the new APP cannot be directly lateralized into an easily transferrable assessment of level of urologic expertise, with a period of time and with close mentorship, a baseline assessment of clinical skill and knowledge in general urology or a specific dimension within an area of urology (e.g., sexual dysfunctions or incontinence) may be ascertained (Level 3). This would allow for additional education, both didactic and clinic-based, in order to meet the needs of a particular practice environment. An APP who moves into urology with previous experience independently managing patients would enter into this process at a much different point (e.g., Level 2) and may require more urology-specific knowledge and less clinical management training.

This can progress to the point that the APP is sufficiently “expert” and may potentially offer a subspecialty service, with supervision, to meet urologic patients’ needs and fulfill a practice gap that is expanding in subspecialty urologic care (Level 1). It is anticipated that as APPs are trained to function at high levels within urology or a urologic subspecialty, resources may be redirected to the mentorship of more junior APPs to continue to build a quality service that will result in satisfactory access to care in our subspecialty domain and prevent a lack of referrals. This may also have the effect of preventing patients’ movement to other subspecialty fields that may not be as well equipped to manage the same problems, or the acuity of problems that urologists or a team of urologic providers have been prepared to treat.

The skill levels of care outlined in Table 2 are built on the basic knowledge of APPs and demonstrate the similarities that form the groundwork of the education and additional training for residents and APPs. Implementation of these levels of supervision and expectations regarding quality of care are subject to the individual expectations and experiences of the individuals involved, as guided by specific state and facility guidelines. These levels of supervision have been defined by applying the outline of the competencies that have already been recognized as vital for residents to the role of the APP within a urology environment. This reflects a process for how an APP may progress through increasing levels of expertise, which in turn indicates their ability to independently care for higher acuity and complex patients with decreasing levels of supervision.

The following skills have been adapted from the review by Crecelius and colleagues.¹⁰

Level 1 skills

This is a highly skilled clinician. The physician and APP will likely communicate routinely via distance communication such as progress notes or telecommunication. Notification of changes to treatment plans or a new significant diagnosis usually occurs promptly by HIPAA-compliant methods. Given the competent skill set, this APP physician team can focus on care collaboration. As highly skilled members of the care team, they are often responsible for quality improvement initiatives. Families, patients, and staff will probably trust the APP and physician equally. This team is ready to conduct educational sessions pertinent to urologic health.

Level 2 skills

This skill set may describe an APP new to urology. The APP possesses basic knowledge and under mentorship of a urologist is expected to mature to Level 1 skills over time. The role of the physician is to verify, validate, and provide constructive feedback. This can be provided via telephone for most circumstances, but ideally some time should be spent face-to-face. The APP will benefit from opportunities to enhance diagnostic and therapeutic skills in caring for complex patients with multiple or complex urologic conditions and those with multiple medical comorbidities. Before talking with families and patients about more complicated interventions or weighing options, the APP may want to discuss and coordinate with the physician and plan the ideal approach for this communication with the patient or their family. The physician will want to be clear on what to delegate to the APP and to make sure that the APP is comfortable with this level of intervention. Trust between the APP and the patient, family, and staff should grow as the skills develop. Continuing education workshops where the APP learns from other skilled practitioners will be helpful (e.g., APP sessions at AUA national meetings).

Level 3 skills

This may describe the newly graduated APP who is also new to urology. Level 3 describes the APP whose skill set in managing urologic conditions is immature. Supervising this APP is essential to ensure safe care. This APP may have difficulty triaging multiple complaints and determining which clinical course is best. The physician will initially want to personally examine or at least make face-to-face contact with each patient seen by the APP. The physician and the APP may want to consider a urology training curriculum (e.g., focusing on routine follow-up of stable patients or shadowing the physician for higher acuity or complex patients). It may be that the APP is not ready to prescribe medications until discussion with the physician at this level. The APP should move toward Level 2 in a matter of weeks to months. If this is not the case, the APP should consider another environment where closer supervision is available or determine whether urology is best suited for him or her.

The AUA has recognized the need for additional educational opportunities regarding the best practices in implementing urologic team based care. The 2012 AUA Educational Needs Assessment conducted by the Office of Education indicated that 65% of respondents are interested in learning how to integrate and utilize physician extenders. The AUA Education Council and APN/PA Education Committee has identified six topic areas in which training modules will be developed to assist in APP training and integration. These topic areas are:

- Overactive bladder/non-surgical
- Urologic oncology
- Male sexual dysfunction

- Surgical assistance
- Stone management
- Female sexual dysfunction

These modules will be available on the “[Education for APN/PA/Allied Health](#)” portion of [AUNet.org](#).

Federal implications

The Social Security Act, Medicare regulations, national medical and nursing associations, federal agencies, and state guidelines provide recommendations and define the supervisory role of physicians and how physicians and advanced care providers collaborate.

Statutory requirements

Supervision Regulations at 42 CFR 483.40 (a)(1) state, “The medical care of each resident is supervised by a physician.” The regulatory definition of “collaboration” is defined at 42 CFR 410.75 (c) as:

“(i) Collaboration is a process in which a nurse practitioner works with one or more physicians to deliver health care services within the scope of the practitioner’s expertise, with medical direction and appropriate supervision as provided for in jointly developed guidelines or other mechanisms as provided by the law of the State in which the services are performed.

“(ii) In the absence of State law governing collaboration, collaboration is a process in which a nurse practitioner has a relationship with one or more physicians to deliver health care services. Such collaboration is to be evidenced by nurse practitioners documenting the nurse practitioners’ scope of practice and indicating the relationships that they have with physicians to deal with issues outside their scope of practice. Nurse practitioners must document this collaborative process with physicians.

“(iii) The collaborating physician does not need to be present with the nurse practitioner when the services are furnished or to make an independent evaluation of each patient who is seen by the nurse practitioner.”

Medicare regulations

In the Medicare Benefit Policy Manual and Medicare Claims Processing Manual, “incident-to” services are noted as integral, yet incidental to the professional and personal services of a physician in diagnosing and treating illness. Thus, they may be performed by nonphysician personnel and still be billed as if the physician personally performed them. However, essential rules must be followed to correctly bill such cases to Medicare.^{11,12}

- They must be performed in the physician’s office. Hospital inpatient services do not qualify.
- Those performing the services must be employed by the billing practice.
- The physician must have personally performed the initial service for a new patient to the practice, established a plan of care, and remain actively involved in the course of

treatment. The same is true for any established patient with a new medical condition. Other practice employees may implement incidental steps in the established plan of care within the scope of practice limits in their state.

- While these “incident to” services are taking place, a physician must be physically present in the same office suite and be immediately available to render assistance if that becomes necessary. This is described by Medicare as “direct supervision.” It need not be the physician who performed the initial service but it must be a physician-member of the group.
- Medicare reimbursement is based on 100% of the physician fee schedule amount. Unless these rules are followed, such delegated services by an APP are only paid at 85% of the physician fee schedule and those delegated to other practice employees are not reimbursed at all.
- It is important to review the contracts for other third-party payers that cover your patients as well as your state’s laws to determine to what extent you can delegate services to non-Medicare patients and how much you can be reimbursed. This will help your practice make wise decisions about how and when to delegate services.

Federal legislation

In the 112th and 113th Congresses, federal bills were introduced concerning a range of healthcare-related issues. Bills and initiatives specific to NPs include expanding authority to conduct assessment for patient admission to skilled nursing facilities, expanding Medicare reimbursement rates for non-physician providers to be similar to those of physicians, and expanding prescribing privileges.

Federal legislation has been introduced that would impact PAs in similar ways, namely expanding their scope of practice, including legislation to allow PAs to order home health services for Medicare patients and expanding authority to certify for hospice care. In addition, PAs have asked Congress to address a rule that will prohibit physicians from delegating the hospital admission order to PAs and other qualified practitioners.

National medical organizations

The AUA’s position is stated in its policy statement on Urological Allied Health Professionals:⁸

“The American Urological Association (AUA) and the Urology Care Foundation recognize that in some areas, allied health personnel contribute to the care of the patient with genitourinary disease and, therefore, encourages the proper utilization of APPS.

Allied health personnel should be considered as para-professionals and should work in a closely and formally defined alliance with a physician.

Where the major duties of allied health personnel (i.e., NP and PA) are those of diagnosis, treatment, or management of [patients with] urological disease or problems, the designated supervising physician should be a urologist certified by the American Board of Urology (ABU).

The AUA recognizes that the role and privileges of allied health personnel vary according to individual state regulations and that the restrictions and/or controls established in any state should be honored.”

The AMA’s position is founded on a physician-led team approach to care with each member of the team playing the role they are educated and trained to play.⁴ The AMA’s House of Delegates also passed a policy statement titled *Support for Physician Led, Team Based Care*¹³ that requires the AMA to advocate to policymakers, insurers, and other groups as appropriate that they should consider the available data to best determine how non-physicians can serve as a complement to address the nation’s primary care workforce needs; to continue to recognize nonphysician providers as valuable components of the physician-led health care team; and to advocate that physicians are best qualified by their education and training to lead the health care team. A June 2014 policy titled *Development of Models/Guidelines for Medical Health Teams* details the four elements to consider when planning a physician-led team-based approach to care according to the needs of each practice: patient-centered, teamwork, clinical roles and responsibilities, and practice management.¹⁴

The American Association of Nurse Practitioners (AANP) seeks to remove limitations in federal laws and regulations that do not recognize the advanced education and clinical preparation of NPs that allows them to furnish the full range of services they are licensed to provide. In particular, the association has focused on providing coverage of NP services as physician services are covered and seeking recognition as primary care providers in all programs and settings.¹⁵

The policy environment and implications for the future

In the current policy environment, some suggest that states could increase access to primary care for their residents by easing their scope of practice restrictions and modifying their reimbursement policies to increase the role of NPs in providing primary care,¹⁶ expanding the Medicare program to include coverage of APRN nurse services that are within the scope of practice under applicable state law just as physician services are covered,¹⁷ amending the Medicare program to authorize APRNs to perform admission assessments, as well as certification of patients for home health care services and for admission to hospice and skilled nursing facilities,¹⁶ and extend the increase in Medicaid reimbursement rates for primary care physicians included in the Patient Protection and Affordable Care Act to APRNs.

In 20 states and the District of Columbia, NPs are allowed to practice independently, while 12 states require NPs to be supervised (directly or indirectly) by a physician. The remaining 19 states require NPs to have a collaborative or supervisory agreement with a physician. Governmental bodies such as the Health Services and Resources Administration’s National Advisory Council on Nurse Education and Practice have stated that nonphysician providers might address the shortage of primary care physicians and specialists, suggesting that states allow NPs to perform at the highest level of their scope of practice. NPs also are seeking independent practice in the 17 states that do not allow it at the time of this writing. Regardless of whether a state allows independent practice, federal regulations in some settings (such as nursing facilities) take precedence over state regulations and may require that a physician to supervise or coordinate patient care.

In addition to statutory and regulatory requirements, it is important to note that each employer, hospital, or payor may have their own unique requirements and policies surrounding the role of APPs. Payors may reimburse services and procedures performed by APPs at lower rates than those of physicians, or refuse to reimburse for certain procedures that are not performed by a physician.

State regulations

As discussed in the federal regulations concerning APPs, state regulatory bodies control what services a health care practitioner can provide. This varies from state to state, but for example, in the state of Georgia the State Medical Board provides control over PAs, and the State Nursing Board oversees the regulation of NPs. Therefore, it is imperative that physicians acquaint themselves with the regulations for APPs in their state of practice. We encourage urologists who are considering expansion of his or her practice to include APPs to review the guidelines for their state of practice to best understand the scope of practice for APPs.

Each state law varies on scope of practice issues. The state practice acts generally outline these four areas: independent practice, practice under the supervision of a physician, independent practice with a collaborative agreement, and independent practice without a collaborative agreement.

Here are several resources practices might consult to identify their state requirements:

- [American Academy of Physician Assistants](#) (login information required)
- [American Association of Nurse Practitioners](#)
- [American Medical Association](#) (login information required)
- [Barton and Associates NP Scope of Practice Laws](#)
- [Barton and Associates PA Scope of Practice Laws](#)

When reviewing state regulations, it is imperative that the practicing urologist becomes acquainted with the federal regulations per procedure or service to fully understand how best to utilize the services of APPs. A quick guide to the allowed federal requirements per service can be found in the *AMA Current Procedural Terminology*,¹⁸ which is commonly known as the AMA CPT book and can be found in most urology offices.

As an example, we will use the urodynamics codes (51725-51798). The AMA CPT book states the following on page 284 of the 2013 edition: *All Procedures in this section imply that **these services are performed by, or under the direct supervision of, a physician or other qualified health care professional** and that all instruments, equipment, fluids, gases, probes, catheters, technician's fees medications, gloves, trays tubing, and other sterile supplies be provided by that individual.*¹⁸ Thus, in regards to urodynamic studies, physicians and APPs are allowed federally to perform these services if the state regulatory body allows it, and the physician does not have to provide direct supervision. It must be clearly understood that if the physician does not provide direct supervision, the procedure must be billed under the APP's NPI number, and Medicare reimbursement will be 85% of the Medicare allowable fee (refer to the physician fee schedule at

<http://www.cms.gov/apps/physician-fee-schedule/overview.aspx>). The billing of the service for non-Medicare patients is determined by contractual agreements with private insurance companies.

Patient satisfaction

Limited comparisons exist among the quality of care provided in *surgical* clinic environments between physicians and NPs, physicians and PAs, NPs and PAs, or between physicians, NPs, and PAs. Many of the studies that have been published to date evaluate the success of APPs in primary care settings or in specialty care settings such as diabetes management. Recent works consistently cite “legacy” studies completed prior to 2000, but many of these studies have not been repeated and lack both comparable patient satisfaction and quality-of-life metrics. Further, results may not be applicable to contemporary medico-legal and insurance environments that reflect the practice expansion of APPs. Groups such as the American Academy of Family Physicians have cited online poll data from 2013 that indicate that physicians are the preferred care provider when asked to choose between a physician and NP. However it is notable that the survey population was significantly skewed towards higher socioeconomic status and politically engaged registered voters. No other national groups have attempted a similar survey. Nonetheless, trends in peer-reviewed literature suggest that additional insight into potential roles for APPs within surgical practices such as urology are needed.

Hooker, Cipher, and Sekscenski investigated the experiences of 146,880 randomly sampled Medicare beneficiaries with generalist physician, NP, or PA care.¹⁹ In this study, 3770 respondents identified a PA or NP as their personal health provider. Data was collected with the Consumer Assessment of Health Plans Survey (CAHPS), a 92-item standardized instrument. The distribution by type of provider for patients in fair or poor health was similar among the three groups, with 30.5% being cared for by a physician, 33.3% a PA, and 38.7% an NP. The distribution across the four measured satisfaction domains on the CAHPS was similar across the three groups, demonstrating a small effect size (Cohen's $D < 0.20$). The authors concluded that the study supports previous findings that patients are generally satisfied in their primary health care setting regardless of the provider. These authors suggest that further study should link patient satisfaction and treatment outcomes among all three provider groups with specific diagnoses.

Resnick and colleagues used a 12-item, anonymous, nonvalidated electronic survey of surgical residents to gauge the status of the use of nonphysician providers in their surgical department.²⁰ A similar nonvalidated survey was administered to the nonphysician providers at the same facility. Respondent rates were 50% for residents and 45% for APPs. Notably, 91% of the resident respondents agreed or completely agreed with the addition of APPs to their service, but only 41% agreed or completely agreed that they understood the role of the APP. These authors concluded that the addition of APPs did not adversely affect their time for operative experiences or exposure to clinical care. Results among the APPs were mixed, with some commenting that they did not feel that their educational goals and job requirements were sufficiently delineated from those of junior residents.

Larkin and Hooker looked specifically at comparisons between emergency medicine residents, NPs, and PAs working in the emergency departments (EDs) of three urban teaching hospitals.²¹ Data was collected via a survey instrument that had established face, construct, and test/retest validity and was specifically designed with three independent clinical scenarios to address this specific research question. Patients were willing to see APPs for minor injuries, but preferred to see residents as the clinical scenarios became more complex. Four out of five patients expected to see a physician in the ED, but were interested in knowing if there was a cost difference among provider types. The results demonstrated support for previous studies that have shown that as complexity of care increases patient satisfaction with seeing APPs declines. Patients were more willing to see a PA if they were female, but there were no statistically significant predictors of patient willingness to use a NP or resident. Overall results demonstrated that patients were more willing to see resident physicians than nonphysician providers for emergency care, especially in the context of a time delay for care. The authors admitted that these were unexpected findings and reflect the results of older studies from the 1970s; it also is congruent with studies from the 2000s reporting that a higher percentage of patients seen by physicians would return to physicians for care.

Kaiser Permanente Study

A study conducted in 1995 by Kaiser Permanente Northwest (KPNW) attempted to evaluate patient satisfaction with care managed by different provider types, including PAs, NPs, CNMs, and physicians.²² Questions were mailed to members of KPNW who visited five different types of medical practices, including internal medicine, family practice, pediatrics, obstetrics/gynecology, and orthopedics. Specific questions utilized from the Art of Medicine survey are listed below:

1. How COURTEOUS and RESPECTFUL was the clinician?
2. How well did the clinician UNDERSTAND your problem?
3. How well did the clinician EXPLAIN to you what he or she was doing and why?
4. Did the clinician USE WORDS that were easy for you to understand?
5. How well did the clinician LISTEN to your concerns and questions?
6. Did the clinician spend ENOUGH TIME with you?
7. How much CONFIDENCE do you have in the clinician's ability or competence?
8. OVERALL, how satisfied are you with the service that you received from the clinician?

The first objective was to explore differences in patient satisfaction with physicians and nonphysician providers. The second objective concurrently examined the attitudes of the patients of three types of providers to see if previous observations were supported by a large-scale study. Overall patient satisfaction was reported by 89-96% of patients of PAs, NPs, CNMs, and physicians. The authors concluded that patient satisfaction appeared to depend on communication style regardless of provider type. The authors concluded that the decision to incorporate PAs, NPs, and CNMs into medical practice has gained patient acceptance.

In a 2013 study, referrals from physicians, NPs and PAs were blindly evaluated in order to examine for differences, within the specific context of patient complexity.²³ These were referrals to the Mayo Clinic Department of General Medicine, which reports that approximately 10% of referrals from primary care practices are submitted by NPs and PAs. The authors reported that while the overall quality of referrals was sub-optimal, there was no statistically significant

difference in the complexity of patients referred; however, patients referred by physicians were older and more likely to be men. The primary difference reported by authors was that referrals from physicians were found to have a more clearly articulated reason for referral, more complete clinical information was provided, and the blinded review determined that MD documentation supported a better understanding of the pathophysiology involved. The authors also queried the NPs and PAs about the frequency with which they discussed referral plans with supervising physicians reporting that only 3 of the 44 respondents indicated that they “always” discussed referral plans. The authors suggested that their findings support the need for increased research on the abilities of NPs and PAs to individually manage patients with complex problems in a primary care setting. They go on to suggest that multidisciplinary teams that include NPs, PAs, and MDs have been found in many environments to provide excellent care, focusing on a team-based approach. The authors also point out that within the context of the changing healthcare system, there may be a need for guidelines regarding best practices for collaboration within any team that includes NPs, PAs, and MDs.

Integration of APPs into practice

The integration of APPs into academic medical center (AMC) practice was scrutinized, specifically examining care delivery performance measures and financial support for these positions.²⁴ A structured three-part survey developed for this study was used to assess the role of organizational demographics, level of resident substitution, and perceived value of APPs within these academic systems. The survey included open-ended questions and assessed the AMC characteristics regarding integration of mid-level providers. The average ratio of APP to physician ranged from 1:3.7 to 1:18.5 in 26 surveyed institutions, which were clustered in the Midwest and East Coast. These AMCs used APPs for most services including outpatient clinics, primary care, and surgical environments. In this study, 81% of the facilities reported that APPs function as resident substitutes, with substitution up to PGY-4, although some facilities did not detail the equivalent level of functioning for their APP population. A total of 18 AMCs did not document the financial impact of APP practice, and the others reported varying degrees of financial awareness of these providers. Patient satisfaction metrics were not tracked directly related to APPs, but were usually tracked based on the specific service (e.g., internal medicine). These AMCs reported that the primary reason for maintaining APP employees was to meet ACGME requirements and to improve patient throughput.

Newhouse and colleagues performed a systematic review of APRN outcomes from 1990 to 2008, including a search for data regarding all four APRN groups, acknowledging that no systematic reviews of CNSs or CRNAs have yet been published.²⁵ They reported on 37 studies that examined patient outcomes by NPs directly compared with care managed exclusively by physicians. In terms of patient satisfaction, self-reported perceived health, functional status, glucose control, blood pressure control, ED/urgent care visits, hospitalization rates, length of stay, and mortality, these authors reported a high level of evidence to support equivalency between the care provided by NPs and that of physicians. Only in the context of lipid management was the care provided by NPs better than that of physicians. The authors concluded that APRNs/NPs should have an expanded role in health care and be incorporated more fully into patient management. The authors support expansion of these roles into more specialty settings.

Very few studies that specifically examine the success of incorporating APPs into surgical subspecialties exist. This may reflect a more recent trend of recognizing the potential cost-effectiveness of incorporating APPs into surgical specialties as well as an acknowledgement born of necessity with the reduction in resident work hours as required by ACGME. Robles and colleagues offered a case report discussing the successful integration of a NP to team of three colorectal surgery attending physicians.²⁶ They reported a 52% reduction in ED visits after the NP was hired, as the NP was able to successfully triage and manage many patients over the phone, either by recommending a routine clinic visit or providing appropriate management. These authors concluded that the addition of an NP to their practice provided improved patient support post-discharge and resulted in significant cost benefit.

Canon and colleagues acknowledged the need for a changing model for pediatric urology, and discussed the development of their practice model, which included the use of pediatric NPs working directly with pediatric urologists throughout the care continuum, including admissions, inpatient orders, and discharges.²⁷ An outpatient care team, which included an NP, managed routine clinic patients, completed postoperative evaluations, and managed nonsurgical urologic disease in children. This model successfully increased the number of pediatric urology patients treated without the addition of a full-time or part-time pediatric urologist, supporting other studies that reported 30% of pediatric urology patients could be effectively managed by APPs with appropriate training and experience. These authors report that their model of care focuses the specialty trained pediatric urologist to cases that are most in need of the specialty training and skills of the pediatric urologist. They also report that they provided their pediatric NPs with an orientation period of several months specific to either the inpatient or outpatient role.

The AANP supports the role of the NP as part of cost-effective, team-based care, consistent with the recommendations of the IOM (documents can be found at www.aanp.org/images/documents/publications/costeffectiveness.pdf).²⁸ This further acknowledges the patient as a center of the health care team and encourages all members of the team to perform at their full potential. The AANP endorses a role for the NP as one that supports a systems approach to care delivery and promotes cooperative partnerships among patients and health care providers.

Multiple sources have cited the consistent, and high-quality care that can be provided by APPs. A review of the literature demonstrates that there is clear potential in a role for APPs in patient management, evidenced by the sustained number of APPs that graduate each year and that APPs are an unrecognized resource in the clinical management of patients within *surgical* specialties. With clear job descriptions, role delineations, and expectations, specialty practices can very successfully incorporate APPs into the care of their patients. APPs can provide consistent, reliable care that can lead to reduced use of the ED and higher patient satisfaction with care, especially postoperatively.

Residency programs in general surgery and orthopedics surgery have long been established for more advanced training and surgery for PAs. While patient satisfaction is often reported in studies of PAs in surgical subspecialties, validated studies that indicate the reason behind the high patient satisfaction have not been conducted.

Liability concerns

Liability statistics

Urologists unfamiliar with the utilization of APPs may be concerned with exposing their practice to additional liability risk with the addition of such practitioners. The delegation of responsibility to APPs requires a relaxing of control over the doctor-patient interaction, which may introduce uncertainty over the care that may have been provided and the potential for harm and subsequent legal action by the patient. A review of archival data on liability actions from various repositories reveal that the absolute incidence of legal action involving APPs is minimal compared to actions involving MDs. Nonetheless, there has been a rising trend of legal action, in particular against NPs, which raises some concern but is at least in part reflective of the increase in their presence in the workforce.

The National Practitioner Data Bank is a federally required repository of claims made against physicians and other licensed health care practitioners. A study of trends of this database from 1991 to 2007 revealed a total of 320,034 liability reports.²⁸ In contrast, the number of reports for PAs was only 1,535 and the number for NPs was similarly low at 2,715. Miller evaluated the more recent trends of the same database and observed that from 2007 to 2010 the annual number of liability allegations against NPs increased 18% from 270 to 327.²⁹ CNA, a major liability carrier for NPs, published an analysis of its claims data from 1995 to 2003, and found a total of 368 actions from 1994 to 2002, a rise from 3/year to 53/year.³⁰ In an analysis of claims made against PAs in the state of Colorado from 2002 to 2009, there were only 34 actions.³¹ From 2007 to 2010 the most litigious states for NPs were in declining order Florida, Washington, Alabama, New York, California, and Massachusetts.

In Hooker's analysis of the National Practitioner Data Bank from 1991 to 2007, the most common reasons for liability claims against PAs were primarily diagnosis and treatment, accounting for 80% of claims.³² Less common reasons included medication and surgery. A reversal in trends has been observed for NPs; initially the most common reasons for claims were anesthesia, obstetrics, and diagnosis, which accounted for 75% of claims. Treatment and medications were less common. However, from 2007 to 2010, the leading reasons for claims were diagnosis, treatment, and medications, with only about 10% of claims relating to obstetrics and monitoring. Regarding the severity of the claims, more recent trends reveal that almost half of the injuries ascribed to NPs were deaths. Slightly more than a quarter of the remaining injuries were classified as "significant or permanent."²⁹

From 1991 to 2007 a total of \$74 billion was paid out due to liability claims. Awards against PAs represented only 0.003% of this total. Similarly, claims against NPs represented only 0.007% of the total. An NP is 24.4-times less likely to incur a liability pay out than a physician, and a PA is 12-times less likely. According to the data bank, the pay out amounts per award were similar for physicians (\$308,383) and NPs (\$306,310), but about 25% less for PAs (\$232,066).

Strategies to reduce risk

Although the numbers of liability actions through 2010 have been, in absolute terms, very modest for PAs and NPs, many physicians postulate that as the number of APPs rapidly increase and as their scope of practice increases, there may be a significantly greater number of lawsuits.

Supervising physicians and other employers are routinely named in lawsuits along with an APP under his or her supervision. In some cases the physician can be held solely responsible under a legal concept known as “respondeat superior (let the master answer).”^{31,33} Supervisory culpability may extend to an NP who is an independent contractor under a legal concept known as “borrowed servant.” In some cases the physician or employer can be held liable for “negligent hiring or selecting” if the NP is shown to have an unsatisfactory background.³³

Understanding the risk factors that lead to legal action may allow urology practices to increasingly engage the services of APPs without jeopardy. As with physicians, most lawsuits can be traced to a breakdown in communication. Detailed protocols, careful documentation, and open channels of communication are essential to avoid patient harm. In many ways APPs may improve the patient experience and satisfaction and diminish the inclination of a patient to sue by virtue of the greater time they are often able to spend with patients taking histories, providing education, and establishing rapport.

Physicians must notify their liability carriers when they hire an APP. The additional premium is usually minimal, and it is a shared limit (such as the standard physician liability limit \$1 million per lawsuit/\$3 million total for all lawsuits). In many cases APPs will carry their own individual liability policy. Individual policies allow them to maintain coverage if they change practices along with value-added services such as legal fees for disputes with the state involving licensure.

PAs: specific considerations

Specific legal action items mitigate a PA’s potential risk for exposure to liability claims. Some of these may be more specific than others to California, which is home state to the author. All PAs are required to have a written Delegation of Services Agreement that must be signed and dated by the supervising physician. Failure to do so has resulted in disciplinary action and stronger liability suits. If the PA provides service that varies with more than one supervising physician, there should be different agreements that reflect such variations. There should exist written emergency back up procedures, a list of services the PA is authorized to perform, and a list of medications that the PA is authorized to administer along with written order sets. Any limitations on the PA should be documented as well.³⁴

Satisfactory supervision of a PA from a legal standpoint may be satisfied by different configurations. (Note: the following are specific to California; check your state’s requirement.)

1. Patient is examined by the supervising physician (SP) on the same day that care is given by the PA.
2. The SP countersigns and dates all medical records written by the PA within 30 days of the care provided by the PA.
3. Most commonly, protocols govern the diagnosis and management of patients and must include the presence or absence of symptoms, signs, and other data necessary to establish a diagnosis or assessment. Protocols also specify any appropriate tests or studies to order. Medication recommendations and patient education is included. Details of informed consent for procedures as well as preparation for and technique of any procedure that is to be performed. Follow-up care is also included in protocols. These protocols do not necessarily have to be written out and may reference texts as long as the texts are readily

available to the PA (including on the internet). When protocol supervision is employed, the SP must sign 5% of charts within 30 days of care.³⁵

Conversely, PAs should maintain careful documentation of their communication with the SP, including any examination results by the SP and all consultations. In many cases a consulting physician will not document in the chart unless they evaluate the patient, yet they have provided a form of supervision and it is important for the PA to document this as such. This can provide the best defense against allegations of inadequate care. The PA should make sure to address all patient complaints in the diagnosis, treatment, or follow-up documentation. All laboratory studies and diagnostic test results should be initialed and dated. If no action is taken on labs outside the normal range, an indication of the reason why as well as the signature of the SP can be important. Documentation should be completed within 24 hours of patient care as the courts view this as a more reliable document from the standpoint of accurate recall of information included in the note.³⁵

Employers must be diligent in hiring and verifying credentials. Reducing liability for the acts of the PA begins with PA selection. SPs should verify the education, licensure, and status with the state medical board. Also important are criminal background checks, due diligence on references provided, and job references from the last place of employment.³⁴ PAs must maintain their skill set and knowledge to reduce the SPs' risk of vicarious liability. SPs should consider providing CME allowances. Liability insurance for SPs and PAs should address both joint and separate liability because SPs can be included in litigation aimed at PAs. Nonetheless, the trend in courts is to hold PAs and NPs independently accountable to the community standards as opposed to holding the SP accountable.³⁵

There is increasing scrutiny by state and federal governments into fraud and abuse, which is particularly relevant to the "incident to" status of claims to Medicare for payment. It is required that the SP must have seen the patient on the patient's first visit and must be in the office at the time of the PA visit. Anti-kickback statutes prohibit payments or rewards from referrals from others; therefore, referrals to the SP must not originate from the PA with the exception of in-office ancillary exemptions such as radiation, oncology, or imaging.³⁵

NPs: specific considerations

Unlike the mandatory supervisory role that physicians must adopt with PAs in every state but Mississippi, many states require physicians to work collaboratively with NPs. Some states may outline formal rules regarding physician accessibility, chart reviews, and conferencing. NPs may be mandated by state law to follow detailed clinical protocols, and may even be subject to physician supervision in states such as Florida. The scope of practice of the NP varies based on state and is related to factors such as educational background, clinical experience, and collaborative relationships with physicians. The scope of practice of the NP is an important factor in a court's decision regarding liability. Negligence may be evaluated in the context of whether the NP operated outside of his or her scope of practice.³⁰

Employers must be diligent in hiring and credentialing; reducing liability for the acts of the NP begins with NP selection. The employers may need to consider the specific population focus of the NP, and the intended patients the NP would be asked to manage (e.g., an NP certified in

women's health cannot legally evaluate adult male patients). SPs should verify the education, licensure, and status with the state medical or nursing board as appropriate. Also important are criminal background checks, due diligence on references provided, and job references from the last place of employment. NPs must also maintain their skill set and knowledge to reduce the risk of liability; SPs should consider providing CME allowances. Liability insurance for NPs may need to address both joint and separate liability, depending on the relationship with an MD that is required by the state, because SPs can be included in litigation aimed at NPs.

Under state nurse practice acts, regulatory bodies define the scope of practice for the NP. Additionally, they delineate requirements for licensure and exercise regulatory authority and disciplinary action. Regulatory bodies evaluate complaints, and a common cause for investigation is NPs prescribing controlled substances and other practices relating to pain management.³⁰

The overall incidence of malpractice is low for PAs and NPs. As these practitioners provide more care, the number of lawsuits will invariably increase, but the ratio may continue to remain low. Evidence-based analysis by Laurant and colleagues demonstrated that as more authority is transferred from physicians to NPs and PAs in the primary care setting, patient outcomes remain similar.³⁵ Thoughtful and comprehensive protocols coupled with responsible oversight and open lines of communication can allow increasing participation of APPs with minimal increase in risk. The greatest risk for malpractice arises when practitioners engage in practice beyond their competency base either because of a lack of protocol, disregard for protocol, or inability to secure adequate collaboration or oversight. It is also important to remember that in any given environment, APPs are held to the same standards of practice as physicians; there are no separate guidelines for care outcomes that apply only for APPs.

Disruptive technology and APPs

The use of APPs extends the number of patients for which a given urologist can provide care. Technology also extends the physician's reach and efficiency. Patients have demonstrated acceptance of APPs in primary care and other surgical specialties such as orthopedics. Similarly, patients will likely accept an increased presence of APPs in urology. Patients are also demonstrating acceptance of telepresent health care providers with favorable satisfaction surveys. New disruptive technologies such as robotic telepresence and smart phone applications are keeping patients out of the office and out of the ED. The expanded incorporation of allied health professionals in urology with technology will enable the number of urologists required to care for a given population to decrease, thereby addressing the looming manpower shortage in urology.

Most stakeholders – from the government to private payers to industry to patients – are motivated to cut costs and increase access. In primary care, APPs are perceived as more willing to work in underserved areas while costing less to provide, in many instances, similar service as compared with physicians. An increase in scope of practice of these allied health professionals is likely to continue, and it is relevant for urologists to consider how to best engage, educate, and train APPs in the physician led team based care model.

The Robert Graham Center analysis of the distribution of primary care physicians in the United States determined the distribution of primary care physicians across the nation.³⁶ Because physicians are not regulated in their location of practice there is a preponderance of doctors in more favorable geographies, leaving the urban (inner city) and rural areas of the nation with a significant shortfall in manpower. The numbers needed to restore adequate coverage range from a total of 6,500 to 20,500 physicians depending on the target one sets for population to physician ratios (2000:1 is the goal set by the Health Resources and Services Administration versus the national average of 1,485:1).

Access to care is critical, but the solution may not have to be producing thousands of more physicians and inducing or compelling them to live in work in areas not of their choosing. The access to care that a single physician currently provides may be amplified by disruptive technology, which may allow a desirably located physician to be remotely accessible to a rural or inner city patient via telemedicine, which may include video link up, remote sensors, and microfluidics point of service diagnostics. With travel time eliminated, the physician can directly encounter additional patients from additional locations in a given day. Additional amplification can be provided by delegating care appropriately to well trained APPs who, with the same telemedicine technology, are able to incorporate robust algorithms of care that ensure safety and minimize the oversight required by the MD, allowing the MD to enable care to even larger populations. IBM's Watson, or other similar artificial intelligence technology, under the supervision of the MD may derive these algorithms.

Watson is now ubiquitously accessible in "the cloud." In fact, initial patient history taking can be accomplished by Watson, which understands and speaks English. Watson can not only provide a summary of the patient to the human provider, but also a recommended treatment. Further amplification of physician access may be derived from shared appointments, also managed remotely, with well-trained APPs. There will always be a need for some degree of hands-on liaison during some patient evaluations, and this service can be provided with less expensively trained individuals who remain under telemedical supervision while providing a physical presence for assistance or for demonstrating a physical examination. Although urologists perform hands-on procedures in the office such as vasectomies, cystoscopies, prostate ultrasound guided biopsies, and urodynamics, some or all of these may be delegated to highly skilled, well-trained APPs with the benefit of televideopresence when desired, as with prostate ultrasound or cystoscopy.

Much of urology is cognitive, and for many patients, the extent of the hands on requirement is genital or prostate examination, which also can be taught to APPs. More advanced surgeries will remain in the domain of the urological surgeon for now, and regional surgical centers staffed by dedicated urological surgeons and surgically trained APNs and NPs can be allocated to meet population demands in a way that is less haphazard than current practice patterns, in which most urologists provide both office and surgical care, often with the preponderance of that care delivered in the office. Ultimately, advances in microprocessing, image recognition, haptic feedback, and robotics promise to eventually produce a true surgical robot.

Although cost is the most politically pressing argument, the most scientifically compelling argument in favor of increasing utilization of APPs is quality outcomes. Laurant and colleagues

demonstrated that expanding authority to APPs in the primary care setting resulted in no detriment to patient outcomes and satisfaction.³⁵ Green and colleagues postulated that APPs could meet up to 70% of patient need in the primary care setting if allowed to practice to the limit of their training.³⁷ This number is reduced in specialty care but evidence suggests a sizeable portion of patients whose urological care could be similarly managed.

Robotic remote presence technology

A key to maximizing patient outcomes under the care of APPs is satisfactory collaboration with and supervision by physicians. Collaboration and supervision may be provided off-site according to many state laws. The concern with remote supervision is the potential for compromised evaluation and decision-making. However, telepresence platforms and remote sensing devices are proving to provide satisfactory transfer of information resulting in no detriment to decision-making and outcomes. Currently telepresence practice may use APPs or they may rely on nursing staff or residents remotely present with the patient.

The currently deployed systems are configured as follows:

- Bidirectional video on mobile cart
- Secured VPN broadband connection
- Recording/archiving capability
- Split/multiple screens for multiple types of information
- Well-informed practitioner attending to patient
- Additional sensors providing data
- Stethoscope, ultrasound, infrared, telemetry

These platforms are currently in use in intensive care units (ICUs), hospital EDs, postsurgical wards, and satellite clinics. There has so far been an excellent track record of performance with equal or superior patient, doctor, and hospital satisfaction.

A multi-institutional study evaluated telepresence postoperative urology rounds. In a randomized prospective trial, a total of 270 patients at three institutions (UC Davis, Sentara Health, and Johns Hopkins) were randomized to postoperative rounds with an attending physician present or with a mobile telepresence platform. Surgeries included the following laparoscopic procedures: nephrectomy, partial nephrectomy, nephroureterectomy, retroperitoneal lymph node dissection, partial ureterectomy, and radical prostatectomy. Patients had an expected hospital stay of 24-72 hours. The number of postoperative complications, length of stay, and patient-reported satisfaction were monitored. Residents rounded on both arms and independently tracked and reported complications prospectively independent of and concomitant with the attendings' evaluations. At the conclusion of the study, there was no increase in patient complications or length of stay. Patient satisfaction was investigated with a 21-question validated questionnaire that included 9 questions specifically about the patient's interest in incorporating the telepresence platform into their postoperative care. Patient satisfaction was found to be similar to or improved with telepresence. In fact, two-thirds of patients preferred it to in-person attending rounds. Patients commented that they felt that their telepresent doctors spent more time with them and were more available. Once the logistical obstacles of travel and competing office/OR schedule were minimized by the telepresent platform, the attending physician could more flexibly devote time and attention to patient care, which was appreciated by the patients.³⁸

In the field of urology, incorporation of a telepresent robotic platform provides both consultations and postoperative rounds to several rural hospitals without access to in-house urology. In many of these hospitals, the ICU and some of the other specialties are similarly covered by telepresent physicians who work closely with the nurses and NPs present in the hospital.³⁹

Telemedicine experience defies preconceived objections that patients will not accept it because they desire the human touch and that doctors will not accept it because it does not allow for information that can only be ascertained from “being there” and that the complexity of the technology is a barrier to entry. Additionally, telemedicine is often relegated to a solution just for underserved areas. A review conducted in 25 centers using telerobotic presence in ICUs revealed a high degree of patient and physician satisfaction with the typical physician user being senior and often in an urban and academic setting.⁴⁰

A pilot program at a surgical ICU compared evening coverage utilizing telephone versus telerobotic presence. The hospital and ICU length of stay decreased, as did unexpected events. The time spent by the physician on rounds increased, as did the number of interventions, but subsequent calls decreased. Users reported a higher rate of satisfaction.⁴¹

Inpatient medicine is not the sole domain of telemedicine. Outpatient diagnostic evaluations and patient instruction are successfully accomplished with telerobotic presence. Highly sophisticated neurotology evaluations have been conducted with the aid of an NP in outreach areas of post-Katrina Louisiana. The NP applies a video otoscope, infrared eye motion tracking goggles, and video laryngoscope to the patient. The information can be stored and reviewed later or can be transmitted and analyzed in real time. The ability to store and view information later allows for physician flexibility not only in space but as well as time. The key to a store-and-view strategy is a well-trained APP who is able to reliably acquire the needed images and data and who is able to adjust to variances appropriately. As with the ICU experience, patient satisfaction with telepresence neurotology evaluation was equivalent to in-person medical visits.⁴²

The capacity for remote telepresence training of inexperienced providers to perform complex tasks was demonstrated in a comparison study of outcomes of neuromodulation programming of neurostimulators as performed by experienced neuromodulation programmers versus untrained nurses receiving instruction by telerobotic presence. The accuracy and clinical outcomes were equivalent with high satisfaction expressed by patient, nurse, and physician. The study group was inspired by their experience to work towards in-home neuromodulation.⁴³

In the future, examinations such as flexible cystoscopy and transrectal ultrasonography might be learned by an APP and then performed remotely with adequate telerobotic physician supervision. Technology can allow for remote control of the scope if desired and access to all monitors.

These various telemedicine programs now exist in every state. Although the technology was initially aimed towards remote outreach, it offers several advantages for local care (Table 3).

Table 3. Advantages of telemedicine

Telemedicine involves multimodality communication between providers-patients and providers-providers to increase the transfer of knowledge. Advantages include the following:

- Telestration
- Texting/text chat
- PowerPoint
- Imaging
- Patient perception of “cutting-edge”
- Less need for commuting
- Practitioner travel eliminated
- Ability to service multiple locations
- Greater availability/more rapid response/more up-to-date
- Practitioners are less rushed with patients

Remote patient sensing

Disruptive technologies, including inexpensive sensors adapted to a smartphone, are increasing the ability to remotely evaluate patients. Current and imminently available capabilities include collection of standard vital signs; cardiac telemetry; visual inspection of the skin, eyes, and body cavities; and even blood and urine analysis.⁴⁴⁻⁴⁶ Some of these technologies are proven to be effective, and others are under evaluation. With tools such as these, patients may be monitored remotely similarly to how they would be evaluated in office, potentially by APPs. The downstream multiplier of patients under the supervision of a single physician can increase dramatically. Applying this concept to urology, an established patient with access to personal, smartphone-based urine testing or serum testing for PSA or testosterone coupled with telepresence could be managed from home by a PA at the office who could likewise be supervised by an off-site urologist.

Virtual collaboration and supervision

From a scientific perspective, the less ambiguous the disease presentation and treatment algorithm is, the less supervision or consultation an APP will require, assuming a satisfactory baseline level of disease-specific training and demonstrated competency. The certainty of knowledge of disease states has grown exponentially over the last century. The ability to capture and analyze data is rapidly improving, and best practice guidelines are quickly transitioning from expert opinion to evidence-based. In our current data-rich environment, there are many more certain diagnoses and clear-cut treatment algorithms. Some of these conditions previously could only be understood by the most astute diagnostician. The wisdom and experience of the doctor at the bedside has been largely replaced, for better or for worse, and will continue to be replaced by datasets and microprocessors. Although the amount of medical information has exploded beyond any one human’s ability to precisely command, computers, such as IBM’s Watson, are able to capture every bit of the world’s English medical literature. Watson can read and understand

English quickly and conduct verbal patient interviews. Watson is currently being used for prior authorizations by WellPoint and is currently redefining cancer protocols at Memorial Sloan Kettering Cancer Center. Watson will soon be available online to any and all.⁴⁷

The smartest clinician in the room may no longer be human, and may be everywhere at once, in the cloud. With ubiquitously available, precise medical information, physician-level supervision or consultation services for APPs may become less necessary. SPs may take a higher order position to oversee the process rather than providing information repetitively. The number of APPs a physician can supervise or collaborate with grows proportionate to the amount of reliable information that is ready to use and that is immediately (i.e., electronically) available to the providers.

Multiplier effects of PAs and NPs and telehealth

APPs can also increase capacity through the utilization of a shared medical appointment.⁴⁸ After an initial presentation and discussion by the urologists, a room full of patients with the same diagnosis can then be educated and advised by the APP while the urologist can open more time for complex patients and avoid the repetitive consultations these patients would otherwise require. This is already being successfully adopted at several major centers of care.

Hospital consultations may be increasingly handled by APPs with telemedical supervision by the urologist. Surgical volume may be consolidated at centers of excellence to which smaller hospitals feed.

Ultimately the urologist will be able to spend more time and focus on more complex patients as well as manage large populations of urology patients by utilizing modern tools of sensing and communicating. He or she will function more like a CEO whose responsibility is to ensure that a population is provided with high-quality, rapidly available urological care.

Residency education

Medical school and residency training may need to direct urologists into the supervisory/surgical role they will need to play. APPs can serve a valuable function in the residency training by performing many of the simpler procedures that do not require as much repetition to be learned by the urology resident; in this way, the resident can focus on more complex surgical training.⁴⁹ They can also fill in provider gaps that result from federally mandated work hour limits.⁵⁰ Furthermore, it is advantageous for both the urologist and APP to begin training in collaboration early on. There will be a dramatic decrease in the total number of physicians, both primary care and specialists, that will be required for the same population, and there will likely be a generation of physicians who are caught in between the manpower shortage bubble and the brave new world of telehealth, sensor technology, and APPs. The biggest challenge will lie with how we revamp our training for all members of the healthcare team a generation ahead of their arrival to the marketplace.

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Appendix: Patient Scenarios

The following patient scenarios are examples of a physician-led team-based approach to patient care with advanced practice providers (APPs). In each of these scenarios a physician may or may not be present on the initial or subsequent patient evaluation, and documentation, billing, and oversight rules and regulations may differ based upon local and state regulations, insurance carrier, and setting. These scenarios are merely examples and are in no way a comprehensive list of all approaches. Furthermore, the scenarios are not intended to show favor for a particular level or method of billing. For the purposes of these scenarios, the use of the term “APP” indicates that the listed applications apply to both the PA and NP.

An APP may see the patient alone or share the visit with the supervising physician. As a PA is an extension of the physician, the physician needs to be either in the office suite or available by a reliable electronic means. NPs may not need physician oversight if seeing a patient within their state scope of practice. If an APP sees the patient alone, billing can either be submitted using the APP’s NPI number (new patients or change in plan) at 85% of the physician’s rate, or “incident-to” the physician (billed under the supervising physician’s NPI number at 100% reimbursement). “Incident-to” criteria for Medicare patients are met when a PA or employed NP sees an established patient with an established plan of care, when the PA or NP is maintaining that plan of care, and when a supervising physician is in the office suite. The physician does not have to see or examine the patient, nor does the case need to be discussed with the physician. With proper documentation, the patient will be billed under the physician’s NPI number at 100% reimbursement. In the eyes of an insurer, every physician within one group is considered the same provider, so the supervising physician does not need to be the same physician who made the plan. Furthermore, the billing should be submitted under the supervising physician’s NPI number who is present in the suite, even if different from the physician establishing the plan of care. In a shared visit, both the APP and the physician should document their individual involvement, and billing should be submitted using the physician’s NPI number. Local, state, and insurance carrier rules may differ slightly and should be understood and followed. For a non-employed NP, the incident-to rules do not apply, and all bills should be submitted under the NP’s NPI number. Commercial insurance rules may differ and should be followed, as should state regulations, both of which may differ slightly.

Scenario 1: Patient with recurrent UTIs

A 66-year-old healthy woman was referred to the urology practice of Dr. Smith and Dr. Jones for recurrent urinary tract infections. She is seen initially by Dr. Smith, who examines her and creates a plan for her, including self-start therapy at the onset of symptoms. She is requested to follow-up in six months with the practice’s PA or employed NP.

Billing: New patient, outpatient visit under Dr. Smith’s NPI number (100% reimbursement).

Note: In some practices, patients such as this are initially scheduled with the APP, and billing can be done either by the APP alone or as a shared visit. A shared visit occurs when the MD and the APP both see the patient; however, the APP must document his or her involvement in the visit. Some practices have the APP perform the initial history, physical exam, and urine analysis, and then present their plan to the physician. The physician can then see the patient, help create the plan, and document his or her involvement in the shared chart. Some practices then have the

APP prescribe an appropriate antibiotic, follow-up on the urine culture results, and communicate the results with patient. In other practices, the APP practices more independently.

Six months later, the patient returns to the office and is seen and examined by the APP. The patient has had one UTI in the interim. She is otherwise doing well. The APP recommends continuing the same plan of care and recommends follow-up in six months. Dr. Smith is not in the office that day, but Dr. Jones (Dr. Smith's partner) is in the office. The APP documents that the patient is being seen "incident-to" Dr. Jones.

Billing: Established patient outpatient visit under Dr. Jones' NPI number (100% reimbursement).

Three months later, the patient calls to be seen emergently due to fever, chills, and back pain. The office staff puts the patient onto the APP's schedule for that day, as Dr. Smith is in the operating room but is immediately available to discuss the case by phone. Dr. Jones is out of town. The APP sees and examines the patient and recommends that she be started immediately on antimicrobial therapy and that she gets lab work and a CT scan that day, and instructs the patient to go to the emergency department if there is not immediate improvement or if the situation worsens, due to the consideration of pyelonephritis. The APP calls and discusses the case with Dr. Smith, who agrees with the plan.

Billing: Established outpatient visit using the APP's NPI number (85% reimbursement).

Scenario 2: Kidney stone

A 47-year-old male presents on a Saturday morning to the local emergency department with left flank pain and nausea. A kidney stone protocol CT shows a 6-mm left proximal ureter stone with hydronephrosis. The patient is afebrile, and urine analysis showed blood but no bacteria or other signs of infection. A urine culture is sent. The pain is controlled in the emergency department, and the patient is started on medical expulsive therapy (MET) with an alpha-blocker and provided with an analgesic and stone strainer. A referral is faxed to the urologist's office, and the patient is discharged.

The next Monday, the office manager reviews the new referrals and schedules the patient for the APP's clinic for the following day. The APP then sees the patient as a new patient. The patient reports that the pain has resolved, although no stone was collected. The APP performs a complete history and physical exam, calls for the old records, notes that the urine culture showed no infection, and schedules a low-dose CT scan. The patient is instructed to contact the APP for the result and to follow-up in one to two weeks. The supervising physician is available by a reliable electronic means and is not in the office.

Billing: New patient outpatient visit using the APP's NPI number (85% reimbursement). Note: If the MD is in the office and examines the patient, helps create a plan of care, and documents their involvement, the visit can be billed under the MD's NPI number at 100% reimbursement.

The CT showed that the stone remained within the proximal ureter. The APP then contacts their supervising urologist, who reviews the imaging and together they decide that it would be an

appropriate time to consider intervention. At the follow-up appointment, the APP reviews the CT findings with the patient and discusses the options and the potential advantages and disadvantages of further observation with MET, ureteroscopy with lithotripsy, and shock wave therapy. The patient chooses ureteroscopy.

Billing: Established patient outpatient visit under the APP's NPI number (85% reimbursement).

The following week, the patient presents for ureteroscopy. The urologist meets with the patient and family in the pre-operative holding area to review the procedure and finalize consent. The patient then undergoes ureteroscopy with lithotripsy and stent placement.

Billing: CPT code(s) by the urologist (the pre- and post-operative work performed on that day falls within the global period of the procedure).

A week after the procedure, the patient returns to the office and the stent is removed with the attached string by the APP. The patient is instructed to complete a renal ultrasound a month after stone removal and to do a 24-hour urine collection and labwork to evaluate for a metabolic etiology for stone disease. The patient is scheduled for a follow-up with the APP in six weeks.

Billing: Established patient visit, under the APP's NPI number (85% reimbursement). Note: If the stent was removed by cystoscopy by the urologist, CPT code 52310 (0 day global) would be billed.

Six weeks later, the APP meets with the patient, informs him that the stone consisted of calcium oxalate dihydrate, that the renal ultrasound was normal, and that the 24-hour urine collection showed a sub-optimal urine volume. The APP counsels the patient regarding these findings, and counsels the patient that improved hydration and other dietary modifications (with an instructional sheet) could reduce the risk of future stone disease. The patient is then discharged from urology clinic with further follow-up as needed if symptoms recur.

Billing: Established patient visit under the APP's NPI number (85% reimbursement).

Scenario 3: Erectile Dysfunction management

A 55-year-old male is referred from the endocrinologist for erectile dysfunction (ED). The patient has type 2 diabetes diagnosed five years earlier and reports developing erection problems for approximately two years prior to his diagnosis of diabetes. He reports having had sufficient trials of three different PDE-5 inhibitors, which were mildly effective initially, but no longer. He notes no decreased energy or libido, but he has had difficulty maintaining his erections. Additionally, there has been poor glycemic control (HbA1c of 9 when normal is ≤ 7) despite treatment with metformin, and the primary provider states the patient has had poor dietary management. His history is also significant for hyperlipidemia managed with a statin. His labs show a total testosterone of 400 ng/dL (normal: >300 ng/dL), free testosterone of 18 ng/dL (normal: 9-30 ng/dL), and a PSA of 2.8 ng/mL.

The patient is initially seen and examined by the APP. The APP briefly discusses the case with the on-site urology clinic attending, and proceeds with the treatment plan the APP has developed.

The physician enters the room, examines the patient, and helps create a step-wise plan with the patient and the APP, and documents the involvement on the chart. The patient is then counseled on the different options for the treatment of Ed (intra-cavernosal injections, intra-urethral suppositories, vacuum erection device, etc). The patient is also educated by the APP on the relationship between poor glycemic control and ED and resulting poor response to PDE5 inhibitor for ED. The patient acknowledged understanding that poor erectile function is reflective of overall vascular health and is an early indicator of the development of more severe vascular disease. Patient elects to utilize intra-cavernosal injections. Injection training is provided, and the patient undergoes an injection trial of alprostadil in the office. He has a satisfactory response in the office and is discharged from the clinic with a prescription for 20 mcg per injection of branded alprostadil that is covered by his insurance and is instructed to follow up in four months to check his progress.

Billing: Office consultation under the physician's NPI number (100% reimbursement) using CPT code 54235 (injection corpora with pharmacologic agent).

At the four-month follow-up, the patient returns to the clinic to see the APP, and notes that the injections allowed him to achieve but not maintain an erection. His prescription was reissued by the APP for 40 mcg with precise instructions to gradually titrate the dose upward and to check for response. It was also recommended that the patient undergo a penile Doppler ultrasound to evaluate the vascular and mechanical function of his erection.

Billing: Established patient visit under the APP's NPI number (85% reimbursement).

The patient returns the following week and undergoes a penile Doppler ultrasound performed by the APP and interpreted in consultation with the urology attending. Results indicate that the patient has severe venous leak, and this is conveyed to the patient. Treatment options, including placing a penile prosthesis, are discussed with the patient. After confirming the patient's manual dexterity, the APP enlists one of the clinic RNs to demonstrate the model prosthesis device with the patient. The patient remains undecided, and is instructed to review the information regarding penile prosthesis and to call if he wishes to proceed.

Billing: Established patient visit, billed under the APP's NPI number (85% reimbursement) with CPT code 93980 (penile Doppler complete procedure [Doppler]) billed by the MD. Note: If the physician visited with the patient to discuss the prosthesis and risks and documented their involvement, the billing would be under the physician's NPI number.

The next week the patient contacts the APP and indicates that he would like to proceed with the penile prosthesis. The patient is referred to a urologist within the group who specializes in penile prosthesis placement. The patient is subsequently scheduled and undergoes an uneventful prosthesis placement.

Billing: CPT code for the prosthesis billed by the MD.

The surgeon sees the patient for a two-week post-operative follow-up visit; this visit falls within the global period. The patient then returns three to five weeks later to see the APP for a final

wound healing check and initial device activation. The APP teaches the patient inflation and deflation techniques for the device and requests follow-up in three months.

Billing: Post-operative visit (within the global period).

The patient is again seen by the APP three months later to ensure that the patient is satisfied with the prosthesis and that there are no other issues. The patient is doing well and is instructed to contact the MD or APP if any problems arise.

Billing: Established patient visit billed under the APP's NPI number (85% reimbursement).