

Collaborative Practice in American Dentistry: Practice and Potential

Elizabeth Mertz, PhD, MA; Vanessa Lindler, MA; and Catherine Dower, JD
UCSF Center for the Health Professions
January 2011

Table of Contents

Introduction	3
Objectives	4
Background: Drivers and Definitions of Collaborative Practice	4
Dimensions of Collaborative Practice.....	7
Model 1: Collegial Relationship.....	10
Model 2: Legal Agreement.....	12
Model 3: A Common Employer	13
Model 4: A Public Health Agency	14
Model 5: Hub and Spoke	15
Key Findings for the Oral Health Care Delivery System	16
Facilitating the Adoption of Collaborative Practice in Dentistry	20
References	21
Acknowledgements	23
Advisory Panel	23
Appendix 1: Report Methodology.....	23
Appendix 2: Glossary	24

Introduction

Practitioners in today's health care environment continue to face a rapid pace of change driven by population demographics, evolving disease patterns, advances in technology and clinical practice, and unsustainable costs. With the passage of the 2010 Patient Protection and Affordable Care Act, there will be continued pressure to improve system performance, increase access, and reduce the pace of cost inflation in the health care sector. In addition, reducing health care disparities and improving service to the increasingly culturally and ethnically diverse population of the United States are high priorities for policymakers. New practice models are needed in all of health care to meet these goals. Toward this end, a number of major initiatives have been proposed to address cost, quality, and access such as establishing the integrated patient-centered medical home (PCMH), developing accountable care organizations (ACOs), and placing an increasing focus on pay for performance and comparative effectiveness research (CER).¹⁻⁴ As well, significant research dollars are being invested to understand health disparities and to find mechanisms for their reduction.

Historically, dentistry has remained relatively insulated from the turmoil within the health care marketplace and has evolved within a separate delivery system. The exclusion of dental benefits from Medicare and the separation of dental benefit plans from medical insurance have shielded the dental care marketplace from the cost and quality assurance pressures that medicine has engaged with for more than a quarter century. Today all practitioners in health care realize that health is produced through complex mechanisms and that the intervention of one provider, such as a dentist, may be necessary but not sufficient to help individuals achieve their health goals. Likewise, as emphasized in the Surgeon General's report Oral Health in America, "oral health means much more than healthy teeth," and "oral health is integral to general health".^{5(pp.17-18)} It follows, then, that the production of oral health as part of overall physical,

mental, and social well-being can be facilitated by a wide range of health care providers. Particularly as the links between oral and systemic diseases are made clearer and as electronic medical and dental records empower providers with more information, teams of providers must be aware of these connections and understand how they can help patients improve their oral health status.

Unlike the gradual shift in medicine away from solo practice, dentists predominantly continue to work in small solo and group practices. The fields of medicine, nursing, and pharmacy have all vastly expanded skill levels and specialization within their professions while the allied health care workforce has grown, adding dozens of new technicians and other assistants. As a result, many providers now have overlapping scopes of practice. Meanwhile, within dental practices, the range of oral health care providers has remained fairly static and well delineated. Almost all general dentists, who make up 80% of the dental workforce, employ dental assistants, and the majority also employ dental hygienists.⁶ In the past decade, however, change has begun to occur. The scope of practice for allied dental providers has evolved, including the expansion of direct access for hygienists and the establishment of extended functions for dental assisting. Currently nine dental specialties have been codified.ⁱ It is only recently that the field has started to expand with the introduction of new members to the dental workforce, such as dental therapists, community dental health coordinators, public health hygienists, and advanced dental hygiene practitioners, who may have overlapping scopes of practice.⁷⁻⁸

Many practice innovations in health care designed to coordinate care among the increasing number of providers have not yet been widely adopted in the dental care field. One of these innovations

ⁱ Dental Public Health, Endodontics, Oral and Maxillofacial Pathology, Oral and Maxillofacial Radiology, Oral and Maxillofacial Surgery, Orthodontics and Dentofacial Orthopedics, Periodontics, Pediatric Dentistry, Prosthodontics.

is collaborative practice. Collaborative practice is widely used in medicine, both formally and informally, and today the belief that comprehensive primary and specialty care can best be achieved through a patient-centered, collaborative team approach is becoming more accepted.⁹ Although a number of studies have promoted collaborative models of care and have examined the factors necessary for effective collaboration, no study has examined the full range of practices that are considered collaborative in both medicine and dentistry.¹⁰⁻¹³

Objectives

This study is designed to evaluate the potential of collaborative practice models in the provision of primary dental care within the oral health care delivery system in the United States. Collaborative practice encompasses a wide number of arrangements and is common in various health care settings between physicians, nurses, and other types of providers in the United States. However, these arrangements are not widely utilized in dental care. The objective of this study is to understand how collaborative practices are arranged and how they may affect patient care, income, productivity, and the culture of dental practice.

The key questions the report seeks to answer are

1. What is the range of practices that are considered collaborative?
2. What are the rationales for collaborative practice?
3. How are those practices structured in terms of formal agreements, referrals, supervision, care protocols, caseloads, malpractice, and financing?
4. How are the various practitioners who are involved in collaborative practice compensated for their work?

5. How do different financing models of collaborative practice impact the income of the different types of practitioners involved?
6. How do collaborative practice models affect other aspects of practice, including productivity and practice culture?

This report assesses and describes collaborative arrangements in health care, with a focus on the impact of providers such as nurse practitioners and physician assistants on the practice of medicine, including income potential and resource uses. Medical models in collaborative practice are examined for their degree of transferability to dentistry. Collaborative practices in dental care in the United States and abroad are examined, with a focus on the structures within which these practices exist and the ways in which parties to the collaborative practice are compensated for their work. This report should serve as a tool for policymakers as they consider and design practice requirements for new or existing dental providers.

The remainder of this report is structured as follows. First, we provide a working definition of the term collaborative practice and examine the ways in which it has been studied in other fields. Second, we outline the dimensions of the practice model in order to understand the building blocks of any collaborative arrangement. Third, we explore five ideal type collaborative practices, providing examples of areas in which these are employed in both medicine and dentistry. Finally, we provide a discussion of the key findings for the oral health delivery system and of ways to facilitate the adoption of collaborative practice within the oral health care field.

Background: Drivers and Definitions of Collaborative Practice

According to published medical and dental literature, the drivers behind collaborative practice models span a range of pragmatic objectives. Some collaborative practice models were developed to

increase access: Patient demand exceeded provider supply (overall or in certain locations), so the pool of primary care providers was expanded to include additional professions.¹⁴⁻¹⁶ Closely related were **efforts to improve practice productivity and efficiency**, which effectively increase a practice's capacity to handle greater numbers of patients or visits.¹⁷ **Lowering or managing costs** was also a reason cited in the collaborative practice literature.^{14, 18} In some cases, the **improvement of patient clinical outcomes** was a primary reason for implementing collaborative care.^{14, 18} Finally, researchers and analysts have noted improved **patient satisfaction** as a reason for instituting collaborative practice.¹⁸

Perhaps reflecting the varying reasons for its adoption, the concept of *collaborative practice* can be described in terms ranging from philosophical to practical and from common, everyday words to clinical and legal definitions. An important starting point is to distinguish *collaborative practice* from *collaboration*. All health care professionals work in collaboration with other providers during the course of their professional activities, but collaborative practice goes further. Thompson (1995) makes this distinction, noting that collaboration is a single temporal event that occurs intermittently over the course of day-to-day work while collaborative practice is a dynamic process involving a commitment to interact on a professional level, thereby empowering participants to blend their talents and achieve more than either could alone.¹⁹

Researchers have identified a number of facilitating conditions considered necessary for collaborative practice to be successful, including an organizational mandate, clear sets of responsibilities, a team structure, a team process, and shared goals and outcomes as well as a supportive environment.¹¹ Among collaborating professionals there must be shared competence, shared accountability, mutual respect and trust, communication, autonomy, assertiveness, cooperation, and mutual support as

well as coordination.²⁰ Unlike efforts to measure teamwork and coordination – such as those being attempted, for example, in patient-centered medical homes, no formal efforts attempting to measure collaborative practice models across organizational settings were revealed in the literature review.

Efforts to bring structure to the concept of collaborative practice can be found in the legal and payment policy arenas. The Centers for Medicare and Medicaid Services (CMS) have adopted a definition of *collaborative practice* for nurse practitioners (NPs) seeking Medicare payment (see sidebar below). In addition, largely driven by attempts to expand or clarify the scope of practice laws for nurse practitioners, state laws often use the term *collaboration* or *collaborative practice* to describe the legislature's goal of having NPs and physicians work together. Almost half of the states have laws on the books requiring NPs and physicians to work collaboratively.²¹ However, not all laws define *collaborative practice*, and the definitions that do appear are not standard among the states (descriptions of and requirements for collaborative practice agreements vary widely) and may even be internally inconsistent and confusing. For example, NPs in Louisiana who engage in medical diagnosis and management must have a collaborative practice agreement but NPs practicing nursing solely are not required to have such an agreement. NPs in Louisiana must therefore distinguish between services that are "medical" and those that are "nursing" even though, in practice, the line between nursing and medicine is sometimes unclear.²¹ In California, NPs must develop written standardized procedures "collaboratively" with their "supervising" physician.²²

Recently enacted state laws regulating dental hygienists and dental therapists in collaborative dental practices (e.g., laws in Alaska, California, Michigan, Minnesota, New Mexico, Oregon, and Washington) echo the NP laws in their inconsistency. The statutory variation across the states reflects more political compromise

than evidence-based decision making by state legislatures. In attempts to establish or expand the legal scope of practice for a new or emerging profession, collaborative practice may be viewed as an area somewhere midway between legally requiring supervision and granting autonomous practice authority.

Political agreement on this middle ground may be easier to reach than agreement at either extreme end of the continuum, although a vague definition of that middle ground could actually result in the implementation of a law that, in practice, is at one end or the other. For example, a statute that purports to require collaborative practice between members of two professions but grants broad authority to the respective regulatory agencies to implement the law may result in detailed regulations spelling out on-site oversight, effectively setting forth an arrangement that is more supervisory than collaborative. Alternatively, absent prescriptive

statutory and regulatory language, laws may be implemented with a wide range of applicability (or interpretation) based on provider or organization preferences. Although providers and organizations cannot go beyond the law, they may have broad discretion to develop the terms of the collaborative agreement within the bounds of the law. It is

also worth noting that over-codification – where an attempt is made to legislate or regulate every aspect of collaborative agreements – may result in an unintended consequence. In particular, the new laws may establish or maintain control of one profession by another despite any stated collaborative goal.

The federal definition of collaboration (between NPs and MDs) as found in CMS regulations regarding Medicare (CFR 410.75 (c)(3)) is

- (i) Collaboration is a process in which a nurse practitioner works with one or more physicians to deliver health care services within the scope of the practitioner's expertise, with medical direction and appropriate supervision as provided for in jointly developed guidelines or other mechanisms as provided by the law of the State in which the services are performed.
- (ii) In the absence of State law governing collaboration, collaboration is a process in which a nurse practitioner has a relationship with one or more physicians to deliver health care services. Such collaboration is to be evidenced by nurse practitioners documenting the nurse practitioners' scope of practice and indicating the relationships that they have with physicians to deal with issues outside their scope of practice. Nurse practitioners must document this collaborative process with physicians.
- (iii) The collaborating physician does not need to be present with the nurse practitioner when the services are furnished or to make an independent evaluation of each patient who is seen by the nurse practitioner.

Taking into account the current breadth of descriptions of collaborative practice, a working definition was developed. As defined for this project, *collaborative practice* encompasses any ongoing, systemic professional relationship between two or more health care providers, each having some degree of authority to independently provide health care services within his or her legal scope of practice. These relationships are distinguished primarily by their variation on two key dimensions. First is the *level of formality* of the relationships among the practitioners involved. This includes whether the relationship involves specific practitioners, is structured by a collaborative practice agreement, or involves a formal referral network, as well as the specificity of

services performed by the parties. Second is the *degree of autonomy* of the practitioners involved. Practitioners might have complete autonomy, constrained only by legal scope of practice, or they could be subjected to some type of supervision by another practitioner.

In summary, the philosophical and pragmatic rationales for collaborative practice are fairly well defined, as are the necessary conditions for a successful collaborative practice at the interprofessional and organizational levels. The legal and payment constructs developed to formally enact this practice exhibit wide variation, and there is little research on the organizational structure of collaborative practices across health care disciplines and settings. In order to best delineate how the collaborative practice model might work in dentistry, the next section of our report outlines these broader organizational structures and systems.

Dimensions of Collaborative Practice

There is no single definition or model of collaborative practice. Rather, a range of practices that vary in their rationales and in their organizational, legal, operational, and financial structures can be considered collaborative. The following list describes the multiple dimensions of the forms of collaborative practice as well as the range that exists within these dimensions. This list is followed by a discussion of a continuum of the most common arrangements of collaborative practices and real-world examples of each type in both medicine and dentistry.

“At its core, interprofessional care has to do with breaking down walls and making a shift from autonomy to interdependency. Individuals engaged in collaborative practice are mutually dependent on each other and are aware of each others’ expertise. Power is shared among team members, including the patient. Making this shift might mean the actual removal of physical walls and changing a practice into an open concept space with minimal or zero private office space. It will certainly mean instituting practices that promote collaboration and the sharing of information – multidisciplinary rounds, for example, where the practitioners in a collaborative practice facility meet to discuss and recommend steps for a particular client’s care, often with the participation of that client.”

—M. DeMone, 2009²³

1. Organizational structure

Professional participants: The participants in collaborative practice arrangements can vary from independent practitioners in separate organizations to practitioners employed by the same organization. Providers most commonly have some overlapping legal scope of practice authority for the services they provide.

Setting: A legal and/or organizational structure is generally present to monitor the agreement between these providers; however, a collaborative practice arrangement can be informally executed between two independent providers with no external oversight. Collaborative practice may span one or more individual practices or exist within a single organization. Collaborating providers are not generally required to be on-site together although, if applicable, the provider with the greater scope of practice is usually required to be available in some manner (e.g., by phone, page, or computer) for consultation or referral if needed. In some cases, providers are limited by law to practice collaboratively only in certain settings.

System ownership: The relationship can exist within a public organization, within a privately owned (profit or nonprofit) organization, or between two independent owners. The ownership status may be connected to funding streams that are likely to have an effect on the organizational rationale and implementation of the collaborative

practice.

Referral networks: The referral network among collaborating providers can be informal, formal (i.e., utilizing contracts), or exclusive within an organizational structure. Referral is an expected part of the collaborative practice when a patient's needs exceed the competence or scope of one provider and must be referred to the next.

Professional relations: Trust, respect, and mutual agreement on shared goals for the patient need to be present in collaborative practices. In our study interviews we were told that providers often initially fear working collaboratively, yet most providers who take on these practice models later report that they are satisfied with the arrangements.

2. Legal and institutional requirements

Formal collaborative agreements: Formal agreements are not always present. However, such agreements are often required by law or by the organization employing the collaborating providers. The range of agreements varies widely, from oral or "handshake" agreements to extensive legal documentation of working arrangements and allowable duties. Some aspects of collaboration have not been legally addressed. For example, the ethics and legality of members of one profession demanding fees from members of another profession for the act of signing a collaborative practice agreement have not been tested. Similarly, it is unclear what can or should be done in situations where one professional has agreed to a collaborative practice agreement but declines to see the patients referred by his or her collaborating colleague.

Protocols: Protocols for clinical care delivery processes may or may not be included in collaborative practice agreements. Some protocols are tailored specifically to the individuals collaborating and are based on the comfort level of the two providers, others are more generic legal templates, and still others involve cases in which the

protocols are strict and evidence based.

Supervision: The collaborating providers each work within their legal scope of practice, which – quite apart from any collaborative agreement – may or may not require supervision by another professional. In addition, a collaborative practice agreement itself may or may not require the supervision of one party by the other. Institutional policy may add yet another possible supervision requirement, and providers working under collaborative practice agreements within a single organization may be required to be supervised by clinical or managerial staff. Types and definitions of supervision vary but typically fall into three main categories: direct, indirect, and general. Direct supervision usually involves the physical oversight of the supervising clinician, while indirect supervision usually requires the supervising provider to be on-site but allows the person to be involved in other activities while the supervised activity is being performed. General supervision can be conducted remotely. General supervision definitions vary by profession and by state. In some cases, general supervision requires the individual being treated to be a patient of record of the supervising clinician and a treatment plan to be on file. In other arrangements (e.g. between MDs and PAs or between dentists and DHATs), general supervision may not have the patient-of-record and treatment plan requirements but is still structured with prospective, concurrent and retrospective elements. The prospective element includes arrangements - such as those regarding 'on-call' responsibilities, practice settings and approved communication modes - made prior to the care being delivered. The concurrent element details how the supervising clinician will be available at the time treatment is delivered (could be onsite but more often by electronic communication). The retrospective element includes post-treatment audits such as reviews at the end of the day, chart inspections and quality assurance processes.²⁴ In any supervision or collaboration arrangement, a number of tools such as standing orders (such

as those for refilling prescriptions or authorizing immunizations), standardized procedures, guidelines, or protocols might be used to structure the activities of the supervised practitioner. In addition, the supervising clinician usually has the discretion, within legal and institutional parameters, to consider an individual's competence when authorizing specific procedures and activities.

Education: The education of providers in collaborative arrangements comes at various stages. Some providers (e.g., nurse practitioners) may be exposed to collaborative practice in their formal professional training, whereas others may be introduced to the concept once they have been employed in an organizational setting. Since both providers involved in a collaborative practice are working within the legal scope of practice for which they have been trained and licensed, there is no additional formal clinical training required for collaborative practice. However, managerial or teamwork training may be helpful or necessary to overcome professional reluctance or resistance.

Licensing and certification:

Within the various states, each group of providers is regulated by a governmental body that implements the respective licensing laws. State licensing requirements include eligibility, education, training and testing elements and professional licenses are usually associated with a legal scope of practice authority that spells out what services members of the profession may provide to the public.

Minnesota is one of 45 states that permit general supervision in the private dental office.²⁵⁻²⁷ In Minnesota, dental supervision is similar to that of most other states and includes the following three definitions:

GENERAL : The dentist has prior knowledge of and has given consent for the procedures being performed. However, the dentist is not required to be present in the dental office or on the premises during the procedures.

INDIRECT: The dentist is in the office, has authorized the procedures, and remains in the office while the procedures are being performed by the allied dental professional.

DIRECT: The dentist is in the dental office, personally diagnoses the condition to be treated, personally authorizes the procedure, and evaluates the performance of the allied dental professional before dismissal of the patient.

Certification is a separate activity offered by the private sector – usually at the national (not federal) level – for some professions. Certification bodies, which may or may not be accredited, have their own eligibility, education and testing requirements. Sometimes, but not always, state licensing laws and regulations reference national certification and may require certification as necessary to meet licensing requirements. Other times, certification may be required or preferred by employers. In still other cases, certification is seen as an aspect of professional development but not required by law or employer policy.

3. Operational and financial structure

Caseloads: A collaborative practice generally indicates an overlapping caseload or client base (e.g. patient of record). If the providers both work for the same organization, patients may be divided by the severity of their conditions or needs, with the provider with more advanced competence taking more difficult cases. If the providers are independent, the case distribution may involve referring patients when deemed appropriate as judged by the provider and consistent with any guidelines or protocols in the collaborative practice agreement. The patient is likely to be a “patient of record” with both providers at some point.

Malpractice Insurance: Providers in a collaborative practice arrangement may each hold their own malpractice insurance, one provider may hold insurance for both parties, or the organization they work for may provide it for them. Although malpractice coverage requirements may or may not be determined by state statute, in general any

provider able to work directly with patients under his or her scope of practice is covered by some sort of malpractice insurance.

Financing: Providers in collaborative practice arrangements have the same financing mechanisms available to them for the services they offer as do providers who are not in collaborative arrangements: Medicare, Medicaid, and other government programs; private insurance; HMOs; general operating budgets for organizations and institutions such as public health departments and community clinics; and patients paying out of pocket. Payments to providers can be based on the services provided or, if the provider is an employee, a negotiated wage. No payors currently pay for the “act” of collaborating; rather, the collaboration itself increases efficiency, reduces costs, or otherwise contributes to increased revenue or decreased costs that result in positive compensation for participating providers. Payment to two providers for the same service on the same day is generally prohibited by private and public payors.

Given the variance within collaborative practice models, it would seem that dozens of arrangements that could be considered collaborative are possible. Although one category above specifically covers some legal aspects, virtually any of the dimensions in all categories could be included in legislation or regulation regarding collaborative practice agreements but, as noted earlier, extensive codification carries risks. Our research identified a continuum of five ideal typeⁱⁱ models of collaborative practice. These models are currently being employed in medicine or dentistry either domestically or abroad. Within any actual model employed in the delivery system, all 13 dimensions discussed in the previous section could be

ii An ideal type is a construct abstracted from experience in which individual elements are combined to form a whole that is conceptually independent of empirical factors or variables, but against which particular examples of the appropriate class found in life can be measured (definition from dictionary.com). The term ideal is not meant to convey that these are standards of excellence or perfection.

identified. Table 1 provides highlights of five of these dimensions for comparison of the ideal types.

Model 1: Collegial Relationship

This model is most common between general practitioners (dentists and physicians) and specialist practitioners in the intraprofessional realm. No legal or formal agreement exists between the providers; rather, a professional referral relationship exists with some coordination and care continuity. These independent professionals have their own patients, and they share a scope of practice, but one provider has advanced or different specialty training. Such arrangements can also be found between nurse practitioners and physicians in states that grant broad practice authority to NPs. Each provider is paid separately by a third party payor on a fee-for-service basis for the services he or she has provided. The primary goal of this collaboration is to ensure comprehensive, quality patient care and to ensure that the providers are not working outside of their expertise, a situation that might open them up to malpractice concerns. Although granting providers such as nurse practitioners or dental hygienists autonomy of practice (or some level of reduced supervision) has been a highly contentious and politicized issue over the years in both medicine and dentistry, studies examining the models in which these changes have been implemented have found no reduction in the quality of care and no instances of harm to patients from these experiences.²⁸⁻³⁰

Medical Example

A primary care clinician (MD or NP) collaborates with specialty physicians (or dentists) by referring patients for their advanced care needs. The relationships are not formal contracts but rather are based on professional and personal contacts and preferences. Each provider has his or her own office, fee structure and billing, and malpractice insurance. If the collaboration is a common occurrence, with referral to the same providers(s) with regular follow-up and care coordination, then in theory this arrangement would fall under the realm of

Table 1. Five Ideal Type Collaborative Practice Structures

	Model 1: Collegial Relationship	Model 2: Legal Agreement	Model 3: Common Employer	Model 4: Public Health Agency	Model 5: Hub and Spoke
Organizational Structure	Operationally and legally independent providers	Operationally independent providers with legal ties	A single health care practice or organization that employs/ contracts with providers	A public health entity that employs/contracts with providers	An ancillary setting (can be retail or part of a public or private health system) working within collaborative protocols
Key Rationale (in order of importance)	Quality (referrals), access	Quality (referrals), access	Quality, efficiency (cost), access	Access, efficiency (cost), quality	Access, quality, efficiency (cost)
Legal	No formal ties—handshake or professional courtesy	Documented legal relationship	Documented legal and/or organizational relationship with organizational policies	Documented legal and/or organizational relationship with organizational policies and protocols	Documented legal and/or organizational relationship with evidence-based protocols
Operational	No operational overlap, independent caseloads (patients are patients of record for both providers)	No operational overlap, independent caseloads (patients are patients of record for both providers)	The health care entity depends on collaboration as part of the business model; caseloads are separate (patients are not necessarily patients of record of both providers)	The health care entity depends on standing orders from clinical staff from administrative supervisors	Limited services and strict guidelines for service and referral
Financial (in order of likelihood)	Fee for service, private insurance, cash, public insurance, health maintenance organization	Fee for service, private insurance, cash, public insurance, health maintenance organization	Health maintenance organization or capitation, public and private insurance, fee for service, cash	Public financing; if a clinic, may be capitated, sliding scale, etc.	Cash, public insurance, private insurance
Medical Examples	A dentist and a physician (e.g., ABCD Program in Washington)	A midwife and a physician of record	An NP and MD in an integrated delivery system, NP/MD in specialty practice	Public health nurses and chief medical officer	NP and MD in retail clinics
Dental Examples**	A dentist and dental specialist; a dental hygienists and dentists in Colorado	RDHAP (CA) and dentist of record; DH and DDS in Netherlands; ADT and DDS in MN	Corporate dental practices; FQHC providers; DT and DDS in MN; UK dental practice	CDCH and chief dental officer; Malaysian and Canadian public health systems	DHAT in Alaska*; New Zealand dental therapists

* Some aspects of the DHAT model could fit into Models 3 and 4 as well.

** Provider type acronyms defined in glossary at end of report

collaborative practice. Although the arrangement is not legal or operational, often the range of providers who can “collaborate” in this way may be limited by contracting practices within preferred provider organizations (PPO), point of service (POS) plans, and health maintenance organization (HMO) networks. An example is the Access to

Baby and Child Dentistry (ABCD) Program in Washington State. Although the program originally focused only on engaging pediatric dentists, an increasing number of Washington physicians are now willing to address oral health during well-child checks because ABCD-trained dentists serve as referral sources. Medicaid reimburses trained and

certified primary care providers for delivering oral screenings, health education, and fluoride varnish during well-child checks and for referral to a dentist as necessary.³¹

Dental Example

This same model exists in dentistry: General practice dentists work collaboratively with dental specialists or physicians by referring patients for care that is needed beyond the dentists' expertise. In Colorado, where dental hygienists have had unrestricted independent practice rights since 1986, this same relationship exists between dental hygienists and dentists. Dental hygienists may have their own offices and patient bases and must refer patients to dentists when they see that patients have dental care needs beyond what they can provide.ⁱⁱⁱ

Model 2: Legal Agreement

The primary difference between this collaborative practice model and the one described in the previous example is the presence of a legally binding agreement between the providers that is usually specified in state law. As well, these agreements are interprofessional, meaning that they regulate the relationship between two different types of providers (usually between a physician and a nurse or between a dentist and a dental hygienist). The legal agreements do not have a standard content or format; each set of professions, on a state-by-state basis, negotiates and enacts a format in the political arena. This process determines the legal basis for liability and creates a more formalized referral network between providers. As in Model 1, the providers work within separate domains, and each provider may be reimbursed separately,

ⁱⁱⁱ The Colorado Dental Practice Law requires that a "dental hygienist recommend to any patient that such patient be examined by a dentist" and stipulates that "failure of a dental hygienist to refer a patient to a dentist when the dental hygienist detects a condition that requires care beyond the scope of practicing supervised or unsupervised dental hygiene" is cause for disciplinary action [Colorado Revised Statute. Dental Practice Law, Title 12-35-100, 1986].

usually by a third-party payor on a fee-for-service basis (although this arrangement can vary, so this reimbursement situation is not always the case^{iv}). The primary goal of this collaboration is to provide comprehensive, quality patient care by ensuring that all providers have a source for referral and consultation.

Medical example

In medicine midwives (particularly direct-entry or professional midwives) have long worked under this type of legal agreement.³² The midwife has a delineated scope of practice and education and credentialing requirements, and she often works in the home setting or in a birthing center, in contrast to certified nurse-midwives, who do practice in hospitals. In order to practice, she must have a legal agreement with a physician (usually an ob-gyn) who agrees to provide consultation, emergency services and hospital admitting for the midwife's patients if they are required. Each provider finances his or her own practice separately through traditional third-party or direct payments, and each maintains his or her own liability insurance.

Dental Example(s)

In California the Registered Dental Hygienists in Alternative Practice (RDHAP) work independently under a separate license and can see patients in certain restricted settings.³³ RDHAPs are sole proprietors of their own practices with their own patient populations, and they may employ other RDHAPs as well as office assistants. In order to

^{iv} In Michigan, public health dental hygienists practicing under a new law, PA 161, must file an application with the state Department of Community Health to obtain permission to practice collaboratively. The application includes the information of a dentist who serves as supervisor of the RDH and also stipulates that there must be standing orders, a referral process, and an emergency protocol established between the dentist and hygienist. Many hygienists practicing in this way in Michigan work in nursing homes or long-term care facilities. Dental hygienists cannot be directly reimbursed under Medicaid in the state, but many have worked out contracts for preventive services offered with the facilities they work in and/or bill through their supervising dentist. Further information on PA 161 is available at this site: http://www.michigan.gov/documents/mdch/6-2010_PA_161_Guidelines_332575_7.pdf.

be licensed, an RDHAP must submit a signed Documentation of RDHAP Relationship with Dentist form to the Dental Hygiene Committee of California. This agreement ensures that the RDHAP has a source for referrals, consultations, and emergency services.^v However, in practice, this agreement has not guaranteed that the signing dental provider will accept the referrals, so the RDHAP may still have to find another dentist who will.³³

Although not yet in practice, the Advanced Dental Therapist (ADT) being trained in Minnesota may also be able to work in this type of arrangement. Minnesota has a legal agreement currently in use with public health hygienists called a collaborative agreement.^{vi} For the ADT, the legal agreement is called a collaborative management agreement (CMA). These two different agreements dictate the terms between the hygienist or therapist and the collaborating dentist. In the case of the ADT, the agreement details the ADT's scope of work based on the dentist's assessment of the ADT's skill set and patient needs, regardless of the full scope of ADT practice. ADTs are then expected to work under the standing orders of the collaborating dentist, but they can work semiautonomously.^{vii}

Model 3: A Common Employer

In this model a single health care organization coordinates the care of its members or patients and employs (or contracts) with providers to work collaboratively to maximize the benefit to the patient. In this case, as in Model 2, there may be legal parameters within which the providers must work, but there is also an organizational policy that dictates the internal operations of the

collaborative practice. This organizational policy is usually determined by three parties: the two collaborating providers and an administrator. The organizational policy is put in place to meet a goal of facilitating high-quality and efficient patient management, and often the collaborating providers each have their own patient caseload or may work in a specific organizational goal area such as chronic disease management. The organization provides malpractice insurance for one or both of the providers. Even if the payment for services is fee-for-service from third-party payors, the providers may still be on salary.

Medical Example

Large integrated health systems (such as Kaiser Permanente and the Mayo Clinic) or medium-sized group practices may use this type of arrangement with nurse practitioners (NPs) for example. Salaried NPs may practice to their full legal authority, providing care to patients under agreements that specify collaborating physicians and practice parameters. Under these arrangements, NPs may provide primary care or – increasingly – specialty care including certain procedures (e.g. sigmoidoscopy). The financial benefit of this arrangement to the organization is primarily through efficiencies and improved volume, enabling the entity to use the savings for organizational improvements or profits. The benefit for patients is improved patient outcomes. A standard textbook, Primary Care: A Collaborative Practice, points out that the National Joint Practice Commission found that “joint practice results in improved quality of care, increased patient and provider satisfaction, decreased morbidity and mortality, and decreased hospital length of stay.”³⁴ It should be noted that Federally Qualified Health Centers (FQHCs), Indian Health Service (IHS), the Department of Veterans’ Affairs (VA), and specialty practices fit into this model as well, although they are financed differently. In all cases, the incentive is to provide more value for the health care dollar by seeking efficiencies while improving the quality of patient care.

v For form, see http://www.dhcc.ca.gov/formspubs/form_rdhap_ddssrelationship.pdf

vi For more information, see <http://www.normandale.edu/dental/>.

vii The Minnesota Board of Dentistry CMA for the dental therapist can be found at: <http://www.dentalboard.state.mn.us/Default.aspx?tabid=1165> and <http://www.dentalboard.state.mn.us/Portals/3/Licensing/Dental%20Therapist/DT%20CMA%20Sept%202024,%202010.pdf>.

Dental Example

There are few dentists who are employed by large health care organizations. However, dentists work in FQHCs, in corporate dental practices, and in the VA, IHS, hospitals, and long-term care settings, all of which could utilize this type of arrangement. The newly created classifications of Dental Therapist (DT) and Advanced Dental Therapist (ADT) in Minnesota, while not yet in practice, provide an example of how this type of arrangement may play out in dentistry. The DTs will be required to work under a collaborative management agreement (just like the ADTs); however, rather than being under standing orders, they must have on-site supervision. The distinction becomes important in terms of rationale. The ADT is able to enhance access through managing routine care while referring patients with complex needs; the DT is able to help the practice by providing an increased number of services but is not independently able to provide care outside of the practice.

Model 4: A Public Health Agency

County public health departments often provide clinical services for the populations that they serve. Instead of using the full-service medical centers described in Model 3, this model utilizes clinical staff to address a specific set of diseases or conditions in the community deemed important to the public's health. In this model the patients often are not considered traditional "patients of record" but instead are clients of the public health department in which they are being case managed or are enrolled in a public health intervention program. The clinical staff is employed or contracted by the organization and work under standing orders from a senior clinical administrator such as a chief medical or chief dental officer. Such an organization is usually funded by tax dollars and may or may not be able to supplement with third-party payments. Collaboration in the delivery of health care services in this model is essential as the majority of the work is done by nonphysicians in disease-specific programmatic areas. Liability

Learning from International Experiences

The dental delivery systems examined in this paper represent a wide range of cultures and systems and identify a number of successful models for interprofessional and intraprofessional collaboration. As in the United States, the term collaborative practice as used internationally can refer to a variety of types of arrangements. Gleaning useful information from other countries' experiences involves understanding both the context in which providers are practicing (the delivery system) and the processes (interprofessional negotiation) that providers undergo within these systems to enact change as well as how each system measures success.

Internationally the range of variation in delivery systems is quite large, yet many countries have systems that are similar to parts of the U.S. system. Overall, the U.S. system is more highly privatized than those of other developed and developing nations, but it has a growing public sector safety net. Some countries (such as Malaysia or New Zealand) have public health systems and programs that take primary responsibility for the oral health of specific populations (i.e. low-income persons, children, or other populations) that, like their counterparts in the United States, have barriers to accessing care in the private system. Yet most countries (e.g., Canada, the Netherlands, the United Kingdom, and New Zealand), like the United States, also have a vibrant set of private practitioners who deliver dental care for the general population. Although the financing systems in other countries may differ from the U.S. private insurance market, like the United States, many other countries do not mandate dental benefits for adults, and their populations often face disease patterns similar to those faced by the populations in the United States.

The processes other countries are using to develop new practice models are almost identical to those being employed in the United States; therefore, they can provide useful examples of challenges and successes. For example, as American states consider dental therapist models, policymakers may want to look to Canada, where a collaborative practice model involving dental therapists has evolved to improve access to primary prevention and primary oral health care. Canadian dental therapists work under general supervision. Although laws governing their practice vary by region (just as U.S. laws vary by state), all dental therapists have relationships with dentists to

insurance is held by either the organization or the provider, and the referral of patients by the community-based provider for additional necessary clinical care is a normal and expected part of the practice.

Medical Example

Public health nurses working to monitor and address infectious diseases for a county public health department are employed by the city or county agency. The nurses may work under general supervision and standing orders from the chief nursing or medical office in the county department in a specific disease or program area. Federal and state block grants (tax dollars) may fund the program; however, the providers' income is set to county pay scales.

Dental Example(s)

In the United States the most common example of this type of arrangement is the use of dental hygienists in public health sealant or fluoride varnish programs. In Malaysia much of the dental workforce is employed by the state department of public health and works under this direction. Health Canada, the public health program for First Nations' individuals, also employs dental therapists under the public health program to combat dental disease in these patient populations.

Model 5: Hub and Spoke

This model of care seeks to provide a basic set of primary care services to clients in a community-based setting where providing access to such services is the motivator. In the for-profit sector this model has proven to be profitable; in the nonprofit or public health realm, the return comes through the improved health of the public. The services act as a first line of defense for common ailments, but they are not intended to replace comprehensive medical care when it is needed. Providers in this model work independently providing diagnoses, treatment, and prescriptions on a walk-in basis, yet they are formally linked with a larger delivery

allow for consultations and/or referrals for care beyond the scope of the dental therapist. The profession has evolved over time both in practice and in legislation. The Canadian dental therapists (and dental hygienists) often have caseloads that overlap with those of dentists. Through respectful and collegial relationships between providers that are enabled by laws allowing self-regulation of each group to ensure that each professional has the right to practice to his or her full scope, a variety of models have evolved in each region. Each model is suited to the local population and provider mix, allowing these collaborations to address access-to-care issues at a reasonable cost.

Today the dental professionals in Canada are engaged in joint planning to identify unmet needs and to strategize about how to best meet them as well as how to measure outcomes, an effort indicating the ongoing evolution of collaborative practice models in the country. To date, the measurement of the success of collaborative practice models has not been clearly defined, an area that warrants further attention both in the United States and internationally.

Although many lessons can be learned from other countries' experiences, from a policy perspective, the issues of timing and applicability are particularly critical. Years of cross-country medical care research have been completed, but the key factors affecting whether models from one country can be seriously considered and adopted in another country have to do with how resistant to change an existing system might be, how volatile the environment is, what the balance of power among central authorities and professions is, and how certain reforms are framed and defined in the context of the history of any nation.³⁵

system for referrals and consultations. The key differences between this model and others are the location of services and the use of evidence-based protocols and diagnostic tools to help ensure the quality and standardization of the services provided in the collaboration.

Medical Example

Retail clinics, also known as convenient care clinics, now number more than 1,000 in 37 states and are one example of how such services are arranged.³⁶ This is usually a nurse practitioner-staffed,

guidelines-based model that provides a core, basic set of primary care services, the prices of which are listed for consumers and from which the employed providers do not deviate. Any service required beyond this core set is referred to collaborating providers in local health delivery systems or, in emergency cases, to the emergency room. Although dental care has not yet been included in retail clinics, the model could be replicated for oral health services.³⁷

Dental Examples

A quite different example in dentistry is the Dental Health Aide Therapist program in Alaska. In this program DHATs are part of a team of providers that are employees of the Alaska Native Tribal Health Consortium (ANTHC) located in Alaska. DHATs scope of practice allows them to provide primary care in isolated villages where they live, which are often also the communities where they were raised. The DHAT is remotely supervised by a dentist, and can access that provider for referrals, consultations and other needed support. Strong quality assurance measures are dictated by the Federal standards under which the DHAT practices. These standards require regular and ongoing direct observation by the supervising dentist of the DHAT providing all services within their scope. Standing order documents are individually prescriptive collaborative agreements between the supervising dentist and the DHAT that outline how the DHAT can practice under general supervision. The standing orders may place restrictions such as requiring consultation prior to specific procedures or limiting the DHAT from performing some procedures within their practice authority to instances when they are under indirect supervision.³⁸ In New Zealand, dental therapists also work in a hub and spoke model, generally in schools, but unlike the DHAT model, they practice independently within a consultative relationship with a dentist supported by a written professional agreement.

Key Findings for the Oral Health Care Delivery System

A wide range of practices fall under the rubric of collaborative practice. The ideal types we present represent a continuum of possible arrangements ranging from unstructured, professionally driven referral networks to highly structured, protocol-driven service provisions. In reality, the number of potential collaborative models is much greater than what is represented here. The fundamental feature of collaborative practice is always the commitment by the collaborating providers to work in concert to provide the best comprehensive care for their patients while respecting, recognizing, and building on each other's strengths and talents. The organization and implementation of this conceptual model are dependent on provider preferences, legal limitations, funding streams, scopes of practice, and patient acceptance.

Starting in the 1970s, expanded scope of practice and collaborative practice demonstration pilots were employed in some states to formally test new practice authorities for health care professionals. Following successful demonstration periods, several practice acts were updated to reflect the expanded practice authority. In the nursing field, expanded scope of practice and collaborative practice models were set up to legitimize and update practices that were widely in use but not actually legal under state board license.³⁸ Today these models are widespread and are still evolving. Similarly, in dentistry the development of expanded practice and the introduction of new providers that also began in the 1970s have come in response to a perceived need for workforce redesign to address access to care problems as well as to requests from within the dental hygiene and assisting communities for greater roles and responsibilities. As these models are put into practice, policymakers must work out the details of how these new arrangements should be codified. Collaborative practice seems one appropriate mechanism under which policymakers might work to improve access and ensure quality.

The various rationales for designing collaborative practice models can be placed into three broad and overlapping policy categories: access, cost, and quality. In the oral health care delivery system, all of these are important; however, it is the access to care issue that has received the most attention as a rationale for new workforce arrangements. Collaborative practice models primarily *increase access* in two ways. First, collaborating providers who work at separate sites, particularly those in rural communities, can provide care at places where people live, learn, and work. While one of the collaborating providers may provide comprehensive care, the other may provide first-contact, primary services and then refer or help patients access and then manage the full range of services the patients may need, thereby moving into the delivery system patients who may otherwise have gone without care. Second, when collaborating providers work at the same site, they can increase the volume and efficiency of care provided, thereby making more appointments available and increasing patients' access to services. All of the new workforce models in dentistry being proposed fit into one of these conceptual models for improving access to care.⁷

The second benefit of collaborative practice is in the area of *reducing costs*. A large portion of health care costs are for labor; therefore, the use of the lowest-cost labor that is adequately trained to provide particular services should bring savings to the delivery system. These savings can translate into lower per-member, per-month costs within a closed, or HMO, system or can translate into higher profits (or fewer losses) for an organization or group working under these conditions if procedures are reimbursed in a fee-for-service system. Improved cost savings (i.e. higher profits or fewer losses) are likely to increase with the volume of services provided due to the substitution of lower-cost labor.

A final and critical set of benefits can be gained from the use of collaborative practice models through the *improvement in the quality of care*. Concerns about the quality of care have been at

the heart of the arguments made by established professions when opposing the expanded scope of practice of emerging professions, yet pilot projects testing expanded scopes of practice across a wide range of professions have consistently shown that the new models provide good quality care.³⁸ Going beyond simply examining the equivalence in the quality of procedures or services provided by two collaborating providers (e.g., an NP and an MD) is a related but separate notion that the improved quality of the system can only come from a set of services that are provided in a collaborative manner. For example, within the public health system, public health nurses and other health care providers have long worked under standing orders in a practice model that relies on both delegation and collaboration to provide a whole host of services to high-risk and low-income populations in addition to the essential public health services the workers provide for the entire population. In the case of disease management programs for chronic diseases, it has been shown that using these collaborative team approaches may be a better way to address the myriad of patient needs than relying only on interactions with a single provider.^{12, 39-40} Improvements in access and quality of care for patients and reductions in cost through the use of collaborative practice tend to come at the organizational or system level, not as gains to individual providers.³⁹ One exception is the increase in the number of referrals, which may improve the financial situation of the provider accepting the referrals.

There are a number of barriers to the more widespread adoption of these models, including a highly politicized policy process (enabling turf battles between professions), a lack of educational models utilizing collaborative practice, a lack of an evidence base for informing the lawmaking process (leading to wide variation in regulation), a lack of information technology systems and referral systems (tools available for tracking quality of care and coordinating care), and a lack of evidence-based protocols to guide oral health treatments that

could be considered for adoption by a wider array of providers. These barriers are each discussed in more detail in the following section.

First, states use a multifaceted and politicized system to determine how health care professions can practice. Scope of practice laws are passed by state legislatures, whereas state health professions boards (made up of political appointees) create regulations to implement those laws. Financing organizations often use these laws as the basis for making payment decisions (determining whom to pay directly and for what legal services) while employing organizations add their own set of parameters, prohibiting interprofessional arrangements. Often policy making focuses more on mediating provider relationships than on designing policies and systems that enhance patient outcomes.

Second, few states have adopted processes to evaluate in a systematic or unbiased way the available evidence linking professional competence to practice authority. In other words, even when high-quality research provides findings about the safety and efficacy of a particular profession's education, training, and ability to provide specific services, political compromises often carry more weight. This

phenomenon is clear when one examines the variation in state-based practice authority for a given profession with the body of research and evidence about that profession. The state-to-state variation cannot be justified by the evidence and must be explained by decisions grounded in state politics and interprofessional negotiation.⁴¹ For many health professions, wide variations in practice acts and mandated working arrangements have been codified into practice.²¹

Third, students' health professions educational experiences may influence how these providers chose to practice after graduation. Dental professionals (dentists, hygienists, assistants) are often not trained together, much less with medical, nursing, pharmacy, or other types of health care providers. Without interprofessional education, there are few opportunities for developing the communication, understanding, and trust needed for working collaboratively. This same training barrier exists for practicing providers who have few continuing education opportunities to learn the logistics and outcome potential of collaborative practice. The use of collaborative educational models may help to facilitate the adoption of these models in practice.

Fourth, within dentistry, providers have historically tended to refer to individuals whom they know and trust because there have not been more sophisticated tools for systemic referrals and collaboration. However, this situation is beginning to change with the expansion in

Educational Innovations in Collaboration: New York University's (NYU) Multidisciplinary Practice Model⁴²

In 2003, in response to the 2001 IOM call to facilitate inter professional collaboration in education and practice, the Colleges of Nursing (CON) and College of Dentistry (COD) at NYU developed an innovative partnership with the goals of 1) developing and evaluating new interdisciplinary practice and education models and 2) to support interdisciplinary translational research. The initiative enriched the curricula in both colleges, resulted in a number of interdisciplinary research projects funded, and created interdisciplinary clinical and outreach rotations for nurse practitioner and dental students. In addition, the CON faculty practice and COD oral medicine practice began working across disciplinary lines. This has resulted in the dental students and faculty having a broader understanding of the whole health of the patient, and the nursing faculty and students having a much greater understanding and role in delivering oral health care services as part of primary care. It is not clear if students continue these collaborative efforts once graduated and in practice, nor how those collaborations might be structured. However the collaborative efforts at NYU have been institutionalized and are now part of the normal educational experience for nursing and dental students.

the use of dental and medical electronic records although interoperability between health records is still in its infancy. These tools, where implemented, can serve to increase trust and accountability between collaborating providers, improve continuity of care for patients, improve health system performance, and provide data repositories for documenting quality and cost outcomes.

Finally, the dental field lags behind the medical field in the use of diagnostic codes, the development of evidence-based protocols for oral health treatments, comparative effectiveness research, and reporting and maintaining transparency of patient outcomes to consumers and payors. This lack of data from which to make clinical decisions impacts the development of collaborative practice agreements in that appropriateness of treatment options, standards for quality of care, and measurement of patient outcomes remain subject to individual providers' judgment.

The trust and confidence necessary between providers participating in collaborative arrangements is much easier to develop when clear, objective, evidence-based care delivery protocols are in place.

The primary goal of collaborative practice is to improve the care

delivery system for patients. **Additionally, there is potential for increased compensation for collaborative practice at the organizational or individual level.³⁹**

There is not currently any monetary compensation for the act of collaboration, yet provider incomes may increase when efficiency is improved or organizational costs are reduced. The financing of dental care has to date been relatively insulated from the turmoil in the health care marketplace. However, the isolation of dental care may change as insurers adjust to the set of changing laws and regulations within the health care environment. If payment models in dentistry shift toward more of a focus on prevention and bundled payments for outcomes, as has been discussed in health care, there may be greater incentive for adopting collaborative practice models.

Achieving health care goals beyond creating individual treatment plans requires a coordinated approach to the preventive, behavioral, and treatment aspects of health care, usually involving skills beyond those that any single provider may possess.

Collaborative practice can exist under any financing model.

Assessing the income of the different types of practitioners involved in the various models is beyond the scope of this report, but our research indicates that the compensation implications of collaborative practice models are tied to care setting, system ownership, and licensing

Marshfield Clinic System

An example of the effective use of information technology and informatics can be found in the Marshfield Clinic system in Wisconsin. It has recently implemented an integrated medical/dental electronic health record (iEHR) environment that supports both the clinical and the administrative processes of care. The iEHR environment provides dentists and physicians with access to the centralized medication histories, information about allergies and special conditions, problems, and demographics of their patients. This environment gives dentists immediate access to medical information when they are developing treatment plans for patients with challenging medical conditions. The oral health tab in the electronic medical record allows physicians to have access to dental records to determine if referred patients have followed through on recommendations and obtained needed services. In addition, physicians soon will be able to view patients' dental diagnoses, dental treatment plans, and dental encounter summaries to determine their patients' overall oral health status. Appointment coordinators currently can schedule dental visits to coincide with medical visits or vice versa, enabling better patient-centered service and reductions of no-shows. Access to HIPAA forms is centralized for ease of administrative use. The goal is to facilitate virtual teaming with appropriate decision support tools that enable improved care and population-based outcomes.

and supervision requirements, all of which affect payment for care.

The implementation of collaborative practice models has a clear impact on other aspects of practice, including productivity and practice culture. These impacts can be seen as happening first during the transition to the new care delivery model and then as the care model becomes solidified and expands. Providers and organizations undergoing a transition to these arrangements report some negative impacts, in particular workflow challenges as providers adjust to new practice models. In one study the collaborative practice between physicians and pharmacists showed improved quality of medication management services but did have workflow ramifications, a finding that indicates that some workflow redesign or loss of efficiency may occur when providers are striving for improved quality of care.⁴⁰

Another ongoing concern is that even when new practice models are adopted, organizational logistics and professional tradition may lead to underutilization of the new team skill mix.⁴³ A study of the utilization of dental care providers (DCP = hygienists and therapists) in the United Kingdom^{viii} discovered significant underutilization of the existing skill mix. It found that although 35.3% of patient visits in a general practice could be delegated to the DCP under existing law, this level of delegation was not occurring. Additionally, if the law were to allow diagnostic power, the study found that 69.5% of visits could be handled by the DCP.⁴⁴

In summary, interprofessional collaboration holds

^{viii} In the United Kingdom, collaborative agreements are not formally regulated. There must be some form of auditable communication between the referring dentist and the dental therapist or dental hygienist, and there are codes of good practice. <http://www.gdc-uk.org/News+publications+and+events/Publications/Guidance+for+dental+professionals/Principles+of+dental+team+working.htm>

promise as part of the ongoing efforts to improve the quality of and access to oral health care in the United States. To implement such models, legislative and cultural barriers must be overcome, and clinical research must be strengthened. In addition, to be successful and meaningful, such practice models must be built on genuine trust between the professions in the working arrangement.

Facilitating the Adoption of Collaborative Practice in Dentistry

Policymakers, educators, providers, and payors are seeking ways to improve the effectiveness and accessibility of the oral health care delivery system in order to reduce the stark disparities in oral health utilization and outcomes that exist in the United States. In order to achieve this goal, new and innovative models of practice will be necessary.

Legislatures across the country are enacting new provider types in dentistry and are enacting laws granting existing providers expanded legal scopes of practice – with added education, training, testing, and authority for emerging or existing professions. One way that policymakers can facilitate the transition to new care delivery models and help manage overlapping legal practice authority for members of different professions is by enacting well-designed collaborative practice laws. As policymakers look to collaborative practice as a way to connect providers within a system of care, they should give careful consideration to both the level of formality of the relationship and the degree of autonomy that each provider should have.

Dental educators can play a facilitating role in the adoption of collaborative practice by training dentists and other health care providers (both within and external to dentistry) together. Interprofessional education may provide openings for better communication, understanding, and trust necessary for professionals to work collaboratively to enhance patient outcomes and provide the best oral health care value.

Providers in the field of dentistry have a lot to learn from the wider health care field on how to educate and employ all the members of its workforce in a way that best benefits patients and the health care system. There is a rapidly expanding set of health and clinical information tools (e.g., electronic health records, evidence-based treatment protocols) that can be used by a wide range of providers within health care organizations to facilitate the adoption of collaborative practice models with a focus on improving several dimensions of care, including clinical outcomes and patient satisfaction. As these tools and methods are validated they can be more widely adopted by the entire health care delivery team.

The payment systems for health care services are strong drivers of provider behavior and can be used as incentives for collaborative practice. The current exploration of new organizational and financing models such as bundled payments and pay-for-performance mechanisms may encourage the use of interdisciplinary skill mixes because the new payment models reward team approaches to improving patient outcomes rather than the traditional provision of procedures by an individual professional. Ongoing research is necessary to identify ways to develop these models as well as ways to document their financial sustainability and determine to what extent patient care outcomes have been improved.

As this report has shown, a number of successful collaborative practice models are currently in use within the oral health care delivery system. Yet, there is still great potential for expanding these models to achieve the goals of providing increased access to care, improving care quality and promoting better health outcomes. Movement toward such goals would further demonstrate to patients, policy makers, and payors the value of oral health services within the broader health care delivery system.

References

1. AHA. Accountable Care Organizations: AHA Research Synthesis Report: American Hospital Association Committee on Research; June 2010 2010.
2. Enthoven AC. Integrated delivery systems: the cure for fragmentation. *Am J Manag Care*. Dec 2009;15(10 Suppl):S284-290.
3. Pham H, Ginsburg P, Lake T, Maxfield M. Episode Based Payments: Charting a Course for Health Care Reform. Washington, DC: National Institute for Health Care Reform;2010.
4. Rittenhouse DR, Shortell SM. The patient-centered medical home: will it stand the test of health reform? *JAMA*. May 20, 2009;301(19):2038-2040.
5. U.S. Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services;2000.
6. American Dental Association. The 2006 Survey of Dental Practice. Chicago, IL: American Dental Association; July 2008.
7. Gehshan S, Tackach M, Hanlon C, Cantrell C. Help wanted: a policy maker's guide to new dental providers. Washington DC: National Academy for State Health Policy, W.K. Kellogg Foundation and the Pew Charitable Trusts; May 2009.
8. Mertz E, Mouradian W. Addressing children's oral health in the new millennium: trends in the dental workforce. *Academic Pediatrics*. November 2009;9(6):433-439.
9. Landon BE, Gill JM, Antonelli RC, Rich EC. Prospects for rebuilding primary care using the patient-centered medical home. *Health Aff (Millwood)*. May 2010;29(5):827-834.
10. Morgan MA, Dunbar J, Reddy P. Collaborative care - the role of practice nurses. *Aust Fam Physician*. Nov 2009;38(11):925-926.
11. Schober M, MacKay N. Collaborative practice in the 21st century. Geneva, Switzerland: International Council of Nurses;2004.
12. Morgan M, Dunbar J, Reddy P, Coates M, Leahy R. The TrueBlue study: is practice nurse-led collaborative care effective in the management of depression for patients with heart disease or diabetes? *BMC Fam Pract*. 2009;10:46.
13. Dower C, Christian S. Physician assistants and nurse practitioners in specialty care: six practices make it work. Oakland, CA: California HealthCare Foundation; 2009.
14. Wagonfeld JB, Murphy RF. The nonphysician provider in the gastroenterology practice. *Gastrointest Endosc Clin N Am*. Oct 2006;16(4):719-725.
15. Reitz M, Jadeja R. The collaborative practice of dental hygiene. *Int J Dent Hyg*. Feb 2004;2(1):36-39.
16. Battrell AM, Gadbury-Amyot CC, Overman PR. A qualitative study of limited access permit dental hygienists in Oregon. *J Dent Educ*. Mar 2008;72(3):329-343.

17. Price D, Howard M, Hilts L, et al. Interprofessional education in academic family medicine teaching units: a functional program and culture. *Can Fam Physician*. Sept 2009;55(9):901-901; e901-905.
18. Reger C, Kennedy DW. Changing practice models in otolaryngology-head and neck surgery: the role for collaborative practice. *Otolaryngol Head Neck Surg*. Dec 2009;141(6):670-673.
19. Thompson D. Physician's perceptions of nurse-physician collaborative practice. Boca Raton, FL, Florida Atlantic University; 1995.
20. Hallas DM, Butz A, Gitterman B. Attitudes and beliefs for effective pediatric nurse practitioner and physician collaboration. *J Pediatr Health Care*. Mar-Apr 2004;18(2):77-86.
21. Christian S, Dower C, O'Neil EH. Overview of nurse practitioner scopes of practice in the United States - discussion. San Francisco, CA: UCSF Center for the Health Professions;2007.
22. State of California. Department of Consumer Affairs. Board of Registered Nursing. An Explanation of Standardized Procedure Requirements for Nurse Practitioner Practice. Nurse Practitioner Practice Information. 2010; <http://www.rn.ca.gov/regulations/np.shtml>.
23. DeMone M. What is "collaborative practice" anyway? *Health Views*. 2009(January 29). <http://peihealthviews.blogspot.com/2009/01/just-what-heck-is-collaborative.html>. Accessed August 19, 2010.
24. Personal Communication with Ruth Ballweg M, PA-C, Associate Professor, MEDEX Northwest Division of Physician Assistant Studies, Physician Assistant Training Program, University of Washington., November 22, 2010.
25. American Dental Hygienists' Association. States where dental hygienists may perform some services in at least one setting under general supervision2009.
26. American Dental Hygienists' Association. States that permit general supervision in the dental office. 2008; http://www.adha.org/governmental_affairs/downloads/ProhyGMap.pdf.
27. American Dental Hygienists' Association. States that Permit General Supervision in the Dental Office2008.
28. Dulisse B, Cromwell J. No harm found when nurse anesthetists work without supervision by physicians. *Health Aff (Millwood)*. Aug 2010;29(8):1469-1475.
29. Freed JR, Perry DA, Kushman JE. Aspects of quality of dental hygiene care in supervised and unsupervised practices. *J Public Health Dent*. Spring 1997;57(2):68-75.
30. Wetterhall S, Bader J, Burrus B, Lee J, Shugars D. Evaluation of the dental health aide therapist workforce model in Alaska. Research Triangle Park, NC: RTI International;201.
31. Washington State Access to Baby and Child Dentistry Program. Overview of the Access to Baby and Child Dentistry (ABCD) Program: Increasing access to care for young Medicaid-eligible children. 2010; <http://www.abcd-dental.org/pdf/overview.pdf>. Accessed September 10, 2010.
32. Dower CM, Miller JE, O'Neil EH, Taskforce on Midwifery. Charting a course for the 21st century: the future of midwifery. San Francisco, CA: UCSF Center for the Health Professions; April 1999.
33. Mertz E. Registered dental hygienists in alternative practice: increasing access to dental care in California. San Francisco, CA: UCSF Center for the Health Professions; May 2008 2008.
34. Buttano TM, Trybulski J, Bailey PP, Sandberg-Cook J. Primary Care: A Collaborative Practice. Third Edition ed. St. Louis, MO: Mosby, Elesvier; 2008.
35. Marmor T, Freeman R, Okma K, eds. Comparative studies and the politics of modern medical care. New Haven, CT: Yale University Press; 2009.
36. Scott MK. Health Care in the Express Lane: Retail Clinics Go Mainstream. Oakland: California HealthCare Foundation; September 2007.
37. Scott MK. Retail dental clinics and access to care for underserved populations: a concept paper. Oakland, CA: California HealthCare Foundation; Spring 2009.
38. Robertson G. Journal of the Health Workforce Pilot Projects Program. Sacramento, CA: State of California, Office of Statewide Health Planning and Development, Healthcare Workforce and Community Development Division;2003.
39. Integrated Healthcare Association. Advancing quality through collaboration: the California Pay for Performance Program. Oakland, CA: Integrated Healthcare Association; February 2006.
40. McKinnon A, Jorgenson D. Pharmacist and physician collaborative prescribing: for medication renewals within a primary health centre. *Can Fam Physician*. Dec 2009;55(12):e86-91.
41. Wing P, Langelier MH, Continelli TA, Battrell A. A dental hygiene professional practice index (DHPPI) and access to oral health status and service use in the United States. *Journal of Dental Hygiene*. Spring 2005;79(2):10.
42. Dorsen C, Shelley D. Expanding the oral health workforce: A unique multidisciplinary practice model. *Workshop: Sufficiency of the U.S. Oral Health Workforce in the Coming Decade*. Washington, DC: Institute of Medicine of the National Academies; 2009.
43. Way D, Jones L, Baskerville B, Busing N. Primary health care services provided by nurse practitioners and family physicians in shared practice. *CMAJ*. Oct 30 2001;165(9):1210-1214.
44. Evans C, Chestnutt IG, Chadwick BL. The potential for delegation of clinical care in general dental practice. *Br Dent J*. Dec 22 2007;203(12):695-699.

Acknowledgements

This study is funded by the Pew Charitable Trusts as part of its Pew Children's Dental Campaign. The views expressed are those of the author(s) and do not necessarily reflect the views of the Pew Charitable Trusts.

Advisory Panel

This report benefited from the insights and expertise of an advisory panel as well as a number of external reviewers. These experts provided feedback and guidance throughout the project. While they have screened the report for accuracy, neither they nor their organizations necessarily endorse its findings or conclusions.

L. Jackson Brown, DDS, MPhil, PhD

Editor

Journal of Dental Education

Wayne Cottam, DMD, MS

Associate Dean for Community Partnerships,
Arizona School of Dentistry and Oral Health
Member, National Network for Oral Health Access
(NNOHA)

Greg Nycz

Executive Director

Family Health Center of Marshfield, Inc.

Jesley C. Ruff, DDS

Senior Vice President, Chief Professional Officer
American Dental Partners

Laura Smith, MPA

President and CEO

Washington Dental Service Foundation

Norman Tinanoff, DDS, MS

Chair, Department of Health Promotion and Policy
University of Maryland

Scott F. Wetterhall, MD, MPH

Senior Program Director, Health Security and
Systems Research
RTI International

Appendix 1: Report Methodology

A review of the literature was conducted to determine the general parameters of the ways in which collaborative practice is defined and applied, both in legal terms and in practice. Search terms in PubMed used included combinations of "collaborative practice," "collaboration," "medicine," "nursing," "nurse practitioner," "dentist," "dental hygienists," "dental therapist," "financing," and "economics." Although there are hundreds of articles that discuss collaboration, our review produced 54 articles that were specifically relevant to our stated aims, 19 in medicine/nursing and 35 in dentistry, that were reviewed in depth. Although many of the articles in the medical and nursing fields contained definitions, rationales, and examples of collaborative practice, only one article discussed the financial mechanisms by which providers were compensated within these arrangements.¹³ Many articles discussed various workforce models in dentistry, but only one article in the dental field directly discussed collaborative practice in relation to dental hygiene practice.¹⁵

The literature review provided the background necessary to develop a set of interview questions to be used to further investigate how collaborative practice in dentistry currently works in the United States and internationally or how it might work in the future. Semi-structured interviews were conducted with U.S. and international experts identified through snowball sampling and through the literature. Interviews with eight of the ten domestic experts identified were conducted by phone. Four of the six international interviews requested were completed through an email survey while one was completed by phone. Domestic interviewees included representatives from states,

programs, and organizations in which collaborative practice was currently in place in some manner for dental professionals. International interviewees included representatives from New Zealand, the Netherlands, Canada, the United Kingdom, and Malaysia.

These qualitative data provide the basis for the analysis of the use and potential of collaborative practice in American dentistry. Once the literature and interview data had been collected, they were reviewed in relation to the six key questions regarding the project objective. This process led to the identification of the organizational dimensions of collaborative practice. Next, examples of various models were compared to identify the ideal type collaborative practice models as well as real-world examples that exemplify each type.

Appendix 2: Glossary

ABCD	Access to Baby and Child Dentistry
ACO	accountable care organization
ADT	Advanced Dental Therapist
ANTHC	Alaska Native Tribal Health Consortium
CDHC	Community Dental Health Coordinator
CER	comparative effectiveness research
CMA	collaborative management agreement
CMS	Centers for Medicare and Medicaid Service
DCP	dental care providers
DHAT	Dental Health Aide Therapist
DT	Dental Therapist
FQHC	Federally Qualified Health Centers
HIS	Indian Health Services
iEHR	integrated medical/dental electronic health record
NP	Nurse Practitioner
PCMH	patient-centered medical home
RDHAP	Registered Dental Hygienist in Alternative Practice
VA	Department of Veterans' Affairs