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Health Workforce Institute
THE GEORGE WASHINGTON UNIVERSITY

HEALTH WORKFORCE INNOVATIONS TO SUPPORT DELIVERY SYSTEM TRANSFORMATION

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September 12 & 13, 2016

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SUMMARIES OF INNOVATIONS

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INNOVATION SUMMARY
AAMC
Scott Shipman, MD, MPH

(Health Affairs paper follows)

By Scott A. Shipman and Christine A. Sinsky

doi: 10.1377/hlthaff.2013.0539
HEALTH AFFAIRS 32,
NO. 11 (2013): 1990–1997

ANALYSIS & COMMENTARY

Expanding Primary Care Capacity By Reducing Waste And Improving The Efficiency Of Care

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ABSTRACT Most solutions proposed for the looming shortage of primary care physicians entail strategies that fall into one of three categories: train more, lose fewer, or find someone else. A fourth strategy deserves more attention: waste less. This article examines the remarkable inefficiency and waste in primary care today and highlights practices that have addressed these problems. For example, delegating certain administrative tasks such as managing task lists in the electronic health record can give physicians more time to see additional patients. Flow managers who guide physicians from task to task throughout the clinical day have been shown to improve physicians' efficiency and capacity. Even something as simple as placing a printer in every exam room can save each physician twenty minutes per day. Modest but systemwide improvements could yield dramatic gains in physician capacity while potentially reducing physician burnout and its implications for the quality of care. If widely adopted, small efforts to empower nonphysicians, reengineer workflows, exploit technology, and update policies to eliminate wasted effort could yield the capacity for millions of additional patient visits per year in the United States.

In 2014 the United States will improve equity in health care access by expanding health insurance coverage to millions of previously uninsured citizens through the implementation of provisions of the Affordable Care Act. Recent popular debate about the insurance expansion has principally focused on its political consequences and cost implications. Less attention has been paid to the capacity of the health care workforce to accommodate the anticipated influx of newly insured Americans, although health reform has underscored concerns about the adequacy of the primary care workforce. Indeed, even before passage of the Affordable Care Act—which includes provisions to strengthen primary care—many groups had predicted a shortage of primary care physicians in the United States.[1–3] Expanded access to insurance in the midst of a primary care physician workforce shortage will not translate into increased access to care.

Common approaches proposed to ameliorate the projected shortage of primary care physicians can be divided into the following three imperatives: train more, lose fewer, or find someone else. This commentary articulates the need to look beyond those approaches and pursue a fourth tack: waste less. To demonstrate the potential of reducing waste and inefficiency, we review evidence of many time-consuming, inefficient activities that greatly diminish the capacity of today's primary care workforce.

Finally, we present solutions to inefficiencies that we have observed through site visits and related contacts with leaders of innovative primary care practices across the country. These observations stem from our separate professional efforts through the Association of American

Medical Colleges (Shipman) and the American Board of Internal Medicine Foundation (Sinsky).[4] Site visits typically included direct observation of clinical activities and semi-structured interviews with administrators, clinical leaders, physicians, nurses, and other team members, in which we sought to understand the motivations behind their innovations, keys to successful implementation, and the impact on the practice and on provider and team satisfaction.

We also offer our reflections on solutions that could increase the proportion of physicians' time spent on activities that require a physician's expertise, increase physicians' productivity and efficiency, and extend the ability of the current workforce to meet the needs of the population. We begin by reviewing the substance and limitations of the three approaches typically considered to be the principal options available to solve the shortage of primary care physicians.

Three Typical Approaches

Train More The projected shortage of physicians has driven a pronounced expansion of new and existing medical schools, with nearly 45 percent more students expected to graduate from allopathic and osteopathic medical schools in 2017 than in 2002.[5] Yet primary care has fallen out of favor for US medical graduates, with fewer than 20 percent of recent graduates expecting to enter primary care careers.[6] Furthermore, persistent geographic maldistribution of the physician workforce demonstrates that newly trained physicians often do not end up practicing where they are needed most.[7,8]

Even if a greater number of incoming medical students were attracted to careers in primary care, the positive effects on the workforce would not be realized for years because of how long training takes. Furthermore, caps on residency funding limit the potential for net growth of the physician workforce.

Lose Fewer Primary care physicians experience a high level of burnout[9] and higher rates of leaving clinical practice than their subspecialty colleagues do.[10] Many primary care physicians respond to burnout and competing personal responsibilities by practicing part time, while others leave practice altogether.[11]

In response, organizations including the American Academy of Pediatrics and the American Medical Association have drawn attention to the need to facilitate providers' reentry into practice.[12,13] Although reentry programs are commendable, they apply only to a relatively small number of physicians who are out of the workforce and seeking to return to practice. Consequently, the net effect of such efforts is likely to be limited.

Find Someone Else Potential solutions to the shortage of physicians include expanding the numbers of physician assistants and nurse practitioners, the roles they can play, or both.[14,15] These providers already serve a vital role in delivering services in primary care and most other clinical settings, and their numbers are increasing. However, like physicians, more physician assistants and nurse practitioners are electing to enter subspecialty practices.[16,17]

In addition, current scope-of-practice regulations in many states restrict the potential of these professionals to serve as substitutes for physicians. Nevertheless, they will increasingly represent an important element of the health care team, offering a broad set of complementary skills while helping meet the comprehensive needs of patients.

Assessing Inefficiency In Primary Care

Although efficiency is highly prized in most industries, it has not been a high priority in many sectors of health care. That is now changing because of expanding efforts to control health spending and to incentivize value over volume of services.

For our purposes, increased physician efficiency translates into the ability to serve a larger population at a constant level of quality, to expand comprehensiveness or improve the quality of care delivered to a population with a given input of physician time or effort, or both. Improved efficiency at the expense of quality or patient and provider satisfaction would ultimately be self-defeating. To improve efficiency, it is first necessary to identify the sources of wasted time—that is, time spent on activities not requiring physician expertise or not adding value to the patient—that consumes much of the primary care physician's workday.

How Primary Care Physicians Spend Their Time In 2008 Richard Baron reported the activities of an independent five-physician general internal medicine practice that had an electronic health record system.[18] His findings illustrated the many directions in which primary care physicians were pulled throughout the workday. On an average day, each physician handled eighteen in-person visits, twenty-four phone calls, twelve prescription refills, seventeen e-mail messages, twenty lab reports, eleven imaging reports, and fourteen consultation reports. Many of these activities generated additional work for the physician beyond direct patient care.

Kimberly Yarnall and coauthors demonstrated

that providing just the preventive services recommended by the US Preventive Services Task Force to an average-size panel of 2,500 patients would take 7.4 hours per day.[19] This excluded the time needed to enter the exam room, greet the patient, conduct a physical examination, address patients' concerns, and manage chronic illnesses or acute symptoms.

Tosha Wetterneck and colleagues identified 191 discrete tasks that physicians accomplish during a typical primary care office visit, including twenty-six tasks associated with gathering information from patients and thirteen associated with addressing treatment options.[20] One important reason for the high level of burnout among primary care physicians is their daily workload.[21]

Several authors have reported that physicians devote a substantial amount of time to patient care activities outside face-to-face visits with patients. Valerie Gilchrist and colleagues found that 39 percent of a physician's day in the office is spent outside the exam room.[22] Andrew Gottschalk and Susan Flocke found that physicians spend 45 percent of the day this way, mostly working on documentation and follow-up.[23] The consequences of this allocation of effort are substantial. In settings where fee-for-service is the predominant form of reimbursement, each minute that a physician spends outside direct patient care costs the practice four to six dollars in lost revenue—assuming that a physician providing direct care is reimbursed for that care at a rate of $250–$360 per hour.

Jeffrey Farber and coauthors studied physician work flow and determined that each thirty minutes of scheduled patient visits generates an additional 6.7 minutes (range: 1.7–13.8 minutes) of care outside clinic time.[24] Across a variety of primary care settings, activities occurring outside scheduled office visits are estimated to result in at least seven to ten hours of work per week for a physician.[25]

▸CLERICAL WORK: Clerical work has become a major element of the physician's workday. This work includes signing off on normal and abnormal lab results in paper and electronic inboxes, responding to notifications that a patient failed to show up for a test, processing requests for prescription renewals, and completing computerized order entry.

Physicians handle these tasks in a variety of ways. For example, a physician interviewed at Group Health reported: "I spend 30 minutes before clinic on inbox work and making phone calls. …I have a working lunch for charting and inbox work; otherwise I am unable to keep up. …I spend another hour at the end of the day completing charts and working on my inbox. … I…might spend another 30–60 minutes that night, clearing out my inbox to prepare for the next day. …Work on the weekends and days off is generally limited to 1–2 hours to clear out the inbox for the next work day."[26]

Although electronic health records are designed to help providers transmit and retrieve data more efficiently than paper records, the process of entering required patient and billing information takes up considerable physician time. Our interviews with primary care leaders at several centers reveal the ubiquity of the clerical burden. In the words of Daniel Johnson, a general internist at Mayo Clinic Health System in Menomonie, Wisconsin, "The [electronic health record] has become the eye of the needle through which all medical care must pass. The mind-set is that no care can occur until it is in the [record]" (personal communication, May 10, 2013). In general, up to two-thirds of the time of a typical patient visit is spent on data entry. At many primary care practices, simple orders once given orally by a physician to a nurse now require the time-consuming and cumbersome process of creation, routing, and acknowledgment of an electronic order.

The encroachment of clerical work affects physicians' training as well. Nearly twice as many residents reported spending four or more hours on documentation and clerical work daily as reported spending that much time on direct patient care.[27] Senior medical students perceive the burden of paperwork in primary care to exceed that in other specialties.[28]

▸ADMINISTRATIVE TASKS: Nonclerical administrative demands, such as speaking with insurance company staff to obtain prior authorization for an imaging test or a medication, also pull physicians away from direct patient care. Lawrence Casalino and coauthors reported that physicians spent 4.3 hours per week on insurance matters,[29] and Julie Sakowski and colleagues found that clinicians spent thirty-five minutes per day dealing with billing and insurance.[30]

Casalino and coauthors also reported that the time physicians, nurses, and clerical staff spent interacting with health plans cost at least $23–$31 billion annually.[29] In 2011 these authors found that US physicians reported spending 50 percent more time interacting with payers than did physicians in Canada, and that the cost of time devoted to those interactions was four times greater in the United States than in Canada.[31]

Inefficient Technology In the practice of one author of this article (Sinsky), a time-motion analysis showed that on average each physician spends seven minutes a day "refreshing" locked

computers, ten minutes signing in online repeatedly, and thirteen minutes completing rote attestation—for instance, clicking through multiple screens to scan and confirm previously transcribed notes. Most electronic billing is now the responsibility of the provider. Creating an electronic invoice requires, on average, twenty-one clicks, eight scrolls down or up, and five screen changes—together, the tasks require slightly more than a minute. Assuming an average caseload of twenty patients, that means a physician spends more than twenty minutes creating invoices each day.

Based on the literature and our observations, we estimate that at least half of a physician's time during a visit with a patient is spent on clerical work that is of limited value to the patient. Anyone who has spent time in a doctor's office and experienced the doctor interacting more with his or her laptop than with the patient is likely to agree.[32]

Opportunities To Improve Efficiency In Primary Care

Research and experience confirm that inefficiency in primary care is widespread. As shown above, physicians currently spend too much time and effort on activities that draw them away from direct patient interaction—activities that neither require a physician's skills and expertise nor build rapport with patients and that therefore should be considered wasteful of physicians' time.

Fortunately, numerous opportunities for improved efficiency exist in primary care practice, with benefits that—in the aggregate—can substantially expand workforce capacity. These opportunities can be grouped into the following categories: teamwork, work flow, technology, and policies.

Teamwork Conservatively, research suggests that other staff members could perform tasks that now consume 15 percent of the time physi- cians spend on patient care activities outside of visits.[33] Based on our observations of innovative primary care practices, we believe that the sav- ings could be much greater.

For instance, many of the clerical duties that physicians have always performed, such as writing a note about each visit, take up more of the physician's time since the introduction of the electronic health record. Practices have found that empowering staff such as health coaches (at Iora Health in Las Vegas, Nevada, for example), medical assistants (at the University of Utah and at Martin's Point Primary Care in Bangor, Maine), or nurses (at Medical Associates Clinic in Dubuque, Iowa) to help document the office visit can markedly improve physicians' efficiency. With their clerical obligations reduced, physicians can increase the time they spend interacting directly with patients during visits, manage a larger panel of patients, and avoid having to devote evening and weekend hours to documentation.

Similarly, the roles of clinical staff can be expanded to include management of a physician's electronic in-box under well-defined work plans and protocols. In states from Washington to Maine, practices we visited have found that these efforts yield improved efficiency, resulting in reduced after-hours work for physicians, less overtime for staff members, and improved physician satisfaction.

Another innovation, perhaps implemented most effectively in the primary care practices of Virginia Mason Medical Center, in Seattle, uses medical assistants as "flow managers" for physicians. The flow manager guides the physician's activities throughout the workday with comments such as: "the patient is ready," "return this call," "take care of these tasks," and "sign this form." Physicians find that their day is much more efficient and less stressful when they trust their flow manager to guide them through it.

Beyond their roles as flow managers and scribes, team members can help meet patients' clinical needs more effectively and comprehensively with less use of the physician's time. For example, medical assistants and nurses can be trained to provide routine preventive counseling and to "close" the visit by answering a patient's questions and ensuring that he or she understands the care plan.

In some cases, pharmacists embedded in practices are responsible for protocol-guided care such as the use of anticoagulants and routine hypertension or cholesterol management.[34] In other practices, behavioral specialists such as counselors, social workers, and clinical psychologists provide a wide range of mental health care services.[35]

The gains that can be achieved through using every member of the team effectively are significant. For example, Justin Altschuler and colleagues suggested that up to 77 percent of preventive care and 47 percent of chronic care could be delegated to nonclinician team members, with the potential to more than double the panel size of a primary care physician.[36]

Work Flow Redesigning the clinical work flow has the potential to improve efficiency and reduce waste through the identification of redundant efforts, improvements to the physical layout of a practice, and other factors. Primary care practices we visited that had the luxury of designing new clinical spaces, for instance, have

uncovered opportunities to improve efficiency by placing physicians not in private offices but side by side with the rest of the primary care team in "flow stations." That arrangement facilitates real-time communication and reduces the down time that can occur when one member of the team can't find another member to request assistance or share information. HealthPartners, in Minneapolis, determined that the use of flow stations can save thirty minutes of a physician's time per day (Beth Averbeck, associate medical director for primary care, HealthPartners Medical Group, Minneapolis, personal communication, December 9, 2012).

More modest modifications of the clinic layout can also pay efficiency dividends: HealthPartners found that placing a printer in every exam room can save another twenty minutes daily for each physician, and the use of large monitors near work stations to assess patients' arrival and visit status can save fifteen minutes more (Averbeck, personal communication). In addition, primary care clinics we visited such as those at Virginia Mason and the South Jordan family medicine clinic at the University of Utah have demonstrated that standardizing the placement of equipment and supplies in every exam room and establishing seamless protocols for restocking can reduce wasted effort and time. Even small efficiency gains multiplied over many visits and many providers can yield substantial new systemwide capacity.

Technology Use of an electronic health record improves efficiency in information retrieval. However, it has created inefficiencies in entering data (such as visit notes and billing information) and in some other tasks (such as orders, messages, and reviews of test results). The cumbersome ordering process for tests has led to anecdotal reports that physicians, in the interest of saving time, put off some tests until the patient's next visit.[37]

In time and with feedback from clinicians, the user interface could be improved to reduce the cognitive burden of information input and retrieval, and thus the time required to complete tasks in the electronic record. Whether there are sufficient financial and policy incentives for vendors to make these improvements is uncertain.

Other elements of technology are being harnessed to improve efficiency. As one of us saw during a site visit, Martin's Point has a problem-oriented software program that enables front-office staff to appropriately triage patients when they call for appointments. The program also has the capacity to recommend treatment without a visit for a small number of straightforward conditions, with a nurse or physician confirming the recommendation. The same program incorporates relevant data entered by patients and medical assistants into the visit note to streamline the documentation process.

Even small efficiency gains multiplied over many visits and many providers can yield substantial new systemwide capacity.

HealthPartners has established an online evaluation and treatment tool, called Virtuwell, that allows patients to receive care for any one of forty conditions without an office visit. Nurse practitioners who are available around the clock review data supplied by patients, make protocol-guided treatment decisions, and call patients to provide guidance and treatment, typically within thirty minutes after the data are submitted online. If this model were widely adopted, up to 20 percent of acute patient visits could be moved online (Averbeck, personal communication).[38]

Other types of technology that are becoming more widely used—such as e-mail, patient portals, and home monitoring devices to digitally transfer patients' health data to providers—offer physicians a growing range of methods to reduce the need for face-to-face visits with some patients. These tools can certainly improve efficiency from the patient's perspective. The net impact on physicians is less clear: For instance, some physicians resist the use of e-mail and secure messages from patients because they believe it will introduce new burdens.[39] Advanced team-based care models that empower nonphysician staff to respond to such communications with standing orders and care protocols will be necessary to free up physicians' time for higher-level tasks.

Policies A reexamination of policies at the institutional, state, and federal levels could facilitate greater efficiency in practice. Examples of well-intended policies that serve as barriers to efficient practice include measures that protect sensitive patient information but preclude other team members from managing a physician's task list and that require an electronic health record to rapidly and automatically sign a user out, meaning that users must sign in multiple times

during a single patient visit.

Nonclinicians could be allowed to order a limited set of tests, such as a fasting cholesterol level, under established protocols. Scope-of-practice regulations could be standardized to allow all team members to consistently function at the level appropriate to their training and skills. As David Eitrheim, a family physician at Mayo Clinic Health System in Menomonie, Wisconsin, observed, "Every minute spent doing order entry or tasks that don't require a physician level of training is less time spent on making a correct diagnosis, creating a plan of care, or engaging the patient in motivational interviewing and goal setting" (personal communication, May 10, 2013).

In addition, rules regarding the renewal of prescriptions for chronic conditions could be standardized, with longer intervals between renewals to reduce the time staff spend renewing medications multiple times throughout the year. Based on time-motion analysis and interviews and observations in site visits, we estimate that primary care physicians may waste an average of thirty minutes per day, and nurses sixty minutes per physician per day, on prescription renewal tasks that policy changes—coupled with workflow modifications—could reduce substantially.

Conclusion

A robust primary care workforce is essential to a high-value health care system, and efforts to ensure a sufficient supply of primary care physicians are needed. However, there is a great deal of untapped capacity available in the current primary care workforce. The solution is not to ask hardworking physicians to do more but rather to support them with infrastructure, systems, and staff to enable them to achieve greater efficiency.

A major barrier to incorporating the innovations we have described is the requirement of up-front investments. Training staff in new and expanded roles requires an investment of time on the part of both trainees and trainers. Buying printers for every exam room requires an outlay without an immediate return on investment. Studying clinic work flow requires dedicated time outside of clinical service. As one physician said, "The hardest thing in the beginning is that you first have to take time out to figure out the problem and that takes away from provider time."[40]

Yet through this process of discovery, important opportunities to increase efficiency can be identified and targeted. The clinics we have visited show that these efforts yield efficiencies that can improve physician satisfaction, reduce evening and weekend work hours, reduce staff overtime, expand the comprehensiveness of services delivered, and make it possible for more patients to receive care.

It may be a challenge to convince some physicians, administrators, and policy makers that nonclinicians can perform many of the day-to-day elements of care as well as or better than a physician, at lower cost. However, the notion that the physician should be directly in charge of every aspect of care is becoming increasingly outdated. Bundled payment, accountable care organizations, and other emerging reimbursement models that incentivize efficient care may catalyze necessary change among practices and providers.

Even with those models, additional challenges exist, such as developing institutional and regulatory policies that support a team-based model of care. Academic discourse has moved in the direction of support for teams, but many institutional and federal policies have, paradoxically, moved in the opposite direction.

Despite the support for team-based care provided by the Affordable Care Act, we have observed that many institutions are pushing more work onto the physician out of fear of running afoul of institutional or federal compliance issues. The result is that only the physician can turn on the computer, reconcile a patient's medications, record his or her history, enter orders for tests, compose the after-visit summary, and complete the billing invoice—all tasks that reduce the physician's capacity to perform higher-value work.

More value can be extracted from the existing physician workforce by empowering other personnel, reengineering work flows, exploiting technology, and updating policies to eliminate waste and leverage the skills of the physician. A medical education is a terrible thing to waste: The unique skills of the physician should be put to use not just a fraction of the time, but the majority of the time.

By disseminating existing innovations that reduce the physician's clerical work, the capacity of the primary care physician workforce can be greatly increased. Extending these efforts so that physicians delegate certain aspects of direct patient care, including preventive counseling, patient coaching, and certain aspects of acute and chronic care, will yield greater efficiencies. New models of primary care delivery that enhance patient convenience—such as care delivered by phone and secure messaging; web-based tools for screening, evaluation, and management of common acute conditions; and technology-mediated management of chronic illnesses— can create still greater capacity with the existing workforce.

30 minutes

Saved each day

If each physician saved 30 minutes a day in reassigning clerical tasks to others, and spent that time with one additional patient per day, 30–40 million more physician visits could take place each year.

It is important to realize that even incremental gains in efficiency can pay substantial dividends, if enacted widely. For instance, reducing time spent on routine prescription refills and walking repeatedly to a printer outside the exam room or delegating certain in-box tasks to nonphysician members of the team could readily save at least thirty minutes per day. That time could be spent instead on one additional thirty-minute visit with a patient. If each of the 150,000–200,000 primary care providers currently practicing[41] had one more visit on each of the 200 workdays in a year, that would be an additional thirty to forty million visits annually.

In comparison, policy researchers have estimated that the insurance expansion through the Affordable Care Act will generate fifteen to twenty-four million additional primary care visits each year.[42,43] Thus, independent of growth in the supply of primary care physicians, broad adoption of modest efforts to improve efficiency could lead to sufficient gains in workforce capacity to meet this additional demand.

Altogether, there is great potential in primary care to increase physician capacity through enhanced efficiency without relying on more physicians as the chief solution to workforce shortages. Whether that increased capacity would lead to larger panel sizes, improved access for patients (either reduced wait times, improved continuity of care, or both), higher-quality care, or more comprehensive care would depend upon many local factors—including the needs of the population, the predominant payment models, and the goals of the physician.

New models of primary care delivery that enhance patient convenience can create still greater capacity with the existing workforce.

Ideally, the increased capacity would be spread out across each of these desirable outcomes, resulting in primary care providers who served more patients, better met their patients' needs, earned more, went home earlier, did less work at home, and were thereby motivated to stay in practice longer. ■

Scott Shipman was supported for this research by the Association of American Medical Colleges, and Christine Sinsky received research support from the American Board of Internal Medicine Foundation. The authors acknowledge Shana Sandberg for her assistance in preparing this manuscript, colleagues who joined the authors on their visits to primary care sites around the country, and the generosity of the many physicians and staff members who welcomed the authors and shared their insights.

NOTES

1 Dill MJ, Salsberg ES. The complexities of physician supply and demand: projections through 2025 [Internet]. Washington (DC): Association of American Medical Colleges; 2008 Nov [cited 2013 May 29]. Available from: https://members.aamc.org/eweb/upload/The%20Complexities%20of%20Physician%20Supply.pdf

2 Salsberg E, Grover A. Physician workforce shortages: implications and issues for academic health centers and policymakers. Acad Med. 2006;81(9):782–7.

3 Colwill JM, Cultice JM, Kruse RL. Will generalist physician supply meet demands of an increasing and aging population? Health Aff (Millwood). 2008;27(3):w232–41. DOI: 10.1377/hlthaff.27.3.w232.

4 For details about the American Board of Internal Medicine project, see Sinsky CA, Willard-Grace R, Schutzbank AM, Sinsky TA, Margolius D, Bodenheimer T. In search of joy in practice: a report of 23 high-functioning primary care practices. Ann Fam Med. 2013;11(3):272–8.

5 Association of American Medical Colleges, Center for Workforce Studies. Results of the 2012 Medical School Enrollment Survey [Internet]. Washington (DC): AAMC; 2013 May [cited 2013 May 29]. Available from: https://members.aamc.org/eweb/upload/12-237%20EnrollmSurvey2013.pdf

6 Council on Graduate Medical Education. Twentieth report: advancing primary care [Internet]. Rockville (MD): Health Resources and Services Administration; 2010 Dec [cited 2013 Sep 19]. Available from: http://www.hrsa.gov/advisorycommittees/bhpradvisory/cogme/Reports/twentiethreport.pdf

7 Goodman DC. Twenty-year trends in regional variations in the U.S. physician workforce. Health Aff (Millwood). 2004;23:var-90–7. DOI: 10.1377/hlthaff.var.90.

8 Shipman SA, Lan J, Chang CH, Goodwin DC. Geographic maldistribution of primary care for children. Pediatrics. 2011;127(1):19–27.

9 Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. Arch Intern Med. 2012;172(18):1377–85.

10 Bylsma WH, Arnold GK, Fortna GS, Lipner RS. Where have all the general internists gone? J Gen Intern Med. 2010;25(10):1020–3.

11 McMurray JE, Heiligers PJ, Shugerman RP, Douglas JA, Gangnon RE, Voss C, et al. Part-time medical practice: where is it headed? Am J Med. 2005;118(1):87–92.

12 PhysicianReentry.org. The Physician Reentry into the Workforce Project [home page on the Internet]. Elk Grove Village (IL): American Academy of Pediatrics; [cited 2013

Oct 7]. Available from: http:// physician-reentry.org/
13 American Medical Association. Physician re-entry [Internet]. Chicago (IL): AMA; [cited 2013 Oct 11]. Available from: http://www .ama-assn.org/ama/pub/education- careers/finding-position/physician- reentry.page
14 Bodenheimer T, Pham HH. Primary care: current problems and proposed solutions. Health Aff (Millwood). 2010;29(5):779–805.
15 Cassidy A. Health Policy Brief: nurse practitioners and primary care (up- dated). Health Affairs [serial on the Internet]. 2013 May 15 [cited 2013 Sep 19]. Available from: http:// www.healthaffairs.org/healthpolicy briefs/brief.php?brief_id=92
16 Coplan B, Cawley J, Stoehr J. Physician assistants in primary care: trends and characteristics. Ann Fam Med. 2013;11(1):75–9.
17 Wilson J. Primary care delivery changes as nonphysician clinicians gain independence. Ann Int Med. 2008;149(8):597–600.
18 Baron RJ. What's keeping us so busy in primary care? A snapshot from one practice. N Engl J Med. 2010; 362(17):1632–6.
19 Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for pre- vention? Am J Public Health. 2003; 93(4):635–41.
20 Wetterneck TB, Lapin JA, Kruger DJ, Holman GT, Beasley JW, Karsh BT. Development of a primary care physician task list to evaluate clinic visit workflow. BMJ Qual Saf. 2012; 21(1):47–53.
21 Dyrbye LN, West CP, Burriss TC, Shanafelt TD. Providing primary care in the United States: the work no one sees. Arch Intern Med. 2012;172(18):1420–1.
22 Gilchrist V, McCord G, Schrop SL, King BD, McCormick KF, Oprandi AM, et al. Physician activities during time out of the examination room. Ann Fam Med. 2005;3(6):494–9.
23 Gottschalk A, Flocke SA. Time spent in face-to-face patient care and work outside the examination room. Ann Fam Med. 2005;3(6):488–93.
24 Farber J, Siu A, Bloom P. How much time do physicians spend providing care outside of office visits? Ann Intern Med. 2007;147(10):693–8.

25 Doerr E, Galpin K, Jones-Taylor C, Anander S, Demosthenes C, Platt S, et al. Between-visit workload in pri- mary care. J Gen Intern Med. 2010; 25(12):1289–92.
26 Reid RJ, Larson EB. Improvement happens: doctors talk about the medical home. J Gen Intern Med. 2012;27(7):873.
27 Oxentenko AS, West CP, Popkave C, Weinberger SE, Kolars JC. Time spent on clinical documentation: a survey of internal medicine residents and program directors. Arch Intern Med. 2010;170(4):377–80.
28 Hauer KE, Durning SJ, Kernan WN, Fagan MJ, Mintz M, O'Sullivan PS, et al. Factors associated with medical students' career choices regarding internal medicine. JAMA. 2008; 300(10):1154–64.
29 Casalino LP, Nicholson S, Gans DN, Hammons T, Morra D, Karrison T, et al. What does it cost physician practices to interact with health in- surance plans? Health Aff (Millwood). 2009;28(4):w533–43. DOI: 10/1377/hlthaff.28.4.w533.
30 Sakowski JA, Kahn JG, Kronick RG. Peering into the black box: billing and insurance activities in a medical group. Health Aff (Millwood). 2009; 28(4):w544–54. DOI: 10.1377/ hlthaff.28.4.w544.
31 Morra D, Nicholson S, Levinson W, Gans DN, Hammons T, Casalino LP. US physician practices versus Canadians: spending nearly four times as much money interacting with payers. Health Aff (Millwood). 2011;30(8):1443–50.
32 Toll E. A piece of my mind. The cost of technology. JAMA. 2012;307(23): 2497–8.
33 Chen MA, Hollenberg JP, Michelen W, Peterson JC, Casalino LP. Patient care outside of office visits: a primary care physician time study. J Gen Intern Med. 2011;26(1):58–63.
34 Sandhoff BG, Kuca S, Rasmussen J, Merenich JA. Collaborative cardiac care service: a multidisciplinary ap- proach to caring for patients with coronary artery disease. Perm J. 2008;12(3):4–11.
35 Mauer BJ (MCPP Healthcare Consulting). Behavioral health/ primary care integration and the person-centered healthcare home [Internet]. Washington (DC): National Council for Community

Behavioral Healthcare; 2009 Apr [cited 2013 Sep 20]. Available from: http://www.allhealth.org/briefing materials/BehavioralHealthand PrimaryCareIntegrationandthe Person-CenteredHealthcareHome- 1547.pdf
36 Altschuler J, Margolius D, Bodenheimer T, Grumbach K. Estimating a reasonable patient panel size for primary care physi- cians with team-based task delega- tion. Ann Fam Med. 2012;10(5): 396–400.
37 Valinoti AM. Physician, steel thyself for electronic records. Wall Street Journal. 2012 Oct 22.
38 Courneya PT, Palattao KJ, Gallagher JM. HealthPartners' online clinic for simple conditions delivers savings of $88 per episode and high patient approval. Health Aff (Millwood). 2013;32(2):385–92.
39 Byrne JM, Elliott S, Firek A. Initial experience with patient-clinician secure messaging at a VA medical center. J Am Med Inform Assoc. 2009;16(2):267–70.
40 Emont S, Emont N (White Mountain Research Associates, Danbury, NH). Evaluation of the Optimizing Primary Care Collaborative [Internet]. Oakland (CA): California HealthCare Foundation; 2009 Dec [cited 2013 May 29]. Available from: http://www.chcf.org/~/media/ MEDIA%20LIBRARY%20Files/ PDF/E/PDF%20Evaluation OptimizingPrimaryCare Collaborative.pdf
41 Agency for Healthcare Research and Quality. The number of practicing primary care physicians in the United States: Primary Care Workforce Facts and Stats No. 1 [Internet]. Rockville (MD): AHRQ; [current as of 2011 Oct; cited 2013 Sep 20]. (Pub. No. 12-P001-2-EF). Available from: http://www.ahrq .gov/research/findings/factsheets/ primary/pcwork1/index.html
42 Hofer AN, Abraham JM, Moscovice I. Expansion of coverage under the Patient Protection and Affordable Care Act and primary care utiliza- tion. Milbank Q. 2011;89(1):69–89.
43 Petterson SM, Liaw WR, Phillips RL, Rabin DL, Meyers DS, Bazemore AW. Projecting U.S. primary care physician workforce needs: 2010–2025. Ann Fam Med. 2012;10(6):503–9.

INNOVATION SUMMARY

Project ECHO

Sanjeev Arora, MD, FACP, FACG

1. **Briefly describe the innovation** (Occupation(s), additional education/training required, activities/tasks/responsibilities, supervision and relationship to other practitioners):

Project ECHO® (Extension for Community Healthcare Outcomes) is a low-cost, high-impact intervention accomplished by linking expert inter-disciplinary specialist teams with primary care clinicians through teleECHO™ clinics, in which the experts mentor primary care clinicians to help them manage their patient cases and share their expertise via mentoring, guidance, feedback and didactic education. This enables primary care clinicians to develop the skills and knowledge to treat patients with common, complex conditions in their own communities which reduces travel costs, wait times, and avoidable complications. The ECHO model™ is not "telemedicine" where the specialist assumes the care of the patient, but instead a guided practice model where the primary care clinician retains responsibility for managing the patient, operating with increasing independence as their skills and self-efficacy grow.

The ECHO model can be adapted for training primary care clinicians, including physicians, nurse practitioners, and physician assistants, nurses, community health workers, social workers, behavioral health practitioners and others in the healthcare field. The ECHO Institute offers free monthly training sessions to share best practices in implementing the ECHO model and also offers a monthly three-day in-depth training for those who are interested in implementing teleECHO clinics at their own sites.

2. **Actual or expected results/outcomes:**

The ECHO model has been widely adopted throughout the United States and, increasingly, around the world as a means of increasing access to specialty care. Replication of the ECHO model is achieved through the creation of ECHO "hubs" or regional centers, in which partner sites or "spokes" connect through teleECHO clinics, gaining specialty expertise and knowledge. Today, Project ECHO Has 92 hub replication partners globally, 59 sites in the U.S. with an additional 33 programs operating internationally covering 45 distinct conditions.

3. **Any external evaluation? If so, findings:**

From 2003 to 2011, the effectiveness of the ECHO model was evaluated by assessing the impact

on rural clinicians participating in teleECHO clinics. Impact measurements included effect on treatment rates, self-efficacy and overall professional satisfaction. The results of this research were first published in Hepatology in September 2010. This article illustrated the ECHO model's impact to the current healthcare system in three major areas: 1) access to specialty healthcare, 2) expanded delivery of evidence-based best practice care, and 3) a new paradigm for team based interdisciplinary professional development.

Patient outcomes were also evaluated via a prospective cohort study, demonstrating that treatment for hepatitis C virus (HCV) using the ECHO model is as safe and effective as treatment at an Academic Medical Center (AMC), was published in the New England Journal of Medicine in June 2011. The study compared treatment of HCV at the University of New Mexico Health Sciences Center (UNMHSC) HCV clinic to treatment by primary care clinicians at Project ECHO partner sites in rural New Mexico.

To date there have been more than 40 studies published about the ECHO model as an effective tool for health workforce development and a means of increasing access to specialty care in rural and underserved areas. The full list of publications is available on the ECHO website at: http://echo.unm.edu/about-echo/research/.

4. **Barriers/challenges faced:**

While the ECHO model has shown great success in being replicated around the world, the primary care providers at spoke sites and specialists at hub sites sometimes face challenges in identifying a sustainable funding source to cover the time spent engaged in the ECHO clinic.

5. **Financing/regulatory changes needed to implement more widely:**

The ECHO Institute at the University of New Mexico is working with the U.S. Congress and the Centers for Medicare and Medicaid Services to address these issues. Recently, an ECHO Act was passed by the U.S. House of Representatives. The ECHO Institute is also engaged in conversations with the Centers for Medicare and Medicaid Services to identify funding mechanisms that will allow for broader reimbursement of the time spent engaged in ECHO.

6. Advice for others:

The ECHO model has wide applicability as a new learning and knowledge sharing model. If you or anyone that you know struggles with how to ensure that the right knowledge is at the right place at the right time to ensure that the patients receive the right care or the right education they need, then the ECHO model can be a solution for you. We encourage you to explore more
at our website: http://echo.unm.edu.

TMC TEXAS MEDICAL CENTER

Health Workforce Institute
THE GEORGE WASHINGTON UNIVERSITY

INNOVATION SUMMARY

Bellin Health
Kathy
Kerscher

1. **Briefly describe the innovation**:
   Redesigning our patient care delivery to a team based model to achieve population health management. We have developed an advanced team based care model that has redesigned the office visit, in between visit work, and population health in a way that everyone on the core or extended care team is working to the highest level of their skillset. We follow a 9 step process for our redesign work that has proven very effective. We have a T-16 week /T+8 week training that every member needs to go through. Included in the T-16 week is a 3 day EHR course.

2. **Actual or expected results/outcomes:**
   3 wins:
   - LOR improvement from 91% to 100%
   - Patient satisfaction from 92% to 98%
   - Quality measures change 11.40% improvement for TBC compared to 4.26% improvement for non TBC
   - Job satisfaction Pre go live - satisfied or very satisfied in their role 60% Post go live - 80%
   - E/M coding increase Level 4's – from 34% to 42%
   - Office visit increase 16.2 to 17 per day average
   - Access to appointments. Short 1.5 to 1.0 Long 1.8 to 1.2

3. **Any external evaluation? If so, findings:**
   In process with AHRQ.

4. **Barriers/challenges faced:**
   - Today mainly in FFS, difficulty getting reimbursed for all services especially the extended care team members and virtual visits.
   - Getting insurance companies on board to reimburse for the highest skill set to see patients, i.e RN visits for simple acute symptoms like conjunctivitis. RN's follow detailed protocol and cannot get reimbursed.

5. **Financing/regulatory changes needed to implement more widely:**
   Reimbursement for other care team members

6. **Advice for others:**
   A transformation of this magnitude, need to by clinicians and administration working together. Your organization needs to be onboard with this change. Take time to build a prototype and test completely. Have implementation support. Have the right measures in place. Do not spread to fast. Change management is key to the success of redesign.

INNOVATION SUMMARY

Eshelman Institute for Innovation
Mary Roth McClurg, PharmD, MHS

1. **Briefly describe the innovation** (Occupation(s), additional education/training required, activities/tasks/responsibilities, supervision and relationship to other practitioners):

   One of the greatest barriers to improving the quality of health care in the United States is the misuse, underuse, and overuse of medications. Prescription drug spending accounts for 10% of total health expenditures with $271 billion of the nearly $3 trillion spent on overall US Health Care in 2013. Most surprising is that health care costs attributed to the improper and unnecessary use of medicines exceed $200 billion, suggesting that for every dollar spent on drugs an additional dollar is spent addressing a medication misadventure. There is no question that appropriate medication use is a critical component of care that must be addressed to improve national health care. Clinical pharmacists embedded within primary care teams play an important collaborative role in optimizing medication use; however, data regarding the value of the pharmacist in primary care are inconclusive. This is largely attributed to wide variability in populations served, inconsistency in the outcome metrics evaluated, limited insight into the intervention itself, and the lack of a sustainable business model. Using a multi-site network of 44 diverse primary care practices throughout the United States and an implementation-effectiveness hybrid research design, we are working to address these limitations and identify best practices in medication optimization to improve patient care and advance value-based care delivery and payment models.

2. **Actual or expected results/outcomes:**

   It is important that we identify and articulate a consistent approach to delivering comprehensive medication management in primary care that can be replicated and scaled. Further, we aim to identify best practices that assure that pharmacists are targeting patients in greatest need as well as identify strategies for integrating these services within the overall infrastructure and operations of the primary care practice. Finally, we are evaluating the impact of the intervention on important metrics of care, including total cost of care, health services utilization, quality metrics, and medication-related problems.

3. **Any external evaluation? If so, findings:**

   No external evaluation; limited findings at this time. We are 6 months into a 2-year study. Will describe the innovation and share lessons learned to date.

4. **Barriers/challenges faced:**

   The greatest barriers are a) limited understanding of the medication management intervention itself (i.e., unclear to many what it is and how one would deliver it); b) wide variability and inconsistency in implementation across care settings; and c) limited reimbursement to support such services in primary care. New value-based payment models hold promise, but we must define what this is and show impact.

5. **Financing/regulatory changes needed to implement more widely:**

   Integration of medication optimization services into new value-based care delivery and payment models.

6. **Advice for others:**

   Everyone can relate to medication misadventure, including problems with non-adherence, inappropriate use, underuse, misuse, and overuse. It is a problem that we all face at some point in our lives whether personally or professionally. There's no doubt that medications, when used right, have tremendous benefit, but when used wrong wreak tremendous havoc and harm. To improve national healthcare, we must place more emphasis on Getting Meds Right.

INNOVATION SUMMARY

Expanded Roles for Pharmacists
Linda Garrelts MacLean, BPharm, RPh, FACA

1. **Briefly describe the innovation**:

Pharmacists in Washington state are increasing patient access to care for minor illnesses and conditions in community pharmacies. After evaluation of the patient who presents with a self-limiting or minor ailment, the pharmacist takes one of the following actions:

1. The patient is referred to the primary care provider, urgent care, or the emergency department for further evaluation and/or follow-up.
2. The pharmacist recommends supportive care and another consultation if symptoms are not improving in 48 hours.
3. Using the Clinical Community Pharmacist protocol, the pharmacist may initiate therapy for one of the minor ailments or conditions covered under the Collaborative Drug Therapy Agreements (CDTAs). Follow-up with both the patient and the primary care provider is detailed in the CDTA agreements.

Examples of minor ailments and conditions for which CDTAs may be developed in this project:

1. Bronchospasm, wheezing, shortness of breath from asthma or COPD
2. Animal Bite (Human, Dog, or Cat)
3. Eye or nasal symptoms from seasonal allergies or other allergic conditions
4. Herpes virus infections (cold sores, genital herpes, shingles)
5. Allergic reactions from bee stings (not anaphylactic)
6. Acute otitis media
7. Anaphylactic allergic reactions
8. Lacerations and abrasions
9. Nausea and vomiting (not related to motion sickness)
10. Contraceptive pregnancy prevention
11. Conjunctivitis
12. Nausea and vomiting caused by motion sickness
13. Wound infections from burns
14. Migraine headaches
15. Ear infections caused by bacteria
16. Lack of fluoride for oral health
17. Diarrhea that occurs while traveling
18. Uncomplicated urinary tract infections
19. Vaginal yeast infections

20. Streptococcal pharyngitis

Pharmacists included in the research project have taken refresher training through the Washington State Pharmacy Association's Clinical Community Pharmacist Training Program. This additional professional development assisted with standardization of the provision of care.
This collaborative approach does not replace health system processes, but supplements them to close gaps and provide care in the community setting.

2. Actual or expected results/outcomes:

The primary aim of this project is to reduce the cost of care while providing valuable, accessible and quality care to residents in Washington State. Health care costs continue to rise and this model of care provides an opportunity to reduce costs for residents in the state of Washington.

As states implement the Triple Aim and seek to ensure access to quality care, this novel care delivery model is being evaluated on the premise that improved access to care for patients in sites such as community pharmacies will result in more rapid assessment and initiation of therapy, thus improving patient health outcomes.

3. Any external evaluation? If so, findings:

Our research team will complete a 3-phase analysis that assesses feasibility and compares care provided by clinical community pharmacists for 20 minor ailments and conditions with care received in other care settings: physician offices, urgent care clinics, and emergency departments. Comparisons will be made in performance on quality of care indicators per ailment (adherence to clinical practice guidelines), costs per episode (based on initial claim plus any claims for same condition for 30-days), and frequency of follow-up care for the same condition within 30 days (an indicator of inadequate management at the initial visit). Phase 1 will consist of the feasibility and implementation stage; Phase 2 will focus on cost comparison across the different care settings, and Phase 3 will examine health outcomes between pharmacist-provided care and that of other health care providers by examining the quality of care provided.

The Washington State University College of Pharmacy research team is currently working in Phase 1 of the project.

4. Barriers/challenges faced:

- Although draft CDTAs were provided by the Washington State Pharmacists Association through the purchase of a toolkit, the protocols need to be customized for each participating pharmacy or pharmacy chain. Adaptation was undertaken in collaboration with the CDTA physician. Timing for atient follow-up and reports/communication with the collaborating physician were often modified to reflect the standard of care agreed upon by the pharmacy and physician collaborator.
- Comprehensive live hands-on pharmacist training sessions were developed and provided to the pharmacists participating in the research project. Scheduling proved to be a challenge for the live sessions. The WSPA pharmacist continuing education refresher course was offered on line, so the preparation prior to the live training was not a challenge.
- The research project control data will be captured by accessing data from a Health Plan. Getting this agreement in place took longer than anticipated.

5. Financing/regulatory changes needed to implement more widely:

This service is currently an out-of-pocket expense for patients. While the first eight months of patient care encounters appear to indicate that cost is not a barrier, for the service to be broadly adopted, the ability to bill insurance is needed. As of January 2017, pharmacists in Washington will be attempting to become credentialed and privileged as providers to facilitate this next step.

6. Advice for others:

Clear communication about "why" this pharmacist care service is offered has been key to success. Once other health care providers and patients understand the positive impact of this model of care (rapid initiation of therapy or referral, cost effectiveness, primary care provider can have more time to spend with complex patients, etc.) there has been broad community support. Finally, the "what" and "what this is *not"* need to be communicated effectively, but we lead the conversations with making the case for "why."

INNOVATION SUMMARY

The CONNECT Community Paramedic program
Dan Swayze, DrPH, MBA, MEMS

1. **Briefly describe the innovation**

EMTs and paramedics are highly-skilled clinicians trained to provide emergency medical services in the home and other community settings. The CONNECT Community Paramedic program uses a specially-trained team of both EMTs and paramedics to help vulnerable patients in Allegheny County (the county surrounding and including Pittsburgh, Pennsylvania). Patients are referred to the program from 15 hospitals, 44 EMS agencies and the 2 largest health insurance companies in the region. To be eligible to receive the community paramedic (CP) services, the patient need only live in the county and be determined to be "vulnerable" as defined by the referring entity.
Community paramedics conduct an in home assessment of the patient that includes the patient's medical and mental health history, a medication reconciliation and a broader "beyond-the-body" assessment that is based on the social determinants of health. For patients with the cognitive and physical capacity to enroll in services, the CP provides patient education and patient navigation services. For patients with cognitive or physical constraints, the CP serves as a patient advocate and conducts activities that include but are not limited to completing applications on the patient's behalf and attending medical, mental health and social service appointments with the patient. Community paramedics also attempt to find stop-gap services to address immediate needs until longer term services can be provided.

EMTs and paramedics hired by the program attend a specialized training program that consists of 40 classrom hours and additional field time under the supervision of a seasoned preceptor. Didactic training includes; chronic disease self-management assessment; patient education using the teach-back method, empathy training for mental health, chronic pain and substance use disorder, trauma informed care and the impact of adverse childhood experiences, verbal de-escalation techniques in crisis management, suicide assessment and intervention, patient assessment using the social ecology model, motivational interviewing, family systems theory, social support, cultural sensitivity and provider safety practices including criminal history gathering, scene safety and compassion fatigue mitigation.

The CONNECT Community Paramedic Program is a collaboration between the Allegheny County EMS Council, the CONNECT Congress of Neighboring Communities and the Center for Emergency Medicine of Western Pennsylvania, Inc. The program was originally funded by a grant from Highmark, the Highmark Foundation and UPMC and is currently transitioning to a more sustainable funding model.

2. **Actual or expected results/outcomes:**

   In the first two years of operations the program assessed more than 200 patients in their homes. A pre-intervention, post-discharge comparison of EMS calls, ED visits and hospital admissions was conducted for a convenience sample and extrapolated to the 200 patients. Preliminary estimates are that the CONNECT Community Paramedic program resulted in a net savings of $1.2 million in avoided healthcare costs compared to the patients' historical use.

3. **Any external evaluation? If so, findings:**

   None yet.

4. **Barriers/challenges faced:**

   - Patient engagement: staff turnover at referring organizations and inaccurate contact information from referring organizations makes it challenging to continuously engage patients in the program.
   - Data collection: existing EMS, hospital and home nursing medical documentation systems proved inadequate to capture the unique and comprehensive nature of the intervention. As such, a customized application was developed to record essential aspects of the CP interactions and evolved over time.
   - Program evaluation: The disparate medical record systems of the 15 hospitals and 40+ EMS agencies prevented an automated review of healthcare utilization. Manual record review proved to be incredibly time-consuming, but remains as the only viable way to conduct a program evaluation in areas that do not have a regional health information network.

5. **Financing/regulatory changes needed to implement more widely:**

   Pennsylvania has recently introduced a bill to credential CP practitioners and to pay for CP services through Medicaid and commercial insurance. Emergency Medical Services are defined as a medical transportation benefit in the federal Medicare statute, which would require re-writing the Medicare law to enable reimbursement for Medicare patients unless the industry can reclassify the services provided.

6. **Advice for others:**
   Healthcare innovation initiatives may benefit from a workforce trained in core competencies from medicine, social work, community health and human services. EMTs and paramedics are already present in most communities in the US, and often share characteristics with the communities they serve much like community health workers. This new role for EMS providers is an emerging movement, present in more than 300 communities in the country.

INNOVATION SUMMARY

Community Paramedics
Peter Carlson

1. **Briefly describe the innovation**:

North Memorial health care, located in Robbinsdale MN, launched its community paramedic (CP) program in 2012. Staff was selected from the existing pool of critical care/emergency paramedics and six individuals were offered the additional 14 credit education in chronic disease management and care coordination. The classroom education was complimented by 196 hours of clinical rotations in a variety of settings, including home health, hospice, primary care clinics, pediatric emergency and out-patient wound care. Upon completion of the program staff were assigned to clinics within our primary care network and worked as a part of the patient centered medical home. We continue to operate in this model to date and have since expanded our group to 11 staff, operating at a 5.0 full time equivalent. The expansion came in response to others in the organization wanting access to a mobile/nimble resource that is able to extend into the community and that operates within the same electronic health record (EHR).

Daily tasks and responsibilities range from medication management to post-surgical follow up for metabolic-bariatric patients in need of hydration and electrolyte replacement. Staff also perform health maintenance review and are able to assist with a wide variety of services, allowing the system to remain efficient and creating a larger network of empanelment for our primary care team. Empanelment of patient populations simply means assigning a primary care provider (team care) to a patient that has been attributed to our network. The community paramedic staff at North Memorial communicate regularly with patient's primary care team along with discharging planners and hospitalists through our transitions work.

2. **Actual or expected results/outcomes:**

Our measurement and reporting (M&R) focuses on several different areas of impact, including re-admission impact (specific populations), total cost of care (TCOC), patient experience, medication error reduction, primary care followup and utilization pattern change. Our results to date have been in sync with our expected outcomes. We have been able to show a consistent 40% reduction in in-patient utilization when viewing patterns through a 20 week pre/post lens. The reduction equates to our system having the opportunity to shift focus onto rising risk populations and make an impact further upstream.

3. **Any external evaluation? If so, findings:**

In process through the state dept of health.

4. **Barriers/challenges faced:**

Our barriers to date have been largely financial in nature. The community paramedic 'tool' is best suited for a capitated payment population vs. fee-for-service and volume driven market. We are currently limited to payment through state based medical-assistance, commercial payers have yet to accept our innovation and pay on a fee based schedule. We have set up our M&R to capture populations served by commercial payers and the

impact made in TCOC by our program and are in the process of meeting with leaders in the insurance industry to further make our case for payment. Another barrier/challenge has been marketing a program whose roots are in an industry that is often not understood by lay people and healthcare providers alike. Our program spent its first year explaining the difference between EMT-basic, paramedic and now community paramedics to anyone willing to listen.

5. **Financing/regulatory changes needed to implement more widely:**

In order to implement CP more widely, as used by our organization, it is vital that risk based contracts grow in size and are tied to appropriate levels of downside risk. Bundled payments are another way to strategically utilize a service such as CP. The mobility and autonomy that comes with our staff presents a unique opportunity for organizations to extend their reach into the community while controlling price and quality. Paramedics, through experience, are uniquely able to gain trust and adapt with ease to a variety of settings that other providers struggle to perform in. Change to reimbursement of ambulance transports to include payment for "no-load" of patients that have been proactively identified through predictive analytics and that have longitudinal care plans to follow would benefit the entire system greatly and make sustaining CP services more of a reality.

6. **Advice for others:**

If your system is considering a community paramedic/mobile integrated health program, I strongly urge front-line staff participation from day one. Our current staff average 30 plus years in the industry and they have actively watched as the 911 system has turned from an emergent response unit to a ride to go see the emergency room doctor for non-emergent reasons. The energy our staff have put into community resource networking and aligning patient's with non-traditional healthcare providers has led to a successful and robust CP program. In addition to involving front-line staff in nearly all decisions made it is also imperative to have access to your patient population's EHR. Lack of interoperability between two or more EHR's will create large barriers to M&R, it will also make it difficult to code out for the services provided. Our program schedules, documents, reports and bills through the hospitals EHR and by doing this we have created visibility for our staff as "community paramedic providers", staff are also able to refer a patient to our program with the same process they use to refer to all other areas of the system.

INNOVATION SUMMARY

Grand Aides
Craig Thomas, MSN, ACNP-BC, CHFN

1. **Briefly describe the innovation**:

We used the Grand-Aides (GA) program for transitional/ chronic care to support our heart failure (HF) program and our readmission work. We leverage a HF nurse practitioner, and 2FTE of CNA trained as Grand-Aides for an in-home visitation program to support HF patients after recent hospitalization or clinic visit. NP was educated in the "train-the-trainer" program of Grand-Aides and then hired and trained the GAs. During the home visit the GA obtains vital signs, and records patients responses to standardized questions. Using phone or video, then communicates this to the program NP whom decides care plan adjustments, educational needs and follow up plan. This program operates within the HF disease management program at University of Virginia Medical Center and provides chronic and on-going support to these patients through earlier symptom identification, recognition and intervention using telehealth platform to bridge the distance between Grand-Aide/ Patient and the NP.

2. **Actual or expected results/outcomes:**
Published in Health Affairs (October 2014): 58% reduction in heart failure 30-day all-cause readmissions. Current data 108 Medicare with 856 concurrent controls. 30-day readmission in Grand-Aides 2.8% (control 15.8%, p=0.0003 – an 82% reduction); 6 month GA 13.0% control 45% (p<0.0001); Emergency Dept visits 30 day GA 2.8% control 45.1% p<0.0001; ED 6 month GA 12.0% control 51.5%, p<0.0001. Medication adherence 92% at 30 days.

3. **Any external evaluation? If so, findings:**
Major Philadelphia hospital (not permitted to release hospital name until publication) heart failure randomized trial GA v community health worker program: GA 6 month ED 13.0%, control 49.0%, p<0.0005 – a 74% reduction.

4. **Barriers/challenges faced:**
One challenge faced was hiring the right Grand-Aides. Hiring high performers leads to turnover for advanced opportunities such as nursing school. Competing programs (home health, Area board on Aging, Remote Pt monitoring) were challenges to navigate with each patient. We needed to be sure we did not apply too many services and confused the patient more than help. Early on in our program we established mutual exclusiveness of all other programs. We've found that some overlap of services can work if managed appropriately. Due to the rural area, distance to travel was a concern we had for GA time spent in the car versus time spent with patient. To mitigate this we limited our service area to 60 miles of the Medical Center. Not all patients welcoming of someone in the home, so this caused short

duration of contact or refusal of the program (83% agree to have the program). When to end the program was not defined and was variable. With experience in caring for this population we decided we would cease home visits when no further benefit was expected. The median time was 6 months. I am told that the right supervisor is important. That is a bit difficult for me to assess.

5. **Financing/regulatory changes needed to implement more widely:**
   Our hospital and others use the cost-avoidance rationale to reduce the likelihood of Medicare penalty. Currently, Medicare does not reimburse - except the 1/mo NP telemedicine post-acute visit can be paid. Medicaid managed care or Medicare Advantage can reimburse for Grand-Aides. Other states have reimbursement by individual insurers

6. **Advice for others:**
   Tough-Love, technology savvy and accountability are important characteristics of GA. Tough love helps provide strength to the education/ recommendations. Technology (being able to operate a tablet and turn on live video in the tablet) is a key component of the program and should not be a barrier for the GA (being able to opera. Accountability is necessary for the GA to be responsible for their work, setting up patient visit schedule and managing the work load. Clinically the GA is closely supervised and directed by the Supervisor/ NP. Further advice is to keep the program patient-centric. Do not get stuck in thinking the program consists of only vital signs and asking protocol questions during home visits. Allow the program to grow to support individual patient needs.

INNOVATION SUMMARY

Community Health Workers
Geoff Wilkinson, MSW

1. **Briefly describe the innovation**:

The American Public Health Association defines Community Health Workers (CHWs) as follows:
"A Community Health Worker (CHW) is a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. A CHW also builds individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support and advocacy."

For additional definitions, including from the US Dept. of Labor and the 2010 Patient Protection and Affordable Care Act, see:
http://www.mass.gov/eohhs/gov/departments/dph/programs/community-health/prevention-and-wellness/comm-health-wkrs/chw-definitions.html

For a detailed description of CHW skills and roles, and the relationship of CHWs to other health workforces, see:
Understanding Scope and Competencies: A Contemporary Look at the United States Community Health Worker Field at: http://files.ctctcdn.com/a907c850501/1c1289f0-88cc-49c3-a238-66def942c147.pdf?ver=1462294723000

2. **Actual or expected results/outcomes:**
There is an extensive and growing body of research documenting positive CHW impacts on addressing chronic disease (e.g., asthma, diabetes, HIV/AIDS, cancers, etc.), cardio vascular disease, maternal and child health, reduction of emergency care and hospital readmissions, access to health insurance and preventive health services, long term care, etc. **The CDC has an excellent eLearning training series on CHWs at:** http://www.cdc.gov/dhdsp/chw_elearning/index.html

For a sample summary of CHW training, supervision, and impacts within integrated health care teams, see: Massachusetts Dept. of Public Health, Achieving the Triple Aim: Success with Community

Health Workers. http://www.mass.gov/eohhs/docs/dph/com-health/com-health-workers/achieving-the-triple-aim.pdf

See also, Sing, P. Community Health Workers—A Local Solution to a Global Problem. New England Journal of Medicine (2013) at http://www.nejm.org/doi/full/10.1056/NEJMp1305636

For an example of the growing literature on CHW Return on Investment studies, see:

- Felix, et al. Medicaid savings resulted when CHWs matched those with needs to home and community care. Health Affairs, 2011:http://content.healthaffairs.org/content/30/7/1366.full

3. **Any external evaluation? If so, findings:**

Here is the reference for a frequently cited, rigorous literature review on CHW effectiveness:

- Institute for Clinical and Economic Review. *Community Health Workers: A Review of Program Evolution, Evidence of Effectiveness and Value, and Status of Workforce Development in New England.* The New England Comparative Effectiveness Advisory Council. Boston, Massachusetts: July, 2013. http://icer-review.org/wp-content/uploads/2011/04/CHW-Draft-Report-05-24-13-MASTER1.pdf

A comprehensive portfolio of evidence documenting CHW effectiveness gathered by Sanofi US in 2015 is also attached.

4. Barriers/challenges faced:

Despite increased engagement of CHWs by public and private sector providers and the growing body of research about the positive impacts CHWs have in improving access to health care, reducing health disparities, improving quality of care, and controlling costs, CHWs are just beginning to be integrated as professionals in the mainstream health care system. Here is a summary of challenges for the field:

- There has been enormous progress with developing standard definitions of who CHWs are, the CHW scope of practice, and CHW skills, roles, and attributes, but emerging consensus among national stakeholders has yet to be widely recognized and adopted at the state and institutional levels.
- The field is still developing a unified professional identity. Dozens of job titles may be appropriately listed under the umbrella term of "Community Health Worker." There is lack of consensus about the relationship between CHWs and patient navigators, or similarly, between CHWs and *promotoras de salud*.
- Because CHW work has traditionally been supported through time-limited categorical grants, CHW wages are comparatively low, turnover is high, and job security is limited. Sustainable financing for CHWs—within health care and community-based settings—is a major focus now for policy development and health system experimentation.
- Respect for and effective integration of CHWs within care teams varies among providers. Supervision quality and organizational readiness vary. Structured opportunities for career ladder development are still emerging.

- Training infrastructure and resources to support development of CHW core competencies and practice specialties vary widely among states.

- The field is making progress with professional credentialing—numerous states have adopted or are developing certification protocols—but there is no widely recognized, portable CHW credential.
- Similarly, the advent of CHW credentialing raises a host of challenges related to assuring barriers of entry to the field are not unintentionally erected and that the CHW workforce retains its distinctive capacities, i.e., the ability to form relationships based on shared experience, unique community knowledge, trust within the community, and commitment to the community.
- There is no overarching professional association for the field. Progress in that direction is underway now.
- As a core public health workforce, CHWs have traditionally been distinguished by spending significant portions of their work time in home and community-based settings. Professionalization of the CHW field is accompanied by concern it may become over-medicalized, that community-based work of CHWs will become marginalized in favor of work "within the walls" of health care settings, and that the advocacy role of CHWs—one of the workforce's core competencies—will be diminished.
- CHWs are valued by health systems for their ability to link clients and patients to community-based resources that address the "social determinants of health," but these resources are inadequately available and unevenly distributed due to racism and structural inequality in society at large and within specific communities. Concerns are emerging about the scope of realistic expectations for CHWs in relationship to larger health system responsibilities for "upstream" investments to promote primary prevention.

5. **Financing/regulatory changes needed to implement more widely:**
   Financing challenges are discussed above (#4). Additional information on CHW financing is available at the Association of State and Territorial Health Officers, CHW resources website: http://www.astho.org/community-health-workers/

6. **Advice for others:**
   CHWs should be directly involved in policy and program development involving the CHW workforce. A number of states have CHW networks, alliances, or associations. Personnel involved in health system design or delivery involving CHWs at any level—whether through Medicaid offices, public health departments, health provider systems, health foundations, academic institutions, or advocacy organizations—should only undertake substantive planning and implementation of policy, programs, or research in partnership with experienced CHWs, preferably those involved in leadership of state CHW

organizations. The CHW Section of the American Public Health Association may provide valuable contacts: https://www.apha.org/apha-communities/member-sections/community-health-workers
For more information, consult the following sample websites:

- Massachusetts Department of Public Health, Office of CHWs: http://www.mass.gov/eohhs/gov/departments/dph/programs/community-health/prevention-and-wellness/comm-health-wkrs/
- CHW Central, resources: http://chwcentral.org/resources
- CHW Network of New York City: http://www.chwnetwork.org/
- Michigan Community Health Worker Alliance: http://www.michwa.org/
- Massachusetts Association of Community Health Workers: http://www.machw.org/

INNOVATION SUMMARY

Overview of Innovations in Oral Health Workforce
Jane Koppelman, MPA

1. Briefly describe the innovation:

Dental therapists are dental providers akin to physician assistants in medicine. Operating as part of a dental team under the supervision of dentists, they provide preventive as well as some basic restorative care that has traditionally been the sole purview of dentists, such as filling cavities and nonsurgically extracting teeth. As compared to dental hygienists who address periodontal disease, dental therapists primarily work to prevent and treat dental caries (cavities). Training for dental therapists ranges from two to up to six years, with longer training required for providers working towards a combined dental hygiene/therapy credential. For decades dental therapists have been used to expand access to care for the underserved in more than 50 countries including Canada, the U.K., Australia, New Zealand and the Netherlands. In the U.S., they began serving Native Alaskans in 2005 and have now been authorized in Minnesota, Maine and Vermont. They are being used as a way to expand access to care for underserved populations (low-income and uninsured individuals; rural residents; and people with difficulty travelling to an office or clinic such as children and disabled or elderly individuals).

2. Actual or expected results/outcomes:

In the U.S. and abroad, dental therapists have been used to expand access to care to the underserved. In New Zealand, where dental therapists have been working since 1921, they are deployed to elementary schools and have contributed to high rates of access to care for school-aged children. In 2009, 81 percent of New Zealand 2-17 year-olds received dental care during the previous year, compared to only 51 percent of U.S. children in the identical age group in 2010.i In Alaska, since 2005 dental therapists have provided routine care to about 40,000 Native Alaskans in 81 rural villages, many of whom previously had no source of regular dental care.ii In Minnesota, where dental therapists have been practicing since 2011, a 2014 evaluation found that they have reduced patient wait times and travel times for care, especially in rural areas.iii

3. Any external evaluation? If so, findings:

A comprehensive literature review released in 2012 of 1100 citations assessing DTs in 26 countries found that dental therapist safety and quality were essentially on par with that of dentists for the same procedures.[iv] In 2013 the American Dental Association's Council on Scientific Affairs published a review of dental therapy studies which found that dental teams employing dental therapists reduce the rate of untreated caries more than dentist-only teams.[v] An economic assessment of Dental Health Aide Therapists practicing in Alaska found that, after accounting for the costs of their employment (including a dental assistant's salary); dental therapists bring in an average of $127,000 in net collected revenues for their practices.

One private practice in Minnesota accrued an additional $24,000 in profit after the dental therapist's first year (after accounting for the DT employment costs), while also increasing by more than 200 the number of Medicaid patients served.vii This is notable given that Minnesota has one of the lowest Medicaid reimbursement rates in the nation.viii

At one private dental practice in Saskatchewan, Canada, two dental therapists paid solely on commission generated combined profits—after accounting for commissions and other overhead expenses—of CA$216,987. This was achieved with 15% of collections coming from government payments ranging from 70-85% of private fees.ix

4. Barriers/challenges faced:

In terms of political barriers, the American Dental Association and state dental societies have lobbied against state-level dental therapy legislation. Other challenges to implementation include generating interest among academic training institutions to launch training programs and marketing this new type of midlevel oral health provider to safety net providers, health plans and group and individual dental practices.

5. Financing/regulatory changes needed to implement more widely:

States interested in authorizing dental therapists would need to implement legislation to change the state dental practice act. State Medicaid agencies and private insurance companies would need to grant dental therapists billable provider status.

6. Advice for others:

Those interested in bringing dental therapy to their states should engage in coalition-building with stakeholders including legislators; dental hygiene state associations; hospital associations; safety net providers; community colleges; advocates for children, the elderly and disabled individuals; and other interested stakeholders.

INNOVATION SUMMARY

Children's Dental Services Sarah Wovcha, JD, MPH

1. **Briefly describe the innovation** (Occupation(s), additional education/training required, activities/tasks/responsibilities, supervision and relationship to other practitioners):

Occupation: Advanced Dental Therapist (ADT)
Training required: There are two models:

- Requires licensure as a Registered Dental Hygienist and provides training to receive a Master of Dental Therapy degree.
- Requires 1 year of prerequisites and provides training to receive a Bachelor of Science in Dental Hygiene/Master of Dental Therapy dual degree program

2,000 hours of clinical training under the direct supervision of a dentist is required before licensure. Post-licensure a Collaborative Management Agreement with a dentist is required, but the ADT may practice under General Supervision in a location without the dentist being present.
Scope of Practice:

General Supervision (i.e. dentist may or may not be present)

1. Oral health instruction and disease prevention education, including nutritional counseling
2. Preliminary charting of the oral cavity
3. Making radiographs
4. Mechanical polishing;
5. Application of topical preventive or prophylactic agents, including fluoride varnishes and pit and fissure sealants
6. Pulp vitality testing
7. Application of desensitizing medication or resin
8. Fabrication of athletic mouthguards
9. Placement of temporary restorations
10. Fabrication of soft occlusal guards
11. Tissue conditioning and soft reline
12. Atraumatic restorative therapy;
13. Dressing changes
14. Administration of nitrous oxide

Indirect Supervision (i.e. dentist onsite)

1. Emergency palliative treatment of dental pain
2. The placement and removal of space maintainers
3. Cavity preparation
4. Restoration of primary and permanent teeth
5. Placement of temporary crowns
6. Preparation and placement of preformed crowns
7. Pulpotomies on primary teeth
8. Indirect and direct pulp capping on primary and permanent teeth
9. Stabilization of reimplanted teeth
10. Extractions of primary teeth
11. Suture removal
12. Brush biopsies
13. Repair of defective prosthetic devices
14. Recementing of permanent crowns

2. Actual or expected results/outcomes:

The actual results seen in Minnesota by Children's Dental Services and other providers is that ADTs are providing services under their scope of practice at a rate comparable to dentists but at approximately half the salary cost. Additionally the distribution of ADTs between urban and rural regions better matches the respective needs in those regions than that of dentists.

3. Any external evaluation? If so, findings:

Yes, the Minnesota Department of Health and Minnesota Board of Dentistry conducted a survey and a 2014 report entitled "Early Impacts of Dental Therapists in Minnesota"; the finding of the report support the outcomes describe in number 2 above.

4. **Barriers/challenges faced:**

Acceptance by the dental community was an initial challenge but has improved.

5. Financing/regulatory changes needed to implement more widely:

Members of the Minnesota Safety Net Coalition ensured that reimbursement rates per procedure were the same for ADTs and dentists.

Integrating ADTs into insurance infrastructure required more than one year of planning.

6. **Advice for others:**
    a. Ability to do preventive care in portable settings is useful.
    b. Ability to practice under general supervision allows flexibility and frees clinic space for additional providers.
    c. Carefully monitor post-legislative process to ensure that regulatory/enforcing bodies implement protocols that are consistent with legislative intent.

INNOVATION SUMMARY

Dental Therapists
Mark Schoenbaum
September 2016

1. **Briefly describe the innovation**:

In 2009, Minnesota became the first state government to license dental therapists and advanced dental therapists. Dental Therapists (DTs) provide evaluative, preventive, restorative and minor surgical dental care within their scope of practice under the direction of a dentist. After working for 2,000 hours, dental therapists are eligible for certification as Advanced Dental Therapists. Advanced Dental Therapists (ADTs) may provide additional services such as oral evaluation and assessment, treatment plan formulation, non–surgical extraction of certain diseased teeth, and more. ADTs also practice under the supervision of a dentist, but the dentist does not need to be on site or see patients before they receive care.

Dental therapists need either a Bachelors or Masters degree; Advanced Dental Therapists need a Masters degree. Many are also dental hygienists. Education programs are located at Metropolitan State University /Normandale Community College and the – Advanced Dental Therapy Program and the University of Minnesota School of Dentistry

2. **Actual or expected results/outcomes:**

Dental therapist education began in 2009 and the first dental therapists became licensed in 2011. There are 10 – 20 graduates per year and currently about 64 licensed dental therapists. Dental therapists and advanced therapists work in a wide variety of settings and locations, both urban and rural, throughout Minnesota.

3. **Any external evaluation? If so, findings:**

Early Impacts of Dental Therapists in Minnesota, 2014. Minnesota Department of Health and Minnesota Board of Dentistry: Dental therapists are serving predominantly low-income, uninsured and underserved patients. Dental therapists are practicing safely, and clinics report improved quality and high patient satisfaction with dental therapist services. Clinics employing dental therapists are seeing more new patients, and most of these patients are public program enrollees or from underserved communities. Dental therapists have made it possible for clinics to decrease travel time and wait times for some patients, increasing access. Benefits attributable to dental therapists include direct costs savings, increased dental team productivity, improved patient satisfaction and lower appointment fail rates. Savings from the lower costs of dental therapists are making it more possible for clinics to expand capacity, such as adding operatories, to see more public program and underserved patients.

Dental therapy practice patterns in Minnesota: a baseline study. Blue CM, Kaylor, MB. Dental therapy practice patterns in Minnesota: a baseline study. Community Dent Oral Epidemiol 2016: Dental therapists are treating a high number of uninsured and underinsured patients, suggesting that they are expanding access to dental care in rural and metropolitan areas of Minnesota. Dentists appear to have an adequate workload for dental therapists and are delegating a full range of procedures within their scope of practice. Dentists performed fewer restorative and preventive procedures after a DT was hired.

Dental Therapy Toolkit. Minnesota Department of Health, 2016[1]. The Minnesota Department of Health is publishing a toolkit for prospective dental therapist employers. Completed topics include a literature review, environmental scan, dental therapist and advanced dental therapist interviews, current employer interviews, potential employer interviews, and summary of dental therapy regulatory and payment processes. The final Toolkit, due in October, will also include interview findings on patient acceptance, office staff acceptance, dentist- dental therapist relationships, reimbursement and financial, clinical practice, barriers to hiring and overcoming hiring barriers, oral health team integration, economic benefits, etc.

Case studies are also forthcoming from Delta Dental of Minnesota.

Minnesota's dental therapy experience has also been the subject of numerous publications by both proponents and opponents.

4. **Barriers/challenges faced:**

As a new provider type, employers experienced the stages of adoption similar to any new phenomenon. Initially, a few early adopters hired dental therapists. As others took notice of the early adoption experience and viability of the model, the pace of hiring, integration and practice increased.

5. **Financing/regulatory changes needed to implement more widely:**

Minnesota's dental employer market is demonstrating a preference for those mid-level practitioners who can provide the broadest range of services, including dental hygiene, and who can work with the greatest independence. In Minnesota's model, that combination is found in Advanced Dental Therapists who are dually licensed as dental hygienists. States designing a mid-level provider model may want to structure it to allow for these components.

Timely establishment of reimbursement schedules, provider enrollment and credentialing infrastructure and other health care finance groundwork by state Medicaid agencies and as many other payers as possible is important to a successful launch.

6. Advice for others:

Expect the classic innovation adoption curve to apply following licensure enactment and make efforts to speed adoption and employment. Among other benefits, this type of effort may help new graduates more quickly find jobs in this new role in U.S. oral health care.

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[i] [1] http://www.health.state.mn.us/divs/orhpc/workforce/emerging/dt/index2.html#toolkit

New Zealand Ministry of Health, *Our Oral Health–Key Findings of the 2009 New Zealand Oral Health Survey*. Chapter 7, Table 93 ; Agency for Healthcare Research and Quality. Table 2.2: Percent of Children Age 2 - 17 with a Dental Visit in the Past Year: United States, 2010. Medical Expenditure Panel Survey Household Component Data. Generated May 09, 2013. http://meps.ahrq.gov/mepsweb/data_stats/quick_tables_results.jsp?component=1&subcomponent=0&year=2010&tableSeries=-1&searchText=dental&searchMethod=1&Action=Search

[ii] Alaska Native Tribal Health Consortium, W.K. Kellogg Foundation, *Alaska Dental Health Aide Therapists mark 10 years in practice, expanding access to dental care for 40,000 Alaska Native people*, (June 4, 2014), http://www.anthctoday.org/news/2014-05-27%20DHAT%20advisory%20FINAL%20Alaska.pdf .

[iii] Minnesota Department of Health and Minnesota Board of Dentistry, *Report to the Minnesota Legislature 2014: Early Impacts of Dental Therapists in Minnesota*, (February 2014), http://www.health.state.mn.us/divs/orhpc/workforce/dt/dtlegisrpt.pdf.

[iv] Nash D, Friedman JW, Mathu-Muju KR, Robinson P, Satur J, Moffat S, et al. A Review of the Global Literature on Dental Therapists. 2012.

[v] Wright JT, Graham F, Hayes C, Ismail AI, Noraian KW, Weyant RJ, et al. A systematic review of oral health outcomes produced by dental teams incorporating midlevel providers. J Am Dent Assoc [Internet]. 2013 Jan [cited 2016 Apr 7];144(1):75–91. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23283929

[vi] *Tribal Health Organization DHAT Survey Results*, January 11, 2012, prepared by Scott & Co. for Alaskan Native Tribal Health Corporation.

[vii] The Pew Charitable Trusts. *Expanding the Dental Team: Studies of Two Private Practices.* February 2014. http://www.pewtrusts.org/en/research-and-analysis/reports/2014/02/12/expanding-the-dental-team;
American Dental Association. Medicaid Fee-for-Service Reimbursement as a Percentage of Commercial Dental Insurance Charges, Pediatric Dental Care Services, 2013.

[viii] The Pew Charitable Trusts. *Expanding the Dental Team: Studies of Two Private Practices.* February 2014. Accessed on August 22, 2016 at http://www.pewtrusts.org/en/research-and-analysis/reports/2014/02/12/expanding-the-dental-team;
American Dental Association. Medicaid Fee-for-Service Reimbursement as a Percentage of Commercial Dental Insurance Charges, Pediatric Dental Care Services, 2013.

[ix] The Pew Charitable Trusts. *Expanding the Dental Team: Studies of Two Private Practices.* February 2014. http://www.pewtrusts.org/en/research-and- analysis/reports/2014/02/12/expanding-the-dental-team.