

Rationale for Future Education Preparation of Nutrition and Dietetics Practitioners

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ENVIRONMENTAL SCAN

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In February 2014, an ACEND® appointed Expanded Standards Workgroup began exploration of degree-based standards and competencies for nutrition and dietetics practitioners. The initial work by the group was to assess existing research and environmental scan data and collect additional stakeholder and market-place data, if needed, to identify the roles of future practitioners, the education level required and the needs of the marketplace. In July, 2014 a Background Report ([Appendix A](#)) was released that provided a summarized overview of the forthcoming evidence-based Rationale Document for the future educational requirements of bachelor's and graduate level prepared nutrition and dietetics practitioners. Three themes emerged from the environmental scan:

1. Continuous high-speed advancements in healthcare, technology, medicine and food systems warrant additional information and a higher level of education may better prepare nutrition and dietetics practitioners to meet the needs of the public.
2. There is a broadening and increased complexity in public health nutrition, food safety, disease prevention, food production and health promotion that may impact the practice of nutrition and dietetics.
3. Many health professions have identified differing skills levels needed by their practitioners in the marketplace and as a result many accrediting agencies have differentiated knowledge and skill requirements at bachelor's and graduate levels.

These themes were explored further. Research data, industry trends and the changing health care environment were explored and results summarized in this document.

ACADEMY OF NUTRITION AND DIETETICS DATA

Workforce Demand Study

The Dietetics Workforce Demand Study Task Force was an appointed collaboration with 14 thought leaders by the Commission on Dietetic Registration (CDR) in 2012¹. The Task Force was charged to conduct an extensive literature review, future scanning with expert opinion, public policy examination, and analysis of numerous research surveys; and to offer viewpoints on the future of nutrition and dietetics practice from 2012 to 2022. The goal of this systematic approach was to identify and analyze change in nutrition and dietetics practice since the last workforce study was conducted greater than 30 years earlier.

The Task Force report indicated that employers wanted to hire leaders “who can innovate, solve problems and organize diverse individuals into results-oriented teams².” Employers valued adaptability, interdisciplinary perspective and leadership qualities. Demand for nutrition and dietetics services was predicted to increase due to health care reform and the expansion of health care services to an additional 30 million people. The report suggested that approximately 75% of the demand for dietetics services would be met by the 2020 supply of dietetics workforce which left 25% as an unmet need.

Credentialed dietetics practitioners' characteristics in 2010 included an average age of 44 years, 96% were women and about 55% worked in clinical dietetics. The net supply of CDR credentialed dietetics practitioners was projected to grow by 1.1% annually. The report indicated that the public will have more options for nutritional advice from the rise in homeopathy and other sources of alternative (natural) medicine. Therefore, without an adequate supply of nutrition and dietetics professionals, the competitive space for registered dietitian nutritionists (RDN) may be challenged.

The report identified the aging population, health care reform, increasing prevalence of certain conditions (including obesity) and growth in the food industry as key factors affecting the demand for nutrition and dietetics practitioners³. This excess demand will provide opportunities for non-registered nutrition practitioners (e.g., naturopathic physicians, athletic trainers, nurses and other health professionals) to provide dietitian services. The task force study authors recommended proactive interventions that included: increasing the supply of RDNs by increasing the number of dietetics internship positions, marketing new employment opportunities to potential nutrition and dietetic students and creating professional growth opportunities.

Dietetics Practice Audits

The National Commission for Certifying Agencies requires that CDR periodically conduct practice audits to delineate performance areas and duties associated with knowledge and/or skills and examination content/item specifications used for certification. CDR uses audit data to develop RDN and dietetic technicians, registered (DTR) examination content. ACEND also uses audit findings to develop and revise educational standards and competencies.

2010 Entry Level Practice Audit. CDR conducted this audit to better understand the level and frequency of involvement and perceived risk associated with nutrition and dietetics activity statements of entry-level (EL) RDNs and DTRs in the first 3 years of practice⁴. An expert panel of RDNs and DTRs, representing multiple and diverse areas of dietetics practice, developed and categorized 166 activity statements for the mixed mode survey instrument. A total of 2,556 surveys were sent out and a 74% response rate was achieved. The results identified that 95% of the EL RDNs held a bachelor's, 39% a master's and 1% a doctorate degree. Current positions held by the EL RDNs varied with 31% in clinical, 10% long-term care, 8% Special Supplemental Nutrition Program for Women, Infants and Children, 4% private practice and 3% each for pediatric/neonatal, nutrition support and general outpatient positions. The survey activity categories that were most frequently done by the EL RDNs included providing nutrition care community/clinical general, providing nutrition care to individuals and managing food and other material resources⁴. The EL RDNs were asked to rate the most high risk activities and their categories. Several of the high risk-rated activity statements were also core activity statements. The survey results indicated that the majority EL RDNs performed activities related to nutrition care delivered to individuals and groups, mostly patients (not populations), significantly more than management or research activities. Most of the EL RDNs were employed in clinical dietetics and they did not identify core activities in research, human resource management or other management areas.

Dissimilarly, EL DTRs performed a broader scope of food and other material resource management activities and a smaller number of nutrition care–related activities to individuals and groups.

2013 DPD Practice Audit. The purpose of this audit was to delineate the practice of bachelor’s prepared EL non-RDN practitioners⁵. The sample consisted of current Pathway III DTRs (Bachelor’s degree graduates and completion of an ACEND DPD) (PIII DTR); PIII DTR eligible; and recent DPD graduates. A questionnaire was sent to 3,789 graduates and 1,784 responded (47%). The survey instrument used was similar to the one used in the 2010 audit and the questions described demographics, education, career experience and trajectories and current employment in nutrition and dietetics. The demographic data suggested respondents were a median age of 27 years; 90% were female and 8% male; 71% reported to be Caucasian, 8% Hispanic, 5% African American and 9% Asian. Career directions included 47% of the Non-RDN BS/DPD Grads had unsuccessfully applied for an internship. One third (34%) reported that they intended to apply for admission within the next 12 months and 29% stated that they might apply for admission later; 18% reported that they had no plans to pursue an internship. The most common employment positions identified were in clinical and community settings with the primary areas of practice being nutrition care and counseling, education and food service. Results suggested few differences in the nutrition and dietetics practice for Non-RDN BS/DPD Graduates and EL DTRs previously measured by the 2010 DTR Practice Audit Committee⁵.

Council on Future Practice Visioning Report

In 2006, an American Dietetic Association Education Task Force noted that basic educational requirements, consisting of a bachelor’s degree and supervised practice, have not changed since 1927 and recommended a review of the educational competencies to allow more opportunity to meet future practice needs through all degree levels⁶. The Council on Future Practice (CFP) was created and has worked collaboratively with the CDR and ACEND to project and plan for the future practice needs of the profession of nutrition and dietetics.

In 2012, the Academy of Nutrition and Dietetics (Academy) CFP released a visioning document recommending that the level of educational preparation for dietitians be elevated to a graduate level to provide a greater depth of knowledge and skills needed for future practice in the profession. The document made the following nine recommendations to support and advance future dietetics practice and keep the Academy and its members at the forefront of food, nutrition and dietetics⁶.

1. Elevate the educational preparation for the future entry level RDN to a minimum of a graduate degree from an ACEND-accredited program.
2. Recommend that ACEND require an ACEND-accredited graduate degree program and/or consortium that integrates both the academic coursework and supervised practice components into a seamless (1-step) program as a requirement to obtain the future entry level RDN credential. Create an educational system for the future entry level RDN based on core competencies, which provides greater depth in knowledge and skills that build on the undergraduate curriculum and includes an emphasis area (clinical, management,

community/public health).

3. Support the development and implementation of a new credential and examination for bachelor's degree graduates who have met DPD requirements. The competencies, skills and educational standards should clearly differentiate between the practice roles of individuals with the new credential and current/future graduate degree-prepared RDNs and provide minimal overlap between the two. Additionally, legislative and regulatory issues (state and federal) will concurrently be examined and a strategy will be designed to address potential unintended consequences of developing a new credential for licensure and Centers for Medicare and Medicaid Services (CMS) reimbursement.
4. Currently-credentialed DTR practitioners will continue to be supported and recertified; DT education programs will continue to exist to meet the needs of the workforce in their local communities and encourage transfer options with four-year institutions. A plan will be created for all existing Dietetics Technician (DT) education programs and DTRs to promote the positive impact of this transition for increasing workforce growth and opportunities.
5. Recommend that ACEND revise the undergraduate curriculum for dietetics education programs to include requirements for practicum and diverse learning experiences outside of the classroom. Develop students' critical thinking, leadership, communication and management skills by providing opportunities to experience them in the context of professional work settings.
6. Continue to support development of board certified specialist credentials in focus areas where there is a reasonable pool of practitioners to justify the cost of development and maintenance of the credential and develop a system to recognize RDNs practicing in focus areas where numbers are too small to justify the financial investment.
7. Support continuing development of advanced practice credentials for the nutrition and dietetics profession, based on objective evidence and continue to encourage and develop advanced practice educational experiences and opportunities.
8. Conduct a well-funded, comprehensive marketing, branding and strategic communications campaign related to all of the recommended changes targeting both internal and external stakeholders.
9. Support a RDN credential name change that will be reflective of the changes outlined previously and align with the name change of the Academy. The current RDN credential will remain intact and the terminology used for the new credential titles for the RDN and the new credential for the bachelor's degree graduate who has met DPD requirements will be complementary and coordinated to provide clarity in distinctions between the two credentials. Legislative and regulatory issues (state and federal) will be examined concurrently and a strategy will be designed to address potential unintended consequences of changing the name of the RDN credential for licensure and CMS reimbursement.

SCOPE OF NUTRITION AND DIETETICS PRACTICE

RDN and DTR Scope of Practice

Scope of practice refers to a range of roles, activities and regulations within the nutrition and dietetics performance arena^{7,8}. The concept of the dietetics scope of practice encompasses practice standards, credentials, education, practice resources and practice management and advancement. A 2005 Federation of State Medical Boards report defined scope of practice as the “definition of the rules, the regulations and the boundaries within which a fully qualified practitioner with substantial and appropriate training, knowledge and experience may practice in a field of medicine or surgery, or other specifically defined field. Such practice is also governed by requirements for continuing education and professional accountability⁹.” Scope of practice should require licensees to demonstrate that they have the requisite training and competence to provide a service⁹.

The scope of practice for the RDN⁷ focuses on “food and nutrition and related services developed, directed and provided by RDNs to protect the public, community and populations; enhance the health and well-being of patients/clients; and deliver quality products, programs and services, including Medical Nutrition Therapy (MNT), across all focus areas. Focus areas include, but are not limited to, oncology, pediatrics, diabetes, nephrology, sports, nutrition support, extended care, corrections, weight management and obesity, wellness and prevention, behavioral health, eating disorders and disordered eating, intellectual and developmental disabilities, mental illness, addictions, integrative and functional medicine, food and culinary and supermarkets, sustainable resilient healthy food and water systems, communities and public health, education and management.” RDNs perform their roles in a variety of practice settings including acute, ambulatory/outpatient, home care and extended health care; business and communications; community and public health; entrepreneurial and private practice; foodservice systems; integrative and functional medicine; management and leadership; military service; nutrition informatics; preventive care, wellness and weight management; research; school nutrition; sports nutrition; sustainable resilient healthy food and water systems, U.S. public health service and universities and other academic settings.

The scope of practice for the DTR⁸ focuses on “food and nutrition and related services provided by DTRs who work under the supervision of an RDN when in direct patient/client nutrition care and who may work independently in providing general nutrition education to healthy populations, consulting to foodservice business and industry, conducting nutrient analysis, data collection and research and managing food and nutrition services in a variety of settings.” DTRs perform their roles in a variety of practice settings including acute, ambulatory/outpatient and extended health care; business and communications; community and public health; entrepreneurial and private practice; foodservice systems; management and leadership; nutrition informatics; preventive care, wellness and weight management; research; school nutrition; sports nutrition; sustainable resilient healthy food and water systems and universities and other academic settings.

More recently health promotion and disease prevention and public policy and advocacy have been highlighted for future growth and focus¹⁰⁻¹⁴. The world population is expected to be greater than nine billion by the year 2050. Concentrated attention is on sustainability and protection of natural resources to ensure safe and healthy food and water. This new practice area for future nutrition and dietetics professionals will require focused knowledge, skills, systems thinking and experience in policy, system and environmental change strategies addressing quality, quantity and safety on human, environmental, economic and social health¹⁰.

Regulation of Scope of Practice

The purpose of scope of practice regulation is for public protection and safety which should be evaluated as most important in scope of practice decisions, rather than professional self-interest. Changes in scope of practice are inherent in a changing health care system. Accrediting and regulatory bodies routinely assess if the current scope of practice accurately reflects nutrition and dietetics professionals' current activities, functions, roles and responsibilities. The Institute of Medicine (IOM) Center for Health Workforce Scope of Practice and the Future of Team Based Care has recommended that future changes in scope of practice will need to first have a foundational basis within four areas: an established history of the practice scope within the profession, education and training, supportive evidence and appropriate regulatory environment¹⁵.

State dietetics licensing boards are the groups responsible for developing and implementing individual state statutes and regulations. Each state defines their RDN practitioner's scope of practice from educational preparation to restriction of performance. For the 46 states that require RDN licensing, the majority of states declare a minimum of the following statutes in their scope of practice: specifications of educational preparation; practice of medical nutrition therapy including nutrition assessment, establishment of nutritional care plans and development of nutritional related priorities, goals and objectives; and provision of nutrition counseling or education as components of preventive and restorative health care (see [Appendix B](#)).

Expanding Scope of RDN Practice

Expanding Scope of Practice in U.S.. As a result of a 2014 Centers of Medicare and Medicaid Services ruling, RDNs may write diet orders for modified diets and medical nutrition therapy including vitamin and mineral supplementation, enteral nutrition and parenteral nutrition and can order nutritional laboratory tests¹⁶. The complex knowledge of pharmacotherapy is needed to carefully select and time medical nutrition therapy in patients also receiving medication therapy.

Martin and Lipman estimated by the year 2050 33% of the U.S. population will have diabetes mellitus¹⁷. Due to the predicted increase in diabetes and the changing health care models, RDNs will be increasingly called upon to provide services as a level 3 educator (uncertified educator of Diabetes Self-Management Education Provider - Four Levels) and DTRs will serve as level 2 educators. The emergence of non-traditional settings will require nutrition and dietetics positions to work in community health centers, faith-based institutions, public libraries, retail pharmacy clinics, congregate housing for the elderly, nephrology clinics, bariatric surgery practices, patient-centered medical homes, nurse-managed health centers, community nursing centers, telehealth, worksites, schools and diabetes-related companies.

Concurrently, the U.S. Bureau of Labor Statistics (2010) has projected a significant growth in demand for diabetes educators due to an expansion of federally qualified health centers and other community health centers from the Patient Protection and Affordable Care Act. Little work has been done at present on state licensure of diabetes educators and they are classified as 'health educators' because there is no standard job classification by the U.S. government¹⁷.

Expanding Scope of Practice in Canada. An example of proposed significant changes in RDN scope of practice can be seen from *The College of Dietitians of Ontario and Dietitians of Canada 2008 Application for Review of the Scope of Practice of Dietetics in Ontario*¹⁸. The document proposed many changes to the scope of practice for dietitians including the ability to prescribe and manage therapeutic diets and enteral and parenteral nutrition; make adjustments to the dose of existing insulin or oral hypoglycemic medications that have been prescribed by a physician or authorized health care practitioner; order specified tests as prescribed in the regulation, within their scope of practice and limited to those of particular relevance to managing nutrition therapy; perform skin pricks for the purpose of monitoring capillary blood levels; and act as an "evaluator" for the purpose of determining capacity for admission to a long term care (LTC) facility.

FUTURE NEEDS IN HEALTH CARE EDUCATION

The Institute of Medicine (IOM)

Core Competencies. After releasing two IOM reports on safety and quality^{19,20}, the IOM sponsored a second summit on health professions education. Attendees at the summit identified five competencies central to the education of all health professions for the future. The IOM then recommended these as core competencies for all health care professionals; they include: provide patient-centered care, work in interdisciplinary teams; provide evidence-based practice; apply quality improvement; and utilize informatics²¹. The IOM stressed that these core competencies would create an outcome-based education system that better prepares practitioners to meet the needs of patients and the requirements of a changing health care system.

Aims of Care. The IOM *Crossing the Quality Chasm*²², discussed concerns that health care harms too often and more often than not is unsuccessful in delivering its potential benefits. The reports highlighted numerous changes that are affecting health care delivery and suggest a shift from acute to chronic care. The report stressed the need to integrate a continually expanding evidence base and technological innovations, provide more clinical practice occurring in teams, prepare practitioners to work in complex delivery arrangements and change patient-clinician relationships. The report suggested six 'aims' of care: *Safe Care* by avoiding injuries to patients, *Effective Care* by providing care based on scientific knowledge, *Patient-centered care* by providing respectful and responsive care that ensures that patient values guide clinical decisions, *Timely care* by reducing waits for both recipients and providers of care, *Efficient care* by avoiding waste and *Equitable care* by ensuring that the quality of care does not vary because of characteristics such as gender, ethnicity, socioeconomic status or geographic location²².

Global Forum on Innovation in Health Professional Education. A 2012 IOM initiative activity, The Global Forum on Innovation in Health Professional Education²³ brought together stakeholders from multiple countries and professors to discuss within health professional education. Three publications resulted from the forum, *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models across the Continuum of Education to Practice – Workshop Summary*²⁴, *Establishing Transdisciplinary Professionalism for Improving Health Outcomes - Workshop Summary*²⁵ and *Assessing Health Professional Education – A Bridge to Quality*²¹. The third report highlights the importance of matching professional competency appropriately with the health care task to obtain a maximum return on investment and patient safety. The health care workforce has produced systems of higher education in the U.S. and elsewhere that has not been adequately aligned with the mix of professionals required to reach comprehensive health care goals effectively. This lack of alignment in workforce planning partly stems from historic reasons (political and bureaucratic), partly from hardened attitudes regarding professional roles and from vested interests that resist change. Health care reform in all health systems requires progression towards the most efficient and collaborative staffing models.

There is a great deal of merit in fostering this progress in a coordinated and efficient manner to achieve desirable levels of standardization. The eight IOM reports emphasized the growing need for leadership and teamwork competencies, skill sets that are relevant to all high, middle and low-income countries¹⁹⁻²⁵.

Interprofessional Education. Interprofessional education (IPE) is increasingly viewed as an important strategy to address health workforce reform and safety and quality issues^{26,27}. According to the World Health Organization (WHO), IPE is an experience that “occurs when students from two or more professions learn about, from and with each other”²⁸. The IOM’s *Future Practice Educational Recommendations*²¹ suggest that learning experiences need to provide students the opportunity to design and measure care such as structure, process and outcomes. Academic and supervised learning experiences need to increase student understanding of improving quality as a vital core value of all health professions¹⁹.

Learning in groups is not the same as learning interprofessionally. According to the IOM²⁷, more IPE education is needed than IPE courses and continuing professional development. Interprofessional Practice-based (IPP) learning experiences are crucial for enhancing collaborative competencies²⁷.

Students adopt interprofessional theories and values through experiential learning with well-functioning teams. Additionally, IPE helps students appreciate other professionals, avoid developing negative stereotypes, prevent working in silos and ultimately improve patient care.

The provision of coordinated care through an interdisciplinary health care team has been shown to deliver safer, more cost-effective, more efficient and higher benefit to patient/client treatment than individual professionals²⁸. Well-functioning teams share qualities such as understanding of the team’s goals and his or her role within the team, mutual trust among team members. In order for health care professionals to work interprofessionally, they must be educated interprofessionally²⁸.

Lancet Commission

The *Lancet Commission's Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World*²⁹ was written by the Lancet Commission, which included 20 professional and academic leaders from a multitude of countries who assembled to develop a common strategy for postsecondary education in medicine, nursing and public health. One of the aims of the commission was to develop a shared vision that was not restricted by borders or the silos (constraints) of individual health professions. The Commission reported that current gaps and inequities in health and health care continue both within and between countries and demonstrate the failure to deliver health advances equitably. Health professional education has not kept up or been able to meet these challenges, largely because of fragmented, outdated and static curricula that produce unprepared graduates. The identified problems were systemic and included²⁹ a mismatch of professional competencies to patient and population priorities because of fragmentary, outdated and static curricula producing ill-equipped graduates from underfinanced institutions. In almost all countries, the education of health professionals has failed to overcome dysfunctional and inequitable health systems because of curricula rigidities, professional silos, static pedagogy, insufficient modification to local conditions and commercialism in the professions. For example, there is a predominant hospital emphasis at the sacrifice of primary care, in both poor and rich countries and failure to share the dramatic health advances equitably. The Commission's goal was for "all health professionals in all countries needing to be educated to mobilize knowledge and to engage in critical reasoning and ethical conduct so that they are competent to participate in patient and population-centered health systems as members of locally responsive and globally connected teams"²⁹.

The Commission emphasized that instructional and institutional modifications are needed with the following two outcomes in mind: transformative learning and positive interdependence in education. Informative learning is about acquiring knowledge and skills in order to produce experts. Formative learning is about socializing students around values with its function to produce professionals.

Transformative learning is about developing leadership attributes; its purpose is to produce enlightened change agents. Positive interdependence is when team members need each other to succeed via learning goals, product goals, rewards, resources, tasks or roles. Positive interdependence occurs with face-to-face affirmative interactions between group members. Effective education builds each level upon the previous one. As a valued outcome, transformative learning involves three fundamental shifts: from fact memorization to searching, analysis and synthesis of information for decision making; from seeking professional credentials to achieving core competencies for effective teamwork in health systems; and from non-critical adoption of educational models to creative adaptation of global resources to address local priorities.

Transformative learning is the proposed outcome of instructional reforms; interdependence in education should result from institutional reforms³⁰. Specific recommendations by the Commission to improve systems performance were divided into instructional reforms and institutional reforms. The Commission report recommended instructional and institutional improvements in

education in order to produce the desired outcomes of transformative learning and interdependence. The instructional improvements included: adopt competency-driven approaches to instructional design; adapt these competencies to rapidly changing local conditions drawing on global resources; promote interprofessional and transprofessional education that breaks down professional silos while enhancing collaborative and non-hierarchical relationships in effective teams; exploit the power of information technology for learning; strengthen educational resources, with special emphasis on faculty development; and promote a new professionalism that uses competencies as objective criteria for classification of health professionals and that develops a common set of values around social accountability³². The Commission's recommendations for institutional improvements included: establish in every country, a joint education and health planning mechanism that take into account crucial dimensions of the health workforce, such as social origin, age distribution and gender composition; expand academic centers to academic systems encompassing networks of hospitals and primary care units; link together through global networks, alliances and consortia; and nurture a culture of critical inquiry³².

Integrative Health Care and Integrative Medicine

Integrative health care, often referred to as interprofessional health care, is an approach characterized by a high degree of collaboration and communication among health professionals²⁶. The sharing of information among team members related to patient care and the establishment of a comprehensive treatment plan to address the biological, psychological and social needs of the patient is what makes integrated health care unique.

As interest in integrative health care and the use of complementary and alternative therapies by the public continues to grow, concern has increased as to whether health professionals are sufficiently educated about integrative health so that they can safely and effectively care for patients. Integrative health topics recommended include relationship-based care, whole person care (i.e., mind, body and spirit), complementary and alternative medicine (CAM) and self-care. As a result, the 2005 IOM Committee on CAM recommended that all conventional health professions training programs incorporate sufficient information about CAM into the standard curriculum to enable licensed professionals to competently advise their patients about CAM³⁰.

The Bravewell Collaborative, a philanthropic organization that works to improve health care, defined integrative medicine as “an approach to care that puts the patient at the center and addresses the full range of physical, emotional, mental, social, spiritual and environmental influences that affect a person's health.”³¹ The Bravewell Collaborative identified integrative medicine as having the following characteristics³¹: the patient and practitioner are partners in the healing process; all factors that influence health, wellness and disease are taken into consideration; the care addresses the whole person, including body, mind and spirit in the context of community; practitioners use all appropriate healing sciences to facilitate the body's innate healing response; effective interventions that are natural and less invasive are used whenever possible; because good medicine is based in good science, integrative medicine is inquiry driven and open to new models of care; alongside the concept of treatment, the broader concepts of

health promotion and the prevention of illness are paramount; care is individualized to best address the person's unique conditions, needs and circumstances; practitioners of integrative medicine exemplify its principles and commit themselves to self-exploration and self-development.

The Consortium of Academic Health Centers for Integrative Medicine uses the following definition: "Integrative medicine is the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence and makes use of all appropriate therapeutic approaches, health care professionals and disciplines to achieve optimal health and healing"³². Suggestion content on integrative medicine in health professional education includes: patient-centered and whole person care; personal responsibility for health and wellness; lifestyle choices, behaviors and outcomes including but not limited to diet, exercise and stress reduction; health promotion and disease prevention; and knowledge, principles, practices and processes that facilitate the integration of conventional biomedical care with CAM³⁰⁻³³.

New U.S. Population Concern - Young Adults

The needs of young adults and the challenges they face, do not receive a great deal of systematic attention in policy and research. Accordingly, the Health Resources and Services Administration asked the Institute of Medicine (IOM) to convene a committee to examine, analyze and synthesize information and knowledge on the health, safety and well-being of young adults³⁴. Young adults (18-26 years of age) today compared to decades ago live in a more global and networked world, marked by increased knowledge and information transfer, heightened risks, low social mobility and greater economic inequality. Young adults are trapped between the exorbitant cost of college (many students have difficulty financing the investment or repaying the debt they incur) and low prospects for well-paying jobs with only a high school diploma. Young college graduates increasingly find it hard to find entry level jobs with an associate's degree or bachelor's degree and more and more jobs have become part-time which does not help to pay back school loans. Many companies do not provide health insurance or other non-salary benefits. Jobs that pay higher wages require additional knowledge, skills and experience.

One key finding of the IOM committee's work was that young adults were unhealthy in terms of diet and physical activity; they pay less attention to health maintenance and mental/behavioral health and partake in risky behaviors. The health status of young adults included a 23% obesity rate, 25% hypertension, 7% diabetes and 27% with impaired glucose tolerance³⁴. Examination of health indicators from *Health People 2010* revealed a surprising pattern of declining health, seen most clearly in health behaviors and related health statuses. As these individuals entered their early and mid-20s, they were less likely to exercise, eat breakfast and get regular physical checkups and dental checkups and they were more likely to eat fast food, contract sexually transmitted diseases, smoke cigarettes, binge drink and use marijuana and hard drugs³⁴. This committee cautioned that this poor young adult health status will negatively affect workforce productivity, public safety, national security and the ability of the workforce to compete on a global level. For example, 12% of all age-eligible men and 35% of all age-eligible women were

unable to meet U.S. Army standards for weight-to-height ratio and percent body fat in 2007-2008³⁴. The Department of Defense reported that, between 2006 and 2011, 62,000 individuals who arrived for military training failed their entrance physical because of their weight.

The IOM committee recommendations focused in three common themes: current policies and programs addressing education and employment, civic engagement and national service, public health, health care systems and government programs are fragmented and uncoordinated; current policies and programs are not focused on specific developmental needs of this population; and there is limited evidence-based data for young adults on effective interventions, policies, programs and service designs³⁴. Knowledge of the use and delivery of preventive services for young adults is limited by the lack of attention to this age group in clinical delivery systems and health services research, programs and education. Coordination is needed between the private and public sector to bring forward public awareness and effort towards prevention. Nutrition and dietetics curricula will need to increase content and skill development in prevention and treatment services for young adults.

EXTERNAL FORCES IMPACTING HEALTH CARE EDUCATION

Education Accreditation

The role of accreditation is to assure quality, provide access to federal funds, generate public confidence in higher education and ease transfer of credit. Accreditation in the United States is undergoing a major change as governmental regulatory authority to judge quality in higher education expands, eclipsing accreditation's collegial model of quality review. The enormous growth of public and private money in higher education, the commitment to universal access and the accompanying calls for greater public accountability, the growing nationalization of public policy and the impact of electronic technology have all contributed to this change. From the 2011 IOM report on *Scope of Practice and Future Team Based Care*, accreditors will continue to influence proactive quality improvement (QI) and act as change agents¹⁵.

Accreditors will be required to work more closely with the U.S. Department of Education (USDE) (www.ed.gov) due to increased public demand for accountability and student performance. Accrediting organizations are required to meet ten recognition standards that are in federal law. These standards cover student achievement, curriculum, faculty, student support services and financial and administrative capacity. Accrediting organizations are also expected to comply with a broad collection of rules and regulations that accompany the standards such as:

- Rule 602.16: Accreditation agency standards *must address the quality of institutions or programs in multiple areas including* "success with respect to student achievement in relation to the institution's mission, including an appropriate consideration of course completion, state licensing examination and job placement rates."
- Rule 602.21 requires that a recognized accreditation agency *"maintain a systematic program of review that demonstrates that its standards are adequate to evaluate the quality of the education or training provided by the institution and program it accredits"*

and is relevant to the education or training needs of students.”

Based upon the recommendations from the 2014 IOM report for *Assessing Health Professional Education*, nutrition and dietetics students may be required by the nutrition and dietetics accrediting body to receive novice and advanced education in IPE in order to develop competencies and skills needed to function as a valued member of the health care team¹⁷. Part of the educational requirements likely will include IPP learning experiences²⁴.

Degree Qualifications Profiles

Accreditors may be required to implement degree qualification profiles (DQP) which are delineations of knowledge and skills between degrees such as IPE differences for bachelor's and master's prepared students³⁵. The DQP attempts to establish specific learning expectations for graduates receiving a particular degree. The Profile proposes sets of competencies in five areas of student learning: specialized knowledge, broad integrative knowledge, intellectual skills, applied learning and civic learning and addresses three degree levels: associate, bachelor and master's. At each degree level, the competencies themselves are described in terms of “action verbs” that portray what a student at that level can actually do. For example, competencies at the associate's level may require students to “describe” or “present” a topic, at the bachelor's level to “construct” or “explain” something and at the master's level to “create” or “assess” something. A degree qualifications profile is a set of requirements of what students should be expected to know and be able to do as a benchmark for the associate, bachelor's or master's degree through specific learning outcomes³⁵. Degree profiles are especially important today because jobs are rapidly changing and use technologies that are still emerging and increasing in complexity and graduates work with colleagues from (and often in) all parts of the globe. The resulting product, a degree profile, includes defined competencies which highlight cumulative *integration* of learning from a multitude of resources and *application* of learning from a variety of settings³⁵.

Professional Maturation

The medical and educational landscapes have changed greatly and continue to change. Over that time, the practice of medicine has become increasingly complex in three main areas: *new knowledge* (e.g., genetics and implications for therapy, bioterrorism); *new skills* (e.g., use of information and medical technology, review and analysis of the medical literature and application of the findings to practice; and *professional attitudes*, which are taking on greater importance in ensuring public trust in medical professionals. These increasing complexities have mandated curriculum reform and the development of objective assessment tools to measure student knowledge, skills and attitudes, as well as the need to prepare students to be self-directed critical thinkers who can adapt to changes in the field. The analytical and critical thinking skills required to negotiate this new medical landscape are traditionally associated with a graduate level of education.

Health professions that have recently increased degree requirements include Audiology (Doctorate), Occupational Therapy (Master's), Pharmacy (Doctorate), Physical Therapy (Master's/Doctorate) and Physician Assistant (Master's)³⁶⁻³⁹. Still other health professions are considering increased degree requirements, such as Dental Hygiene⁴⁰. Professional degree

maturation requires examination of the incentive for advancing the entry level degree requirement. The necessity should stem from a mixture of data to demonstrate the demands for increased educational and skill requirements of the profession, patient and public safety as well as increased access for patients and increased recognition of the profession. When evaluating higher education for entry level practice it should consist of a review of data and evidence to support increased educational levels, assess educational preparation and performance abilities and requirements, assess job demands and requirements as prescribed by health care facilities, determine demographic characteristics of health professionals at various degree levels, consider career pathways and expanded functions gained through educational and practical experience such as transitional degrees⁴¹.

Careful consideration should be taken when evaluating the impact and success of implementing a new advanced degree requirement. Potential negative impacts from a degree creep could be exacerbation of workforce shortages, lack of capacity in colleges in universities (faculty, facilities, funds, clinical sites), lack of credentialed faculty to deliver instruction, decrease in workforce diversity as inaccessible to minorities and economically disadvantaged, increase in tuition, increase in time in college and access to health care limited in rural areas. Another concern to mitigate may be the creation of a decline in job satisfaction and morale if advanced skills and knowledge are underutilized⁴².

External Drivers of Safety and Quality

As nutrition regulations and legislation change, RDNs and the dietetics education and training process will need to adapt and requirements of external accrediting bodies will need to reassess proficiency and educational requirements. The changing focus of many government agencies is enhancing the practice of dietetics in many areas.

Health Care Accreditation. The Joint Commission health care accreditation, certification and standards manuals for organizations such as hospital, behavior health, long-term care/assisted living demonstrate the paradigm shift from department policies and procedures to an organizational focus on patient safety goals and elements of performance and moving from survey ready to continuous standard compliance. The Provision of Care, Treatment and Services standards are collaborative and interdisciplinary and require RDNs to take a proactive leadership role on committees and focus on improving the safety and quality of care provided (www.jointcommission.org). Like The Joint Commission, DNV-GL Health Care is a Center of Medicare and Medicaid Services (CMS) authorized accrediting organization for acute care hospitals. The purpose of these organizations is to manage risk and improve patient safety, quality and overall health care delivery.

United States Department of Health and Human Services (DHHS). The DHHS Strategic Plan includes strategic goals and associated objectives, strategies for FY 2014-2018 to include: strengthen health care; advance the health, safety and well-being of the American people; and ensure efficiency, transparency, accountability and effectiveness of HHS programs⁴³. Nutrition and dietetics practitioners will be involved in the strategic initiatives by promoting a high value, safe and effective health care practice, implementing a 21st century food safety system, promotion of

prevention and wellness across the lifespan, achieving and maintaining healthy weight for Americans and fostering a 21st century health workforce.

Cooperative Extension System. The Nation's Cooperative Extension System created a program focus in health and wellness, which is aligned with the U.S. Department of Health & Human Services' National Prevention Strategy: Strategic Directions and the National Prevention Strategy. The Cooperative Extension program brings a multitude of assets to the partners (university system, health professionals, education, private and public sectors, engaged communities, community organizations and clinical and community preventative services). Additionally, Cooperative Extension has developed core themes to guide the Extension Health Task Force Recommendations that include: strengthen organizational functioning; enhance leadership and professional development; increase strategic marketing and communications; and build partnerships and acquire resources for health⁴⁴. Nutrition and dietetics practitioners will be able to both serve the strategy initiatives and benefit from core theme developments.

U.S. Preventive Services Task Force. The U.S. Preventive Services Task Force (USPSTF) recommendations to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease (CVD) Prevention in Adults with Known Risk Factors- Behavioral Counseling are to provide screening at the primary, secondary and tertiary levels of health care on all at-risk adults for obesity and provide comprehensive weight loss and behavior management by qualified professionals naming the primary care provider and the RDN¹²⁻¹⁴.

National Prevention Strategy. The National Prevention Strategy is supported by the Affordable Care Act. It represents a shift in health care from problem-based medicine to prevention and wellness endorsed by the U.S. legislature and the Surgeon General. The National Prevention Strategy's vision is to improve the health and quality of life for individuals, families and communities by moving the nation from a focus on sickness and disease to one based on prevention and wellness⁴⁵. The healthy eating and active living strategic priorities involve and need leadership from nutrition and dietetics practitioners. Healthy eating includes increasing access to healthy and affordable foods in communities; implementing organizational and programmatic nutrition standards and policies; improving nutritional quality of the food supply; helping people recognize and make healthy food and beverage choices; supporting policies and programs that promote breastfeeding; and enhancing food safety. Active living comprises RDN involvement in conducting physical activity assessments, providing counseling and referring patients to allied health care or health and fitness professionals; offering low or no-cost physical activity programs; developing and instituting policies and joint use agreements that address liability concerns and encouraging shared use of physical activity facilities (e.g., school gymnasiums and community recreation centers); and offering opportunities for physical activity across the lifespan.

Centers of Medicare and Medicaid Services. Medical nutrition therapy (MNT) services may be provided under Medicare Part B (Medical Insurance)^{46, 47}. A registered dietitian or nutrition professional who meets certain requirements can provide these services, which may include nutritional assessment, one-on-one counseling and therapy services through an interactive

telecommunications system. Coverage is provided for patients/clients with diabetes, renal disease, on dialysis, who have had a renal transplant within the last 36 months and other physician/health care provider referrals. As the Affordable Care Act continues to unfold and its emphasis on preventative services and management of chronic diseases the number of CMS covered services is expected to continue to grow.

As part of a large recent ruling (July 2014) by CMS, qualified dietitians or qualified nutrition professionals will be explicitly permitted to become privileged by the hospital staff to order patient diets, order lab tests to monitor the effectiveness of dietary plans and orders and make subsequent modifications to those diets based on the lab tests, if in accordance with state laws including scope of practice laws⁴⁸. In order for patients to have access to the timely nutritional care that can be provided by RDNs, a hospital must have the regulatory flexibility either to appoint RDNs to the medical staff and grant them specific nutritional ordering privileges or to authorize the ordering privileges without appointment to the medical staff⁴⁷. The rule is a first step toward positioning RDNs in the care coordination environment to ensure nutrition is an essential component of client/patient/customer transitions of care^{49, 50}.

Physician Compare is a CMS website that helps participants find and choose physicians and other health care professionals enrolled in Medicare as part of the Affordable Care Act⁵¹. In the future as the 'over 65' population increases and health care shifts to keep seniors at home, RDNs may increase the volume of home visits to provide their patients' nutritional care.

Changes are occurring in our health care payment systems that will directly impact MNT, nutrition services and the business of dietetics across practice settings⁵². Transformations in the payment systems include bundled payments or global payments, pay-for-performance, value-based purchasing, hospital readmissions reduction programs and hospital-acquired conditions (HAC). "Pay-for-performance" is an umbrella term for initiatives aimed at improving the quality, efficiency and overall value of health care⁵³. These arrangements provide financial incentives to hospitals, physicians and other health care providers in the private and public sectors to carry out such improvements and achieve optimal outcomes for patients. The Affordable Care Act expands the use of pay-for-performance approaches in Medicare and encourages research to identify designs and programs that are most effective. The typical pay-for-performance program provides a bonus to health care providers if they meet or exceed agreed-upon quality or performance measures, such as reductions in hemoglobin A1c in diabetic patients. The programs may also reward improvement in performance over time, such as year-to-year decreases in the rate of avoidable hospital readmissions. Pay-for-performance programs can also impose financial penalties on providers that fail to achieve specified goals or cost savings. For example, the Medicare program no longer pays hospitals to treat patients who acquire certain preventable conditions during their hospital stay. RDNs have the expertise and skill set to establish improvement in specific health care quality issues. The challenge will be to demonstrate evidence-based MNT outcomes and cost-effectiveness on a broad scale.

KNOWLEDGE AND SKILLS NEEDED FOR FUTURE NUTRITION AND DIETETIC PRACTICE

There is a need to fill the gap relating to health promotion, health coaching, wellness, and public health nutrition. These skills will be beneficial as RDNs address issues related to client/patient compliance with MNT and health promoting lifestyle behaviors. Motivational interviewing to influence and sustain behavior change skills is critical in practice and research in the area of behavior change skills is needed.

Nutritional Genomics

The advancement of genomics is progressing at a swift pace. Nutritional genomics is a component of genomics and includes nutrigenomics, nutrigenetics and nutritional epigenomics. 'Personalized nutrition' has been earmarked by the Academy as future opportunities for RDN, however, specialized knowledge and training will be required⁴. RDNs using nutritional genomics in clinical practice will demand a full understanding, interpretation and communication of complex genetic testing results as a tool to assess the risk of a disease⁵⁴. Currently RDNs are not trained in clinical genetics and molecular testing. RDNs surveyed in the U.S., Canada and the U.K. over the past ten years have consistently revealed that RDNs are not confident in their knowledge of translating genomic science into clinical practice and limited ability to communicate probability and risk of disease from genetic testing⁵⁴⁻⁵⁸.

Behavioral Counseling, Coaching, Coordination of Care and Program Planning and Evaluation

The U.S. Preventive Services Task Force (USPSTF) has recommended intensive, behavioral dietary counseling for adult patients with hyperlipidemia and other known risk factors for cardiovascular and diet-related chronic disease¹¹⁻¹⁴. Intensive counseling can be delivered by nutrition and dietetics practitioners. Expansion of scope of nutrition and dietetics practice into behavioral counseling suggests a need for increased skills in the areas of coaching, motivational interviewing, coordination of care and program planning and evaluation. RDNs will positively impact the prevention and treatment of co-morbid conditions and chronic diseases. Besides changing practice, health care settings for counseling, coaching and care coordination are changing shown by the increase in home care and in the evolution of the patient-centered medical home. RDNs will need to adapt to these changes and forge the frontier to be successful⁵⁹⁻⁶³.

Changes affecting health care delivery are occurring, including a shift from acute to chronic care, the need to integrate a continually expanding evidence base and technological innovations, more clinical practice occurring in teams, complex delivery arrangements and changing patient-clinician relationships⁵⁹⁻⁶³.

Informatics

The Academy recently outlined informatics Skills Specific to Levels of Dietetics Practice⁶⁴. The term *informatics* is used to describe how humans find, store, analyze and manage information. For entry level competence, minimum basic computer and information literacy skills should be: demonstrate principles of computer file organization including information storage, data protection (backing up data) and basic computer skills; demonstrate basic proficiency with use of

selected operating systems (e.g., Mac OS, Windows, Linux); use basic software applications to create documents, spreadsheets and presentations; access and use a web browser to find information; demonstrate proper use of email, including sending, receiving, forwarding, storing and attachments and proper use of email etiquette; quickly identify, evaluate and disseminate accurate information to consumers and other health care professionals; manage user security to protect patient/client information; retrieve a reasonable number of relevant documents using PubMed to search the Medline database; find and evaluate online information sources using appropriate search engines; understand appropriate use of social media tools; and be familiar with basic functions of clinical information systems (e.g., computerized provider order entry, results reporting, documentation and report generation)⁶⁴.

Telenutrition

According to the IOM's 2012 Workshop summary on *The Role of Telehealth in an Evolving Health Care Environment*, social media and social networking are the most prevalent online activities, have increased in the elderly since 2010 and participation of all ages are expected to continue to grow⁶⁵. These technologies are already being used in health care for numerous functions. The entry level RDN will need to keep abreast of the new technologies as well as keep up with their professional, personal, legal and ethical responsibilities related to providing telehealth. Responsibilities include digital competence, regulatory requirements and privacy laws to name a few⁶⁶.

Teledietetics encompasses telephone consultation through dietitian call centers as well as the use of other electronic modalities, such as interactive website tools that support knowledge and behavior change (e.g. dietary assessment tools), social networking, video-based applications (e.g. online learning modules/classrooms/webcast, educational videos), smartphone texting and applications and e-mail messaging. Teledietetics services may involve client-professional (e.g. individual consultations, group education) or professional-professional contact (e.g. support to health professionals)⁶⁶. A variety of nutritional care and health promotion activities may be provided through teledietetics communication, including interventions (such as education, advice and reminders) and monitoring of interventions.

The Health Resources and Services Administration (HRSA) has asked the IOM to focus on the potential for telehealth to serve geographically isolated individuals and extend the reach of scarce resources while also emphasizing the quality and value in the delivery of health care services⁶⁵. In the health care continuum, it is proposed that telehealth be used for health promotion and disease prevention, for acute care and for chronic disease management. Behavioral patterns and lifestyle choices have some of the largest impacts on health and premature death. Most health care is self-care and the individual patient is the biggest untapped resource in health care. However, the current system does not activate individuals to change their behaviors. The IOM report states that as the baby boomers begin to retire and attempt to maintain independent living in affordable and possibly more rural areas, telehealth will only continue to grow⁶⁵. One such model includes TREAT (Telemedicine for Reach, Education, Access and Treatment) which uses

telemedicine provided by an endocrinologist from an urban setting and a diabetes educator in a rural area working with patients and their primary care providers⁶⁷.

Currently, the RDN is named as a 'Distance Site Practitioner' under the Center for Medicare and Medicaid Services⁶⁹. The Medicare Part B program allows several services provided by RDNs and nutrition professionals to be offered via telehealth^{68,69}. However, according to a 2009 Medicare claim review, growth in adoption of telehealth among providers has been modest despite increases in Medicare payment rates for telehealth services, expansions of covered services, reductions in provider requirements and provisions of federal grants to encourage telehealth. There were no RDN-submitted claims for this cross-sectional review⁷⁰.

Systems Thinking Knowledge and Experience

Systems thinking refers to the understanding of and ability to plan, implement, evaluate and develop policy for health care systems involving food and/or nutrition and food systems and their global impact on local and national issues. Systems thinking includes processes, sets of skills and technologies. The systems thinking process applies a scientific method-based approach to building, communicating and applying understanding to leadership decisions that cause many complex and unforeseen cascade of reactions. It is vital for strategic planning. An example of a systems thinking learning experience includes the Sustainable Food Lab which is a partnership among governments, NGOs and private sector organizations responsible for the production and distribution of food around the globe. Their efforts are program-focused (e.g., coffee supply chain) and while working on any program, participants learn and apply systems thinking concepts to develop deeper understanding of why the systems behave in ways they wish to change and where leverage points are for improving that behavior⁷¹. Skills included are: skillful learning within complex economic, social and environmental systems; acting effectively in change processes involving multiple stakeholders with diverse goals and needs; and understanding webs of system's interdependence.

According to Thornton, Peltier and Perreault, systems thinking is the ability to understand (and sometimes predict) interactions and relationships in complex, dynamic systems use such concepts as continuous incremental improvement, organizational learning and feedback loops⁷². Systems thinking assumes: systems cause most of their problems; solutions lie within the systems; and systems cannot blame outside circumstances for problems. Examples of systems thinking include: sustainable improvement in health care; sustainable healthy eating environment to prevent obesity; systems thinking regarding obesity, health care, food industry, marketing, economics and disability; and management of systems. Systems thinking has also been applied to many other areas, such as sustainability, ecoliteracy, interdisciplinary learning and obesity prevention and decision making⁷².

Management and Leadership

Management. Management in dietetics practice has been a 'mega' issue for the Academy for a number of years⁷³. RDNs in management positions continue to decrease and be the minority type of RDN jobs. According to the 2013 Compensation and Benefits Survey, 24% of RDNs worked in

inpatient acute-care facilities, 12% in ambulatory/outpatient care facilities and 10% of RDNs worked in long-term, extended care or assisted living facilities. These top three job settings employed approximately 50% of practicing RDNs⁷⁴. Twelve percent of practicing RDNs indicated their area of practice as food and nutrition management. Supervisory responsibility has been found to be strongly associated with wage gains; those with direct and/or indirect supervision of 100 or more employees had a median hourly wage 50% greater than the typical RDN. Budgetary responsibility is also strongly correlated with hourly wages.

Educational competencies need to be revisited to promote management as a fundamental part of dietetics curriculum and professional practice. The Academy has identified management competencies for dietitians that work in food and nutrition services in health care. The following core competencies that directly reflect food management and preparation are those competencies that a professional must be able to master^{75, 76}: manage change and transition; develop menus and foodservices that exceed customer expectations; identify, develop and evaluate new business opportunities; lead teams of culturally diverse members; incorporate new information technologies; ensure service of safe food to customers through focus on Hazard Analysis Critical Control Points (HACCP); analyze and improve production and service processes through the application of appropriate operations management quantitative business analysis techniques; measure customer satisfaction; accurately interpret data; make appropriate operational changes; and lead in a constantly changing environment.

Management skills related to competencies for the role of a hospital foodservice director are specifically needed in financial management, project management, strategic planning, marketing and human resource management⁷⁷⁻⁷⁹. These same management skills are also vital in most other areas of dietetics. Critical thinking, problem solving, strategic planning and emotional intelligence may be due to an inadequate or a complete lack of experiential learning in undergraduate curricula²¹. Management is a group of skills, a science, an art that is interconnected to every facet of nutrition and dietetics⁸⁰.

Management is needed to be successful in research to plan the research budget and apply for grant funding; in private practice to plan for income to offset expenses and non-reimbursement; for interdisciplinary team function to use emotional intelligence and persuasion skills, in public health nutrition and community nutrition to plan and evaluate programs; and in academics to establish return on investment for the university to approve new curriculums to name a few⁸¹.

The 2006 Employer Qualitative Research Study surveyed the views of 140 employers of RDNs and DTRs specifically on entry-level practitioners. Employers mainly identified management skills as a weakness for entry level RDNs (unpublished data). Employers emphasized the need for RDNs who are able to look at the big picture and think strategically, run and justify programs, understand health care as a business, add value and who are entrepreneurial. Employers wanted RDNs with the following skills and abilities: work in a team; work across levels/departments in the organization (patients, doctors, nurses, technicians, administrators, cooks); supervise and delegate; coach/mentor and negotiate. Skills were also needed in accounting and finance; budget and cost control; inventory control; quality assurance and performance improvement;

marketing/selling; revenue generation; reimbursement and sales; research and grant writing; forecasting future needs; problem solving and decision making; effective communications, meeting management, strategic planning; marketing, human resources, and technology.

According to the most recent standards of performance for generalist and advanced RDNs in food and nutrition systems⁸², RDNs must be able to demonstrate basic competencies in the following areas: environmental protection rules; the political environment; marketing and customer satisfaction; continuous quality improvement; work redesign and productivity; innovative cost-containing measures; food consumption patterns; food and equipment technology; human resources trends; food and water safety; disaster and emergency planning; project and process management; and cultural diversity in the workplace⁸².

Leadership. Often RDNs are perceived as assisting in instead of leading the nutrition care process; a perception which can hinder career advancement⁸³. The profession must prepare for continued change in the future by defining, recognizing and supporting multiple levels of practice in a variety of practice areas to meet marketplace demands and to encounter ongoing constant change⁶. Specific leadership skills needed in RDNs to be successful include collaboration via networking and the sharing of knowledge; communication and mentoring; authentic leadership with emotional intelligence and feedback; vision including keeping abreast of future trends; and innovation such as taking a risk and being creative⁸³⁻⁸⁶. The changing landscape of the health care community further emphasizes that leadership skills are essential for RDN accomplishments and viability as well to spread nutrition messages, build brands and businesses, communicate more effectively with employees and stakeholders, enhance the 'bottom line' and ultimately improve nutrition service.

Case Management

The effectiveness of use of an RDN as a case manager was demonstrated in a randomized controlled trial that compared usual medical care to usual care-plus-lifestyle case management provided by an RDN over a one year period. The case-managed group showed substantially greater weight loss, reduced A1c values, decreased prescription use and increased health-related quality of life⁸⁷. Case management participants had fewer inpatient admissions, which substantially lowered medical care costs. Providing medical nutrition therapy to high-risk patients with type 2 diabetes and obesity decreased health plan costs by 34 percent⁸⁸.

Coding, Coverage and Reimbursement for Nutrition Services

The results of the Academy's 2013 Coding Survey indicated that respondents mainly used two of the five MNT CPT codes (97802, 97803, 97804, G0270 and G0271)⁸⁹. Those respondents not using any codes (n=759 of the 3,182 respondent providers of outpatient MNT) cited reasons as they did not bill insurance plans or some other group determined billing code. Regarding establishment of usual and customary fee for nutrition services delivery, only 32% (n=1,006) answered they had and 44.5% (n=1,402) specified that they did not know⁸⁹. The authors concluded that RDNs have a limited knowledge of basic practice and management concepts. Additional education is needed in order to improve third party payment for nutrition services through provider training on coding,

billing, documentation of initial and sustained efficacy from nutrition services and skills to market efficacy outcomes to private payers to justify and expand coverage of MNT services. One of the concerns in the survey observed by the authors was the increasing trend in the number of RDNs who reported not billing insurance plans and using “self-pay only⁸⁹.” This type of practice limits access to the underserved population. As noted earlier, few RDNs participate in the Medicare Physician Quality Reporting System program which becomes problematic in 2015 when Medicare fee for service providers will have their payments reduced if they do not meet satisfactory reporting requirements⁹⁰.

Evidence-based Medicine and Practice

Evidence-based medicine (EBM) is defined as “... the conscientious, explicit and judicious use of current best substantiated data in making decisions about the health care of individual patients⁹¹”. The term is now expanded to “evidence-based practice” (EBP) to include all health professional disciplines. EBP is the integration of best research with clinical expertise, patient values and available resources⁹². EBP, a decision making process, involves the selection and use of the current best available research evidence, clinical circumstances and the consideration of patient values⁹³. Irrespective of the health field, it is common to see gaps between research and clinical practice and EBP is used to bridge the gap⁹⁴.

A total of 342 U.S. credentialed RDNs in clinical practice completed an online survey in a 2011 pilot study evaluating their perceptions, attitudes, knowledge, clinical practice and clinical use of EBP⁹⁵. EBP is a requirement for entry level dietetics education however, the study RDNs responded to using evidence-based resources occasionally even though they had adequate access to the resources. Prior surveys have reported lack of time as a barrier to the use of EBP. RDNs perception and attitude scores were more positive than knowledge scores. Awareness of databases, knowledge of EBP terms, formal training and access to research mentors were reported to be lacking. Additionally, evidence-based practice training of health students appears in the literature for medicine and most health programs but little information is available for nutrition and dietetics curricula⁹⁴.

EBP is and will continue to be essential to demonstrate cost savings, effectiveness of outcomes and ultimately justify the impact of the RDN. In 2014, the Institute of Medicine held a roundtable on value and science-driven health care with the vision for the development of a continuously learning health system in which science, informatics, incentives and culture are aligned for continuous improvement and innovation⁹⁶. The goal is by the year 2020, 90 percent of clinical decisions will be supported by accurate, timely and up-to-date clinical information and will reflect the best available evidence.

Research

The dietetics profession relies on research to advance practice. In 2006, a cross-sectional, descriptive study surveyed 258 randomly selected RDNs from Clinical Nutrition Management, Diabetes in Care and Education, Dietitians in General Clinical Practice, Dietitians in Nutrition Support, Nutrition Educators of Health Professionals, Renal Dietitians and Research dietetics

practice groups were surveyed⁹⁷. Key variables reported to predict the level of research skills included perceptions, attitudes, knowledge of evidence-based practice score, level of education, having taken a research course and how recent research was read⁹⁷. Some of the research scores of individual faculty members were comparable to the clinical RDNs⁹⁷. This finding may be related to the lower number of food and nutrition research mentors available. The results from this study imply that current entry level RDNs may have lower research scores.

In 2011, Readex Research, Inc. conducted a survey on Member Research Activities, Needs and Perceptions⁹⁸ for the American Dietetic Association on the gaps in dietetics-related research. The most common gap noted by the respondents was limited undergraduate education related to the research process and the paucity of research examining the cost effectiveness of nutrition intervention and outcomes. RDNs were strongly interested in public health research on methods to promote behavior change and maintenance, long-term and sustained community-based health promotion and disease prevention and research on specific populations such as Hispanics and the elderly. The most commonly cited barriers to RDN research were lack of research skills, lack of time and/or lack of staff and funding^{99,100}. Determinants to RDN involvement in research have been associated with education and knowledge¹⁰⁰. The perpetuation and advancement of the nutrition and dietetics profession depends on evidence-based practice and research furnishes the basis for the development of the data.

All RDNs will be expected to conduct nutrition research or collaborate in nutrition research as part of their work activity to establish nutrition outcomes recommendations for individuals and populations. Evidence-based practice is an important tool that includes complicated and cognizant decision making based on the highest quality of research available and substantiation on patient or client or program or system characteristics, conditions and subjectivities. Sixteen years ago an article appeared in the *Journal of the American Dietetic Association* titled, A Model for Making Outcomes Research Standard Practice in Clinical Dietetics¹⁰¹. Stakeholders and employers need to value and assign RDNs' time for research. One model presented included clinical RDNs collaborating with academic RDNs since the responsibility of academic dietetics training programs in the integration of research and clinical practice. When academic RDNs are not as skilled in research, collaboration with allied health faculty colleagues or industry RDNs may help supplement training programs. Research skills will be vital to the excellence and advancement of the profession.

Nutritional Pharmacology

Earlier nutrition and medication communications and the study of medical nutrition therapy focused primarily on drug-nutrient interaction. However, parallel to advances seen in medical nutrition therapy and technology, nutritional pharmacology has evolved into a multitude of relationships between nutrition and medication and the effect of nutritional status on drug metabolism, distribution and effectiveness^{102,103}. Polypharmacy increasingly complicates pharmacology. Pharmacology encompasses pharmacodynamics, pharmacokinetics and phase 1 and 2 of drug metabolism (oxidation reduction reactions and water-soluble formation,

respectively). More information has been learned about the impact of individual micronutrients on drug pharmacokinetics and pharmacodynamics.

Pharmacokinetics refers to the study of the time course of drug absorption, distribution, metabolism and excretion (known as ADME). Due to the advances seen in these two clinical areas, RDN education requires an expanded curriculum to include nutritional pharmacotherapy.

Knowledge and research on phytochemicals has progressed. For example, Chemopreventive and angiopreventive properties in epigallocatechin (green tea), triterpenoids (citrus juices), resveratrol (red wine), xanthohumol (beer), procyanidin (chocolate) and caffeine (coffee) have been associated with risk reduction of cardiovascular diseases, type 2 diabetes, neurodegenerative diseases and some cancers¹⁰⁴. Therefore, nutrition and dietetics practitioners will need to stay at the forefront of on ongoing research results to translate into practice.

Health Care Practice Setting

There is a shift in health care occurring from new health care legislation (HR 3590) where the emphasis in acute nutrition care is now moving towards community and public health nutrition evaluation and intervention. This is predicted to significantly elevate health promotion and disease prevention practice. The Center for Health Workforce Studies (CWS), with the IOM, conducted an allied health workshop in 2011 on Scope of Practice (SOP) and the Future of Team Based Care¹⁵. These thought leaders defined scope of practice as governance “based in state licensing laws and rules which sets legal framework for service delivery by a specific health profession in a state, defines parameters of practice for a profession, limits practice to people who successfully complete specified education and/or training, restricts use of title and/or credential to license holders in the profession and is designed to provide consumer protection”^{14, 15}.

This shift will include an increasing use of teams in health care delivery, patient-centered medical homes and will use interprofessional teams in the provision of health care services. Evolving practice settings, besides the patient-centered medical home, include accountable care organizations, health homes for chronically ill, primary care case management and managed care or coordinated care organization (MCO/CCO). Care will be coordinated among multiple providers and team configurations will vary depending on patient needs. Team members will actively communicate and collaborate with each in the delivery of patient care. Robust team cohesiveness will be associated with higher levels of clinical outcomes. There are emerging models of care that emphasize team based approaches. The success of these models will require a commitment to team-based education and training and there will be a greater need for regulatory flexibility related to SOP. It will be important to develop impact measures of SOP changes on efficiency, cost quality and access¹⁵.

Increased Medical Complexity and Acuity

Considering the aging population, home-based and hospital patients with multiple chronic diseases will increase. RDNs will need to be proficient in determining and prioritizing nutritional care while understanding the significance of multiple diseases and their conflicting pathology¹⁰⁵. As a part of designing nutritional care, RDNs will be writing diet orders and other increasing scope of practice

functions which will impact outcomes, safety, timeliness of care and readmission rates. Therefore, important areas of RDN's knowledge include acid-base balance and compensatory mechanisms, electrolyte abnormalities, fluid shifts and edema, acute changes in liver, renal, cardiac, respiratory function, multi-system organ failure and nutritional pharmacology to name a few¹⁰⁶. Concurrently, RDNs will continue to be faced with demonstrating the benefits of treatment by the RDN for patients with multiple medical conditions¹⁰⁷.

Public Health

The health care shifts from acute care to chronic disease care and prevention public health will greatly change public health nutrition. On one end of the spectrum, public health will become more integrated with nutrition and on the other end there will be an increased demand for RDNs to have enhanced clinical nutrition skills due to the increasing severity of illness in the community¹⁰⁸. The National Prevention, Health Promotion and Public Health Council from the Office of the Surgeon General advocates for a National Prevention Strategy: America's Plan for Better Health and Wellness^{19,43}. Two of the seven priorities require nutrition expertise (Healthy Eating and Active Living). The upcoming 2015 Dietary Guidelines for America (DGA) will include nutrition and lifestyle recommendations and anticipatory guidance for pregnant and lactating women, as well as, infants and toddlers, which are new additions to the DGA. The new additions result from the solid evidence of epigenetic effects of nutrition imprinting and from the multitude of studies demonstrating rapid infant weight gain in the first three months of life on later development of obesity.

Branding and Marketing

RDNs, in general, do not market themselves or communicate their roles as food and nutrition experts to non-dietetics groups¹⁰⁹. The vast public interest in nutrition continues to grow and there is often confusing, and sometimes conflicting, research reports and advice in the popular media. Therefore, RDNs, individually and as an organization, will need to promote the RDN brand. Besides confusion around nutrition in the popular media, there is public uncertainty around identifying qualified nutrition professionals. RDN's active participation in the profession's and its practitioners' 'branding' process will be instrumental in demonstrating RDN's superior nutritional expertise compared to competitors.

In 2011, on behalf of the Academy, Polaris Marketing Research conducted a qualitative survey followed by a quantitative evaluation of the RDN brand¹¹⁰. The purpose of the survey was to understand perceptions of the RDN in the marketplace. The survey population consisted of member and non-member RDNs, physicians, nurses and consumers (n=1,558). The results indicated a strong RDN brand with the exception of low awareness of RDNs among consumers. There was a segment of consumers that believed that RDNs prescribe an inflexible diet without considering the consumer's preferences or lifestyle. As the public becomes increasingly interested in nutrition, competition from other nutrition and health professionals is also increasing. The RDN brand must become stronger with distinct and pervasive messaging in the marketplace to differentiate RDNs from other nutrition and health professionals. This will be accomplished by implementing RDN communication and services aimed at focused consumer groups.

Industry Knowledge and Skills

RDNs working in business and industry are trained and exposed to new and different knowledge and skills, not otherwise included in the nutrition and dietetics curriculum. Some examples include, but are not limited to, product development, which requires knowledge and expertise in good manufacturing practice, industrial food production, sensory testing, writing specifications, disassembling, primary and secondary processing. RDNs who work in regulatory affairs are individuals who ensure regulatory compliance and prepare submissions, as well as those whose main job function is clinical affairs or quality assurance and are all considered regulatory professionals. Regulatory professionals can be employed in industry, government and academia and are involved with a wide range of products, including: pharmaceuticals, medical devices, in vitro diagnostics, biologics and biotechnology, nutritional products, cosmetics and veterinary products.

Regulatory professionals come from diverse backgrounds. Most regulatory professionals have earned a bachelor's degree and more than half have an advanced degree, most often in a scientific or technical field. Valuable skills include project management and organization, negotiation and communication and the ability to learn from the experience of others, both inside and outside the organization.

Nutrition-industry prospective clinical trials (NICTs) are often developed to show either safety/tolerance or efficacy, or both in many cases for a new nutrition product¹¹¹. NICTs may also be initiated to support a marketing claim based on either a novel ingredient (e.g. docosahexaenoic acid-DHA) or new application (e.g. liquid versus powder). Types of NICTs include drugs (investigational new drug - IND), infant formula, medical food, biologics and medical devices. RDNs are part of the 'pipeline' where they organize and run focus groups and advisory boards with key opinion leaders to generate product ideas and develop multi-center research protocols. NICTs are run to the same standards as pharmaceutical drug trials and infant formula results must be approved by the FDA. Industry RDNs are trained in a multitude of valuable skills such as project management, leadership, study monitoring and product production, packaging, labeling and distribution, adverse event reporting and coding, post-market product surveillance and monitoring, medical writing and statistics.

SUMMARY

The environmental scan represents an extensive examination and comparison of the current and future states of the rapidly growing and increasingly complex health care system. It examines stakeholder needs, findings in global and national reports, advances in medical science and technology, preparation and roles of other health professionals and the professional preparation of nutrition and dietetics practitioners. As noted by IOM and the Lancet Commission, the global health care systems are fractured and health professional education is old and disconnected. Five competencies recommended by the IOM for all health professionals include: patient-centered care, interdisciplinary teams and research, evidence-based practice, continuous quality improvement and informatics. These areas further demonstrate opportunities to gentrify the

educational preparation of nutrition and dietetics professionals to meet today's and tomorrow's health care system demands.

Educational levels and changes observed in other health professions provides timely guidance for RDN educational programs. Namely, the majority of health professions have established multiple degree levels. A graduate degree, often doctoral degree, represents the entry level professional practice degree for most of the health professions. All of the health professions require a significant number of hours in supervised practice (or its equivalent) as part of their overall training and education. Therefore, the success and advancement of the nutrition and dietetics practitioner may require a progressed academic preparation that includes interdisciplinary education, informatics, telehealth, skills thinking, nutritional genomics, nutritional pharmacology, case management, coding and reimbursement, evidence-based practice and outcomes research, behavioral counseling and multi-disease clinical care to meet the growing demands of advancing knowledge, skills and new practice settings.

REFERENCES

1. Nyland N, Lafferty L. Implications of the dietetics workforce demand study. *J Acad Nutr Diet.* 2012;112:(Suppl 1):S92-S94.
2. Rhea M, Bettles C. Future changes driving dietetics workforce supply and demand: future scan 2012- 2022. *J Acad Nutr Diet.* 2012;112(Suppl 1):S10-S24.
3. Hooker RS, Williams JA, Papneja J, Sen N, Hogan P. Dietetics supply and demand: 2010-2020. *J Acad Nutr Diet.* 2012;112(Suppl 1):S75-S91.
4. Ward B, Rogers D, Mueller C, Touger-Decker R, Sauer K. Entry level dietetics practice today: results from the 2010 Commission on Dietetic Registration Entry-Level Practice Audit. *J Am Diet Assoc.* 2011;111(6):914-941.
5. Sauer KL, Rogers D. Results of the 2013 non-RD bachelor's-DPD graduate dietetics practice audit. *J Am Diet Assoc.* 2014;114(10):1630-1639.
6. Academy of Nutrition and Dietetics. Final report of the joint meeting of the Council for Education in Nutrition and Dietetics, Commission on Dietetic Registration, Council on Future Practice, Education Committee, Nutrition and Dietetic Educators and Preceptors DPG. Commission on Dietetics Registration website. <http://cdrnet.org/vault/2459/web/files/JointMeetingReport.pdf>. Published March 25, 2013. Accessed July 25, 2014.
7. Academy of Nutrition and Dietetics Quality Management Committee and Scope of Practice Subcommittee of the Quality Management Committee. Academy of Nutrition and Dietetics: scope of practice for the registered dietitian. *J Acad Nutr Diet.* 2013;113(6, Suppl 2):S17-S28.
8. Academy of Nutrition and Dietetics Quality Management Committee and Scope of Practice Subcommittee of the Quality Management Committee. Academy of Nutrition and Dietetics: scope of practice for the dietetics technician, registered. *J Acad Nutr Diet.* 2013;113(6, Suppl 2):S46-S55.
9. Federation of State Medical Boards. Assessing scope of practice in health care delivery: critical questions in assuring public access and safety. http://library.fsmb.org/pdf/2005_grpol_scope_of_practice.pdf. Published 2005. Accessed July 25, 2014.
10. Academy of Nutrition and Dietetics. Standards of professional performance for registered dietitian nutritionists (competent, proficient and expert) in sustainable, resilient and healthy food and water systems. *J Acad Nutr Diet.* 2014;114(3):475-488.
11. LeFevre ML, The U.S. Preventive Services Task Force. Behavioral counseling to promote a healthful diet and physical activity for cardiovascular disease prevention in adults with cardiovascular risk factors: U.S. preventive services task force recommendation statement. *Ann Intern Med.* 2014;161(8):587-93.
12. Fitzgerald N, Morgan KT, Slawson DL. Practice paper of the Academy of Nutrition and Dietetics abstract: the role of nutrition in health promotion and chronic disease prevention. *J Acad Nutr Diet.* 2013;113(7):983. doi:10.1016/j.jand.2013.05.007.
13. Slawson DL, Fitzgerald N, Morgan KT. Position of the Academy of Nutrition and Dietetics: the role of nutrition in health promotion and chronic disease prevention. *J Acad Nutr Diet.* 2013;113(7):972- 979. doi:10.1016/j.jand.2013.05.005.

14. Olstad DL, Raine KD, McCargar LJ. The role of registered dietitians in health promotion. *Can J Diet Pract Res*. 2013;74(2):80-83. PMID: 23750980.
15. Institute of Medicine. Center for Health Workforce Studies. Allied Health Workshop, Institute of Medicine: May 9 and 10, 2011, Scope of Practice and the Future of Team Based Care. https://www.health.ny.gov/health_care/medicaid/redesign/docs/2011-10-03_chws_presentation.pdf Accessed September 11, 2014.
16. Federal Register. Medicare and Medicaid programs; regulatory provisions to promote program efficiency, transparency and burden reduction; part II. <https://www.federalregister.gov/articles/2014/05/12/2014-10687/medicare-and-medicaid-programs-regulatory-provisions-to-promote-program-efficiency-transparency-and>. Published May 12, 2014. Accessed August 27, 2014.
17. Martin AL, Lipman RD. The future of diabetes education: expanded opportunities and roles for diabetes educators. *Diabetes Educ*. 2013;39(4):436-446.
18. The College of Dietitians of Ontario and Dietitians of Canada. Application for review of the scope of practice of dietetics in Ontario submitted to the Health Professions Regulatory Advisory Council. Dietitians of Canada website. <http://www.dietitians.ca/Downloadable-Content/Public/scope-of-practice-survey-Ontario-2008.aspx>. Published June 30, 2008. Accessed September 11, 2014.
19. Institute of Medicine. *America's Health Care Safety Net: Intact but Endangered*. Washington, DC: National Academy Press; 2000.
20. Institute of Medicine. *Rebuilding the Unity of Health in the Environment: A New Vision of Environmental Health for the 21st Century. Workshop Summary*. Washington, DC: National Academy Press; 2001.
21. Institute of Medicine. *Health Professions Education – A Bridge to Quality*. Washington, DC: National Academy Press; 2003.
22. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press; 2001.
23. Institute of Medicine. Global Forum on Innovation in Health Professional Education. <http://www.iom.edu/Activities/Global/InnovationHealthProfEducation.aspx>. Accessed November 16, 2014.
24. Institute of Medicine. *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models across the Continuum of Education to Practice – Workshop Summary*. Washington, DC: National Academy Press; 2012.
25. Institute of Medicine. *Establishing Transdisciplinary Professionalism for Improving Health Outcomes - Workshop Summary*. Washington, DC: National Academy Press; 2012.
26. Interprofessional Education Collaborative Expert Panel. *Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel*. Washington, DC: Interprofessional Education Collaborative; 2011.
27. Institute of Medicine. *Interprofessional Education for Collaboration: Learning How to Improve Health from Interprofessional Models across the Continuum of Education to Practice: Workshop Summary*. Washington, DC: The National Academies Press; 2013.

28. World Health Organization. Framework for action on interprofessional education and collaborative practice.
http://www.who.int/hrh/resources/framework_action/en/index.html. Published 2010. Accessed September 11, 2014.
29. Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756): 1923-1958.
30. Institute of Medicine. *Complementary and Alternative Medicine in the United States*. Washington, DC: The National Academies Press; 2005.
31. Bravewell Collaborative. Elements of integrative care.
http://www.bravewell.org/integrative_medicine/integrative_care/. Accessed August 15, 2014.
32. Consortium of Academic Health Centers for Integrative Medicine. 2005. Definition of integrative medicine. <http://www.imconsortium.org/cahcm/about/home.html>. Accessed August 15, 2014.
33. Kreitzer MJ, Kligler B, Meeker WC. Health professions education and integrative health care.
<http://www.iom.edu/~media/Files/Activity%20Files/Quality/IntegrativeMed/Health%20Profession%20Education%20and%20Integrative%20HealthCare.pdf>. Accessed August 15, 2014.
34. Institute of Medicine, National Research Council. *Investing in the Health and Well-being of Young Adults*. Washington, DC: The National Academies Press; 2014.
35. Adelman C, Ewell P, Gaston P, Schneider CG. *The Degree Qualifications Profile*. Lumina Foundation for Education: Indianapolis, IN: 2011.
36. Coppard BM, Dickerson A; Commission on Education. A descriptive review of occupational therapy education. *Am J Occup Ther*. 2007;61(6):672-677.
37. American Physical Therapy Association. Designation "PT," "PTA," "SPT," AND "SPTA" HOD P06-03- 17-14.
http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/HOD/Terminology/Designation.pdf. Updated December 14, 2009. Accessed, July 2, 2014.
38. Physician Assistant Education Association. PA Clinical Doctorate Summit final report and summary. <http://www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/78715>. Published April 15, 2009. Accessed July 2, 2014.
39. Accreditation Council for Pharmacy Education. Accreditation standards and guidelines for the professional program in pharmacy leading to the doctor of pharmacy degree.
<https://www.acpe-accredit.org/standards/>. Accessed, July 2, 2014.
40. Boyleston ES, Collins MA. Advancing our profession: are higher educational standards the answer? *J Dent Hyg*. 2012;86(3):168-178.
41. Holmes DE, ed. *From Education to Regulation: Dynamic Challenges for the Health Workforce*. Association of Academic Health Centers: Washington, DC: 2008.
42. Siler W, Randolph DA. Clinical look at clinical doctorates. *Chron Rev*. 2006;52(46):B12.

43. US Department of Health and Human Services. HHS strategic plan and secretary's strategic initiatives. <http://www.hhs.gov/strategic-plan/priorities.html>. Reviewed July 29, 2014. Accessed September 15, 2014.
44. Cooperative Extension's National Framework for Health and Wellness. March 2014. <https://www.aplu.org/document.doc?id=5134> Accessed November 16, 2014.
45. National Prevention Council. *National Prevention Strategy*. US Department of Health and Human Services, Office of the Surgeon General: Washington, DC; 2011.
46. The Benefits Improvement and Protection Act of 2000. Pub L No. 106-554, 2000.
47. Nutrition therapy services (medical) Medicare.gov <http://www.medicare.gov/coverage/nutrition-therapy-services.html> Accessed October 7, 2014.
48. Academy of Nutrition and Dietetics. CMS final rule on therapeutic diet orders means new opportunities for RDNs. *J Acad Nutr Diet*. 2014;114(9):1326-1328.
49. Roberts SR. Improving patient outcomes through registered dietitian order writing. *Nutr Clin Pract*. 2013;28(5):556-65. doi: 10.1177/0884533613499375.
50. Imfeld K, Keith M, Stoyanoff L, Fletcher H, Miles S, McLaughlin J. Diet order entry by registered dietitians results in a reduction in error rates and time delays compared with other health professionals. *J Acad Nutr Diet*. 2012;112(10):1656-1661. doi: 10.1016/j.jand.2012.05.020.
51. Medicare.gov. About Physician Compare. <http://www.medicare.gov/physiciancompare/staticpages/aboutphysiciancompare/about.html>. Accessed October 7, 2014.
52. Academy of Nutrition and Dietetics. Nutrition services delivery and payment: the business of every Academy member: House of Delegates Fact Sheet. Public Health/Community Nutrition dietetics practice group website. <http://www.phcnpg.org/docs/Governance/HOD%202013/HOD-Fact-Sheet- Outcomes-of-Fall-HOD-Meeting-FINAL-11-21-13.pdf>. Published Fall 2013. Accessed October 7, 2014.
53. Bardach NS, Wang JJ, De Leon SF, Shih SC, Boscardin WJ. Effect of pay-for-performance incentives on quality of care in small practices with electronic health records: A randomized trial. *JAMA*. 2013;310(10):1051-1059. doi:10.1001/jama.2013.277353.
54. Rosen R, Earthman C, Marquart L, Reicks M. Continuing education needs of registered dietitians regarding nutrigenomics. *J Acad Nutr Diet*. 2006;106(8):1242-1245.
55. Whelan K, McCarthy S, Pufulete M. Genetics and diet-gene interactions: involvement, confidence and knowledge of dietitians. *Br J Nutr*. 2008;99(1):23-28.
56. McCarthy S, Pufulete M, Whelan K. Factors associated with knowledge of genetics and nutritional genomics among dietitians. *J Hum Nutr Diet*. 2008;21(6):547-554.
57. Camp KM, Trujillo E. Position of the Academy of Nutrition and Dietetics: nutritional genomics. *J Acad Nutr Diet*. 2014;114(2):299-312.
58. Vickery CE, Cotugna N. Incorporating human genetics into dietetics curricula remains a challenge. *J Acad Nutr Diet*. 2005;105(4):583-588.

59. Gregg S, Cohen D, Cerami J, Conn CA, The role of the registered dietitian in the patient-centered medical home. *Top Clin Nutr.* 2014;29(3):201-209.
60. Fuhrman MP, Galvin TA, Ireton-Jones CS, Thorpe J; American Dietetic Association. Practice paper of the American Dietetic Association: Homecare--opportunities for food and nutrition professionals. *J Am Diet Assoc.* 2009;109(6):1092-1100. PMID: 19480085.
61. Sahyoun NR. Expanding opportunities for registered dietitians in the healthcare system. *J Am Diet Assoc.* 2011;111(6):813-815. doi: 10.1016/j.jada.2011.03.024. PMID: 21616192.
62. Rogers D. Dietetics trends as reflected in various primary research projects, 1995-2011. *J Acad Nutr Diet.* 2012;112(Suppl 1):S64-S74.
63. Gilbride JA, Parks SC, Dowling R. The potential of nutrition and dietetics practice. *Top Clin Nutr.* 2013;28(3):209-219.
64. Ayres EJ, Greer-Carney JL, McShane PE, Miller A, Turner P. Nutrition informatics competencies across all levels of practice: A national Delphi study. *J Acad Nutr Diet.* 2012;112(12):2042-2053.
65. Institute of Medicine. *The Role of Telehealth in an Evolving Health Care Environment: Workshop Summary.* Washington, DC: The National Academies Press; 2012.
66. Health Resources and Services Administration, US Department of Health and Human Services. Telehealth. <http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/index.html>. Accessed November 12, 2014.
67. Siminerio S, Ruppert K, Huber K, Toledo FG. Telemedicine for Reach, Education, Access and Treatment (TREAT): linking telemedicine with diabetes self-management education to improve care in rural communities. *Diabetes Educ.* 2014;40(6):797-805. doi: 10.1177/0145721714551993.
68. Chapter 12 of the "Medicare Claims Processing Manual" (Publication 100-04) located at <http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Internet-Only-Manuals-IOMs-Items/CMS018912.html>. Accessed September 20, 2014.
69. Chapter 15 of the "Medicare Benefit Policy Manual" (Publication 100-02) located at <http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/clm104c12.pdf>. Accessed September 20, 2014.
70. Gilman M, Stensland J. Telehealth and medicare: payment policy, current use and prospects for growth. *Medicare Medicaid Res Rev.* 2013;3(4):E1-E14. doi: 10.5600/mmrr.003.04.a04.
71. Soderquist C, Overakker S. Education for sustainable development: a systems thinking approach. *Global Environ Res.* 2010;14:193-202.
72. Thornton B, Peltier G, Perreault G. Systems thinking: a skill to improve student achievement. *The Clearing House.* 2004;77(5):222-227.
73. Academy of Nutrition and Dietetics. Business and management skills: HOD backgrounder. California Dietetic Association website. http://www.dietitian.org/d_orange/materials/sep2014_mtg/Business_and_Management_Skills_Bac_kgrounder.pdf. Published Fall, 2014. Accessed December 21, 2014.

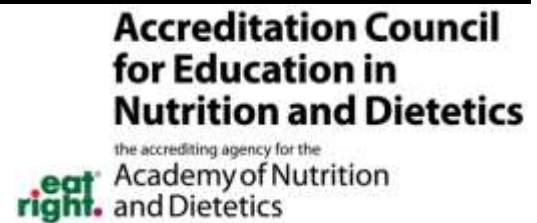
74. Academy of Nutrition and Dietetics Compensation and Benefits Survey 2013: education and job responsibility key to increased compensation. *J Acad Nutr Diet*. 2014;114(1):17-33.
75. Academy of Nutrition and Dietetics. Management and leadership across practice: HOD backgrounder. http://www.eatright.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=6442481596&libID=64424_81573. Published February 2010. Accessed December 20, 2014.
76. Karp SS, Lawrence ML. Uses of new competencies to assess entry-level dietitians. *J Am Diet Assoc*. 1999;99(9):1098-1100.
77. Canter DD. Management is a multifaceted component essential to the skill set of successful dietetics practitioners. *J Acad Nutr Diet*. 2012;112:(Suppl 1):S5.
78. Gould RA, Canter D. Management matters. *J Am Diet Assoc*. 2008;108(11):1834-1836.
79. Puckett RP, Barkley W, Dixon G, et al. American Dietetic Association standards of professional performance for registered dietitians (generalist and advanced) in management of food and nutrition systems. *J Am Diet Assoc*. 2009;109(3):540-543.e13.
80. Gregoire MB, Sames K, Dowling RA, Lafferty LJ. Are registered dietitians adequately prepared to be hospital foodservice directors? *J Am Diet Assoc*. 2005;105(8):1215-1221.
81. Cluskey M, Gerald B, Gregoire M. Management in dietetics: are we prepared for the future? *J Am Diet Assoc*. 2007;107(3):386-389.
82. Puckett RP, Barkley W, Dixon G, Egan K, Koch C, Malone T, Scott-Smith J, Sheridan B, Theis. American Dietetic Association Standards of Professional Performance for registered dietitians (generalist and advanced) in management of food and nutrition systems. *J Am Diet Assoc*. 2009;109(3):540-543.
83. O'Sullivan Maillet J, Brody RA, Skipper A, Pavlinac JM. Framework for analyzing supply and demand for specialist and advanced practice registered dietitians. *J Acad Nutr Diet*. 2012;112(Suppl 1):S47- S55.
84. Gregoire MB, Arendt SW. Leadership: reflections over the past 100 years. *J Acad Nutr Diet*. 2014;114(Suppl 1):S10-S19.
85. Institute of Medicine. *Integrating research and practice: Health system leaders working toward high-value care: Workshop summary*. Washington, DC: The National Academies Press; 2014.
86. Boyce B. Learning to lead: developing dietetics leaders. *J Acad Nutr Diet*. 2014;114(5):688-692.
87. Wolf AM, Conaway MR, Crowther JQ, et al. Translating lifestyle intervention to practice in obese patients with type 2 diabetes: Improving Control with Activity and Nutrition (ICAN) study. *Diabetes Care*. 2004;27(7):1570-1576.
88. Wolf AM, Siadaty M, Yaeger B, et al. Effects of lifestyle intervention on health care costs: Improving Control with Activity and Nutrition (ICAN). *J Am Diet Assoc*. 2007;107(8):1365-1373.
89. Parrott JS, White JV, Schofield M, et al. Current coding practices and patterns of code use of registered dietitian nutritionists: the Academy of Nutrition and Dietetics 2013 coding survey. *J Acad Nutr Diet*. 2014;114(10):1619-1629.

90. Center for Medicare and Medicaid Services. Physician Quality Reporting System (PQRS) overview. http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/Downloads/PQRS_OverviewFactSheet_2013_08_06.pdf. Accessed October 13, 2014.
91. Greiner A. *Educating Health Professionals to Use an Evidence Base. Current Reality, Barriers and Related Actions*. Washington, DC: National Academy Press; 2001.
92. Sackett D, Rosenberg W, Gray M, Haynes B, Richardson S. Evidence-based medicine: what it is and what it isn't. *BMJ*. 1996;312:71-72.
93. Haynes EB, Devereaux PJ, GuyatT GH. Clinical expertise in the era of evidence-based medicine and patient choice. *Evid Based Med*. 2002;7:36-38.
94. Lusardi MM, Levangie PK, Fein BD. A problem-based learning approach to facilitate evidence-based practice in entry-level health professional education. *J Prosthet Orthot*. 2002;14(2):40-50.
95. Vogt EAM, Byham-Gray LD, Touger-Decker R. Perceptions, attitudes knowledge and clinical use of evidence-based practice among U.S. registered dietitians: A prospective descriptive pilot study. *Top Clin Nutr*. 2013;28(3):283-294.
96. Institute of Medicine. Roundtable on value and science-driven health care. <http://www.iom.edu/Activities/Quality/VSRT.aspx>. Accessed September 11, 2014.
97. Byham-Gray LD, Gilbride JA, Dixon LB, Stage FK. Predictors for research involvement among registered dietitians. *J Am Diet Assoc*. 2006;106(12):2008-2015.
98. Anchondo IM, Campbell C, Zoellner J. Academy of Nutrition and Dietetics 2011 survey on member research activities, needs and perceptions. *J Acad Nutr Diet*. 2014;114(5):803-810.
99. Gardner JK, Rall LC, Peterson CA. Lack of multidisciplinary collaboration is a barrier to outcomes research. *J Am Diet Assoc*. 2002;102(1):65-71.
100. King C, Byham-Gray L, O'Sullivan Maillet J, Parrott S, Splett JP, Roberts MM. Dietitians and research: facilitating involvement: history of dietitian involvement in dietetics research in the U.S. *Top Clin Nutr*. 2014;29(3):227-238. doi: 10.1097/TIN.0000000000000002.
101. Eck LH, Slawson DL, Williams R, Smith K, Harmon-Clayton K, Oliver D. A model for making outcomes research standard practice in clinical dietetics. *J Am Diet Assoc*. 1998;98(4):451-457.
102. Sears B, Ricordi C. Anti-inflammatory nutrition as a pharmacological approach to treat obesity. *J Obesity*. 2011. doi:10.1155/2011/431985.
103. Academy of Nutrition and Dietetics. Position of the American Dietetic Association: integration of medical nutrition therapy and pharmacotherapy. *J Acad Nutr Diet*. 2010;110(6):950-956.
104. Rossi T, Gallo C, Bassani B, Canali S, Albini A, Bruno A. Drink your prevention: beverages with cancer preventive phytochemicals. *Pol Arch Med Wewn*. 2014;124(12):713-722.

105. Rich E, Lipson D, Libersky J, Parchman M. Coordinating care for adults with complex care needs in the patient-centered medical home: challenges and solutions. AHRQ Publication No. 12-0010-EF. Rockville, MD: Agency for Healthcare Research and Quality; January 2012.
106. Jaarsma T. Inter-professional team approach to patients with heart failure. *Heart* 2005;91(6):832-838. doi: 10.1136/hrt.2003.025296.
107. SEO Economic Research. Cost-benefit analysis of dietary treatment. http://www.seo.nl/uploads/media/2012-76a_Cost-benefit_analysis_of_dietary_treatment.pdf. Published November 2013. Accessed September 11, 2014.
108. Davis AM, Affenito SG. Nutrition and public health: preparing registered dietitian nutritionists for marketplace demands. *J Acad Nutr Diet*. 2014;114(3):695-699.
109. Kicklighter JR, Cluskey MM, Hunter AM, Nyland NK, Spear BA. Council on future practice visioning report and consensus agreement for moving forward the continuum of dietetics education, credentialing and practice. *J Acad Nutr Diet*. 2013;113(12):1710-1732.
110. Academy of Nutrition and Dietetics. Academy of Nutrition and Dietetics registered dietitian brand evaluation research results. *J Acad Nutr Diet*. 2014;114(10):1640-1646.
111. Yannicelli S, Davis A; Research Dietetics Practice Group of the Academy of Nutrition and Dietetics. Conducting Clinical Trials in the Nutrition Industry: We're Not in Academics Anymore! *The Digest*. 2010;45(2):1-8.

Appendix A

EXPANDED STANDARDS COMMITTEE
Background Report
July 2014



The Accreditation Council for Education in Nutrition and Dietetics (ACEND), the accrediting agency for the Academy of Nutrition and Dietetics (Academy), serves the public by establishing and enforcing standards for the educational preparation of nutrition and dietetics practitioners and by recognizing nutrition and dietetics education programs that meet these standards. The mission of ACEND is to ensure the quality of nutrition and dietetics education to advance the practice of the profession and to serve and protect the public.

The educational preparation of future dietitians and dietetic technicians includes didactic and supervised practice components completed through ACEND-accredited programs. The educational preparation of dietetic technicians is at the associate's level and the preparation of dietitians is typically at the baccalaureate level, combined with or followed by a supervised practice experience. Some master's and doctoral level programs also exist. In 2014, there were 570 ACEND-accredited programs. Under the current system, some graduates are unable to obtain supervised practice experience.

In 2006, an American Dietetic Association Education Task Force recommended a review of the educational competencies to allow more opportunity to meet future practice needs through a graduate degree. In 2012, the Academy's Council on Future Practice released a visioning document recommending that the level of educational preparation for dietitians be elevated to a graduate level to provide a greater depth of knowledge and skills needed for future practice in the profession. In response, ACEND has been conducting a thorough review of the current standards for nutrition and dietetics education.

An ACEND-appointed Expanded Standards Committee met in February 2014 to begin exploration of degree-based standards and competencies for nutrition and dietetics practitioners potentially at both the baccalaureate and graduate levels. The following guidance emerged:

- Use evidence-based practice information to determine knowledge and skills needed for nutrition and dietetics practice assuring resultant education requirements be ethically and legally sound, meet requirements of the United States Department of Education, maintain national recognition and assure high quality accreditation practices and standards.
- Assess existing research and environmental scan data and collect additional stakeholder and market-place data, if needed, to identify the roles of future practitioners, the education level required and the needs of the marketplace.
- Compile a Rationale Document to serve as the foundation for accreditation standards revisions.

This Background Report provides a summarized overview of the forthcoming evidence-based Rationale Document for the future educational requirements of baccalaureate and graduate level prepared nutrition and dietetics practitioners. The following themes will be detailed in the Rationale Document.

1. Continuous high-speed advancements in healthcare, technology, medicine and food systems warrant additional information and a higher level of education may better prepare nutrition and dietetics practitioners to meet the needs of the public.
 - Profound and extensive changes continue to affect health care delivery systems, economics, governmental constraints and societal expectations. The profession of nutrition and dietetics has adapted quickly to new technologies and practices. However, the increase in innovations will continue to pressure the educational process of assuring adequately prepared practitioners¹.
 - The Institute of Medicine's core skills for all health care professionals include: provide patient-centered care, work in interdisciplinary teams; provide evidence-based practice; apply quality improvement; and utilize informatics².
 - On the horizon are the growth in patient medical homes, increased use of home health care services, expanded use of health information management (HIM) and improved understanding of the impact on health of microbiota, genomics and pharmacology. Nutrition and dietetics practitioners may require additional training to understand the impact of these topics and assure their ability to cross-function on interprofessional teams and be flexible at working in a variety of venues. With the marked changing of the population demographics, intensive training in cultural diversity and geriatric nutrition may also be needed.
 - The future may hold fewer permanent fulltime employees with increasing outsourcing and contracted services³. Employment challenges may require creative and flexible nutrition and dietetics professionals with the educational leadership, higher level management, entrepreneurship and business skills needed to adapt to these challenges.
2. There is a broadening and increased complexity in public health nutrition, food safety, disease prevention, food production and health promotion that may impact the practice of nutrition and dietetics.
 - There has been an upsurge in incidences of obesity and diabetes⁴, food allergies, foodborne illness outbreaks, and food insecurity. In addition, interest in food sustainability places additional responsibilities and diverse aptitude prerequisites on nutrition and dietetics professionals to meet capacity demands.
 - Emphasis on patient outcomes⁵ is necessitating proficiency in outcomes research design, execution, analysis, presentation and publication to demonstrate the benefit and cost savings of nutrition intervention.
 - The U.S. Preventive Services Task Force (USPSTF) recommends intensive behavioral dietary counseling for adult patients with hyperlipidemia and other known risk factors for cardiovascular and diet-related chronic disease⁶. Intensive counseling can be delivered by nutrition and dietetics practitioners. Expansion of scope of nutrition and dietetics practice into behavioral counseling suggests a need for increased skills in the areas of coaching, coordination of care and program planning and evaluation. Nutrition and dietetics practitioners could enhance the prevention and treatment of co-morbid conditions and chronic diseases.
 - There is vast public interest in nutrition that continues to grow and individuals increasingly seeks expert advice to optimize health and well-being through food and to interpret confusing and sometimes conflicting research reports and advice in the popular media. The dietetic and nutrition professional's role is central to meeting this need as experts in foods and nutrition who focus on promoting a healthy lifestyle and diet adherence through education, counseling and behavior change techniques. The use of the Internet for client counseling, coaching and communications is increasing^{7,8}. Practitioners in this area must demonstrate proficiency in communication, innovation, business management, technology, marketing and sales entrepreneurship and

negotiation skills to compete successfully^{9, 10}. Despite these opportunities, access and reimbursements are barriers to nutrition and dietetics professionals.

- According to 1995-2011 nutrition and dietetics trends, fewer nutrition and dietetic professionals are assuming managerial responsibility as more choose to practice in the clinical arena, in inpatient and outpatient settings. The number of nutrition and dietetic professionals in clinical long-term-care, as well as in healthcare and school food and nutrition services management, business and industry and consultation/business practice is decreasing¹¹ creating a void of skilled nutrition and dietetics practitioners to provide leadership for these operations.
3. Many health professions have identified differing skills levels needed by their practitioners in the marketplace and as a result many accrediting agencies have differentiated knowledge and skill requirements at baccalaureate and graduate levels.
- The majority of health professions have two to four education levels in their professional programs¹²⁻¹⁹.
 - Approximately half of health professions have an associate-bachelor degree level as a technical assistant working to support the practitioner level¹²⁻¹⁹.
 - Many health professions have terminal degree programs at the graduate level; medicine, nursing, occupational therapy, physical therapy, audiology and pharmacy all have practice doctorate degrees¹²⁻¹⁹.
 - Professional business and management (Masters of Business Administration, MBA), hospital administration (Healthcare Administration, MHA) and health information management (Masters of Information Management, MIM) degrees are at the graduate level^{20, 21}.
 - Certified Nutrition Specialists (CNS), Naturopathic doctors, Chiropractors and other integrative health coaches have graduate degrees and often are providing nutrition information to the public²²⁻²⁴.
 - The number of schools offering baccalaureate degrees in public health has increased in response to the increase in student demand for this major²⁵.
 - Demands of accreditors for enhancing interprofessional education and practice experiences for students may require nutrition and dietetics professionals to have advanced education beyond the baccalaureate degree to develop competence needed to function as a valued member of the healthcare team.
 - The increased focus on evidence-based practice requires outcomes research to help document optimal practices. Nutrition and dietetics professionals may need additional research skills to direct and participate in outcomes research.

A review of the current data and information available about nutrition and dietetics practice suggests that more information is available about current practice than exists for future nutrition and dietetics practice. The environmental scan completed for this Background Report created awareness of the advancements in healthcare, technology, medicine and food systems and the increased complexity in public health nutrition, food safety, disease prevention, food production and health promotion. Additional information may need to be gathered from key stakeholders, including employers, practitioners, students and the public, about the future roles of nutrition and dietetics professionals to determine the impact of these environmental changes on future nutrition and dietetics practice and guide the exploration of degree-based standards and competencies for nutrition and dietetics practitioners.

Key stakeholders to contact include healthcare administrators across the spectrum of care from clinics to nursing homes to hospitals as an evolving industry. Medicare, insurance companies and the U.S. Preventive Services Task Force members may provide information about reimbursement of, barriers to and future for

nutrition services. Healthcare regulators may help identify strategies to contain cost and improve health. Educators of graduate level dietetic students may help identify how education differs at the higher level and education administrators of focused graduate programs such as MPH and MBA for dietetic practitioners may provide information on employment of those with these unique sets of skills. Employers in other businesses such as food technology, health communication, biotechnology, pharmaceuticals and food service management may disclose needed skills, educational preparation and future trends in those areas. Gastroenterologists, neonatologists, pediatricians, endocrinologists, geneticists, oncologists, bariatric and gastroenterology surgeons, internists, family practitioners, pharmacists, nurses and other health professionals who work interprofessionally with dietetic practitioners will suggest additional knowledge and skills needed by the nutrition and dietetics practitioner.

1. Rhea M and Bettles C. Future Changes Driving Dietetics Workforce Supply and Demand: Future Scan 2012-2022 *J Acad Nutr Diet*. 2012;112(suppl 1):S10-S24.
2. IOM (Institute of Medicine). 2003. *Health profession education: A bridge to quality*. Washington, D.C.: The National Academies Press.
3. Cluskey M, Gerald B, Gregoire M. Management in dietetics: Are we prepared for the future? *J Amer Diet Assoc*. 2007;3:386-389.
4. U.S. Diabetes Cases Jump to 29 Million: www.CDC.gov Accessed June 6, 2014.
5. Evidence-Based Medicine Working Group. Evidence-based health care: a new approach to teaching the practice of health care. *JAMA* 1992; 268(17): 2420-5.
6. The U.S. Preventive Services Task Force, 2014. USPSTF Recommendations Draft Behavioral Counseling to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease (CVD.) Prevention in Adults with Known Risk Factors. <http://www.uspreventiveservicestaskforce.org/uspstf13/cvdhighrisk/cvdhighriskdraftfact.pdf> Accessed July 2, 2014.
7. Online Nutrition Businesses. Nutrition Entrepreneurs (NE) is a Dietetic Practice Group of the Academy of Nutrition and Dietetics. <https://www.nedpg.org/products-services/counseling-coaching>, Accessed June 16, 2014.
8. Aronson D. High-Tech Counseling: An Untapped Market for Today's Dietitian? *Today's Dietitian* 2007; 9(3):46.
9. Zanteson L. RD Licensing Legislation — Is It a Matter of Public Safety or Monopoly? *Today's Dietitian* 2012;14(11): 46.
10. Rhea M and Bettles C. Four Futures for Dietetics Workforce Supply and Demand: 2012-2022 Scenarios. *J Acad Nutr Diet*. 2012;112(suppl 1):S25-S34.
11. Rogers D. Dietetics Trends as Reflected in Various Primary Research Projects, 1995-2011 *J Acad Nutr Diet*. 2012;112(suppl 1):S64-S74.
12. A Descriptive Review of Occupational Therapy Education. The American Occupational Therapy Association. *American Journal of Occupational Therapy* 2007;61 (November/December).

13. Understanding Physical Therapy Degrees, Designators, and Other Credentials. PTDegreeExplanation.pdf http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/HOD/Terminology/Designation.pdf Accessed, July 2, 2014.
14. Physician Assistant Clinical Doctorate Summit Final report and summary, April 15, 2009. <http://www.paeaonline.org/index.php?ht=a/GetDocumentAction/i/78715> Accessed, July 2, 2014.
15. Accreditation Council for Pharmacy Education. Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree, Effective: July 1, 2007. <https://www.acpe-accredit.org/standards/> Accessed, July 2, 2014.
16. American Music Therapy Association. (2010). *Sourcebook*. Silver Spring, MD: Author.
17. American Art Therapy Association. (2007). *Masters education standards for master's degree programs providing art therapy education*. <http://www.americanarttherapyassociation.org/upload/masterseducationstandards.pdf> Accessed July 2, 2014.
18. The Council on Social Work Education (CSWE) <http://www.cswe.org/About.aspx>, Accessed June 16, 2014.
19. Barnes TA, Kacmarek RM, Kageler WV, Morris MJ, Durbin CG. Transitioning the respiratory therapy workforce for 2015 and beyond. *Respiratory Care*. 2011; 56(5):681-690.
20. AHIMA. Climbing Higher: Bridging the Gap to Advanced Degrees in HIM. http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049694.hcsp?dDocName=bok1_049694 Accessed July 2, 2014.
21. The American Health Information Management Association. AHIMA National Workforce Assessment Final Report. http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_050524.pdf Accessed July 2, 2014.
22. Institute for Integrative Nutrition, <http://www.muih.edu/about/partnerships/institute-integrative-nutrition>, Accessed June 16, 2014.
23. Certified Nutrition Specialists® are Advanced Nutrition Professionals http://cbns.org/wp-content/uploads/2010/08/CNSBrochure_web.pdf, Accessed June 16, 2014.
24. Prerequisites - Naturopathic Medicine. <http://www.bastyr.edu/academics/areas-study/study-naturopathic-medicine/prerequisites-naturopathic-medicine> Accessed June 16, 2014.
25. CEPH. History and overview of baccalaureate accreditation. Council on Education for Public Health. Silver Spring, MD, 2014. <http://ceph.org/constituents/programs-baccalaureate-level/history-and-overview/> Accessed: June 25, 2014.

Appendix B

Scope of Practice in State Laws

State	Link	Statutes/Regulations
Alabama	http://www.legislature.state.al.us/CodeofAlabama/1975/34-34A-4.htm	<p>Section 34-34A-4 Dietetics/nutrition is the integration and application of principles derived from the sciences of nutrition, biochemistry, physiology, food, management and behavioral and social sciences to achieve and maintain people's health. The primary function of dietetics practice is the provision of nutrition care services which shall include: (1) Assessing the nutritional needs of individuals and groups and determining resources and constraints in the practice setting; (2) Establishing priorities, goals and objectives that meet nutritional needs and are consistent with available resources and constraints; (3) Providing nutrition counseling in health and disease.</p> <p>(4) Developing, implementing and managing nutrition care systems; (5) Evaluating, making changes in and maintaining appropriate standards of quality in food and nutrition services.</p> <p><i>(Acts 1989, No. 89-866, p. 1733, §4.)</i></p>
Alaska	http://commerce.state.ak.us/dnn/Portals/5/pub/DietitianStatutes.pdf	<p>Sec. 08.38.010. License required. (a) An individual may not, unless licensed as a dietitian or nutritionist by the department, use the title "dietitian," "licensed dietitian," "nutritionist," "licensed nutritionist," or an occupational title using the word "dietitian" or "nutritionist."</p> <p>(b) The only penalty that may be imposed on an individual who engages in conduct that violates (a) of this section is a fine of not more than \$1,000 under a citation issued under AS 08.01.102 – 08.01.104. (c) An individual who obtains or attempts to obtain a dietitian or nutritionist license by dishonest or fraudulent means or who forges, counterfeits, or fraudulently alters a dietitian or nutritionist license, is punishable by a fine of not more than \$1,000 under a citation issued by the department. For a citation under this subsection, the department shall use the citation procedures applicable to citations for unlicensed practice under AS 08.01.102 – 08.01.104 and an individual who receives a citation under this subsection is subject to the same requirements as an individual who receives a citation under AS 08.01.102 – 08.01.104.</p>
Arkansas	http://www.arkdieteticslicbrd.net/docs/pdf/Act_392_1989.pdf	<p>1989 Dietetics Practices Act- Unable to access.</p>
California	http://caselaw.lp.findlaw.com/cacodes/bpc/2585-2586.8.html	<p>(a) Notwithstanding any other provision of law, a registered dietitian, or other nutritional professional meeting the qualifications set forth in subdivision (e) of Section 2585 may, upon referral by a health care provider authorized to prescribe dietary treatments, provide nutritional and dietary counseling, conduct nutritional and dietary assessments and develop nutritional and dietary treatments, including therapeutic diets, for individuals or groups of patients in licensed institutional facilities or in private office settings. The referral shall be accompanied by a written prescription signed by the health care provider detailing the patient's diagnosis and including a statement of the desired objective of dietary treatment, unless a referring physician and surgeon has established or approved a written protocol governing the patient's treatment. The services described in this subdivision may be termed "medical nutrition therapy." (b) A registered dietitian, or other nutritional professional meeting the qualifications set forth in subdivision (e) of Section 2585, may accept or transmit verbal orders or electronically transmitted orders from the referring physician consistent with an established protocol to implement medical nutrition therapy. (c) A registered dietitian, or other nutritional professional meeting the qualifications set forth in subdivision (e) of Section 2585, may order medical laboratory tests related to nutritional therapeutic treatments when authorized to do so by a written protocol prepared or approved by the referring physician and when, in the absence of the referring physician at a patient visit, in a clinic where there is a registered nurse on duty, a registered nurse is notified that a medical laboratory test is being ordered and is afforded an opportunity to assess the patient. - See more at: http://codes.lp.findlaw.com/cacode/BPC/1/d2/5.65/s2586#sthash.KPZE4WP4.dpuf</p>

State	Link	Statutes/Regulations
Connecticut	http://search.ct.gov/search/pub_statutes.html	None specific other than- Sec. 20-206q. Verbal orders from physicians. When a physician conveys an order for a diet or means of nutritional support to a certified dietitian-nutritionist by verbal means for a patient in an institution, as defined in section 19a-490, such order shall be received and immediately committed to writing in the patient's chart by the certified dietitian-nutritionist. Any order so written may be acted upon by the institution's nurses and physician assistants with the same authority as if the order were received directly from the physician. Any order conveyed in this manner shall be countersigned by the physician within twenty-four hours unless otherwise provided by state or federal law or regulations.
Delaware	http://delcode.delaware.gov/title24/c038/index.shtml#TopOfPage	(2) "Dietetic and nutrition therapy" shall mean the scope of services utilized in the delivery of preventive nutrition services and/or nutrition therapy. It involves an assessment of the individual's specific nutritional needs and the development and implementation of an intervention plan. The intervention plan can include nutrition education, counseling, administration and monitoring of specialized nutrition support and/or referrals for additional services. This application and practice of "dietetics and nutrition therapy" shall include the following Scope of Practice: (a) Nutrition assessment to include the establishment of nutritional care plans, including the development of nutritional related priorities, goals and objectives; (b) Provision of nutrition counseling or education as components of preventive and restorative health care; (c) Evaluation and maintenance of appropriate standards of quality in food and nutrition; (d) Evaluation and education of nutrient-drug interactions; (e) Interpreting and recommending interventions to meet nutrient needs relative to individual health status, including but not limited to medically prescribed diets, tube feedings and specialized intravenous solutions; (f) Development, administration, evaluation and consultation regarding nutritional care standards; (g) Conduct independent research or collaborate in research areas including, but not limited to food and pharmaceutical companies, universities and hospitals by directing or conducting experiments to answer critical nutrition and food science questions and develop nutrition recommendations for the public; (h) Direct supervision of registered dietetics technicians.
District of Columbia	http://government.westlaw.com/linkedslice/default.asp?RS=GVT1.0&VR=2.0&SP=DCC-1000&Action=Welcome	Except as provided in § 4403, an applicant for a license shall furnish proof satisfactory to the Board that the applicant holds a baccalaureate or higher degree, with a major in human nutrition, foods and nutrition, dietetics, or food systems management, from an institution that was approved by an accrediting body recognized by the Council on Postsecondary Accreditation or the Secretary of the United States Department of Education at the time the applicant graduated, in accordance with § 702(a) of the Act, D.C. Official Code § 3-1207.01(a) (2001). 4402.2 An applicant shall have completed an American Dietetic Association approved, planned, continuous, preprofessional experience component in dietetics practice of not less than nine hundred (900) hours under the supervision of a registered dietitian or licensed dietitian. 4402.3 An applicant who provides evidence of current registration as a registered dietitian with the Commission on Dietetic Registration of the American Dietetic Association (CDRADA) shall be deemed to have met the education and experience requirements of this section. 4402.4 An applicant, including a registered dietitian deemed to be qualified under § 4402.3, shall submit a certified transcript of the applicant's educational record(s) and an official certificate of graduation to the Board with the completed application.
Florida	http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=Ch0468/ch0468.htm	Not Available
Georgia	http://www.lexis-nexis.com/hottopics/gacode	Not Available

State	Link	Statutes/Regulations
Hawaii	http://www.capitol.hawaii.gov/hrscurrent/Vol10_Ch0436-0474/HRS0448B/HRS_0448B-.HTM	Not Available
Idaho	http://adminrules.idaho.gov/rules/current/22/0113.pdf	<p>2. Dietitian. A person who meets all of the requirements of and is licensed under the provisions of Title 54, Chapter 35, Idaho Code, to engage in the practice of dietetics as set forth in Section 54-3505(3), Idaho Code. Dietitian and dietician are interchangeable terms. (4-2-03)</p> <p>3. Dietetic Practice. Dietetic practice, the practice of dietetics or practicing dietetics means the integration and application of principles derived from the sciences of nutrition, biochemistry, food physiology, management and behavioral and social sciences to achieve and maintain human health through the provision of medical nutrition services and the development of therapeutic nutrition care plans to assist in the maintenance of health and the prevention and treatment of disorders of body function, systems or organs. (4-2-03)</p> <p>4. Licensure Board. The Dietetic Licensure Board. (4-2-03)</p> <p>5. Medical Nutrition Services. Medical nutrition services refers to the nutritional assessment, the design and implementation of therapeutic nutrition care plans and nutrition therapy counseling provided by a licensed dietitian. (4-2-03)</p> <p>6. Monitor of Provisionally Licensed Graduate Dietitian. An Idaho licensed dietitian who shall be responsible for the activities of the provisionally licensed graduate dietitian being supervised and shall review and countersign all patient documentation performed by the provisionally licensed graduate dietitian being supervised.(4-2-03)</p> <p>7. Nutritional Assessment. The evaluation of nutritional needs of individuals and groups based upon appropriate biochemical, anthropometric, physical and dietary data which is necessary to determine nutrient needs and to recommend appropriate enteral or parenteral nutritional intake. (4-2-03)</p> <p>8. Nutrition Therapy Counseling. The advising or assisting individuals or groups on appropriate nutrient intake by integrating information from the nutritional assessment and therapeutic nutrition care plan with information on food and other sources of nutrients and meal preparation consistent with health needs, disease state, psychological status, cultural background and available resources. (4-2-03)</p> <p>9. Provisional License. The Board may issue a provisional license to a graduate dietitian who meets the requirements set forth by Sections 54-3506(1) and 54-3506(2), Idaho Code. A provisional license shall authorize the practice of dietetics under the supervision of a monitor who is an Idaho licensed dietitian. (4-2-03)</p>
Illinois	http://ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1297&ChapterAct=225%26nbsp%3BILCS%26nbsp%3B30%2F&ChapterID=24&ChapterName=PROFESSIONS+AND+OCCUPATIONS&ActName=Dietetic+and+Nutrition+Services+Practice+Act%2E	<p>Dietetics and nutrition services" means the integration and application of principles derived from the sciences of food and nutrition to provide for all aspects of nutrition care for individuals and groups, including, but not limited to: (1) nutrition counseling; "nutrition counseling" means advising and assisting individuals or groups on appropriate nutrition intake by integrating information from the nutrition assessment; (2) nutrition assessment; "nutrition assessment" means the evaluation of the nutrition needs of individuals or groups using appropriate data to determine nutrient needs or status and make appropriate nutrition recommendations; (3) medically prescribed diet; "medically prescribed diet" is one form of medical nutrition therapy and means a diet prescribed when specific food or nutrient levels need to be monitored, altered, or both as a component of a treatment program for an individual whose health status is impaired or at risk due to disease, injury, or surgery and may only be performed as initiated by or in consultation with a physician licensed under the Medical Practice Act of 1987 acting within the scope of his or her practice, except that a medically prescribed diet for a resident of a nursing home shall only be performed as initiated by or in consultation with a physician licensed to practice medicine in all of its branches; (4) medical nutrition therapy; "medical nutrition therapy" means the component of nutrition care that deals with the systematic use of food and oral supplementation, based on the nutrition assessment and individual health status and need to manage health conditions; (5) nutrition services for individuals and groups; "nutrition services for individuals and groups" includes, but is not limited to, all of the following:</p>

State	Link	Statutes/Regulations
Illinois	http://ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1297&ChapterAct=225%26nbsp%3BILCS%26nbsp%3B30%2F&ChapterID=24&ChapterName=PROFESSIONS+AND+OCCUPATIONS&ActName=Dietetic+and+Nutrition+Services+Practice+Act%2E	<p>(A) providing nutrition assessments relative to preventive maintenance or restorative care; (B) providing nutrition education and nutrition counseling as components of preventive maintenance or restorative care; and (C) developing and managing systems whose chief function is nutrition care; nutrition services for individuals and groups does not include medical nutrition therapy as defined in this Act; and (6) restorative; "restorative" means the component of nutrition care that deals with oral dietary needs for individuals and groups; activities shall relate to the metabolism of food and the requirements for nutrients, including dietary supplements for growth, development, maintenance, or attainment of optimal health. "Telepractice" means the delivery of services under this Act by means other than in-person, including, but not limited to, telephone, email, Internet, or other methods of electronic communication. Telepractice is not prohibited under this Act provided that the provision of telepractice services is appropriate for the client and the level of care provided meets the required level of care for that client. Individuals providing services regulated by this Act via telepractice shall comply with and are subject to all licensing and disciplinary provisions of this Act. (Source: P.A. 97-1141, eff. 12-28-12; 98-148, eff. 8-2-13)</p>
Indiana	http://www.state.in.us/legislative/ic/code/title25/ar14.5/	<p>IC 25-14.5-1-4 "Certified dietitian" Sec. 4. "Certified dietitian" refers to a person certified under this article to practice dietetics. Activities of a certified dietitian do not include the medical differential diagnoses of the health status IC 25-14.5-1-5 "Commission on dietetics registration" Sec. 5. "Commission on dietetics registration" refers to the Commission on Dietetic Registration that is: (1) a national certifying agency for voluntary professional credentialing in dietetics; and (2) a member of the national commission for health certifying agencies. IC 25-14.5-1-6 "Degree" Sec. 6. "Degree" means a degree received from a college or university that:(1)was located in the United States; and (2) was regionally accredited; at the time the degree was conferred. IC 25-14.5-1-7 "Dietetics" Sec. 7. "Dietetics" means the integration and application of principles derived from the science of food and nutrition to provide for all aspects of nutrition therapy for individuals and groups, including nutrition therapy services (as defined in section 12 of this chapter) and medical nutrition therapy (as defined in section 9 of this chapter). IC 25-14.5-1-8 "Examination" Sec. 8. "Examination" means an examination for the certification of dietitians used or approved by the board. The examination may be created by the board, created by a person as determined by and approved by the board, or created in part by the board and in part by a person or entity other than the board. Sec 8 IC 25-14.5-1-9 "Medical nutrition therapy" Sec. 9. "Medical nutrition therapy" means the component of nutrition therapy that concerns: (1) determining and recommending nutrient needs based on nutritional assessment and medical</p>

State	Link	Statutes/Regulations
Indiana (cont.)	http://www.state.in.us/legislative/ic/code/title25/ar14.5/	<p>(2) interactions of prescription drugs with food and nutrients; or (3) developing and managing food services operations that have the chief function of providing nutrition therapy services and providing medically prescribed diets. IC 25-14.5-1-10 "Medically prescribed diet" Sec. 10. "Medically prescribed diet" means a diet that is: (1) prescribed when specific food or nutrient levels need to be monitored or altered, or both, as a component of a treatment regimen for an individual whose health status is impaired or at risk due to disease, injury, or surgery; and (2) performed as initiated by or in consultation with a physician licensed to practice medicine in Indiana. IC 25- 14.5-1-11 "National commission for health certifying agencies" Sec. 11. "National commission for health certifying agencies" refers to the national organization that: (1) established national standards for certifying bodies that attest to the competence of individuals who participate in the health care delivery system; (2) grants recognition to certifying bodies that voluntarily apply and meet the established standards; and (3) monitors the adherence to those standards by the certifying bodies that the national commission for health certifying agencies has recognized. IC 25-14.5-1-12 "Nutrition therapy services" Sec. 12. (a) "Nutrition therapy services" means the following services that are directed toward humans: (1) Assessing the nutritional needs of individuals and groups, considering the resources and constraints in the practice setting. (2) Establishing priorities, goals and objectives for therapy that meet nutritional needs of individuals and groups and that are consistent with available resources and constraints. (3) Providing nutrition counseling in health and disease. (4) Developing, implementing and managing: (A) nutrition therapy of; and (B) food service systems for; individuals and groups. (5) Maintaining appropriate standards of quality in food and nutrition therapy services for individuals and groups, (b) The term does not include the retail sale of food products or vitamins. IC 25-14.5-1-13 "Practice experience"9 Sec. 13. "Practice experience" means a preprofessional, documented, supervised practice. Sec. 13. "Practice experience" means a preprofessional, documented, supervised practice in dietetics services that is acceptable to the board in compliance with requirements for certification. It may be or may include a documented, supervised practice experience that is a component of the educational requirements for certification. IC 25-14.5-1-14 "Practice of dietetics" Sec. 14. "Practice of dietetics" means the integration and application of the principles derived from the sciences of nutrition, biochemistry, food, physiology, management and behavioral and social sciences to achieve and maintain people's health through the provision of nutrition therapy services.</p>
Iowa	https://www.legis.iowa.gov/law/iowaCode/sections?codeChapter=152A	<p>152A.2 License requirements. 1. An applicant shall be issued a license to practice dietetics by the board when the applicant satisfies all of the following: a. Possesses a baccalaureate degree or post baccalaureate degree with a major course of study in human nutrition, food and nutrition, dietetics, or food systems management, or in an equivalent major course of study which meets minimum academic requirements as established by the accreditation council for education in nutrition and dietetics of the academy of nutrition and dietetics and approved by the board. b. Completes an accredited competency-based supervised experience program approved by the accreditation council for education in nutrition and dietetics of the academy of nutrition and dietetics and approved by the board. c.</p>
Kansas	http://www.kslegislature.org/legsrv-statutes/index.do	http://www.kdads.ks.gov/HOC/Dietitian/Dietitian_Index.html

State	Link	Statutes/Regulations
Kentucky	http://trc.ky.gov/KRS/310-00/CHAPTER.HTM	http://www.bdn.ky.gov/Pages/default.aspx An applicant for licensure as a dietitian shall meet the standards of Professional responsibility and practice consistent with those standards of professional responsibility and practice adopted by the American Dietetic Association
Louisiana	http://www.lbedn.org/Diet_Practice_Act2009.pdf	§3082. Legislative findings: A. The Legislature of Louisiana finds that the application of scientific knowledge relating to nutrition is important in the treatment of disease and in the attainment and maintenance of health. B. The Legislature of Louisiana further finds that the rendering of sound dietetics or nutrition services in hospitals, nursing homes, health departments, in private practice and consultation and in other settings requires trained and competent professionals. C. The Legislature of Louisiana declares, therefore, that the purpose of this Chapter is to protect the health, safety and welfare of the public by providing for the licensure and regulation of persons practicing the profession of dietetics and nutrition. Acts 1987, No. 574, §1, eff. July 9, 1987.
Maine	http://janus.state.me.us/legis/statutes/32/title32ch104sec0.html	Not available
Maryland	http://www.dsd.state.md.us/comar/	Not available
Massachusetts		<p>5.01: Appropriate Standards of Practice and Activities</p> <p>(1) Food and Nutrition: In the area of food service, food safety, nutrient composition of foods, nutrition and supporting sciences, examples of appropriate standards and activities include, but are not limited to, the following: (a) Evaluating, interpreting and applying the science of food, food components, nutrients, vitamins and nutraceuticals to nutrition care plans; (b) Understanding the nutrient composition of foods and food components as it is applied to human nutrition in individuals and populations; (c) Understanding and applying the current principles of food safety as they apply to individuals, groups and communities.</p> <p>(2) Nutrition Services - Community/Clinical: In the area of nutrition screening, assessment, implementation and documentation, normal nutrition/health promotion/disease prevention and medical nutrition therapy, examples of appropriate activities include, but are not limited to, the following: (a) Providing, facilitating and promoting quality services based on client needs and expectations, current knowledge and professional experiences; (b) Developing and implementing plans of nutritional care for individuals, including oral, enteral and parenteral nutrition, based on assessment of nutritional needs; (c) Recommending diet prescriptions and methods of feeding; (d) Developing criteria for nutrition screening; (e) Directing and coordinating nutrition assessment activities; (f) Collecting and evaluating clients' diet histories and nutrition care and communicating data collected through written record systems;</p> <p>(g) Collaborating with clients to assess needs, background and resources and to establish mutual goals. Monitoring progress towards client goals and outcomes; (h) Developing individualized education programs; (i) Recognizing visual and behavioral symptoms of nutritional deficiencies and conditions requiring nutrition interventions; (j) Collaborating with physicians and allied health personnel as the provider of nutritional care using tools and procedures such as, but not limited to, diet histories, calipers, BMI tables, finger stick blood-sugar measurements, blood pressure, vital sign assessment and oral cavity assessment;</p>

State	Link	Statutes/Regulations
Massachusetts (cont)		<p>(k) Communicating appropriate actions, evaluating resources and implementing options, monitoring the implementation process and making appropriate adjustments; documenting activities related to nutrition care; (l) Negotiating revisions to the care plan with the client and health care team when appropriate and evaluating new tools, techniques and strategies contributing to the evaluation of nutrition care plan; (m) Providing consultation and nutritional care to community groups and identifying and evaluating needs to establish priorities for community nutrition programs; identifying populations at nutritional risk; monitoring client populations to assess prevalence of nutrition problems; compiling data on nutrition and health indicators for populations and developing objectives for community nutrition program service; promoting public understanding of nutrition; managing nutrition services in state/local agencies; evaluating the quality and effectiveness of community programs; (n) Implementing quality practice by following policies, procedures, legislation, licensure, practice guidelines, standards of professional practice and Code of Ethics; (o) Continuously acquiring knowledge and developing skills to maintain accountability to the public; licensee should conduct self-assessments at regular intervals to identify professional strengths and weaknesses, target areas for professional development, seek continuing professional education and document professional development activities. (3) Education and Research: In the area of counseling, education, training and research, examples of appropriate activities include, but are not limited to, the following: (a) Planning, conducting and evaluating educational programs relating to nutritional care; (b) Counseling and educating individuals, families and groups in nutritional principles, meal patterns and plans, insulin administration, food selection, food and drug interactions and economics, as appropriate; (c) Collaborating with clients to develop goals, objectives, evaluation criteria and strategies for nutrition counseling plans; (d) Planning, conducting or participating in current research related to nutritional care, or interpreting and evaluating pertinent research findings for utilization in nutritional care; (e) Publishing and evaluating of technical and lay food and nutrition publications for all ages, socioeconomic and ethnic groups; (f) Selecting, adapting and developing of nutrition education materials to reach specific client markets and to use with individuals; (g) Participating in or generating research to enhance practice; (h) Reviewing research findings for their application to dietetics practice and basing practice on sound scientific principles, research and theory; (i) Promoting research through alliances and collaboration with other professionals and organizations and contributing to the development of new professional knowledge and research; (j) Collecting measurable data and documenting outcomes within the practice setting and sharing research data and activities through various media; (k) Planning, conducting and evaluating dietary studies and participating in nutritional epidemiological studies; (l) Formulating research questions, designing and conducting research projects that may include collecting, recording and summarizing data according to protocols, conducting statistical analyses, interpreting results, preparing written reports and evaluating others' research proposals or publications.</p> <p>) Foodservice Systems: In the areas of menu planning, foodservice purchasing, production, distribution and service, safety and sanitation, facility layout and management, examples of appropriate activities include, but are not limited to, the following:</p> <p>(a) Planning, developing, controlling and evaluating food service systems;</p> <p>(b)) Establishing and maintaining standards of food production, service, sanitation, safety and security;</p> <p>(c) Developing menu patterns and evaluating such for nutritional adequacy;</p> <p>(d) Planning layout designs and determining equipment requirements for food service facilities;</p> <p>(e) Developing specifications for the procurement of food and food service equipment and supplies.</p>

State	Link	Statutes/Regulations
Massachusetts (cont)		<p>(5) Management:</p> <p>In the area of human resources, finance and materials, marketing of products and services, functions and characteristics and quality improvement, examples of appropriate activities include, but are not limited to, the following: (a) Coordinating and integrating clinical and administrative aspects of professional to provide quality food service and nutrition care; (b) Negotiating contractual agreements, implementing and evaluating quality assurance measures, handling staffing issues, performing cost/benefit analyses, developing standards of professional care and determining departmental missions, goals and objectives; (c) Utilizing measurable resources such as personnel, monies, equipment, guidelines, protocols, reference materials and time in the provision of professional services; (d) Conducting market research, determining primary and secondary market segments, developing messages that communicate the features and benefits of products or services to intended markets; and (e) Tracking marketing response and evaluating marketing strategy; understanding products and services from the consumer's perspective; and developing, modifying and assessing products and services in order to make them more marketable</p>
Michigan	http://www.michigan.gov/lara/0,4601,7-154-35299_63294_27529_44216-334661--,00.html	<p>Michigan Board of Dietetics and Nutrition: On July 1, 2014, Governor Snyder signed into law Public Act 267 of 2014, which repeals the licensure requirements for dietitians and nutritionists. This act also abolishes the Board of Dietetics and Nutrition.</p>
Minnesota	https://www.revisor.mn.gov/rules/?id=3250.0010	<p>3250.0010 REQUIREMENTS FOR LICENSURE AS A DIETITIAN: Subpart 1. Generally. To be eligible for licensure as a dietitian, an applicant must submit a fully completed application on a form provided by the board, along with the applicable fee as provided in part 3250.0050 and meet one of the sets of requirements described in subparts 2 to 4. Subp. 2. Education and experience. The applicant must provide the board with: A.an official transcript showing that the applicant has received a baccalaureate or postgraduate degree with a major in dietetics, human nutrition, nutrition education, food and nutrition, or food services management from a United States regionally accredited college or university; B. documented evidence of having completed a supervised preprofessional practice experience component in nutrition practice of at least 900 hours under the supervision of a registered dietitian, a state licensed nutrition professional, or an individual with a doctoral degree conferred by a United States regionally accredited college or university who has completed a major course of study in human nutrition, nutrition education, food and nutrition, dietetics, or food system management. Supervised practice experience must be completed in the United States or its territories. Supervisors who obtain their doctoral degrees outside the United States and its territories must have their degrees approved by the board as equivalent to the doctoral degree conferred by a United States regionally accredited college or university; and C. documented evidence of successful completion of the registration examination for dietitians administered by the Commission on Dietetic Registration within five years immediately preceding application for licensure. Subp. 3. National registration. The applicant must provide a notarized copy of the applicant's current registration card from the Commission on Dietetic Registration demonstrating registration as a dietitian.</p>
Mississippi	http://msdh.ms.gov/msdhsite/_static/resources/135.pdf	<p>"Dietetics Practice" means the integration and application of the principles derived from the sciences of nutrition, biochemistry, food, physiology, management and behavioral and social sciences to achieve and maintain people's health. Dietetic practice includes, but is not limited to: a. Providing medical nutrition therapy; b. Development, administration, evaluation and consultation; regarding nutritional care standards of quality in food services and medical nutrition therapy; c. Providing nutrition counseling in health and disease; d. Developing, implementing and managing nutrition care systems; and e. Providing case management services.</p>

State	Link	Statutes/Regulations
Missouri	http://www.pr.mo.gov/boards/dietitians/Dietitian%20practice%20act.pdf	<p>(3) "Dietetics practice", the application of principles derived from integrating knowledge of food, nutrition, biochemistry, physiology, management and behavioral and social science to achieve and maintain the health of people by providing nutrition assessment and nutrition care services. The primary function of dietetics practice is the provision of nutrition care services that shall include, but not be limited to: (a) Assessing the nutrition needs of individuals and groups and determining resources and constraints in the practice setting; (b)) Establishing priorities, goals and objectives that meet nutrition needs and are consistent with available resources and constraints; (c) Providing nutrition counseling or education in health and disease; (d) Developing, implementing and managing nutrition care systems; (e)) Evaluating, making changes in and maintaining appropriate standards of quality and safety in food and in nutrition services; (f)) Engaged in medical nutritional therapy as defined in subdivision* (8) of this section; (4) "Dietitian", one engaged in dietetics practice as defined in subdivision* (3) of this section; (5) "Director", the director of the division of professional registration in the department of economic development; (6) "Division", the division of professional registration of economic development; (7) "Licensed dietitian", a person who is licensed pursuant to the provisions of sections 324.200 to 324.225 to engage in the practice of dietetics or medical nutrition therapy; (8) "Medical nutrition therapy", nutritional diagnostic, therapy and counsel</p>
Montana	http://www.bsd.dli.mt.gov/license/board/nut.asp	<p>A Nutritionist is an individual licensed by the Board of Medical Examiners under Montana law or a person who has satisfactorily completed a baccalaureate and master's degree or a doctorate degree in the field of dietetics, food and nutrition, or public health nutrition conferred by an accredited college or university. You can download a list of licensed Nutritionists or learn if a specific individual is licensed by clicking on the appropriate topic to the left. Individuals who want to practice as a Nutritionist in Montana and who do not have an advanced degree as described above must apply to the Montana Board of Medical Examiners for licensure. The Board evaluates the applicant's fitness to practice and assures the basic requirements are met. The requirements include being registered with the Commission and meeting the educational requirements set by Montana law or in administrative rule.</p> <p>Only a Nutritionist can provide the following services in Montana: (1) assessing the nutrition needs of individuals and groups and determining resources and constraints in the practice setting; (2) establishing priorities and objectives that meet nutritive needs and are consistent with available resources and constraints; (3) providing nutrition counseling for any individual; (4) developing, implementing and managing nutrition care systems; and (5) evaluating, adjusting and maintaining appropriate standards of quality in food and nutrition services.</p>
Nebraska		Not Available
New Hampshire	http://www.dhhs.state.nh.us/oos/blc/dietitian/	<p>Initial License Requirements: Submit a dietitian's license application & pay the required license fee; Hold a baccalaureate or higher degree from a regionally accredited college or university in the US and complete a major course of study in human nutrition, nutrition education, food and nutrition, dietetics, public health nutrition, or food systems management; Successfully complete a dietetics internship of no less than 900 hours, pre-professional practice program, or coordinated program with documented experience in the practice of dietetics under supervision of a registered, certified, or licensed dietitian; and Successfully pass the examination administered by the Commission on Dietetic Registration.</p>

State	Link	Statutes/Regulations
New Mexico	http://164.64.110.239/nmac/parts/title16/16.014.0003.htm	<p>16.14.3.8 REQUIREMENTS FOR DIETITIAN LICENSE:</p> <p>A. Prerequisites: (1) valid current registration with CDR which includes successful completion of the CDR examination and gives the applicant the right to use the term “registered dietitian” or “RD” or (2) license in another state which has standards for licensure not less stringent than those in New Mexico.</p> <p>B. Documentation: Each applicant for a license to practice as a dietitian must submit the required fees and following documentation:</p> <p>(1) a completed and signed application; (2) a copy of CDR card; and (3) applicants who are currently, or have previously been, licensed in another state(s) must provide a copy of each license and a verification of license status directly to the board from the state(s) where licensed.[3/30/90...8/31/96; 16.14.3.8 NMAC - Rn, 16 NMAC 14.3.8, 11/22/2005; A, 08/01/2011]</p> <p>16.14.3.9 REQUIREMENTS FOR NUTRITIONIST LICENSE:</p> <p>A. Education requirements: Each applicant for a license as a nutritionist must have one of the following: (1) master’s degree or doctorate in human nutrition, nutrition education, foods and nutrition, or public health nutrition from a college or university accredited by a member of the council on post-secondary accreditation; or (2) valid current evidence of membership in one of the following organizations: American clinical board of nutrition or American society for nutrition.</p> <p>B. Additional requirements: (1) pass an examination related to entry level nutrition practice and nutrition care services which has been approved by the board; or (2) be licensed in another state which has standards for licensure not less stringent than those in New Mexico.</p> <p>C. Documentation: Each applicant for license to practice as a nutritionist must submit the required fees and following documentation:</p> <p>(1) completed and signed application; (2) official transcript verifying degree required in Paragraph (1) of Subsection A of 16.14.3.9 NMAC, mailed directly from the college or university; or (3) proof of membership in the organizations specified in Paragraph (2) of Subsection A of 16.14.3.9 NMAC; (4) applicants who are currently, or have previously been, licensed in another state(s) must provide a copy of each license and a verification of license status directly to the board from the state(s) where licensed.[3/30/90...8/31/96; 16.14.3.9 NMAC - Rn, 16 NMAC 14.3.9, 11/22/2005; A, 08/01/2011]</p> <p>16.14.3.10 REQUIREMENTS FOR NUTRITION ASSOCIATE LICENSE:</p> <p>A. Education requirements: Each applicant for a license as a nutrition associate must have (1) a baccalaureate or higher degree from a college or university accredited by a member of the council on post-secondary accreditation; and (2) completion of the academic requirements that qualify the applicant for an internship or equivalent program as approved by the commission on dietetics registration; and</p> <p>B. Additional requirements: (1) pass an examination related to entry level nutrition practice and nutrition care services which has been approved by the board; or (2) be licensed in another state which has standards for licensure not less stringent than those in New Mexico.</p> <p>C. Documentation: Each applicant for a license to practice as a nutrition associate must submit the required fees and following documentation: (1) completed and signed application; (2) official transcript verifying degree required in Paragraph (1) of Subsection A of 16.14.3.10 NMAC, mailed directly from the college or university; and (3) American Dietetics Association verification statement completed by a program director which verifies eligibility for an internship or equivalent program approved by CDR; and (4) applicants who are currently, or have previously been, licensed in another state(s) must provide a copy of each license and a verification of license status directly to the board from the state(s) where licensed; and (5) completed employment information form documenting supervision by a New Mexico licensed dietitian or nutritionist; documentation is required for subsequent changes in employment or supervision. [3/30/90...8/31/96; 16.14.3.10 NMAC - Rn, 16 NMAC 14.3.10, 11/22/2005; A, 08/01/2011]</p>

State	Link	Statutes/Regulations
New York	http://www.op.nysed.gov/prof/diet/article157.htm	<p>§8001. Definitions. Dietetics and nutrition are herein each defined as the integration and application of principles derived from the sciences of nutrition, biochemistry, physiology, food management and behavioral and social sciences to achieve and maintain people's health. Where the title "certified dietitian" or "certified nutritionist" is used in this article it shall mean "certified dietitian", "certified dietician", or "certified nutritionist". A certified dietitian or certified nutritionist is one who engages in the integration and application of principles derived from the sciences of nutrition, biochemistry, physiology, food management and behavioral and social sciences to achieve and maintain people's health and who is certified as such by the department pursuant to section eight thousand four of this article. The primary function of a certified dietitian or certified nutritionist is the provision of nutrition care services that shall include: Assessing nutrition needs and food patterns; Planning for and directing the provision of food appropriate for physical and nutrition needs; and Providing nutrition counseling.</p>
North Carolina	http://www.ncbden.org/laws_rules/scope_of_practice/	<p>The scope of practice for licensed dietitians/nutritionists in North Carolina is defined in the law as nutrition care services. Nutrition care services means any, part or all of the following: Assessing the nutritional needs of individuals and groups and determining resources and constraints in the practice setting; Establishing priorities, goals and objectives that meet nutritional needs and are consistent with available resources and constraints; Providing nutrition counseling in health and disease; Developing, implementing and managing nutrition care systems; and Evaluating, making changes in and maintaining appropriate standards of quality in food and nutrition services. Nutrition care services do not include the retail sale of food products or vitamins. Nutrition care services do not include the retail sale of food products or vitamins.</p>
North Dakota	http://www.ndboddp.com/docs/law/Chapter_43-44_2013-08-01.pdf	<p>"Dietitian" includes dietician.</p> <p>4. "General nutrition services" means the counseling of individuals or groups in the selection of food to meet normal nutritional needs and the assessment of nutritional needs of individuals or groups by planning, organizing, coordinating and evaluating the nutritional components of community health services.</p> <p>5. "Licensed nutritionist" means a person licensed to provide general nutrition services as provided in this chapter.</p> <p>6. "Licensed registered dietitian" means a person licensed to practice dietetics as provided in this chapter.</p> <p>7. "Nutrition assessment" means the screening and evaluation of the nutrition of individuals and groups based upon appropriate biochemical, anthropometric, physical and dietary data to determine their nutritional needs and recommend appropriate nutritional intake including enteral and parenteral nutrition.</p> <p>8. "Nutrition care services" includes: a. Providing nutrition assessment; b. Planning or providing of food appropriate for physical and medical needs; c. Providing nutrition counseling to meet both normal and therapeutic needs; d. Providing general nutrition services and related nutrition activities.</p>

State	Link	Statutes/Regulations
Ohio	http://codes.ohio.gov/oac/4759-6	<p>Chapter 4759-6 Professional Responsibility 4759-6-01 Standards of practice in nutrition care. The standards of practice in nutrition care provide a common understanding about the profession's minimum expectations for practice and form a basis for self-evaluation and improvement and an expectation about nutritional care and service delivery. The standards of practice in nutrition care are comprised of four standards representing the four steps of the nutrition care process. The "nutrition care process" is a systematic problem-solving method that dietitians may use to critically think and make decisions when providing medical nutrition therapy or to address nutrition related problems and provide safe, effective, high quality nutrition care. The nutrition care process shall consist of four distinct, <u>but interrelated</u> steps including nutrition assessment, nutrition diagnosis, nutrition intervention and nutrition monitoring and evaluation. (A) The licensee uses accurate and relevant data and information to perform nutrition assessment and identify nutrition-related problems, as the foundation for nutrition diagnosis, the second step of the nutrition care process. (1) "Nutrition assessment" means the same as "nutritional assessment" defined in paragraph (A) of rule <u>4759-2-01</u> of the Administrative Code. (2) A nutrition assessment is initiated by referral and / or screening of individuals or groups for nutrition risk factors. (3) The licensee systematically obtains, verifies and interprets data in order to make decisions about the nature and cause of nutrition-related problems. (4) Nutrition assessment is an ongoing, dynamic process that involves not only initial data collection, but also reassessment and analysis of client or community needs. (5) Problems that require consultation with or referral to another provider are recognized. (6) Documentation and communication of nutritional assessment shall be complete, relevant, accurate and timely. (B) The licensee determines a nutrition diagnosis to identify and label specific nutrition problem(s) that the dietitian is responsible for treating. (1) "Nutrition diagnosis" is the identification and labeling that describes an actual occurrence, risk of, or potential for developing, a nutritional problem that dietetics practitioners are responsible for treating independently. (2) The nutrition diagnosis is not a medical diagnosis. It results following nutrition assessment and the clustering, analysis and synthesis of data and demonstrates a link to determining goals for outcomes, selecting appropriate interventions and tracking progress in attaining expected outcomes. (3) Documentation of nutrition diagnosis(es) shall be relevant, accurate and timely and shall be revised and updated as additional assessment data become available. (C) The licensee utilizes nutrition intervention as the third step in the nutrition care process to identify and implement appropriate, purposefully planned actions designed with the intent of changing a nutrition-related behavior, risk factor, environmental condition or aspect of health status for an individual, target group, or the community at large. (1) "Nutrition Intervention" is a specific set of activities and associated materials used to address the problem; purposely planned actions designed with the intent of changing a nutrition-related behavior, risk factor, environmental condition, or aspect of health status for an individual, target group, or the community at large. It involves selection, planning and implementing appropriate actions to meet patient / client / group's nutrition needs. (2) "Intervention planning" involves prioritizing the nutrition diagnoses, conferring with the patient / client / and / or others, reviewing practice guides and policies and setting goals and defining the specific nutrition intervention strategy. (3) "Implementation of the nutrition intervention" is the action phase that includes carrying out and communicating the plan of care, continuing data collection and revising the nutrition intervention strategy, as warranted, based on the patient / client response. (4) The licensee performs the interventions or assigns the nutrition care that other competent practitioners may provide in accordance with federal, state and local laws and regulations. (D) The licensee monitors and evaluates indicators and outcomes data directly related to the nutrition diagnosis, goals and intervention strategies to determine the progress made in achieving desired outcomes of nutrition care and whether planned interventions should be continued or revised. (1) "Nutrition monitoring and evaluation" is the fourth step of the nutrition care process. Monitoring specifically refers to the review and measurement of the patient /client / group's status at a scheduled (preplanned) follow-up point with regard to the nutrition diagnosis, intervention plans / goals and outcomes, whereas evaluation is the systematic comparison of current findings with previous status, intervention goals, or a reference standard. Monitoring and evaluation use selected outcome indicators (markers) that are relevant to the patient / client / group's defined needs, nutrition diagnosis, nutrition goals and disease state. (2) The licensee uses standard nutrition care outcome indicator(s) to measure outcomes. (3) Monitoring data should be compared with the nutrition prescription / goals / or reference standards to evaluate impact of the sum of all interventions on overall patient / client health outcomes.</p>

State	Link	Statutes/Regulations
Ohio (cont.)	http://codes.ohio.gov/oac/4759-6	(4) Documentation of nutrition monitoring and evaluation shall be comprehensive, specific, accurate, relevant and timely and reflect the indicators measured, results and method for obtaining measurement. The criteria to which the indicator is compared and factors facilitating or hampering progress should be referenced in support of positive or negative outcomes. Future plans for nutrition care, monitoring and follow-up or discharge should be included.
Oklahoma	http://www.okmedicalboard.org/dietitians/download/12/LDRULES1.pdf	435:35-1-4. Standards of professional conduct (a) Purpose. The rules in this section on the profession of dietetics shall be to establish the standards of professional conduct required of a licensee. (b) Statutory standards. Examples of activities included in the statutory definition of dietetics are as follows: (1) Planning, developing, controlling and evaluation of food service systems. (2) Coordinating and integrating clinical and administrative aspects of dietetics to provide quality nutritional care. (3) Establishing and maintaining standards of food production, service, sanitation, safety and security. (4) Planning, conducting and evaluating educational programs relating to nutritional care. (5) Developing menu patterns and evaluating them for nutritional adequacy. (6) Planning layout designs and determining equipment requirements for food service facilities. (7) Developing specifications for the procurement of food and food service equipment and supplies. (8) Developing and implementing plans of nutritional care for individuals, both enteral and parenteral, based on assessment of nutritional needs. (9) Counseling and educating individuals, families and groups in nutritional principles, meal patterns and plans, insulin administration, food selection, food and drug interactions and economics, as appropriate. (10) Communicating appropriate diet history and nutritional care data through written record systems. (11) Participating with physicians and allied health personnel as the provider of nutritional care using tools and procedures such as, but not limited to, diet histories, calipers, BMI tables, finger stick blood sugar measurements, blood pressure and vital sign measurement and oral cavity assessment. (12) Planning, conducting or participating in and interpreting, evaluating and utilizing pertinent current research related to nutritional care. (13) Providing consultation and nutritional care to community groups and identifying and evaluating needs to establish priorities for community nutrition programs. (14) Publishing and evaluating technical and lay food and nutrition publications for all age, socioeconomic and ethnic groups. (15) Planning, conducting and evaluating dietary studies and participating in nutritional epidemiologic studies with a nutritional component.
Oregon	http://www.oregon.gov/OHLA/LD/Pages/issue_responses.aspx#What_cann_a_Dietitian_do?	The statutory definition of "dietetics practice" means the integration and application of principles derived from the sciences of nutrition, biochemistry, food, management, physiology and behavioral and social sciences to achieve and maintain the health of people through: Assessing the nutritional needs of clients; Establishing priorities, goals and objectives that meet nutritional needs of clients; Advising and assisting individuals or groups on appropriate nutritional intake by integrating information from a nutritional assessment with information on food and other sources of nutrients and meal preparation; Evaluating and making changes in food, diets and nutrition services, maintaining appropriate standards of nutritional quality in food and maintaining appropriate standards of nutrition services
Pennsylvania		Not Available
Puerto Rico		Not Available

State	Link	Statutes/Regulations
Rhode Island	http://sos.ri.gov/documents/archives/readdocs/release	No information on scope of practice.
South Carolina		Not Available
South Dakota	http://www.sdbm-sde.gov/content/licensed-nutritionistdietitian-in	Licensed Nutritionist/Dietitian (LN): Unlicensed practice as a dietitian/nutritionist is a criminal offense in violation of SDCL 36-108. The board intends this notification to serve as notice upon you that unlicensed practice is unprofessional conduct, a violation of the above codified laws and grounds for denial of licensure.
Tennessee	http://www.state.tn.us/sos/rules/0470/0470-01.pdf	Practice of Dietetics/Nutrition - The integration and application of scientific principles of food, nutrition, biochemistry, physiology, management and behavioral and social sciences in achieving and maintaining health through the life cycle and in the treatment of disease. Methods of practice include, but are not limited to, nutritional assessment, development, implementation and evaluation of nutrition care plans, nutritional counseling and education and the development and administration of nutrition care standards and systems.
Texas	file:///C:/Users/owner/Downloads/dt_rules.pdf	No information on scope of practice.
Utah	http://dopl.utah.gov/licensing/certified_dietitian.html	Certified Dietitian- no information on scope of practice
Vermont	www.sec.state.vt.us/professionalregulations.aspx	Not Available
Washington	http://www.doh.wa.gov/LicensesPermitsandCertificates/ProfessionsNewReneworUpdate/DietitianandNutritionist/LicenseRequirements	Not Available
West Virginia	http://www.wvboard.com/	Not Available
Wisconsin	http://dsps.wi.gov/Boards-Councils/Administrative-Rules-and-Statutes/Dietitians-Administrative-Rules-and-Statutes/	Not Available
Wyoming	http://plboards.state.wy.us/dietetics/RulesRegs.asp	Not Available