

# Endocrinologists' Opinions of Diabetology as a Primary Care Subspecialty

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**IN BRIEF** This study was conducted to ascertain the opinions of endocrinologists about diabetes care as it relates to the health care provider workforce. A survey was administered to endocrinologists in the Planning Research in Inpatient Diabetes and Planning Research in Outpatient Diabetes (PRIDE/PROUD) group and given to attendees of the American Diabetes Association (ADA) Scientific Sessions special interest group whose focus was primary care. The majority of respondents agreed that there is a need for more providers to be trained to take care of patients with diabetes and that more trained providers are needed, and almost half agreed that primary care providers (PCPs) with advanced training in diabetes should be part of the workforce for managing the diabetes pandemic. Expanding diabetes fellowship programs for PCPs remains an important potential solution for addressing workforce development needs in diabetes care.

Diabetes is a pandemic in the United States and around the world. In the United States, diabetes continues to increase in prevalence. According to the American Diabetes Association (ADA), 30.3 million Americans had diabetes as of 2015 (1), with 7 million of these undiagnosed; 1.5 million Americans are diagnosed every year (1).

In 2014, ~85% of people with diabetes in the United States were being managed by primary care providers (PCPs) (2). A 2011 study reported that PCPs are likely to refer patients to diabetes specialists for management issues related to insulin, as well as for advanced treatment options such as continuous glucose monitoring (CGM) and insulin pump therapy (3). The number of these referrals is expected to increase with the growing rates of diabetes and the significant time challenges placed on PCPs. Although changing, the current model of health care in the

United States compensates physicians based on productivity, which favors volume of care rather than recognizing the time-intensiveness, quality, or complexity of care provided. This approach does not allow PCPs adequate time to comprehensively address diabetes management in addition to the other chronic illnesses and complaints that patients bring to their appointments.

Less than half (46%) of a typical endocrinologist's patients are seen for diabetes management (2). There is also a profound mismatch between the growing prevalence of diabetes and the current shortage of endocrinologists in the United States. Multiple reasons have been cited for this shortage of endocrinologists, including a small number of existing endocrine fellowship programs, a large percentage of endocrinologists in academia, and a large percentage of providers who may be retiring in the near future (4).

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One solution to the problems posed by the endocrinologist shortage may be to train more diabetologists. There are currently two diabetology fellowship programs in the United States. These programs are more common internationally but are relatively new in this country. These 1- to 2-year fellowships are designed to train physicians from family medicine, internal medicine, pediatrics, and internal medicine/pediatrics in comprehensive diabetes care, including management of diabetes-related complications.

The purpose of this study was to survey endocrinologists about their opinions of diabetology as a primary care subspecialty and to gauge opinions about diabetes management and the current workforce to address the diabetes pandemic in the United States.

### Methods

This study was approved by the institutional review boards at Ohio University in Athens, East Carolina University (ECU) in Greenville, N.C., and Touro University California in Vallejo. A 15-question survey developed and distributed electronically using an online survey platform, Qualtrics survey software (Qualtrics, Seattle, Wash., and Provo, Utah) to the PRIDE/PROUD email list and in a paper format to the ADA Scientific Sessions interest group focused on primary care. The PRIDE/PROUD group comprises endocrinology health care providers who focus on diabetes care delivery in the inpatient or outpatient setting. A survey link was sent from Qualtrics to the PRIDE/PROUD email group in January 2016 and remained available through February 2016. Paper copies of the survey, along with a web link for the online survey, were also distributed at the 2016 ADA Scientific Sessions for attendees of the primary care special interest group. The Qualtrics survey link was also posted on the ADA 2016 Scientific Sessions website from June through September 2016.

Information obtained through the survey included respondents' demographic information, thoughts on the supply of endocrinologists, awareness of diabetology programs, support of diabetology programs, and willingness to collaborate with diabetologists. A Likert scale was used for the opinion questions, with answer choices of Strongly Agree, Agree, Neither Agree Nor Disagree, Disagree, or Strongly Disagree. Text questions were also used to obtain reasons for support or lack of support of diabetology as a primary care subspecialty.

### Results

A total of 156 surveys were sent out; 86 surveys (55%) were completed. One hundred and three survey links were emailed to the PRIDE/PROUD group, and 33 responses were received electronically from Qualtrics. The other 53 responses were obtained on paper from the ADA primary care special interest group and via a link posted to the ADA Scientific Sessions web page, which was the same link available at the conference. Six of the surveys were completed on paper, and the other 47 responses were received via Qualtrics. The survey link was available from 10 June to 31 August 2016 on the ADA Scientific Sessions website.

Sixty-four percent of respondents had been in practice for >20 years (Table 1). Half of respondents (50%) reported managing most of the patients with diabetes in their practice, with two-thirds (66.6%) self-reporting their focus as diabetes. Most respondents reported practicing in an urban setting, with a lesser number in suburban areas and only 3.5% in rural areas. More than half (51.2%) reported practicing in academia, 26.7% said they were in private practice, and 18.6% said they work in a hospital-owned practice.

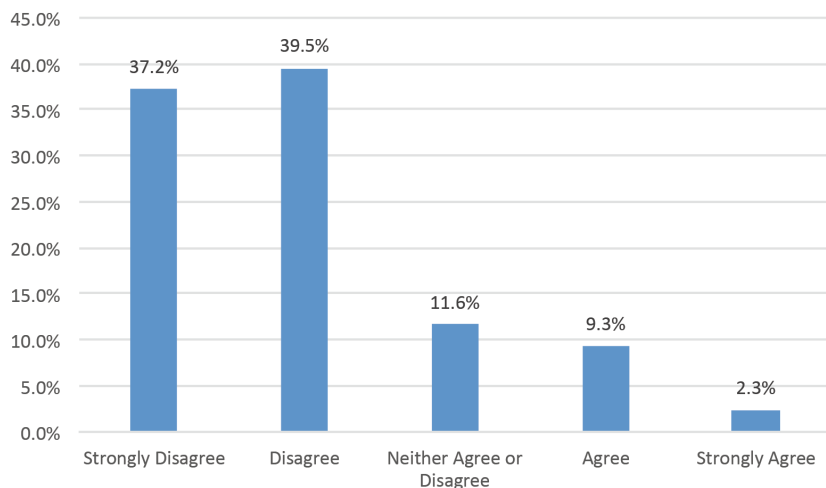
About seventy-six percent (76.7%) of respondents indicated that they think we need more endocrinologists, and most of those endocrinologists

**TABLE 1. Respondents' Demographics**

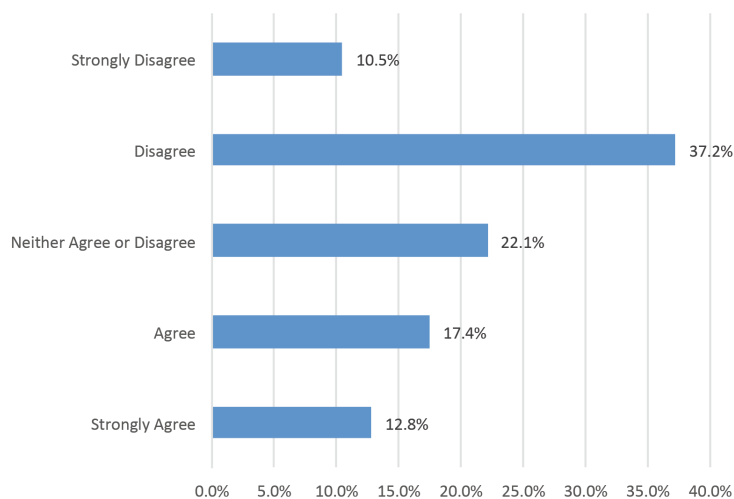
	Percentage of Respondents
Years in practice	
≤5	25.90
6–10	14.80
11–15	16.05
16–20	5.00
21–25	16.05
26–30	11.10
>30	11.10
Area served	
Urban	70.60
Suburban	24.70
Rural	3.50
Other	1.20
Type of practice	
Private	26.70
Community center	0.00
Government-funded	2.30
Hospital-owned	18.60
Veterans Affairs	1.20
Academic center	51.20
Focus of practice	
Diabetes	66.60
Thyroid disorders	10.70
Bone metabolism	3.60
Neuroendocrine	3.60
Other	15.50

identified themselves as having diabetes-focused practices (Figure 1). Of the one-third of endocrinologists who identified themselves as having a practice not focused on diabetes, most felt that their partners who focused on diabetes were adequately trained and that there are enough endocrinologists to handle the diabetes epidemic. Sixty-two percent of respondents reported having a wait time of >1 month for new referrals to get into their practice, and 25% reported a 3- to 4-month wait for an initial appointment.

Of the endocrinologist respondents, 34% had worked with



**FIGURE 1.** When queried about the supply of endocrinologists to manage diabetes, respondents felt that there are not enough endocrinologists. Just over 76% disagreed or strongly disagreed with the statement that there are enough endocrinologists for diabetes. Of those surveyed, two-thirds identified their practices as being diabetes-focused.



**FIGURE 2.** Respondents were asked if they would be supportive of diabetology as its own primary care subspecialty. Not quite one-third were supportive. Just under half were not supportive, and the remaining respondents gave neutral responses regarding their support.

nonendocrine-trained diabetologists. When asked to rate their experience with such diabetologists, 11% were negative, whereas 24% were positive. The remaining 65% either did not respond or gave a neutral answer regarding their experience with diabetologists. Only 30.2% of respondents were supportive of diabetology as its own primary care subspecialty, and 47.7% were not

supportive (Figure 2). Nearly three-fourths (74%) of those surveyed said they would be willing to add a diabetologist to their practice. Of these same respondents, 50% stated that they see the majority of the patients with diabetes in their practice, 21% said that a physician colleague sees the most patients with diabetes, and the remaining 29% reported that advanced practice providers, nurse

practitioners, or physician’s assistants see most of the patients with diabetes in their practices.

Opinions and concerns expressed about diabetology as its own subspecialty varied. Supportive comments included that a diabetes-focused specialty would improve patient outcomes and help address the scarcity of endocrinologists; that there is a need to train more physicians who are interested in diabetes; that there needs to be a faster alternative route to addressing the diabetes pandemic; and that more diabetes specialists are needed in underserved areas. Reasons cited for a lack of support for a diabetes subspecialty included concern about compromising quality of care, concern that internists already try to manage diabetes, the opinion that endocrinologists are adequately trained, and the belief that a diabetology subspecialty would dilute the prestige of being an endocrinologist.

Other general comments and opinions shared by respondents included concern that physicians would “burn out” if they were only seeing patients with diabetes, concern about PCPs being challenged by rapidly changing guidelines, concerns that even endocrinologists face difficulty in keeping up to date given the rate of new medications being developed for the treatment of diabetes, and the belief that endocrinologists will never be able to see all the patients needing management of type 2 diabetes. Some endocrinologists reported feeling that diabetes and endocrinology are already two separate specialties, whereas others reported feeling that diabetes should not be removed from the parent specialty of endocrinology. One endocrinologist noted that this has been done in other countries and, although it resulted in improved access to care, it raised concerns about the quality of the care provided.

**Discussion**

This study demonstrates that, among those surveyed, there is agreement that more endocrinologists/diabetes

specialists are needed to better address the diabetes epidemic.

Several U.S. population factors have contributed to the increased demand for diabetes care, including demographic trends, lifestyle trends, insurance issues, and regulatory requirements. The proliferation of new medications, new technologies, and more challenging care guidelines has also played a role.

The U.S. population is aging, and with increasing age has come an increase in the prevalence of diabetes. The ADA reported that 12 million Americans >65 years of age had diabetes in 2015 (1).

Relevant lifestyle trends include the growing prevalence of obesity, which often precedes the development of type 2 diabetes. The Centers for Disease Control and Prevention reported that, between 2011 and 2014, 36.5% of U.S. adults (5) and 17% of U.S. children were obese (6). There has been an increase in calorie consumption and in time spent in sedentary activities (5). People increasingly rely on convenience foods and fast food for nutrition and on cars for transportation.

The Patient Protection and Affordable Care Act of 2010 improved insurance coverage for many Americans and thus increased access to medical care, which in turn has led to greater demand for all types of physicians (2). Regulatory requirements and guidelines have encouraged referrals to specialists to optimize management.

In addition, medication options have increased dramatically in the past 15 years. Several new classes of oral medications, as well as new insulins and other injectable medications, have become available for the treatment of diabetes. Given the ever-changing guidelines for the treatment of numerous chronic conditions, keeping up with all of the new medications can be a daunting task for PCPs. Furthermore, technological advancements contribute to the complex nature of diabetes management.

Insulin pumps and CGM systems continue to evolve, and although many patients are interested in such devices, PCPs often are not familiar with them, which increases the need for referrals to specialists (3). When achieving optimal outcomes seems nearly impossible and patients' glyce-mic goals are not being met, patients and PCPs typically seek the help of a specialist. As the U.S. health care system transitions from volume-based to value-based compensation, utilization of specialists—in this case, endocrinologists—will increase.

Unfortunately, the supply of endocrinologists is not increasing at a rate sufficient to keep up with this increasing demand. As of 2015, there were 4,841 adult endocrinologists, or 15.5 adult endocrinologists per 1 million people in the United States (2). There were 30.3 million Americans estimated to have diabetes in 2015 (1).

Contributing to the shortfall in the number of practicing endocrinologists are the limited number of available training programs, the number of endocrinologists nearing retirement age, and an increasing number of endocrinologists who are choosing to work only part time while raising families. Furthermore, the settings in which some endocrinologists practice have contributed to a reduced average amount of time spent seeing patients with diabetes (e.g., academic physicians who have to split time between clinical, research, and teaching duties) (2,4,7). As was reflected in this study, a large portion of endocrinologists tend to practice in the academic setting. As of 2011, there were only 280 entrants per year to endocrinology fellowship programs (2). It has been estimated that ~195 endocrinologists per year will be retiring in the coming years, and physicians >65 years of age also tend to practice only part time (2). In our study, 38% of respondents had been in practice for >20 years, and 22% reported having been in practice for >25 years. As of 2013, 72% of endocrinology fellows were female

(7). Studies have shown that women have a higher burn-out rate across all professions, which leads to more frequent career changes, early retirement, and reduced hours, all of which could lead to a reduction of full-time equivalent positions in endocrinology (4). Burn-out is not unique to female physicians, however; male physicians are also affected, leading to similar outcomes.

Our survey revealed that 76% of endocrinologist respondents agreed that there is a shortage of endocrinologists to care for people with diabetes, and 30% of this group are supportive of diabetology as its own subspecialty. One of the concerns expressed about training a group of PCPs to focus primarily on diabetes is that this effort could decrease the main part of endocrinologists' practices.

There are a number of limitations to our study. The study had a very small sample size, and we used a convenience sample from a selected group of endocrinologists; this may limit the generalizability of our findings. Indeed, the fact that our surveys went to a group of endocrinologists who belong to a diabetes-focused interest group could mean that our sample over-represents the provision of diabetes care by endocrinologists.

The response rate to our electronic survey was ~33%; a higher response rate would have made the data more meaningful. Only 86 members of the practicing endocrinology workforce responded, from a potential pool of >4,800 adult endocrinologists in the United States (3). Future versions of this study may try to capture a national sample, although national surveys tend to have much lower response rates.

The survey was emailed directly to a group of endocrinologists, but it was also available online, so it is not known exactly how many endocrinologists received the survey. However, with 103 reaching PRIDE/PROUD and then another 53 responses from the ADA link, there were ~150–160 surveys sent to endocrinologists. We



would have liked the response rate to have been higher for a bigger representation of endocrinologists. Also, PRIDE/PROUD is a group of endocrinologists who focus on diabetes, so our sample may have been biased with regard to perceived need for providers who manage diabetes and support for diabetology as its own subspecialty.

Regardless of these limitations, the shortfall in available diabetes specialty care providers will need to be addressed, and this survey provided valuable information to assist in that effort. Given the projection that diabetes will affect one-third of all Americans by 2050 (8), there will be more than enough patients with diabetes for all physicians, be they endocrinologists or PCPs.

Although PCPs will continue to provide the majority of diabetes care, they likely will be overwhelmed by the complexity of the disease and its rapidly expanding treatment armamentarium. The treatment of chronic diseases already takes more time per patient visit than is currently available in most primary care practices. Most people with diabetes (especially those with type 2 diabetes) have multiple chronic diseases. Thus, PCPs often are unable to give diabetes the time it deserves when they must also address patients' multiple comorbid conditions.

All current indicators suggest that wait times for appointments with endocrinologists will lengthen, as the supply of these specialists decreases and demand continues to increase. Additionally, a large proportion of the future endocrinology workforce may wish to work part time for at least some part of their career, and this could further limit access to endocrinology care.

This combination of circumstances increases the likelihood that poorly controlled diabetes and resultant diabetes complications will increase because of a lack of provider resources that could potentially overwhelm the U.S. health care

system and economy. Although the development of a primary care diabetology subspecialty alone likely would not solve this problem, it may be an important step in increasing the diabetes-related competence of the primary care workforce and expanding access to high-quality diabetes care. This would at least incrementally help to meet the anticipated increased demand for specialty care of patients with diabetes that simply will not be fully met by the anticipated number of endocrinologists in the coming years.

There are currently only two diabetes fellowship programs in the United States, at ECU's Brody School of Medicine and at Ohio University Heritage College of Osteopathic Medicine (OUHCOM). These programs are 1-year clinical training programs open to physicians who are trained in primary care specialties. To be eligible for these fellowships, candidates must have completed a residency in family medicine, internal medicine, or pediatrics and be board-eligible in their primary specialty. Both programs focus on the management of the full spectrum of diabetes (with some age limitations) and of all of the major complications associated with diabetes (9). The programs are not accredited by the Accreditation Council for Graduate Medical Education (ACGME) at this time. Both programs are operated out of endocrinology divisions/clinics in affiliation with medical schools. Faculty members at both programs are predominantly endocrinologists.

More of these programs, if developed, organized, and executed properly, could help to solve the problem of how to manage the diabetes pandemic. Both the ECU and OUHCOM programs have trained providers/endocrinologists who focus primarily on diabetes in their practice of medicine. The ECU diabetes fellowship program coexists in a robust manner with an endocrinology fellowship program, through which all

fellows receive optimal exposure to diabetes management (10).

Another strategy to address the specialist shortfall might be to develop a Certificate of Added Qualification (CAQ) in diabetes care. This would require approval by each of the relevant primary care specialty boards, as well as the development of a certifying examination and experience requirements. Currently there are seven different medical organizations/boards that would need to approve a CAQ in diabetes. With multiple boards comes the possibility of increased variance in the skills of graduates because each board likely would have its own skill requirements for a CAQ. The diplomate system is another consideration; there are currently opportunities to explore lipidology, obesity, or hypertension to earn a diplomate recognition.

Other countries have adopted models that include a care focus on diabetes as a branch of an endocrine subspecialty. Identifying a model that could gain physician support and achieve ACGME accreditation will benefit the U.S. population and needs to be done soon, given the rapidly rising prevalence of diabetes. The time is now to train PCPs better for treating a condition they will encounter in their clinic multiple times each day. Such training will expand the workforce, help to ensure greater diabetes care competency in primary care practice, and facilitate the development of a network of support to better cover the needs of all people with diabetes.

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## Duality of Interest

A.M.H. is the program director for the OUHCOM diabetes fellowship program. R.J.T. is the program director for the ECU Brody School of Medicine diabetes fellowship program. All other authors are or have been involved in the two diabetes fellowship programs. No other potential conflicts of interest relevant to this article were reported.

## Author Contributions

A.M.H. and J.H.S. researched data, wrote and edited the manuscript, and contributed to the discussion. F.L.S. and A.J.D. contributed to the discussion. D.M.C. and R.J.T. researched data, edited the manuscript, and contributed to the discussion. A.M.H. is the guarantor of this work and, as such, had full access to all the data in the study and takes full responsibility for the integrity of the data and the accuracy of the data analysis.

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