

# Curing the Physician Shortage:

State-Level  
Prescriptions for a  
National Problem



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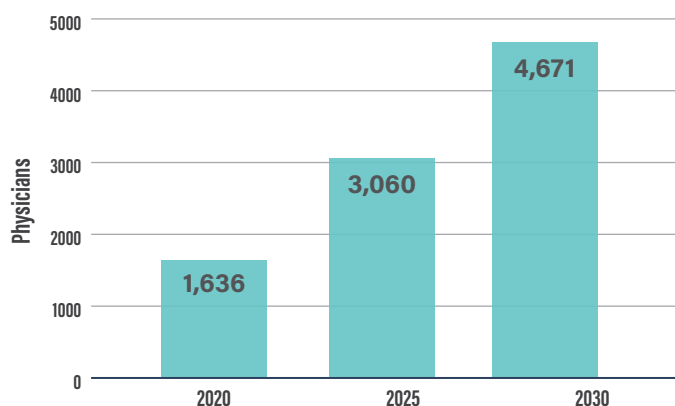
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# I. Introduction

In Florida, and across the country, there is an impending shortage of physicians. According to the Association of American Medical Colleges (AAMC), a growing, aging population is expected to generate a shortage of between 46,900 and 121,900 physicians by the year 2032.<sup>1</sup> This trend may be particularly problematic in a state like Florida where more than 20 percent of the population is over 65 years old. The Health Resources and Services Administration estimates that Florida already needs an additional 1,636 primary care physicians to address existing shortages.<sup>2</sup> The shortage is projected to grow to over 3,000 primary care physicians by 2025 and as high as 4,671 by 2030.<sup>3,4</sup>

**Figure 1. Primary Care Physician Shortage in Florida 2020-2030**



Source: HRSA, First Quarter of Fiscal Year 2020 Designated HPSA Quarterly Summary; HRSA, State-Level Projections of Supply and Demand for Primary Care Practitioners: 2013-2025; Robert Graham Center, Florida: Projecting Primary Care Physician Workforce

Many of the challenges faced by our healthcare system are national in nature. For example, private and public forms of health insurance act as third-party payers, distorting the market and insulating consumers from prices. Recent expansions of health insurance coverage under the Affordable Care Act only exacerbate this distortion and place further strains on the healthcare system. As demand for healthcare services outpaces the supply of providers, prices will continue to increase. Fortunately, there are several policy measures that can be pursued at the state level to address provider shortages, expand access, and lower costs for patients. This report examines policy reforms that will enable innovations in the healthcare industry to take hold and help mitigate the growing physician shortage in the Sunshine State.

Telehealth is one of many emerging trends in healthcare with tremendous potential to expand access and achieve cost-reduc-

tions. In 2019, the Florida Legislature took significant steps to clear the way for telehealth providers, but telehealth should not be perceived as a panacea for issues in the healthcare industry. The problems of rising costs and shrinking supply can only be addressed through a broad suite of reforms across a range of policy areas. Addressing the growing physician shortage will require Florida to expand the Scope of Practice for non-physician providers, pursue comprehensive licensing reform, eliminate remaining Certificate of Need requirements, and embrace future technological innovation. Taken together, these measures could go a long way toward ensuring adequate access to healthcare in Florida.

## II. Physician Shortages in Florida

The Florida Department of Health (FDOH) conducts annual surveys of the physician workforce in Florida. Physicians are required to complete the survey as part of the license renewal process every two years. The department compiles the two most recent surveys each year to produce an annual report which provides reliable estimates of the physician workforce.<sup>5</sup> As of 2019, there are approximately 52,936 physicians actively practicing in the state of Florida.<sup>6</sup> The Association of American Medical Colleges provides a similar estimate of 56,484 active physicians.<sup>7</sup> The AAMC's estimates are based on data from the American Medical Association's Masterfile of active physicians and are available for all 50 states. Data from both sources are used throughout this section as each provides unique insights into Florida's physician workforce.

### EXISTING SHORTAGES IN FLORIDA

Health Professional Shortage Areas (HPSAs) are geographic areas, populations, and facilities in which the need for care exceeds the supply of primary care, dental health, or mental health providers. HPSAs are designated by the U.S. Department of Health and Human Services' Health Resources and Services Administration. There are currently 282 primary care HPSAs in Florida covering a population of more than 6,063,708 people.<sup>8</sup> The existing physician workforce meets just 21.4 percent of the need in those areas. In order to meet the remaining need and remove the HPSA designations, an additional 1,636 primary care physicians are required.

An important factor in designating HPSAs is the physician to population ratio. Comparing the ratio in Florida to that of other states is another metric by which to gauge the adequacy of the current supply. The AAMC data is ideal for cross-state comparison because it is available for all 50 states. **Table 1** provides a summary of physician workforce in Florida relative to other states. Overall, Florida ranks 23rd for the number of total active physicians but ranks worse in terms of primary care physicians. Compared to the

state median of 90.8 primary care physicians per 100,000 people, Florida has just 86.8 physicians. With only 6.9 general surgeons per 100,000 people, Florida ranks 42nd among the 50 states.

**Table 1. Summary of Physician Workforce in Florida Relative to Other States**

	Physicians per 100,000 People	State Mean	FL Rank
Total Active Physicians	265.2	257.6	23
Primary Care Physicians	86.8	90.8	31
General Surgeons	6.9	7.7	42

Source: Association of American Medical Colleges, 2019 Florida Physician Workforce Profile available at <https://www.aamc.org/system/files/2019-12/state-physician-florida-2019%5B1%5D.pdf>

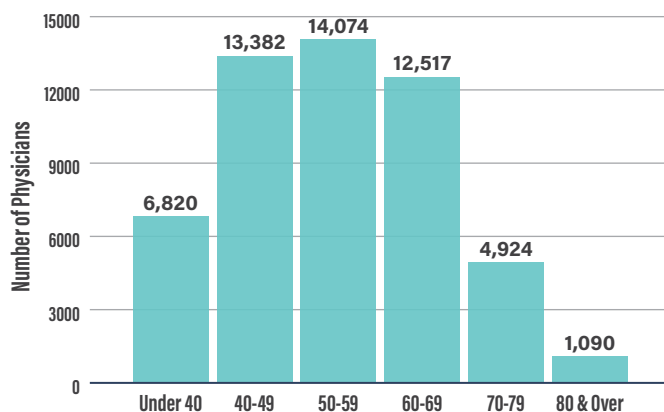
## FUTURE SHORTAGES IN FLORIDA

The FDOH survey provides insight into the demographic composition of the physician workforce. The data suggest that current shortages will grow over time as the physician workforce ages along with Florida's population. The current age distribution of physicians is shown in **Figure 2**. The median age of physicians in 2019 was 54 years old with more than 35 percent over 60 years old. While about 19 percent of physicians continue to work past retirement age, more than 12 percent of Florida's physicians plan to retire in the next five years. The average age of those planning to retire is 66 years old. **Figure 3** shows the percentage of physicians planning to retire by area of specialty. The specialties with the highest number of physicians planning to retire are internal medicine (1,560), family medicine (1,035), anesthesiology (516), pediatrics (442), and surgery (406).<sup>9</sup>

In addition to demographic trends, state-level projections indicate a growing shortage in Florida. A 2016 report from the Health Resources and Services Administration (HRSA) projected a shortage of over 3,000 primary care physicians in Florida by 2025.<sup>10</sup> Projecting future supply and demand for healthcare providers is not an easy task and requires several assumptions. The HRSA model uses state population demographics, health status, healthcare use, and insurance status, to project the demand for physicians including the number required to de-designate Health Professional Shortage Areas. Supply is projected by estimating (1) the number of new entrants, (2) exits due to retirement and mortality, and (3) changes in the average number of hours worked based on demographic data. The difference between estimated supply and demand is used to determine the projected shortage of approximately 3,060 primary care physicians.

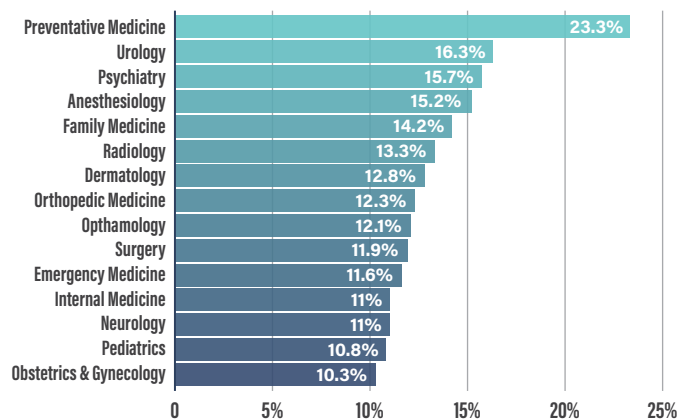
Additional projections of primary care physician shortages in all 50 states are available from the American Academy of Family Physicians' Robert Graham Center. The Center's report for Florida projects a shortage of 4,671 primary care physicians by 2030 using a similar methodology to the HRSA model. Taken together, these projections suggest that Florida will face a significant shortage of physicians in the coming years. The following sections discuss several policy reforms that Florida could pursue in order to reduce the strain on healthcare services resulting from this shortage.

**Figure 2. Age Distribution of Physicians in Florida**



Source: Florida Department of Health, 2019 Physician Workforce Annual Report available at <http://www.floridahealth.gov/provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/index.html>

**Figure 3. Physicians Planning to Retire by Specialty (%)**



Source: Florida Department of Health, 2019 Physician Workforce Annual Report. Data on additional specialties available at <http://www.floridahealth.gov/provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/index.html>





### III. Expanding Scope of Practice for Non-Physician Practitioners

While physicians are a critical piece of Florida's healthcare workforce, non-physician practitioners also play important roles in providing care to patients. In contrast to physicians, the supply of nurses, physician assistants, and pharmaceutical workers is growing rapidly. Expanding the role of non-physician practitioners would go a long way toward addressing the growing physician shortage, but Scope of Practice (SOP) laws limit the ability of these workers to practice to the full extent of their training and education. Fortunately, wide variation in SOP laws across states suggests that there is ample room for reform in Florida without compromising the quality of care. In fact, the vast majority of research on the subject suggests that expanding the role of non-physician providers improves access with no effect on quality. This section provides an overview of several non-physician practitioners, their educational requirements, and potential SOP reforms in Florida.

#### ADVANCED PRACTICE REGISTERED NURSES

APRNs are state-licensed registered nurses who receive additional training through accredited graduate-level programs. To become licensed as an APRN in Florida, applicants must (1) hold a valid Registered Nurse License in any U.S. jurisdiction; (2) meet minimum educational requirements; (3) submit proof of national advanced practice certification from an approved nursing board; and (4) provide proof of malpractice insurance or exemption.<sup>11</sup> National advanced practice certification may be obtained from one of many existing organizations depending on the APRN role and population focus a nurse chooses to pursue. Florida recognizes five APRN roles: Nurse Practitioners, Certified Registered Nurse Anesthetists, Certified Nurse-Midwives, Clinical Nurse

Specialists, and Advanced Practice Psychiatric Nurses.<sup>12</sup>

APRNs in Florida must adhere to general SOP restrictions that apply to all APRNs in addition to role-specific restrictions. All APRNs must have a collaborative practice agreement with a physician which outlines the procedures the APRN can perform and protocols for consulting the physician. Agreements may be more restrictive than the maximum SOP outlined in statute but, at a maximum, APRNs in Florida currently may:

1. Prescribe, dispense, administer, or order "any drug." However, an APRN may only prescribe controlled substances "pursuant to [their] education, training, experience and protocol." Moreover, the prescription of "psychiatric mental-health controlled substances to children younger than 18 years of age" is restricted to psychiatric nurses.<sup>13</sup>
2. Initiate therapies for certain conditions specified in collaborative practice agreements with their supervising physicians
3. Order diagnostic tests and physical or occupational therapy<sup>14</sup>

A primary care physician may only engage in supervisory agreements with four offices in addition to their primary practice location while specialty doctors may only engage in agreements with two other offices. Moreover, each office must post a schedule of the hours during which the physician is present at the office and the hours during which the office is open without the presence of the physician.<sup>15</sup> Supervision requirements and collaborative practice agreements unnecessarily limit the autonomy of APRNs and reduce their ability to alleviate physician shortages.

APRNs possess the necessary education and training to practice independently without the supervision of a physician, and many states do not require such supervision. Moreover, a report from the National Academies of Medicine strongly recommended expanding the role of APRNs to meet the growing need for primary care providers.<sup>16</sup> The report specifically cited the importance of nurses in expanding access and improving the quality of care. Additional SOP provisions for each of the APRN roles and corresponding supervision requirements in other states are discussed below.

#### Certified Nurse Practitioners

In the course of certification and training, Nurse Practitioners (NPs) must select populations of focus. There are six population foci including: (1) family/individual across the lifespan, (2) adult gerontology, (3) neonatal, (4) pediatrics, (5) women's health/gender related, (6) psychiatric/mental health. NPs may further spe-

cialize in areas of medicine though certification exams if necessary. Which specializations and population of focus an NP selects will inform which school they attend and how they practice after graduation.

Generally, NPs possess the training and expertise to conduct many of the same tasks as physicians – including assessing patients, making diagnoses, and devising treatment plans. A report from the former congressional Office of Technology Assessment found that NPs could perform a substantial portion of tasks normally provided by physicians and “as much as 75 percent of the well-patient care for adults and children.”<sup>17</sup> In addition to the general SOP provisions applicable to all APRN roles, NPs in Florida may:

1. Manage selected medical problems.
2. Order physical and occupational therapy.
3. Initiate, monitor, or alter therapies for certain uncomplicated acute illnesses.
4. Monitor and manage patients with stable chronic diseases.
5. Establish behavioral problems and diagnosis and make treatment recommendations.

However, supervision requirements and collaborative practice agreements reduce NPs’ level of autonomy and may limit the range of services they provide. For example, collaborative practice agreements may place additional restrictions on the types of medication an NP can provide.

According to the American Association for Nurse Practitioners, Florida is among the 12 most restrictive states.<sup>18</sup> Removing supervision requirements and allowing NPs to practice independently would help address the physician shortage in Florida by allowing NPs to practice to the full extent of their education and training. NPs’ SOP could also be expanded to include a wider range of basic services currently reserved for physicians. This would free physicians to focus on providing more complex care that requires the expertise of a medical doctor without compromising the quality of care. Currently, 25 states already allow NPs to prescribe medication without the supervision of a physician while 24 states allow full independent practice for NPs.<sup>19</sup> Of these, 11 require a transition period before NPs are allowed to practice independently.

Research suggests that less restrictive SOP laws improve health-care access without posing risks to public safety. A study published in the *Journal of Law and Economics* found that more restrictive SOP policies resulted in between 3 and 16 percent higher costs for well-child visits with no difference in quality or safety.<sup>20</sup> A meta-analysis of 36 empirical studies found that, compared to resident physicians, NPs were associated with higher rates of patient satisfaction.<sup>21</sup>

## Certified Registered Nurse Anesthetists

Certified Registered Nurse Anesthetists (CRNAs) work with surgeons, anesthesiologists, and other healthcare professionals to administer anesthesia and provide care to patients before, during, and after medical procedures. CRNAs consult with patients and review medical histories before procedures to ensure safe administration of anesthesia. During procedures, they monitor patients’ vital signs and adjust anesthesia as necessary. CRNAs may also be involved in patient recovery and pain management.<sup>22</sup>

Like all other APRNs, CRNAs in Florida must practice under the supervision of a physician—typically an anesthesiologist or surgeon. However, there is no requirement that the supervising physician be an anesthesiologist, meaning that the supervising physician may not have specialized knowledge related to the administration of anesthesia. It is therefore not clear that supervision requirements contribute to the safe administration of anesthesia. In addition to general SOP provisions for APRNs in Florida, CRNAs may:

1. Determine patients’ health status related to risk factors and administration of anesthesia
2. Determine, with the consent of the responsible physician, the appropriate type of anesthesia based on history, physical assessment, and supplemental laboratory results
3. Order preanesthetic medication.
4. Perform surgical, obstetrical, therapeutic, or diagnostic clinical procedures to manage pain including ordering and administering regional, spinal, and general anesthesia; inhalation agents and techniques; intravenous agents and techniques; and techniques of hypnosis.
5. Order or perform monitoring procedures related to anesthetic healthcare management
6. Support life functions during anesthesia healthcare, including induction and intubation procedures; the use of appropriate mechanical supportive devices; and the management of fluid, electrolyte, and blood component balances.
7. Recognize and take appropriate corrective action for abnormal patient responses to anesthesia, adjunctive medication, or other forms of therapy.
8. Recognize and treat cardiac arrhythmia while patients are under anesthetic care.
9. Participate in the management of patients while in the post-anesthesia recovery area, including ordering the administration of fluids and drugs.
10. Place special peripheral and central venous and arterial lines for blood sampling and monitoring.<sup>23</sup>

Federal law requires that CNRAs work under the supervision of physicians, but a rule promulgated by the Centers for Medicare and Medicare Services in 2001 allows states to opt out of this requirement. In order to opt out, a state's governor must send a letter of attestation to the CMS stating that (1) the state's governor has consulted with the state's boards of medicine and nursing about issues related to access to and the quality of anesthesia services in the state, (2) that it is in the best interests of the state's citizens to opt-out of the current federal physician supervision requirement, and (3) that the opt-out is consistent with state law.<sup>24</sup> As of December 2019, 17 states have opted out of supervision requirements and allow CNRAs to practice independently.<sup>25</sup>

Considering that nearly 42 percent of anesthesiologists are over the age of 60 and more than 15 percent of Florida's anesthesiologists plan to retire in the next five years, allowing CRNAs to practice independently could help ensure an adequate supply of anesthesia services in the coming years. Significantly, research suggests that expanded SOP for CRNAs has no measurable impact on the incidence of anesthesia-related complications.<sup>26</sup> Regardless of whether anesthesia is provided by a physician, CRNA, or in collaboration between the two, the odds of a complication occurring are virtually the same.

## Certified Nurse Midwives

Certified Nurse Midwives (CNMs) provide care to women, including gynecological exams, family planning services, and prenatal care.<sup>27</sup> Typical responsibilities include delivering babies, assisting physicians with cesarean births, and educating patients regarding nutrition and disease prevention. They may also act as primary care providers to women and newborns. In addition to general SOP provisions for APRNs, CNMs in Florida may:

1. Perform superficial minor surgical procedures.
2. Manage patients during labor and delivery to include amniotomy, episiotomy, and repair.
3. Order, initiate, and perform appropriate anesthetic procedures.
4. Perform postpartum examination.
5. Order appropriate medications.
6. Provide family-planning services and well-woman care.
7. Manage the medical care of the normal obstetrical patient and the initial care of a newborn patient.<sup>28</sup>

While Florida requires CNMs to have supervisory agreements with physicians, CNMs are sufficiently trained to manage patients before, during and after delivery without the supervision of a physician. As of June 2018, 24 states and the District of Columbia al-



low CNMs to practice without supervision. A working paper from the National Bureau of Economic Research found that “states that allow for CNMs fully enabled practice, have on average, little or no differences in maternal health behaviors or infant health outcomes as compared to states with more restrictive SOP.”<sup>29</sup> Moreover, less restrictive states had significantly lower rates of labor inductions, elective labor inductions, C-sections, and elective C-sections. The authors conclude that these findings suggest that removing SOP restrictions for CNMs “has the potential to improve the efficiency of the healthcare system for delivery and infant care.”<sup>30</sup>

## Clinical Nurse Specialists

Clinical Nurse Specialists (CNSs) provide direct patient care and work with other providers to improve the quality of care across the healthcare system. They can take on leadership positions advising fellow nursing staff and identifying strategies to improve practices through research and observation.<sup>31</sup> In addition to general SOP provisions for APRNs, CNSs in Florida may:

1. Assess the health status of individuals and families using methods appropriate to the population and area of practice;
2. Diagnose human responses to actual or potential health problems;
3. Plan for health promotion, disease prevention, and therapeutic intervention;
4. Implement therapeutic interventions based on the nurse specialist's area of expertise including, but not limited to, direct nursing care, counseling, teaching, and collaboration with other licensed healthcare providers; and
5. Coordinate healthcare as necessary and appropriate and evaluate with the patient or client the effectiveness of care.

There is insufficient research on the impact of expanded SOP for CNSs, but the broader literature on APRNs as a whole suggests that eliminating supervision requirements in Florida would expand access to care without compromising quality. In 28 states and the District of Columbia, CNSs are able to practice without the supervision of a physician. These states have not experienced any notable issues associated with independent practice.

## PHYSICIAN ASSISTANTS

Physician assistants (PAs) are required to participate in approved graduate-level programs to receive licensure from state boards. PA programs are modeled after traditional medical school curriculums and prepare PAs to perform many of the same functions as physicians. By definition, PAs work under the supervision of physicians, but their degree of autonomy varies widely across states depending on supervision requirements, prescriptive authority, and other SOP laws. Generally, PAs' responsibilities include taking or reviewing patients' medical histories, examining patients, ordering and interpreting diagnostic tests, diagnosing a patient's injury or illness, providing treatment, and prescribing medicine.

In 47 states including Florida, SOP is determined by the supervising physician at the practice site rather than being stipulated in statute or rule. Florida, along with 43 other states, also allows PAs to prescribe Schedule II-V medication. In these respects, Florida's SOP laws for PAs are flexible and in line with most states. However, the particular stipulations of supervision requirements vary widely across states, with Florida's being relatively restrictive. Physicians in Florida "may not supervise more than four currently licensed physician assistants at any one time."<sup>32</sup> Meanwhile, eight other states allow physicians to supervise more than four PAs and twelve have no limits on the number of PAs a physician may supervise. Several others allow for exceptions depending on the needs of a particular practice site. Allowing more flexibility for PAs in Florida may be especially beneficial considering growing physician shortages.

## PHARMACISTS AND PHARMACY TECHNICIANS

### Pharmacists

Pharmacists primarily dispense medications and provide guidance on the safe use of prescription medications. They may also provide health and wellness screenings and provide immunizations.<sup>33</sup> In total, training and education to become a pharmacist takes between five and eight years. Pharmacists are generally required to complete two to four years of undergraduate education



before pursuing a Doctor of Pharmacy degree. Most Doctor of Pharmacy programs last four years, but some can be completed in three years. Pharmacists are trained to perform a range of health services including filling prescriptions, verifying proper dosage instructions from physicians, identifying and explaining potential side effects of medications, checking for potential negative interactions between medications, and administering flu shots.

In several states, pharmacists may administer tests and initiate treatment for certain conditions under collaborative practice agreements with physicians. For example, Kentucky allows pharmacists to test and—if the test is positive—prescribe medications for conditions including streptococcal pharyngitis, influenza, and urinary tract infections.<sup>34</sup> Other states allow pharmacists to administer tests but require them to refer patients to physicians for treatment. Pharmacists providing these services must receive special training and establish collaborative practice agreements with physicians. Expanding pharmacists' SOP in Florida to include diagnosing and initiating treatment for conditions with safe and reliable methods of testing would provide patients with convenient access to care while allowing physicians to focus on more demanding responsibilities.

### Pharmacy Technicians

Pharmacy technicians work under the supervision of pharmacists and aid in the dispensing of prescription medications. They are required to obtain state-issued licenses in 44 states including Florida, but requirements for licensure vary widely.<sup>35</sup> While many states allow pharmacy technicians to learn on the job without any formal training, Florida requires the completion of a board-approved training program. They must also complete 20 hours of continuing education every two years. Individuals actively training to become pharmacists or pharmacy technicians are exempt from these requirements.





## IV. Removing Barriers for Out-of-State Telehealth Providers

The terms telehealth and telemedicine broadly refer to the delivery of healthcare services via telecommunication or digital communication technologies. By allowing patients to receive care without the physical presence of a healthcare provider, these technologies have tremendous potential to address the challenges posed by physician shortages, increase access to care in rural communities, and—in some cases—reduce costs for consumers.<sup>36</sup> However, outdated regulatory schemes stand in the way of widespread adoption.

In 2019, Florida lawmakers passed significant reforms to allow for wider use of telehealth services. The 2019 legislation defines the term telehealth as “the use of synchronous or asynchronous telecommunications technology by a telehealth provider to provide healthcare services.”<sup>37</sup> The law excludes services provided via audio-only telephone calls, email messages, or facsimile transmissions. Florida, unlike many states, does not limit the practice of telehealth to any particular type of care provider. Services permitted to be provided through telehealth technologies include but are not limited to:

1. Assessment, diagnosis, consultation, treatment, and monitoring of a patient;
2. Transfer of medical data;
3. Patient and professional health-related education;
4. Public health services; and
5. Health administration.

Despite making significant progress through these reforms, obstacles to realizing the full potential of telehealth services remain. Of these, licensing requirements and SOP regulations for out-of-state providers are particularly important to the role of telehealth

in mitigating physician shortages. Under the 2019 legislation, telehealth providers must adhere to their SOP as outlined in Florida statutes—even if they are practicing in a state with less restrictive SOP laws than Florida. This creates unnecessary burden for out-of-state providers who must now maintain knowledge of SOP provisions in their state and in Florida. Short of expanding SOP requirements in Florida, allowing these providers to practice within the SOP provisions of their state of residence would reduce this burden and expand access to care.

Telehealth providers must also be licensed in Florida, licensed under a multi-state healthcare licensure compact of which Florida is a member, or register as a telehealth provider with the applicable board or department. Registration and multi-state licensure compacts are the most relevant to out-of-state providers because they are unlikely to pursue an additional Florida-specific license. To register as a telehealth provider, one must:

1. Complete the necessary application;
2. Be licensed with an active, unencumbered license that is issued by another state, the District of Columbia, or a possession or territory of the United States and that is substantially similar to a license issued to a Florida-licensed provider;
3. Not have been the subject of disciplinary action relating to his or her license during the 5-year period immediately prior to the submission of the application;
4. Designate a duly appointed registered agent for service of process;
5. Maintain professional liability coverage that includes coverage for telehealth services provided to patients outside of the provider's home state in an amount equal to or greater than the requirements for a practitioner licensed in Florida;
6. Not open an office or provide in-person care within the state of Florida; and
7. Only use a Florida-licensed pharmacy or a registered non-resident pharmacy or outsourcing facility to dispense medicinal drugs to patients located in Florida.

The registration process created under the 2019 legislation is a major step in the right direction because it allows providers licensed in other states to practice telehealth in Florida without obtaining a separate license. However, there are additional policy measures that would further reduce the burdens faced by out-of-state providers and encourage more providers to practice telehealth in Florida. Namely, Florida could (and should) join additional interstate licensure compacts or recognize licenses issued in all other states. Each of these options are discussed in detail below.



## MULTI-STATE LICENSURE COMPACTS

Broadly, interstate licensure compacts seek to reduce the burden of receiving licensure in multiple states. If a practitioner receives a license in any member state, they are able to receive licensure in all other member states with little or no additional effort. The telehealth legislation passed in 2019 allows out-of-state providers to practice telemedicine in Florida if they are licensed under a multi-state licensure compact of which Florida is a member. There are currently compacts for physicians, APRNs and registered nurses, but Florida only belongs to the compact for registered nurses. A summary of existing compacts is provided in **Table 3**.

**Table 3. Interstate Licensure Compacts**

Provider Type	Compact Name	Number of Member States	Florida Membership
Physicians (MDs, DOs)	Interstate Medical Licensure Compact	29*	No
Advanced Practice Registered Nurses	APRN Compact	3	No
Registered Nurses	Nurse Licensure Compact	33	Yes

Source: Interstate Medical Licensure Compact Commission; National Council of State Boards of Nursing  
\*Some states have enacted legislation but have not fully implemented the IMLC; 23 states are actively issuing and accepting licenses under the compact.

## RECOGNIZING OUT-OF-STATE LICENSES

While interstate licensure compacts facilitate the adoption of telemedicine by reducing the burden of receiving licensure in multiple states, there are no existing compacts for physician assistants or pharmacists. Furthermore, the compacts that do exist rely on widespread adoption to be effective, and many states have not yet joined. License reciprocity, or recognition, offers a simpler—albeit controversial—solution. Recognizing out-of-state licenses would allow practitioners in other states to provide telehealth services in Florida without undergoing additional registration or licensure processes. Such a policy would not be detrimental to the quality of services as licensure standards for healthcare providers are largely comparable across states. Florida already has programs to recognize out-of-state licenses held by veterans, active-duty service members, and military spouses in all healthcare professions.<sup>38</sup> Expanding out-of-state license recognition to all new residents and out-of-state providers would increase competition, expand access, reduce costs, and promote the adoption of telehealth

technologies by expanding the healthcare labor market in Florida. Nevertheless, associations of healthcare providers, particularly the American Medical Association, are strongly opposed to policies which would allow out-of-state providers to practice more readily in Florida.

Reforms that more narrowly target telehealth providers could also be pursued. Generally, states have focused on the location of patients regarding telehealth regulation rather than the location of healthcare providers. An alternative approach would consider the location of the patient-provider interaction to be in the state where the provider is licensed. Under this approach, any legal disputes would fall under the jurisdiction of the provider’s state of residence. This is preferable to a state-by-state approach which requires providers to seek licensure or registration in every state they wish to serve remotely. In effect, patient-provider interactions would be treated the same as if a patient traveled to the provider’s state to receive care. For example, if a Floridian travelled to New York for a medical appointment, any subsequent legal dispute would be handled in New York and any resulting disciplinary actions would be the responsibility of the appropriate New York licensing board. Telehealth services could be treated in a similar manner such that a healthcare provider would only need to be licensed in their state of residence. This would be less controversial than a universal license recognition policy but may require federal action.

## V. Eliminating Certificate of Need Requirements and Bans on Specialty Hospitals

Certificate of Need (CON) laws are a set of regulations that require healthcare providers to demonstrate an unmet need before constructing new facilities, expanding existing ones, or offering new services. The origin of many states’ CON laws can be traced back to the National Health Planning and Resources Development Act of 1974, which withheld federal funds from states which did not enact CON laws under the rationale that excessive competition would increase healthcare costs through over-investment in facilities and equipment. The incentive was repealed in 1987, and since then several states have repealed their CON laws.<sup>39</sup>

Florida’s CON program was created in 1973 and has been reformed a number of times in the past 15 years. The most recent reform, which came in July 2019, eliminated CON review for general hospitals, comprehensive rehabilitation, certain specialty hospitals, and tertiary health services. CON requirements were maintained for nursing homes, skilled nursing facilities, hospice programs, and intermediate care facilities for the developmentally

disabled. The legislature also stopped shy of eliminating Florida’s ban on specialty hospitals that restrict their services to cardiac, orthopedic, surgical or oncology care.

Research suggests that CON laws have failed to accomplish the goals of preventing over-investment and reining in healthcare costs. A report from the Mercatus Center at George Mason University surveyed 20 peer-reviewed studies spanning four decades to examine the effects of CON laws along the dimensions of (1) per unit costs, prices, and charges; (2) total expenditures; (3) hospital efficiency; and (4) hospital investment.<sup>40</sup> The findings in each of these categories are presented in **Table 2**.

**Table 2. Summary of Certificate of Need Research**

Per Unit Costs, Prices, and Charges	Three out of four studies found CON to be “associated with higher per unit prices, costs, or charges, while the fourth—which focused only on per diem Medicaid charges for nursing-home and long-term care—found that repeal of CON had no statistically significant effect on those charges.”
Total Expenditures	Seven out of twelve studies found that CON laws increased expenditures. Two found no statistically significant results while another two found that CON laws increased some expenditures while reducing others. Only one study associated CON laws with reduced expenditures, but the relationship was indirect.
Hospital Efficiency	The studies pertaining to hospital efficiency—how cost-effectively hospitals transform inputs into outputs—found mixed results. Two out of four concluded that CON laws lead to greater efficiency. Of the remaining two, one found evidence of reduced efficiency while the other found no statistically significant effect.
Hospital Investment	Two studies examined the effect of CON laws on reducing unnecessary investment. One found that CON laws change the composition of investments but fail to reduce investments overall. The other suggested that hospitals actually increased investment in anticipation of CON laws that would complicate future investments.

CON laws and bans on specialty hospitals limit the supply of healthcare services which reduces access and raises costs for consumers. Considering that a shortage of physicians will also raise costs and limit access to care, policies such as CON laws that unnecessarily exacerbate these problems should be eliminated. CON laws for nursing homes and hospices are particularly detrimental in Florida given the relatively-high elderly population in the state.

## VI. Embracing Innovative Technologies

Technological innovation has the potential to transform the healthcare industry and reduce the impact of physician shortages, but it is essential that our laws and regulations allow for such innovation to take place. While it is impossible to know what innovations lie around the corner, technologies including artificial intelligence, unmanned aerial vehicles (UAVs), and telepharmacy technologies are already demonstrating their potential. To address the growing physician shortage, Florida should embrace these technologies and avoid limiting future innovation through excessive regulation. Policymakers should be particularly careful to not stifle innovation by forcing new technologies to comply with outdated regulatory schemes.

Preliminary testing suggests that artificial intelligence (AI) could be used to diagnose a variety of diseases—even more accurately than physicians. In a study published by Nature Medicine, an algorithm outperformed six radiologists at screening for lung cancer.<sup>41</sup> Another AI application from Babylon, a digital healthcare startup in the UK, scored 10 points higher than trainee general practitioners on an exam designed to test their diagnostic abilities.<sup>42</sup> A recent meta-analysis of 82 studies found that the diagnostic performance of deep learning models was equivalent to that of physicians, but many of the studies suffered from methodological issues.<sup>43</sup> Nevertheless, the vast majority of research on the subject indicates artificial intelligence is a promising technology that could greatly improve the quality of healthcare services. While it will take some time before artificial intelligence is advanced enough to replace physicians, it could become an essential aid to physicians in the near future. States should be cautious not to limit the potential of artificial intelligence through regulation.

UAVs, commonly referred to as drones, are already being used in developing countries to deliver blood, vaccines, and other life-saving medical supplies. Developing countries have less air traffic and fewer regulations over airspace than the United States. Consequently, deploying UAVs is more difficult in the United States and will likely require collaboration between federal, state, and local authorities.<sup>44</sup> UAVs could be particularly valuable in a state like Florida to deliver essential medical supplies during hurricanes and flood events. While Florida cannot clear the way for UAV deployment on its own, the state can be a leader in coordinating with federal and municipal authorities.

Telepharmacy is another recent healthcare innovation that could expand access to care—particularly in rural areas. There are several types of telepharmacy services including remote consultation, remote dispensing, and automated dispensing machines. In a remote counseling setting, a pharmacist provides guidance to patients via video or audio link to ensure safe and proper use of medications. Remote dispensing is a relatively common form of telepharmacy wherein a physician manages several remote sites staffed by pharmacy technicians. This model allows for wider access in rural areas where traditional pharmacies staffed by in-person pharmacists may not be feasible. Automated pharmacy dispensing machines take the remote dispensing model a step further. Machines, stocked with common prescriptions (non-narcotics), allow pharmacists to interact with patients and remotely dispense medications via video or audio link. Automated dispensing machines are particularly promising as they provide 24-hour access to pharmacy services without significant labor costs. Currently, 24 states allow some form of telepharmacy services, eight of which allow automated pharmacy dispensing machines.<sup>45</sup> Florida allows machines to be used in institutional settings like prisons and long-term care facilities. However, only pharmacists and staff are allowed to operate machines in those settings. “Patient-facing” automated dispensing machines have only been authorized for use in two Florida hospitals. Machines in those hospitals must be located in or near emergency rooms for use by patients upon discharge. Expanding the use of patient-facing automated pharmacy dispensing machines to community pharmacy settings would increase access to pharmacy services in Florida.

While protecting patients is critical, it is also important that laws and regulations governing healthcare and the use of patient information not limit current technologies and future innovations. For example, wearable technologies capable of tracking and storing patient data are becoming more widespread. These devices are already saving lives by detecting falls and heart conditions.<sup>46,47</sup> Lawmakers must always balance the needs of protecting patients and allowing innovation to take place. This is particularly important when it comes to determining which entities are subject to regulations related to protected health information. A good approach to striking this balance is to ensure that regulations are precise and are expanded with caution.<sup>48</sup> In many cases, new technologies and health delivery systems may not fit neatly into existing regulatory frameworks. Rather than trying to force compliance with outdated standards, lawmakers should consider whether existing regulations are well-suited to the needs of an ever-changing healthcare industry.

## Conclusion

Florida stands at a crossroads. The combination of our geographic location, positive business climate, economic conditions, and commitment to a light-touch governance model have converged over the past 25 years to create a state in which the population grows by approximately 1,000 people every single day. That success story necessitates a thoughtful, deliberate, and practical approach to the very real challenges present in our healthcare supply chain. We cannot wish away the shortages in healthcare providers – they will only continue to grow as more and more people migrate to Florida and we live longer.

We possess the tools, the brainpower, and the governing philosophy to truly revolutionize how a state can lead the way in addressing a critical need in healthcare. We can learn from other states that have come before us in regulatory reform, and we can be the tip of the spear in embracing innovations that can expand access to care and make the Sunshine State a model for the country.

*We thank Maxx Schoenblatt for his research and writing contributions to this paper. Maxx Schoenblatt is a junior at Florida State University studying Political Science and Economics. He is currently a policy research intern at the James Madison Institute.*



## Endnotes

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- 1 Association of American Medical Colleges. (2019)  
“The Complexities of Physician Supply and Demand: Projections from 2017 to 2032.” Available at  
<https://www.aamc.org/news-insights/press-releases/new-findings-confirm-predictions-physician-shortage>
- 2 U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce.  
(2019). Designated Health Professional Shortage Areas Statistics: First Quarter of Fiscal Year 2020 Designated HPSA Quarterly  
Summary.
- 3 U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce,  
National Center for Health Workforce Analysis. (2016) “State-Level Projections of Supply and Demand for Primary Care Prac-  
titioners: 2013-2025.” Available at [https://bhwh.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/  
primary-care-state-projections2013-2025.pdf](https://bhwh.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-state-projections2013-2025.pdf)
- 4 American Academy of Family Practitioners, Robert Graham Center. (n.d.) “Florida: Projecting Primary Care Physician  
Workforce.” Available at [https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/state-collections/work-  
force-projections/Florida.pdf](https://www.graham-center.org/content/dam/rgc/documents/maps-data-tools/state-collections/workforce-projections/Florida.pdf)
- 5 Newly licensed physicians do not complete the survey.
- 6 Florida Department of Health. (2019) “2019 Physician Workforce Annual Report.” Available at [http://www.floridahealth.gov/  
provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/2019DOH-  
PhysicianWorkforceReport-10-30-19.pdf](http://www.floridahealth.gov/provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/2019DOH-PhysicianWorkforceReport-10-30-19.pdf)
- 7 Association of American Medical Colleges. (2019) “Florida Physician Workforce Profile.” Available at  
<https://www.aamc.org/system/files/2019-12/state-physician-Florida-2019%5B1%5D.pdf>
- 8 U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce.  
(2019). Designated Health Professional Shortage Areas Statistics: First Quarter of Fiscal Year 2020 Designated HPSA Quarter-  
ly Summary.
- 9 Florida Department of Health. (2019) “2019 Physician Workforce Annual Report.” Available at [http://www.floridahealth.gov/  
provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/2019DOH-  
PhysicianWorkforceReport-10-30-19.pdf](http://www.floridahealth.gov/provider-and-partner-resources/community-health-workers/physician-workforce-development-and-recruitment/2019DOH-PhysicianWorkforceReport-10-30-19.pdf)
- 10 U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce,  
National Center for Health Workforce Analysis. (2016) “State-Level Projections of Supply and Demand for Primary Care Prac-  
titioners: 2013-2025.” Available at [https://bhwh.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/  
primary-care-state-projections2013-2025.pdf](https://bhwh.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-state-projections2013-2025.pdf)
- 11 Florida Board of Nursing. (n.d.) “Advanced Practice Registered Nurse.” Available at  
<https://floridasnursing.gov/licensing/advanced-practice-registered-nurse/>
- 12 Advanced Practice Psychiatric Nurses are titled differently by state but are often considered a sub-specialty of NPs or CNSs. In  
Florida, Advanced Practice Psychiatric Nurses are the only APRNs authorized to prescribe psychotropic controlled substances  
for the treatment of mental disorders.
- 13 Florida Administrative Code & Administrative Registrar. Rule: 64B9-4.016. “Controlled Substances Formulary.” Available at  
<https://www.flrules.org/gateway/ruleNo.asp?id=64B9-4.016>
- 14 Section 464.012, F.S. “Licensure of advanced practice registered nurses; fees; controlled substance prescribing.” Available  
at [http://www.leg.state.fl.us/statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_String=&URL=0400-0499/0464/Sec-  
tions/0464.012.html](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0464/Sections/0464.012.html)
- 15 Section 458.348, F.S. “Formal supervisory relationships, standing orders, and established protocols; notice; standards.” Avail-  
able at  
[http://www.leg.state.fl.us/Statutes/index.cfm?App\\_mode=Display\\_Statute&URL=0400-0499/0458/Sections/0458.348.html](http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0458/Sections/0458.348.html)
- 16 Institute of Medicine. (2011) The Future of Nursing: Leading Change, Advancing Health. Washington, DC: The National  
Academies Press. <https://doi.org/10.17226/12956>.

- 
- 17 U.S. Congress, Office of Technology Assessment, Nurse Practitioners, Physician Assistants, and Certified Nurse-Midwives:  
A Policy Analysis (Health Technology Case Study 37), OTA-HCS-37 (Washington, DC: U.S. Government Printing Office,  
December 1986). Available at <https://digital.library.unt.edu/ark:/67531/metadc39616/>
- 18 American Association of Nurse Practitioners. (n.d.) "State Practice Environments." Available at  
<https://www.aanp.org/advocacy/state/state-practice-environment>
- 19 Scope of Practice Policy. (n.d.) "Nurse Practitioners Overview." Available at  
<http://scopeofpracticepolicy.org/practitioners/nurse-practitioners/>
- 20 Kleiner, M. M., Marier, A., Park, K. W., & Wing, C. (2016) "Relaxing Occupational Licensing Requirements: Analyzing Wages  
and Prices for a Medical Service," *The Journal of Law and Economics* 59, (2), 261-291. <https://doi.org/10.1086/688093>
- 21 Carter, A., & Chochinov, A. (2007). "A Systematic Review of the Impact of Nurse Practitioners on Cost, Quality of Care, Satis-  
faction and Wait Times in the Emergency Department." *Canadian Journal of Emergency Medicine*, 9(4), 286-295.  
<https://doi.org/10.1017/S1481803500015189>.
- 22 Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Nurse Anesthetists, Nurse Midwives,  
and Nurse Practitioners, (visited January 30, 2020). Available at  
<https://www.bls.gov/ooh/healthcare/nurse-anesthetists-nurse-midwives-and-nurse-practitioners.htm>
- 23 Section 464.012, F.S. "Licensure of advanced practice registered nurses; fees; controlled substance prescribing." Available  
at [http://www.leg.state.fl.us/statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_String=&URL=0400-0499/0464/Sec-](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0464/Sec-tions/0464.012.html)  
[tions/0464.012.html](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0464/Sections/0464.012.html)
- 24 American Association of Nurse Anesthetists. (2018) "Fact Sheet Concerning State Opt-Outs and November 13, 2001 CMS  
Rule." Available at [https://www.aana.com/docs/default-source/sga-aana-com-web-documents-%28all%29/801-fact-sheet-con-](https://www.aana.com/docs/default-source/sga-aana-com-web-documents-%28all%29/801-fact-sheet-con-cerning-state-opt-outs-pdf.pdf?sfvrsn=450743b1_8)  
[cerning-state-opt-outs-pdf.pdf?sfvrsn=450743b1\\_8](https://www.aana.com/docs/default-source/sga-aana-com-web-documents-%28all%29/801-fact-sheet-con-cerning-state-opt-outs-pdf.pdf?sfvrsn=450743b1_8)
- 25 Santiago, A. C. (2019) "States That Allow CRNAs to Practice Without Physician Supervision." Available at  
<https://www.verywellhealth.com/which-states-allow-crnas-to-practice-independently-1736102>
- 26 Negrusa, B., Hogan, P. F., Warner, J. T., Schroeder, C.H., & Pang, B. (2016) "Scope of Practice Laws and Anesthesia Compli-  
cations: No Measurable Impact of Certified Registered Nurse Anesthetist Expanded Scope of Practice on Anesthesia-related  
Complications." *Med Care*. 54, (10), 913-20. doi: 10.1097/MLR.0000000000000554. PubMed PMID: 27213547.
- 27 Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*,  
Nurse Anesthetists, Nurse Midwives, and Nurse Practitioners, (visited January 30, 2020). Available at  
<https://www.bls.gov/ooh/healthcare/nurse-anesthetists-nurse-midwives-and-nurse-practitioners.htm>
- 28 Section 464.012, F.S. "Licensure of advanced practice registered nurses; fees; controlled substance prescribing."  
Available at [http://www.leg.state.fl.us/statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0464/Sections/0464.012.html)  
[String=&URL=0400-0499/0464/Sections/0464.012.html](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0464/Sections/0464.012.html)
- 29 Markowitz, S., Adams, E. K., Lewitt, M. J., & Dunlop, A. L. (2016). "Competitive Effects of Scope of Practice Restrictions:  
Public Health or Public Harm?" *NBER Working Paper No. 22780*. © 2016 by Sara Markowitz, E. Kathleen Adams, Mary Jane  
Lewitt, PhD,CNM, and Anne Dunlop, MD. All rights reserved. Available at <https://www.nber.org/papers/w22780.pdf>
- 30 Markowitz, S., Adams, E. K., Lewitt, M. J., & Dunlop, A. L. (2016). "Competitive Effects of Scope of Practice Restrictions:  
Public Health or Public Harm?" *NBER Working Paper No. 22780*. © 2016 by Sara Markowitz, E. Kathleen Adams, Mary Jane  
Lewitt, PhD,CNM, and Anne Dunlop, MD. All rights reserved. Available at <https://www.nber.org/papers/w22780.pdf>
- 31 Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Registered Nurses,  
(visited January 09, 2020). Available at <https://www.bls.gov/ooh/healthcare/registered-nurses.htm#tab-2>
- 32 Section 459.022, F.S. "Physician Assistants." [http://www.leg.state.fl.us/statutes/index.cfm?mode=View%20Statutes&Sub-](http://www.leg.state.fl.us/statutes/index.cfm?mode=View%20Statutes&Sub-Menu=1&App_mode=Display_Statute&Search_String=459.022&URL=0400-0499/0459/Sections/0459.022.html)  
[Menu=1&App\\_mode=Display\\_Statute&Search\\_String=459.022&URL=0400-0499/0459/Sections/0459.022.html](http://www.leg.state.fl.us/statutes/index.cfm?mode=View%20Statutes&Sub-Menu=1&App_mode=Display_Statute&Search_String=459.022&URL=0400-0499/0459/Sections/0459.022.html)
- 33 Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Pharmacists,  
(visited January 09, 2020). Available at <https://www.bls.gov/ooh/healthcare/pharmacists.htm#tab-2>

## Endnotes

---

- 34 Kentucky Board of Pharmacy. “Board Approved Protocols.” Available at <https://pharmacy.ky.gov/Pages/Board-Approved-Protocols.aspx>
- 35 Institute for Justice (2017). “License to Work: A National Study of Burdens from Occupational Licensing.” Occupation Profiles, Pharmacy Technician. Available at <https://ij.org/report/license-work-2/ltw-occupation-profiles/ltw2-pharmacy-technician/>
- 36 Rhodes, J. (2019) “Senate HELP Proposal (Telemedicine).” Mercatus Center at George Mason University.. Available at [https://www.mercatus.org/system/files/rhoads\\_-\\_testimony\\_-\\_senate\\_help\\_proposal\\_telemedicine\\_-\\_v2.pdf](https://www.mercatus.org/system/files/rhoads_-_testimony_-_senate_help_proposal_telemedicine_-_v2.pdf)
- 37 Section 456.47, F.S. “Use of telehealth to provide services.” Available At <https://www.flsenate.gov/Session/Bill/2019/23/BillText/er/PDF>
- 38 Florida Department of Health. (n.d.) “Licensing for Military Members and Spouses.” Available at <http://www.flhealthsource.gov/valor>
- 39 National Conference of State Legislatures. (2019). “CON-Certificate of Need State Laws.” Available at <https://www.ncsl.org/research/health/con-certificate-of-need-state-laws.aspx>
- 40 Mitchell, M. D. (2016). “Do Certificate-of-Need Laws Limit Spending?” Mercatus Working Paper. Available at <https://www.mercatus.org/system/files/mercatus-mitchell-con-healthcare-spending-v3.pdf>
- 41 Ardila, D., Kiraly, A.P., Bharadwaj, S. et al. (2019). “End-to-End Lung Cancer Screening with Three-Dimensional Deep Learning on Low-Dose Chest Computed Tomography. *Nature Medicine* 25, 954–961. <https://doi.org/10.1038/s41591-019-0447-x>.
- 42 Olson, P. (2018). “This AI Just Beat Human Doctors On A Clinical Exam.” *Forbes*. <https://www.forbes.com/sites/parmyolson/2018/06/28/ai-doctors-exam-babylon-health/#3590b13c12c0>
- 43 Liu, X., Faes, L., Kale, A. U., Wagner, S. K., Fu, D. J., Bruynseels, A., Mahendiran, T., Moraes, G., Shamdas, M., Kern, C., Ledsam, J. R., Schmid, M. K., Balaskas, K., Topol, E. J., Bachmann, L. M., Keane, P. A., & Denniston, A. K. (2019) A Comparison of Deep Learning Performance Against Health-Care Professionals in Detecting Diseases from Medical Imaging: A Systematic Review and Meta-analysis.” *The Lancet Digital Health*, 1, (6), e271-e297. [https://doi.org/10.1016/S2589-7500\(19\)30123-2](https://doi.org/10.1016/S2589-7500(19)30123-2).
- 44 Graboyse, R., Bryan, D. N., & Coglianese (2020) “Overcoming Technological and Policy Challenges to Medical Uses of Unmanned Aerial Vehicles.” Mercatus Center at George Mason University. Available at <https://www.mercatus.org/publications/healthcare/overcoming-technological-and-policy-challenges-medical-drones>
- 45 Tzanetakos, George, Fred Ullrich, and Keith Mueller (2018). “Telepharmacy Rules and Statutes: A 50-State Survey,” *American Journal of Medical Research* 5, (2), 7–23
- 46 Holmes, A. (2019) “A Hiker Says His Apple Watch Saved His Life by Calling 911 After He Fell Off a Cliff.” *Business Insider*. Available at <https://www.businessinsider.com/hiker-apple-watch-dials-911-cliff-fall-saves-life-report-2019-10>
- 47 Holmes, A. (2019) “A Texas Man Says His Apple Watch Saved His Life by Detecting Problems With His Heartbeat.” *Business Insider*. Available at <https://www.businessinsider.com/apple-watch-saved-mans-life-detected-heart-problems-2019-11>
- 48 Huddleston, J. (2019). “Security, Privacy, and Innovation in the Future of Telemedicine.” Testimony, Massachusetts House of Representatives, Committee on Technology and Intergovernmental Affairs. Mercatus Center at George Mason University. Available at <https://www.mercatus.org/publications/regulation/security-privacy-and-innovation-future-telemedicine>









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