



# Implications for Practice

*How will RDNs and NDTRs thrive in a changing technological landscape?*

RDNs and NDTRs of the future will:

## Learn and continually update knowledge and skills related to technology.

- **Maintain awareness** of new tools available to patients, providers, and businesses.
- **Evaluate** which new technologies reflect the best available evidence or generate meaningful data, how they might change the care plan, and potential benefits and risks related to health, equity, privacy, and other considerations.
- **Define technological needs** and bringing nutrition and dietetics expertise to the development of new technologies.

## Promote digital fluency: learn the language of technology and share it with others.

- **Provide students and dietetic interns** with the foundational knowledge and applied skills to use new tools.
- **Help clients**—including individuals, institutions, and populations—choose and use new technologies in ways that reflect the best evidence available.

## Lead the development of new technologies.

- **Bring nutrition expertise** and knowledge of the social, behavioral, and economic realities of end-users to the development of tools that promote nutritional status, population health, or sustainable food systems.

## Generate, manage, and interpret an evolving data-driven evidence base.

- **Generate data** and ensure that data are organized, valid, useful, transparent, accessible, and usable.
- **Analyze data** and tap into a diverse array of analytical insights that complement each other. Traditional methods (such as experimental studies) and newer analytic methods (such as complex machine learning algorithms made possible by the advancement of computational power) both have unique strengths, important limitations, and can reveal novel insights.
- **Visualize data** by leveraging new tools to tell the story of data in a compelling way for different audiences.

## Advocate for equitable access to and impacts of technology.

- **Advocating for better access** to infrastructure (e.g., broadband internet) and tools (e.g., internet-connected devices), especially in low resource settings both nationally and globally, so that people can equitably access information and services.
- **Ensuring diverse representation** of people (e.g., in development teams and user communities) and data (e.g., in machine learning training data). Mechanical and digital automation rely on algorithms, and these algorithms are subject to the same biases—known as algorithmic biases—present in the humans who code them.

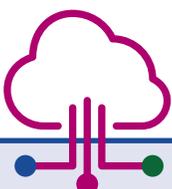
## Opportunities and Risks

### What future *opportunities* open up if RDNs and NDTRs embrace or lead new technologies?

- Maintaining relevance with clients and allied professionals who continue to use technology in new ways.
- Embracing tools that can decrease human error and increase patient safety, guide data-driven decisions for organizations or public policy, enable greater preparedness and emergency response, and make nutrition services more accessible to more people (e.g., digital access to federal nutrition programs).
- Advocating for interoperability standards to ensure new technological developments support the specific needs of nutrition practice in a variety of settings.
- Emphasizing the value of human qualities: The automation of lower-order tasks increases the relative value of creativity, collaboration, critical thinking, and systems thinking.

### What are the *risks* of not keeping up with or shaping new technologies?

- Nutrition and dietetics practitioners may miss opportunities for efficiency in their practice, research, education, and policy work.
- Platforms that communicate nutrition information to the public—including new tools, apps, or social media content—may not reflect evidence-based messaging.
- Tools that impact nutrition may be developed by other professions that have technological but not nutrition expertise.
- Tools for clinical settings may not be tailored to the needs of RDNs and NDTRs, or may be incompatible with systems commonly used in nutrition practice.
- Technology may not be incorporated into practice in ways that consider health equity by taking into account the social determinants of health; cultural relevance; ethics; privacy, security, and legal issues; and the diverse needs of end-users.



This is the second in a series of briefs from the **Academy of Nutrition and Dietetics Council on Future Practice** describing change drivers that will affect the future of the profession. This brief is intended to familiarize readers with technology and its implications, so that readers can share this knowledge with their organizations. [Click here to learn more about the CFP's Visioning Process.](#)

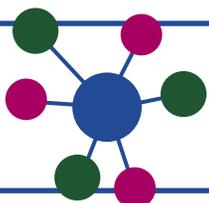
# Navigating Future Practice: VUCA

The concept of **VUCA** describes environments characterized by **volatility, uncertainty, complexity, and ambiguity**. This increasingly relevant term was coined by the United States military, and the concept is widely used within business, education and other sectors to promote resilient, adaptable leadership in a changing world. The realities of a VUCA world have many implications for future dietetics practice, and understanding them will prepare registered dietitian nutritionists (RDNs) and nutrition and dietetic technicians, registered (NDTRs) to thrive in practice.

## Forecasts & Trends

### What does a VUCA world look like?

- In a rapidly changing world, experience rooted in the past needs to be complemented by the knowledge that **the future may deviate from prior patterns**. Novel opportunities and threats may be missed because they do not fit expectations or former patterns. Quick responses are critical, increasing the importance of decision-making based on the best available evidence, which may come from a variety of sources and may not always be complete.
- The world is becoming increasingly unpredictable, not only due to changes in technology, information, and social systems, but also due to **unpredictability in the physical world**. Heightened resource stresses, climate change, trade conflicts, and other disruptions have far-reaching effects on food systems and human health, affecting factors ranging from the basic availability of certain foods to the affordability and nutritional quality of the food supply.
- People increasingly **struggle to trust** health professionals, technologies, digital infrastructure, media reporting, government, and even audio and visual information. This may be driven by the larger volume of information available, as well as increased politicization and polarization in all aspects of life.
- **The way we collect, access, and use data** is changing:
  - > The world is more connected — news can be spread globally within minutes.
  - > Information is easier to access, but it may be harder to identify which information is meaningful. This makes it even more challenging for the public to identify evidence-based nutrition information.
  - > The amount of data available is growing rapidly, driven in part by the proliferation of internet-based technology. This requires new ways of organizing and interpreting diverse data sets.
- Labor intensive processes are increasingly automated. **Automated processes** may be more efficient, but they can also be less transparent and less well understood.



*This is the first in a series of briefs from the **Academy of Nutrition and Dietetics Council on Future Practice** describing change drivers that will affect the future of the profession. This brief is intended to familiarize readers with this specific change driver and its implications for the profession, so that readers can share this knowledge with their organizations. Learn more about the **CFP's Visioning Process**.*

# Charting a Course

## How can RDNs and NDTRs thrive in a VUCA world?

Navigating volatility, uncertainty, complexity, and ambiguity is challenging, for both individuals and organizations. Thriving in a VUCA world requires RDNs and NDTRs to think in new ways; to be effective leaders and contributors within interprofessional teams; and to continually seek opportunities to lead, learn, and grow.

### RDNs and NDTRs of the future are agile

**They:**

- ... Engage their **collaborative networks** to make decisions that have scientific foundations, even when research is still emerging.
- ... Develop capacity for ad-hoc teams and decentralized decision making so they are prepared to **respond to a rapidly evolving environment**. Dietitian leaders empower their teams to stay abreast of current research and hone their decision-making skills.
- ... Are prepared to take advantage of software, taskification, and automation in order to **devote more time to higher-order tasks** that require critical thinking and responsive communication.

### RDNs and NDTRs of the future are systems thinkers

**They:**

- ... Hone specific skill sets, and also **see broader connections** between actions at the individual level and actions at the level of policy, systems, and environments.
- ... Shift emphasis from providing facts to driving change, thinking critically, and **understanding complex systems**.
- ... Develop **collaborative relationships** with other professions, disciplines, and sectors. Diverse teams are better equipped to work at the systems level, be responsive to changing conditions, and think in new ways that don't rely on past patterns.

### RDNs and NDTRs of the future are courageous

**They:**

- ... Share their expertise with **confidence**. They also recognize that the evidence base is rapidly evolving, and they continually pursue **lifelong learning**.
- ... Are willing to engage with and tolerate **risk**. They create learning environments where it is safe to share and learn from **critical feedback**.
- ... Seek out **innovative partnerships**, identifying opportunities to collaborate with both traditional allies and competitors.
- ... Are willing to serve in **non-traditional leadership roles**.

### RDNs and NDTRs of the future are trusted

**They:**

- ... Sharpen their ability to uphold standards of **evidence-based practice** in an environment where the timeliness of decisions grows in importance.
- ... Expand their reputation as a **trusted source** in the ambiguous and psychologically fraught world of diet and health.
- ... Value and build **diversity**, inclusion, and representation in order to support diverse perspectives and communication mediums.



Workgroup were reviewed and analyzed by Workgroup members and analysts from the Academy's Evidence Analysis Library. Reviewers identified whether each reference supported any of the preliminary change drivers and trends and noted any new change drivers and trends related to the five priority categories not previously identified. Of the 357 references reviewed, 218 references were used in the development of the *Change Drivers and Trends Driving the Profession: A Prelude to the Visioning Report 2017*<sup>5</sup> and the recommendations for the Visioning Report 2017.

### **SURVEY #1: PRIORITY SCANNING FRAMEWORK CATEGORIES AND TRENDS SURVEY OF CFP THINK TANK MEMBERS AND EXTERNAL ACADEMY ALLIANCE ORGANIZATIONS**

Based on the CFP's standardized process and guidelines for visioning and futures thinking, the Workgroup surveyed members of the CFP's think tank (n=49) and individuals representing external Academy alliance organizations (n=15) in February 2015 to seek their input on priority categories and trends. Individuals identified the top 5 categories from the 16 scanning framework categories and related trends they believed would have the most impact on the future of the nutrition and dietetics profession in 10 to 15 years. A total of 44 responses were received (69% response rate). The results from this survey provided support and helped validate the five categories previously identified as priorities by the CFP.

According to the World Future Society,<sup>6</sup> the most common techniques used in futuring include historical analysis, scanning for trends, trend analysis, brainstorming, visioning, and consulting others. Furthermore, the World Future Society states that most futurist methods strive for objectivity but rely heavily on subjective human judgment. As a result of the Workgroup's literature review, input from CFP think tank members and individuals representing external Academy alliance organizations, and the Workgroup's analysis, synthesis, and evaluation of all sources of information, as well as its collective judgment, 10

priority change drivers and their associated trends were identified. Because there is considerable overlap among many of the categories in the scanning framework, several of the change drivers and trends also overlap and interact, for example, technology is a separate change driver, but it also impacts the genomics and simulations change drivers.

### **SURVEY #2: CHANGE DRIVERS AND TRENDS SURVEY**

A document including the 10 priority change drivers, their associated trends, rationale, and implications, along with a glossary and references, was released to Academy members, CDR-credentialed dietetics practitioners, CFP think tank members, and Academy external organization liaisons on November 12, 2015. An electronic Change Drivers and Trends Survey asking participants to rate each priority change driver and trend on a scale from strongly disagree (1) to strongly agree (4) and to select their top five change drivers (ranking) was conducted through December 17, 2015. Participants were also given an opportunity to submit written comments related to the priority change drivers either individually or as a representative of an Academy organizational unit.

Data on the survey distribution and response rate and information on survey respondents are provided in [Tables 1](#) and [2](#), respectively; 3.7% of those who received and opened the e-mail communication completed the survey (n=1,786). Eighty-five percent of those who completed the survey were Academy members (n=1,524). Demographic characteristics of the respondents to the Change Drivers and Trends survey were similar to those in the Academy's 2015 Compensation and Benefits Survey,<sup>7</sup> except there were more educators and doctoral degree respondents in the current survey.

Based on the scale from 1 to 4, mean standard deviation scores for the 10 priority change drivers ranged from a high of 3.68 ± 0.53 (strongly agree) for Food Becomes Medicine in the Continuum of Health to 2.94 ± 0.77 (agree) for Population Health and Health Promotion Become Priorities. Triangulation between two separate data points, the ratings and rankings, was used to further examine the data.

Results are shown in [Table 3](#). Based on consistency among ratings and rankings, the top-tier change drivers that emerged included Food Becomes Medicine in the Continuum of Health, Aging Population Dramatically Impacts Society, and Accountability and Outcomes Documentation Become the Norm. However, change drivers in the middle and bottom tiers were also perceived as important by respondents. The lowest mean rating for any change driver approached 3 (agree) and 8 of the 10 change drivers were selected as one of the top 5 change drivers by at least 40% of the respondents. Data were also examined based on age and years in practice and there was only one major difference across these subgroups. Consumer Awareness of Food Choice Ramifications Increases was one of the most frequent change drivers ranked in the top 5 among those with <9 years of dietetics experience (64.7%) and significantly less frequent among those with 10 to 29 years and >30 years of experience (55.2% and 49.7%, respectively;  $P<0.001$ ).

Twelve pages of typewritten comments were submitted in response to the Change Drivers and Trends Survey by individuals and Academy organizational groups; these comments were reviewed by the CFP Workgroup. The Workgroup determined that most of the comments submitted were addressed in the change driver document and utilized these comments when drafting the recommendations for the Visioning Report.

Based on results from the Change Drivers and Trends Survey, input from the CFP, and a thorough review of current Academy organizational unit initiatives, the CFP Visioning Process Workgroup considered implications of all 10 change drivers, and in early 2016 began drafting recommendations for the Visioning Report.

### **SURVEY #3: SURVEY OF DRAFT RECOMMENDATIONS**

The CFP Visioning Process Workgroup initially drafted 31 potential recommendations and five statements of support of Academy ongoing initiatives. The statements of support were developed to avoid duplication of current Academy initiatives. All Academy organizational units, CFP think tank members, and Academy external

<b>Society's Future Needs and Changes</b>	
<b>Demographics</b> Diversity Generations Geographic distribution Financial and political disparities Education levels	<b>Client/Patient Needs, Preferences and Health Education</b> Lifestyles Cultural values Consumer trends Health disparities Health education Health and nutrition literacy Personal resources (income)
<b>Food and Nutrition Systems and Sustainability</b> Food industry Food systems management Food and nutrition security Food safety Food-related environmental sustainability Agricultural systems	<b>Health care</b> Health care reform Coordinated care Health care delivery systems and models including long-term care and acute care facilities Alternative medicine/health Access to primary care Access to RDNs <sup>a</sup> and NDTRs <sup>b</sup> Quality care and outcomes
<b>Public Health, Policies and Priorities</b> Obesity Nutrition and physical activity across the lifespan Chronic disease management Health promotion and wellness Changing the environment/infrastructure to promote healthy lifestyle	<b>Economics/Market Forces</b> Economic outlook General employment trends <ul style="list-style-type: none"> <li>○ Wages</li> <li>○ Areas for job growth</li> </ul> Delivery and payment for nutrition services Public reporting of measureable results for nutrition services
<b>Advances in Medicine, Science, and Technology</b> Genetics, genomics Behavioral science Information communication technologies Mobile connectivity Electronic health records	<b>Global Context</b> Nutrition and dietetics practices in other countries Migration/immigration and global workforce Global professional collaboration Trends in population health and agriculture
<b>Profession's Future Needs and Changes</b>	
<b>Education/Professional Development</b> Integrated didactic education and supervised practice Knowledge and continuing competence Education programs and curriculum Learning technologies and platforms	<b>Work and Workplaces</b> Practice roles Business models Emerging opportunities Competitive providers of nutrition and dietetics services Work and family balance Salaries and benefits
<b>Workforce Projections</b> Supply and demand Mobility and adaptability Workplace settings and focus areas Staffing models and ratios Retention of RDNs, NDTRs, and dietetics students/interns Diversity of the workforce	<b>Practice Requirements</b> Evidence-based practice Business and entrepreneurial skills Technology use Education, counseling, and behavior change Cultural competency Interprofessional training and proficiency Practice efficiency methods
<i>(continued on next page)</i>	

**Figure 1.** Scanning framework highlighting the five priority categories identified for the 2014-2017 Visioning Cycle by the Council on Future Practice.





























