Academic Quality and Workforce

CAWS AGENDA ITEM V-N

60x30TX

Texas Higher Education Coordinating Board

BOARD AGENDA ITEM IX-J

DRAFT

Study of the Feasibility of Streamlining Physician Licensing Requirements for Advanced Practice Registered Nurses

A Report to the Texas Legislature
per Texas Education Code, Section 61.06693

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Texas Higher Education Coordinating Board

Agency Mission

The mission of the Texas Higher Education Coordinating Board (THECB) is to provide leadership and coordination for Texas higher education and to promote access, affordability, quality, success, and cost efficiency through *60x30TX*, resulting in a globally competitive workforce that positions Texas as an international leader.

Agency Vision

The THECB will be recognized as an international leader in developing and implementing innovative higher education policy to accomplish our mission.

Agency Philosophy

The THECB will promote access to and success in quality higher education across the state with the conviction that access and success without quality is mediocrity and that quality without access and success is unacceptable.

The THECB's core values are:
Accountability: We hold ourselves responsible for our actions and welcome every opportunity to educate stakeholders about our policies, decisions, and aspirations.
Efficiency: We accomplish our work using resources in the most effective manner.
Collaboration: We develop partnerships that result in student success and a highly qualified, globally competent workforce.
Excellence: We strive for excellence in all our endeavors.

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Executive Summary

This report concerns the feasibility of developing of a pilot program to streamline the requirements for Advanced Practice Registered Nurses (APRNs) to be eligible for physician licensure. In 2019, the 86th Texas Legislature passed Senate Bill 2011 (SB 2011), which added Section 61.06693 to the Texas Education Code (expiring on September 1, 2021) and requires the Texas Higher Education Coordinating Board (THECB) to conduct a study on the feasibility of developing such a program and to prepare and submit a report that includes the study results and any recommendations for legislative or other actions. The bill directed the THECB to collaborate with an institution of higher education, the Texas Medical Board (TMB), and the Texas Board of Nursing on the study. This report fulfills the legislative directive.

The Texas Occupations Code, Title 3, Section 301.152, defines an APRN as a nurse practitioner, nurse midwife, nurse anesthetist, or clinical nurse specialist. SB 2011 specified eligibility for physician licensure as per Title 3, Chapter 155 of the Texas Occupations Code, "License to Practice Medicine." The current pathway to a medical license in Texas, per the Occupations Code, involves enrollment in and graduation from an accredited medical school approved by the Texas Medical Board.

THECB staff communicated and consulted with the Texas Board of Nursing and the Texas Medical Board to outline the education and licensing processes for APRNs and physicians. Additionally, THECB staff consulted with representatives of the Texas Medical Association, Texas Nurse Practitioners, The University of Texas System, and The University of Texas Health Science Center at Houston regarding the study. Available data maintained by the THECB, the Texas Center for Nursing Workforce Studies, and the Texas Medical and Dental Schools Application Services helped inform the analysis and are included in the report.

The outbreak of the COVID-19 pandemic in spring 2020 challenged the collaborative work originally planned by the THECB. Deterred by the disruption of COVID-19 and unable to convene an in-person inclusive group of representatives from institutions, THECB staff completed the legislatively required study by relying on information regarding educational and licensing pathways for physicians and APRNs, data on nursing professionals' participation in medical education, and information from a small group of institutional representatives.

Based on available data, a review of the education models, and consultations with stakeholders, the THECB concludes that a pilot program to streamline physician licensure requirements for APRNs is likely not feasible at this time. THECB enrollment and graduation data suggest that APRNs do not show an interest in pursuing medical education in numbers that indicate a need for such a pathway to a medical license. Only a small percentage (0.35%) of nursing professionals embarked on the pathway to a medical license in the past 10 years. To develop a pilot program that would be of interest to so few would be unlikely to have positive impact on the existing healthcare workforce. Obtaining a medical license in Texas would have to be extensively revamped, as it currently requires a medical license holder be a graduate of an accredited medical or osteopathic medical school approved by the TMB. Perhaps most importantly, an institution that would offer such an educational path would need to secure approval from the national accreditation agency for medical education before such a pilot program for APRNs could be implemented.

To develop a pilot program that would streamline and accelerate the attainment of a medical license for APRNs, extensive review and discussions of the education and practice models in medicine and advanced practice registered nursing would be required. Alignment and

development of curricula would require a strong partnership between stakeholders and would require a detailed course-level analysis and comparisons of learning outcomes. Undertaking such complicated work, without requisite student interest, would not be a prudent use of resources. Finally, accreditation requirements would also hinder the implementation of such a pilot program.

The THECB offers the following recommendation:

Recommendation: Encourage health-related and general academic institutions that offer either a Doctor of Medicine or Doctor of Osteopathic Medicine and also offer master's level Advanced Practice Nursing programs to use existing resources to continue to foster the promotion and support of interprofessional education. Collaboration and coordination of care among healthcare professionals enhances patient outcomes. A high level of professional understanding among medical and APRN students could lead to a high level of readiness for interprofessional practices upon entry into the healthcare workforce and could also provide a better understanding of how the different educational pathways align.

Introduction

Senate Bill 2011, 86th Texas Legislature, added Section 61.06693 to the Texas Education Code. The bill directs the Texas Higher Education Coordinating Board (THECB) to:

> "collaborate with at least one institution of higher education, the Texas Medical Board, and the Texas Board of Nursing to conduct a study regarding the feasibility of developing a pilot program to streamline the requirements for an advanced practice registered nurse to become eligible under Chapter 155, Occupations Code, for a license to practice medicine."

An advanced practice registered nurse (APRN) is defined in the Texas Occupations Code, Title 3, Section 301.152, as a nurse practitioner, nurse midwife, nurse anesthetist, or clinical nurse specialist.

Senate Bill 2011 (SB 2011) requires the THECB to submit a report that includes the study results regarding the feasibility and any recommendations for legislative or other actions. In performing the work required by the bill, THECB staff communicated and consulted with the Texas Board of Nursing and the Texas Medical Board to outline the education and licensing processes for APRNs and physicians. THECB staff also received input from the Texas Medical Association, Texas Nurse Practitioners, The University of Texas System, and The University of Texas Health Science Center at Houston.

In spring 2020, as the THECB planned to convene a workgroup that would have included a representative from each medical school and each nursing school at an institution that offers both degree pathways, the COVID-19 pandemic escalated. In recognizing that the potential members of such a workgroup were needed to care for COVID-19 patients and that they would also be moving their academic programs to a remote format, THECB staff suspended that plan.

THECB staff completed the legislatively required study by relying on information regarding educational and licensing pathways for physicians and advanced practice registered nurses, data on nursing professionals' participation in medical education, and information from a small group of institutional representatives. The conclusion and recommendations presented in this report, with regards to feasibility and the work needed for the pilot program, are based on the stakeholder input and available data.

Feasibility of Developing a Pilot Program to Streamline Physician Licensing Requirements for APRNs

The pathway to a license to practice medicine, as provided by the Texas Occupations Code and summarized in Appendix A, involves enrollment in and graduation from an accredited medical school approved by the Texas Medical Board. This pathway to a medical license is applicable to all individuals, regardless of their prior experience or education in other health professions. The national accrediting bodies for medicine, the Liaison Committee on Medical Education and the Commission on Osteopathic Colleges Accreditation, require that all enrolling medical students have the requisite foundational education to enroll and be successful in medical school.

Texas has 15 higher education institutions with a medical or osteopathic school that currently enroll students (Appendix B). The typical length of time required to complete medical school is four years and commonly follows the completion of a bachelor's degree program. However, to become licensed to practice in Texas, as in most states, a medical student is also required to complete a minimum of one full year of post-graduate or residency training before beginning the process of obtaining a medical license. Additionally, most medical residency programs require a minimum of three years to complete and adhere to the requirements of specific medical specialties, as required by the nationally accrediting agency, the Accreditation Council for Graduate Medical Education.

A critical part of the Texas health workforce providing patient care, APRNs are highly trained nursing professionals and, like physicians, must also fulfill specific educational and licensing requirements, which are described in detail in Appendix C. The typical length of time required to complete APRN education, after baccalaureate degree attainment, is approximately two to three years. This includes a practicum component that is a minimum of 500 supervised clinical hours. Approximately 30 higher education institutions offer APRN education programs in Texas.

A total of 12 Texas institutions have both a medical school, granting either a Doctor of Medicine (MD) or Doctor of Osteopathic Medicine (DO) degree, and a graduate professional nursing program with tracks leading to APRN certification and licensure. The degree programs are not similar in their didactic or clinical experiences. In addition, among the institutions with APRN programs, differing curricula are likely prevalent. For informational purposes, Appendix D provides a sample crosswalk of the post-baccalaureate curricula in family medicine training and family nurse practitioner education offered at one health-related institution in Texas. It should also be noted that for baccalaureate-level education, science courses for non-science majors, such as nursing, would not fulfill medical school prerequisite requirements (see Appendix A).

In February 2020, the Texas Nurse Practitioners organization conducted a survey about SB 2011 and received responses from eight nurse practitioner education programs. The organization provided the THECB with de-identified survey results representing the nursing perspective from the eight programs that responded. Six of the eight nurse practitioner programs did not perceive it feasible and another two were uncertain. Four of the eight responding programs were from Texas institutions with both medical and APRN degree programs.

THECB staff consulted with representatives from The University of Texas Health Science Center at Houston with expertise in medical school admission and education. Their conclusion regarding the feasibility of the pilot program mirrored the ARPN programs' responses. The pilot

program may not be feasible particularly because of the national accreditation agency's requirement to have an equitable admission process for accredited medical schools. While applicants' prior experiences are reviewed, medical schools do not grant exemptions based on such experiences. National accreditation requires that each admitted medical student complete the full cadre of medical school courses.

THECB staff concludes that without a conceivably laborious process of aligning and developing curricula and extensive review and discussions of the two different education models, including their clinical training components, a pilot program to streamline physician licensing requirements for APRNs is likely not feasible at this time. Additionally, as experts and faculty in medical and nursing education frequently articulate the different practice models and differing focuses in providing patient care in the two health professions, the extensive work in the development of the pilot program to be undertaken by the institutions would also need to address such distinctions in practice and clinical expectations.

Nursing Professionals in Medical Education

While professionals with a nursing background have enrolled and graduated from medical schools, currently there is not a pathway in Texas or other states that streamlines or expedites requirements for APRNs to become eligible for physician licensure. During an online search for such expedited medical school pathways, two international programs indicated accelerated medical degrees for APRNs in the United States: Oceania University of Medicine in Samoa and the Faculty of Medicine at the University of Science, Arts, and Technology in Montserrat. Upon additional research, THECB staff concluded that there were concerns about the legitimacy of these programs, including medical education in Samoa and Montserrat that is deemed not suitable for comparison to medical education in the United States.

Focusing on Texas, the following sections present data in graduation, enrollment, and applications among medical school students with prior nursing attainment.

THECB Graduation and Enrollment Data

Institutions report to the THECB student-level graduation and enrollment data, which can be disaggregated by the Classification of Instructional Programs (CIP) codes. CIP codes are the national taxonomy of degree programs. For medical education, the pertinent CIP codes are 51.1201 for MD programs and 51.1901 for DO programs. CIP codes for graduate professional nursing programs that are relevant to APRN licensure are:

51.3803	Adult Health Nurse/Nursing
51.3804	Nurse Anesthetist
51.3805	Family Practice Nurse/Nursing
51.3806	Maternal/Child Health and Neonatal Nurse/Nursing
51.3807	Nurse Midwife/Nursing Midwifery
51.3809	Pediatric Nurse/Nursing
51.3810	Psychiatric/Mental Health Nurse/Nursing
51.3813	Clinical Nurse Specialist
51.3818	Nursing Practice
51.3821	Geriatric Nurse/Nursing
51.3822	Women's Health Nurse/Nursing

While educational attainment in Registered Nursing (RN, CIP 51.3801[1]), an undergraduate-level undertaking at both the baccalaureate and associate degree levels, does not by itself confer eligibility for APRN licensure, THECB staff also looked at the 51.3801 CIP code, as an RN license is required for an APRN license in Texas.

Medical school graduates with prior nursing attainment. THECB staff investigated how many medical school graduates from 2010 through 2019 also had a nursing degree in the RN or an APRN-relevant CIP code. The 2019 graduation data set was the most current certified data at the time of the report and included graduates through summer 2019. For each cohort of medical school graduates, a search for prior nursing attainment was conducted for a period up to 15 years before medical school graduation, or approximately a decade prior to medical school enrollment. When an individual had more than one prior nursing degree, the highest nursing degree was used.

[1] CIP codes for nursing disciplines underwent a revision in 2010. THECB staff included both the codes before 2010 and after the revision when compiling the data files.

Certain limitations and assumptions were present in using the THECB data. The investigation included all types of institutions offering post-secondary degree programs in Texas. Non-public institutions, however, started to report data to the THECB at different times. For instance, independent institutions of higher education only began to report graduation data, including in nursing, in 2002-2003. In addition, the THECB RN and APRN data provide information on students who graduated and obtained a degree from a Texas institution of higher education. Therefore, the data convey eligibility for RN licensure and APRN certification, but do not indicate whether a graduate from a Texas RN or APRN program succeeded in obtaining a license to practice as a nursing professional. Additionally, the data do not include Texas students whose nursing degrees were conferred by out-of-state online programs or RNs who have practiced in Texas under a multistate licensure privilege through the nurse licensure compact (as per Texas Occupations Code, Title 3, Chapter 304) before medical school graduation.

The THECB data showed that of the total 16,044 medical and osteopathic school graduates for the 10-year period 2010 through 2019, just 56 had prior nursing attainment (0.35%). These graduates received their medical degrees from eight Texas medical schools, including:

- Texas A&M University Health Science Center
- Texas Tech University Health Sciences Center
- Texas Tech University Health Sciences Center-El Paso (TTUHSC-EP)
- The University of Texas Health Science Center at Houston
- The University of Texas Health Science Center at San Antonio
- The University of Texas Medical Branch at Galveston (UTMB)
- The University of Texas Southwestern Medical Center
- University of North Texas Health Science Center (UNTHSC)

Over the 10-year period, UTMB had the largest number of medical school graduates with a prior nursing degree—14 of 2,201 graduates (0.64%). TTUHSC-EP had the highest percentage of dual-degree holders among medical school graduates, at 1.24% (six of 483 graduates).

The vast majority of the 56 dual-degree holders in medicine and nursing finished an undergraduate RN degree program as their highest nursing degree before medical school. None of the dual-degree holders had a doctoral degree or a post-graduate certificate in an APRN-relevant CIP code, and fewer than four had a master's degree in APRN. Fifty-one of the 56 dual-degree holders (91%) had a baccalaureate RN degree, and 12 of the 51 baccalaureate degree holders (23%) also had an associate degree in nursing. The few master's degree holders completed their APRN education in family practice nursing (CIP 51.3805).

Medical school enrollees with prior nursing attainment. Before 2016, the eight medical schools that reported having graduates with nursing degrees, along with the independent Baylor College of Medicine, were the only medical schools in Texas. The graduation data between 2010 and 2019, therefore, did not include any of the recently established medical schools at the following institutions, whose first cohorts started in the years specified below:

The University of Texas at Austin (UT-Austin)	June 2016
The University of Texas Rio Grande Valley (UTRGV)	July 2016
University of the Incarnate Word	July 2017
Texas Christian University/UNTHSC (MD degree)	July 2019

University of Houston	July 2020
Sam Houston State University	August 2020

As the more recently established medical schools did not have a cohort of graduates until 2020 (UT-Austin and UTRGV) and the increased number of medical schools could potentially generate more interest in a medical career among nursing professionals, THECB staff used enrollment data reported by institutions to determine how many first-time medical school enrollees between 2013 and 2019, who were included in the data submitted in 2014-2020 ("Year of Data" in Table 1), had prior nursing attainment in the RN or an APRN-relevant CIP code.

The enrollment data showed a total of 13,392 first-time medical school enrollees for the years included. The file encompassed the years after the first two new medical schools, both in The University of Texas System, enrolled their first cohort, through spring 2020. The data, therefore, did not include first-time medical school enrollees for the two newest schools—Sam Houston State University and University of Houston—whose first cohorts started in fall 2020 so certified data were not available at the time of the report. To determine if there were any trends in the data, THECB staff included a couple of years before the two new medical schools in The University of Texas System enrolled their first cohorts in 2016.

For each yearly cohort of medical school enrollees, a search for prior nursing attainment was conducted for a period up to 10 years before medical school enrollment. When an individual had more than one nursing degree before medical school enrollment, the highest nursing degree was used. The same assumptions and limitations regarding nursing attainment noted for the graduation data remain applicable to the enrollment data.

With the increased number of medical schools, there was an overall increase of roughly 250 first-time medical school enrollees in the state when the 2020 enrollment number in Table 1 is compared to the 2015 number. The number of first-time medical school enrollees with prior nursing attainment remained relatively stable among the years included in the data, with the percentage of enrollees with prior nursing degrees at less than 0.5%.

Among the medical school enrollees with prior nursing attainment, nearly all had an undergraduate RN degree as the highest nursing degree. The majority of the prior undergraduate RN degrees were at the baccalaureate level, and the average length in years between medical school enrollment and baccalaureate nursing degree attainment was 1.3 years.

No first-time medical school enrollee had a doctoral degree or a post-graduate certificate relevant for APRN licensure. The data reported in 2020, with a total of nine enrollees with prior nursing attainment, was the only year when a very small number (fewer than four) completed APRN education before medical school enrollment—all in master's degree in family practice nursing (CIP 51.3805).

Table 1. First-Time Medical School Enrollees and Prior Nursing Attainment

Year of Data	Number of Medical School Enrollees	Number of Enrollees with Prior Nursing Degrees
2020	2,058	9
2019	2,006	8
2018	2,035	9
2017	1,907	5
2016	1,815	6
2015	1,810	*
2014	1,761	14

Source: THECB, CBM 001
**Data redacted due to four or fewer students.*

Medical School Applicants with Prior Nursing Attainment

Applicants to Texas public medical schools use a coordinated submission process through the Texas Medical and Dental Schools Application Services (TMDSAS). Data submitted by applicants to TMDSAS include their prior educational background. Private medical schools in Texas do not receive their applications through TMDSAS and, therefore, information about applicants to these schools is not available through TMDSAS. The three private medical schools in the state are Baylor College of Medicine, Texas Christina University/UNTHSC School of Medicine, and the University of the Incarnate Word, School of Osteopathic Medicine.

According to the data provided by TMDSAS, for the 2019 medical school entry year, 49 applicants to Texas public medical schools (approximately 0.8% of all applicants) indicated they had a nursing degree. In 2020, 30 applicants, or approximately 0.5%, previously completed a nursing degree. In both the 2019 and 2020 medical school entry years, the number of total applicants to Texas public medical schools exceeded 6,000, compared with 5,811 in 2018. The TMDSAS data include both Texas and out-of-state applicants, and degree levels in nursing are not differentiated in the data.

The low numbers and percentages in the TMDSAS data correspond to the THECB graduation and enrollment data presented in the sections above. In addition, the survey conducted by the Texas Nurse Practitioners organization in February 2020 provided some insight about student interests. The survey inquired whether students in nurse practitioner education programs indicated interest in attending medical school. None of the eight institutions that responded to the survey reported any student interest; at the time of the survey, the eight institutions combined had approximately 4,000 enrolled students.

Conclusion

The current pathway to a medical license in Texas involves enrollment in and graduation from a nationally accredited medical school approved by the Texas Medical Board. SB 2011, 86th Texas Legislature, requires the THECB explore the feasibility of a pilot program to streamline the requirements for APRNs to be eligible for physician licensure.

Based on available data, including information on education models and input from various stakeholders, the THECB concludes that a pilot program is likely not feasible at this time. Available longitudinal data in medical school enrollment and graduation further suggest that APRNs have not pursued medical education in numbers that suggest such a pilot program would be readily used. The number of MD or DO physicians with prior nursing degrees is less than 1% over a 10-year period. Of those, almost all the prior nursing degrees are at the RN licensure level, not the APRN level.

To develop a pilot program that would streamline and accelerate the attainment of a medical license for APRNs, extensive review and discussions of the education and practice models in medicine and advanced practice registered nursing would be required. Alignment and development of curricula would require a strong partnership between stakeholders and would require a detailed course-level analysis and comparisons of learning outcomes. Undertaking such complicated work without requisite student interest would not be a prudent use of resources. Finally, accreditation requirements would also hinder the implementation of such a pilot program.

The THECB offers the following recommendation:

Recommendation: Encourage health-related and general academic institutions that offer either a Doctor of Medicine or Doctor of Osteopathic Medicine and also offer master's level Advanced Practice Nursing programs to use existing resources to continue to foster the promotion and support of interprofessional education. Collaboration and coordination of care among healthcare professionals enhances patient outcomes. A high level of professional understanding among medical and APRN students could lead to a high level of readiness for interprofessional practices upon entry into the healthcare workforce and could also provide a better understanding of how the different educational pathways align.

Appendix A: Physician Educational and Licensing Requirements

Becoming a Physician

The study required by Senate Bill 2011, 86th Texas Legislature, regarding the feasibility of a pilot program streamlining the requirements for advanced practice registered nurses to practice medicine, establishes eligibility for a medical license under Chapter 155 of the Texas Occupations Code. In addition to a summary of the Texas Occupations Code (TOC), this appendix presents an overview of medical education, graduate medical education, and continuing medical education.

Texas Occupations Code, Title 3, Chapter 155, License to Practice Medicine. Chapter 155 of the Texas Occupations Code establishes the eligibility for a medical license to include completion of medical school courses and at least 60 semester hours of courses acceptable to The University of Texas at Austin for credit on a bachelor of arts or bachelor of science degree, or substantially equivalent courses as determined by the Texas Medical Board (TMB); graduation from a medical school approved by the TMB; completion of the required length of graduate medical training; and passage of required examinations. A student is eligible to sit for the medical license exam when he/she has completed the medical school training and curriculum. The Texas Medical Board defines acceptable approved medical schools in Texas Administrative Code (TAC), Title 22, Part 9, Section 163.1, as those located in the United States or Canada and accredited by the Liaison Committee on Medical Education (LCME) or the American Osteopathic Association Bureau of Professional Education (AOA Bureau). The AOA Bureau was reorganized in 2004 to include a single accrediting body that is known as the Commission on Osteopathic College Accreditation (COCA).

Chapter 155 of the TOC also addresses graduates of medical schools outside the United States and Canada. Per Section 155.004, to be eligible for a medical license, graduates must prove that the medical school curriculum meets the requirements as determined by a THECB-selected committee of experts, in addition to having a minimum of two years of graduate medical training approved by the TMB in the United States or Canada, certification from the Educational Commission for Foreign Medical Graduates, and English proficiency. Section 155.0031 (d) of the TOC, which addresses physician licensure applications, lists that specialty board certification by an organization acceptable to the TMB can also serve as proof for licensing requirements, in addition to attendance at a medical school substantially equivalent to a Texas medical school. Per the TMB rule found in TAC, Title 22, Part 9, Section 163.4, the certification should be from a board approved by the Bureau of Osteopathic Specialists or the American Board of Medical Specialties, both of which require medical school graduation to establish eligibility for physician certification.

Chapter 155 of the Texas Occupations Code allows issuance of medical licenses limited in scope. The Texas Medical Board is authorized to adopt rules and issue limited licenses to individuals with "conceded eminence and authority in the [individuals'] specialty" under Section 155.006 of the Texas Occupations Code. The TMB defines conceded eminence and authority in the specialty in Texas Administrative Code, Title 22, Part 9, Section 172.13:

> "[The] physician has achieved a higher level of academic or professional recognition for excellence in research, teaching, or the practice of medicine, as evidenced by objective factors, including academic appointments, length of time in a profession, scholarly publications and presentations, professional accomplishments, and awards."

In addition, for an individual to receive a limited license, certain conditions must be met, including recommendations from and employment by authorized entities and successful completion of nationally accredited subspecialty training for at least one year. However, per the Accreditation Council for Graduate Medical Education (ACGME), specifically its Institutional Requirement IV.A. regarding Resident/Fellow Recruitment, graduation from an accredited medical school is required for appointment to a graduate medical training program.

Other than limited licenses based on conceded eminence, individuals can be granted limited licenses for practice of administrative medicine or public health medicine (TOC Section 155.009 and TAC, Title 22, Part 9, Sections 172.15 and 172.17). While not required to demonstrate active practice of medicine, to be eligible to the limited license, an individual must meet the requirements for a full Texas medical license, including completion of required college and medical school courses, graduation from a TMB-approved medical school, completion of graduate medical training, and passage of required examinations.

The TMB has established rules, under authority granted by Chapter 155 of the TOC, regarding issuance of different types of limited medical licenses. Generally, to be eligible for a limited medical license, an individual must satisfy the educational and training requirements for a full license or is licensed in good standing as a physician in another state.

Medical education in the United States. There are two types of medical schools in the United States, conferring Doctor of Osteopathic Medicine (DO) and Doctor of Medicine (MD) degrees, respectively. Individual medical schools have differing requirements for entry, including, for example, Medical College Admission Test scores and prerequisite pre-medical courses. The Texas Medical and Dental Schools Application Services (TMDSAS), which provides centralized medical school application processing for entering classes of DO and MD schools at public institutions, lists guidelines for prerequisite courses that are generally necessary for medical school admissions. The prerequisites include credits and grades of C or better in biological sciences, general chemistry, organic chemistry, biochemistry, physics, English, and statistics completed at regionally accredited higher education institutions in the United State or Canada. Additionally, TMDSAS specifies that the science courses taken should be applicable toward a science degree and that courses for non-science majors, including health professions such as nursing, pharmacy, and allied health, do not fulfill requirements.

Accreditation of medical schools is considered crucial for ensuring education standards and, in Texas, is required for TMB-approved medical schools per TAC, Title 22, Part 9, Section 163.1. The accrediting body for DO-granting schools is the Commission on Osteopathic College Accreditation, or COCA, while accreditation of MD schools is through the Liaison Committee on Medical Education, or LCME. Accreditation of medical schools further ensures an equitable admission process among all applicants to a medical school. For instance, the LCME requires that identical requirements and criteria be applied to all applicants seeking admission to an accredited medical school granting MD degrees.

The accreditation standards of COCA and LCME provide guidelines for the curriculum leading to medical degrees and preparing students for graduate medical training and practice of medicine. Notable similarities exist in the accreditation standards for DO and MD programs. In addressing competencies and curricular elements, both COCA and LCME include medical knowledge, patient care, communication, professionalism, practice-based learning, systems-based practice, self-directed and life-long learning, cultural competence, interprofessional collaborative skills, scientific method, clinical and translational research, ethics, critical judgment and problem-solving skills. Distinctions in curricular guidelines appear to include DO programs'

emphasis on osteopathic principles and osteopathic manipulative medicine[2] and LCME's explicit references to societal problems and health care disparities in its Standard 7[3] concerning curricular content of the MD program.

The Texas Medical Board provides information about basic and clinical sciences in medical school education through its definition of "Substantially equivalent to a Texas medical school" for schools operating outside of the United States and Canada in Section 163.1(11)(B)(iii) of TAC, Title 22, Part 9, Chapter 163:

> "(I) The basic sciences curriculum shall include the contemporary content of those expanded disciplines that have been traditionally titled gross anatomy, biochemistry, biology, physiology, microbiology, immunology, pathology, pharmacology, and neuroscience.
>
> (II) The fundamental clinical subjects, which shall be offered in the form of required patient-related clerkships, are internal medicine, obstetrics and gynecology, pediatrics, psychiatry, family practice, and surgery."

The curriculum should be at least 130 weeks in length as required for U.S. medical education.

Graduate medical education and continuing education. After graduation from an approved U.S. or international medical school, the pathway to become a physician includes graduate medical education (GME) training. GME takes three to eight years to complete and may include training in a subspecialty and/or fellowship beyond a residency after medical school graduation. The TMB requires GME programs to be accepted for certification by a specialty board, nationally accredited, or approved by the TMB if a post-residency fellowship that provides additional training in a medical specialty/subspecialty (TAC, Title 22, Part 9, Section 163.1(9)). GME accreditation in the United States is now through one single entity, the Accreditation Council for Graduate Medical Education, or ACGME, with GME programs previously accredited by the American Osteopathic Association also accredited by ACGME. The integration was completed on June 30, 2020.

Physicians licensed to practice medicine in Texas are required to register their permits with the TMB. A requirement for the physician registration is completion of 48 credits of continuing medical education (CME) every 24 months, per the TMB rules found in Section 166.2 of TAC, Title 22, Part 9, Chapter 166. Generally, physicians need formal CME course credits in medical ethics and/or professional responsibility, which can encompass the required training in human trafficking prevention, pain management and prescription, according to the TMB rules. Fifty percent of the required CME credits may be informal and include activities such as self-studies, hospital lectures, grand rounds, or case conferences.

[2] American Association of Colleges of Osteopathic Medicine, *Glossary of Osteopathic Terminology,* 3rd ed. (2017), https://www.aacom.org/docs/default-source/insideome/got2011ed.pdf

[3] Liaison Committee on Medical Education, *Functions and Structure of a Medical School*, March 2020. (2020), https://lcme.org/publications/

Appendix B: Texas Medical Schools

Institutions	Locations
Baylor College of Medicine	Houston
Sam Houston State University College of Osteopathic Medicine	Conroe
Texas A&M University Health Science Center College of Medicine	Bryan/College Station, Dallas, Round Rock, Houston, Temple
Texas Christian University and University of North Texas Health Science Center (TCU/UNTHSC) School of Medicine	Fort Worth
Texas Tech University Health Sciences Center Medical School	Amarillo, Lubbock, Odessa
Texas Tech University Health Sciences Center-El Paso, Paul L. Foster School of Medicine	El Paso
The University of Texas at Austin Dell Medical School	Austin
The University of Texas Health Science Center at Houston McGovern Medical School	Houston
The University of Texas Health Science Center at San Antonio Long School of Medicine	San Antonio
The University of Texas Medical Branch at Galveston School of Medicine	Galveston
The University of Texas Rio Grande Valley School of Medicine	Harlingen, Edinburg, McAllen
The University of Texas Southwestern Medical Center School of Medicine	Dallas
The University of the Incarnate Word School of Osteopathic Medicine at Brooks City Base	San Antonio
University of Houston College of Medicine	Houston
University of North Texas Health Science Center at Fort Worth, Texas College of Osteopathic Medicine	Fort Worth

Appendix C: APRN Educational and Licensing Requirements

Becoming an Advanced Practice Registered Nurse

Per the Texas Occupations Code, Title 3, Section 301.152, an APRN is a registered nurse licensed by the Board of Nursing "to practice as an advanced practice registered nurse on the basis of completion of an advanced educational program. The term includes a nurse practitioner, nurse midwife, nurse anesthetist, and clinical nurse specialist," and is the same as "advanced nurse practitioner" and "advanced practice nurse." This appendix presents information relevant to APRNs at the national and state levels.

The Consensus Model. The 2018 National Sample Survey of Registered Nurses conducted by the Health Resources and Services Administration's Bureau of Health Workforce estimated that more than 400,000 registered nurses (RNs), 8.1%, had completed advanced practice training, representing a 3.4% increase since 2008. The national survey reported that among APRNs, 68.7% were nurse practitioners, 19.6% were certified nurse specialists, 9.3% were nurse anesthetists, and 2.4% were nurse midwives.

At the national level, efforts to have a consistent model for APRN-related regulation have led to what is known as the "Consensus Model," in which the National Council of State Boards of Nursing and multiple stakeholder groups have been involved.[4] The Consensus Model addresses accreditation, education, certification, and licensure. The model recognizes that state licensing boards make the ultimate decision, according to state regulations and laws, which individuals are granted the authority to practice as APRNs.

Nationally consistent adoption and implementation of the Consensus Model has not been achieved. Some states, such as Alaska and Oregon, have fully implemented the model, including provisions for independent practice and independent prescribing by nationally certified and state licensed APRNs. In Texas, adopted components of the Consensus Model include the four recognized APRN roles (i.e., nurse practitioner, nurse midwife, nurse anesthetist, and clinical nurse specialist), national accreditation of graduate-level education programs, and certification through national examinations. APRN licensure issued by the state of Texas, under both typical circumstances and in a disaster-relief setting, does not permit independent practice or prescribing without a delegating physician. For instance, under Governor Abbott's COVID-19 disaster declaration, delegation requirements remained, while, as a way to expand the health care workforce, increased flexibility was granted regarding the establishment and maintenance of the supervisory relationships with the delegating physicians.

APRN licensure requirements. The Texas Board of Nursing is the state agency charged with the responsibility of licensing APRNs, granting the authority to practice in Texas. To be eligible for APRN licensure, individuals must be an RN, have completed nationally accredited graduate-level advanced practice nursing education, attained a minimum of a master's degree, and obtained national certification in a role and population focus area consistent with the graduate education program. In Texas Administrative Code, Title 22, Part 11, Chapter 221, the Board of Nursing details how individuals can request for waivers and exemptions from certain requirements. The waivers and exemptions are limited and are grand-parenting provisions for individuals who completed APRN education programs in the past and

[4] "APRN Consensus Model: The Consensus Model for APRN Regulation, Licensure, Accreditation, Certification and Education," National Council of State Boards of Nursing, accessed March 16, 2020, https://www.ncsbn.org/aprn-consensus.htm.

would have met APRN licensure requirements in effect in Texas at the time of program completion.

In the same chapter of Texas Administrative Code, Title 22, the Board of Nursing specifies and recognizes the following population focus areas for the APRN roles:

- Adult-Gerontology: Acute Care and/or Primary Care
- Family/Individual across the Lifespan
- Neonatal
- Pediatric: Acute Care and/or Primary Care
- Psychiatric/Mental Health
- Women's Health/Gender-related

An eligible individual must apply for licensure in one or more of the four APRN roles and in one or more of the population focus areas.

Regarding the education attainment for APRN licensure, the Texas Board of Nursing requires completion of minimum one academic year with a full-time academic load; separate courses in advanced health assessment, advanced physiology and pathophysiology, and advanced pharmacology that includes pharmacodynamics, pharmacokinetics, and pharmacotherapeutics; APRN role preparation addressing core competencies; nursing specialty practice theory; diagnosis and clinical management of health status; research; legal, ethical, and professional responsibilities of the APRN; and a minimum of 500 supervised clinical hours pertaining to each role and population focus area of licensure and including pharmacotherapeutic management. Continuing education to ensure continued competence is also required. Individuals seeking licensure as clinical nurse specialists, in addition to attainment of a master's degree, must complete nine semester credit hours of clinical major courses in a specific population focus area and a minimum of 45 clock hours of advanced-level coursework in diagnosis and management of diseases and conditions.

Post-graduate preparation, including programs that confer a post-master's certificate, could also qualify an individual to meet the required education attainment for APRN licensure. Individuals seeking APRN licensure through post-master's preparation will still have to meet all of the requirements specified by the Texas Board of Nursing; however, required courses may be waived for a student if equivalent coursework is documented in the individual's transcript.

APRN education programs in Texas. The Texas Center for Nursing Workforce Studies, created per Title 2, Section 105.002 of the Texas Health and Safety Code in response to concerns about the state's nursing shortage, conducts an annual survey of graduate nursing education programs. The annual Graduate Nursing Education Program Information Survey (G-NEPIS) contains questions specific to APRN tracks offered by institutions. The 2019 survey indicated that about 30 Texas higher education institutions offer an APRN-relevant pathway, including post-master's certificate programs. The pathway that produced the largest number of graduates in 2019 was master's degree programs for family nurse practitioners.

Including the three required courses in advanced health assessment, advanced physiology and pathophysiology, and advanced pharmacology, the total length of curriculum in credit hours reported in the 2019 G-NEPIS as required for each pathway (e.g., master's degree) was fairly consistent and varied only slightly among institutions. However, the required numbers of precepted clinical practice hours frequently showed a range among the institutions. For instance, the 23 institutions that reported offering a master's degree program for family nurse practitioners indicated a range from 525 hours (Texas Tech University Health Sciences Center)

to 800 hours (The University of Texas Rio Grande Valley). The next lowest number was 576 (Midwestern State University) and the next highest number was 780 (Prairie View A&M University and The University of Texas Medical Branch). More than half of the institutions (14) reported hours in the 600s, ranging from 605 (one institution) to 675 (four institutions). While there may be various reasons for the differences in the clinical practice hours, one possible explanation could be varying admissions requirements (e.g., years of RN practice, practice settings, and employment status).

Appendix D: Sample Medicine and APRN Curricular Crosswalk

One health-related institution in Texas with both a medical school and a graduate professional nursing program conducted a comparison of the post-baccalaureate curricula between family medicine training and family nurse practitioner education. The comparison, based on medical school years, presents what students study each year in the two programs and, for family medicine, includes the three years of residency training.

Medical School	Family Physician	Family Nurse Practitioner
Education Year 1	• Gross Anatomy and Radiology • Molecules, Cells, and Tissues • Pathobiology and Host Defense • Neuroscience and Human Behavior • Practice of Medicine	Semester 1: • Theoretical and Research Foundations for Advanced Nursing Practice (3 hours) • Pathophysiology (3 hours) Semester 2: • Advanced Health Assessment (3 hours) • Nurse Practitioner Diagnostic Reasoning (2 hours) Semester 3: • Pharmacology (3 hours) • Public Policy (3 hours)
Education Year 2	• Cardiovascular and Pulmonary System • Renal, Fluid, and Electrolytes • Gastrointestinal/Nutrition • Endocrine/Reproduction • Dermatology/Hematology/Musculoskeletal • Great Syndromes • Practice of Medicine	Semester 4: • Introduction to Primary Care of Adults (6 hours) • Families and Health Promotion (2 hours) Semester 5: • Primary Care: Children and Comprehensive Prenatal Care (6 hours) • Informatics/Quality Improvement (3 hours) Semester 6: • FNP Chronic Illness (6 hours) • Nurse Practitioner Business and Roles (3 hours)
Education Year 3	• Internal Medicine (12 weeks) • Pediatrics (8 weeks) • Surgery (8 weeks) • Obstetrics/Gynecology (6 weeks) • Psychiatry (6 weeks) • Family Medicine (4 weeks) • Elective (4 weeks)	Semester 7: • Public Health Principles in Advanced Practice Nursing (3 hours) • FNP Clinical Practicum (3 hours)
Education Year 4	• Neurology Selective (4 weeks) • Emergency Medicine Selective (includes Advanced Cardiac Life Support) (4 weeks) • Acting Internship Selective (4 weeks) • Ambulatory Community Selective (4 weeks) • Basic Science/Humanities Selective (4 weeks) • Electives are 20 weeks with at least one required clinical	
Family Medicine	• Continuity Clinic (1 half-day each week) • Ambulatory Pediatrics	

Residency Year 1	• Community Medicine • Emergency Medicine • Essential Skills in Family Medicine • Inpatient Medicine • Obstetrics 1 • Medical Intensive Care Unit • Newborn Nursery • Pediatric Urgent Care • Principles of Family Medicine • Surgery	
Residency Year 2	• Continuity Clinic (4 half-days each week) • Behavioral Medicine • Cardiology • Electives • Geriatrics • Inpatient Medicine • Inpatient Pediatrics • Obstetrics 2 • Procedures • Orthopedics • Women's Health	
Residency Year 3	• Continuity Clinic (4 half-days each week) • Ambulatory Family Medicine • Ambulatory Pediatrics • Electives • Family Medicine Board Review • Inpatient Medicine • Nephrology • Neurology • Orthopedics with Sports Medicine • Practice Management/Research • Surgical Subspecialties (Urology/ENT)	

This document is available on the Texas Higher Education Coordinating Board website: http://highered.texas.gov.

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