



Addressing Nurse Workforce Issues for the Health of Florida

Emerging & Evolving Roles and Occupations within the Healthcare Industry: *Florida's Perspective*

*A report prepared by the Florida Center for Nursing
for the Florida Healthcare Workforce Initiative
funded by*

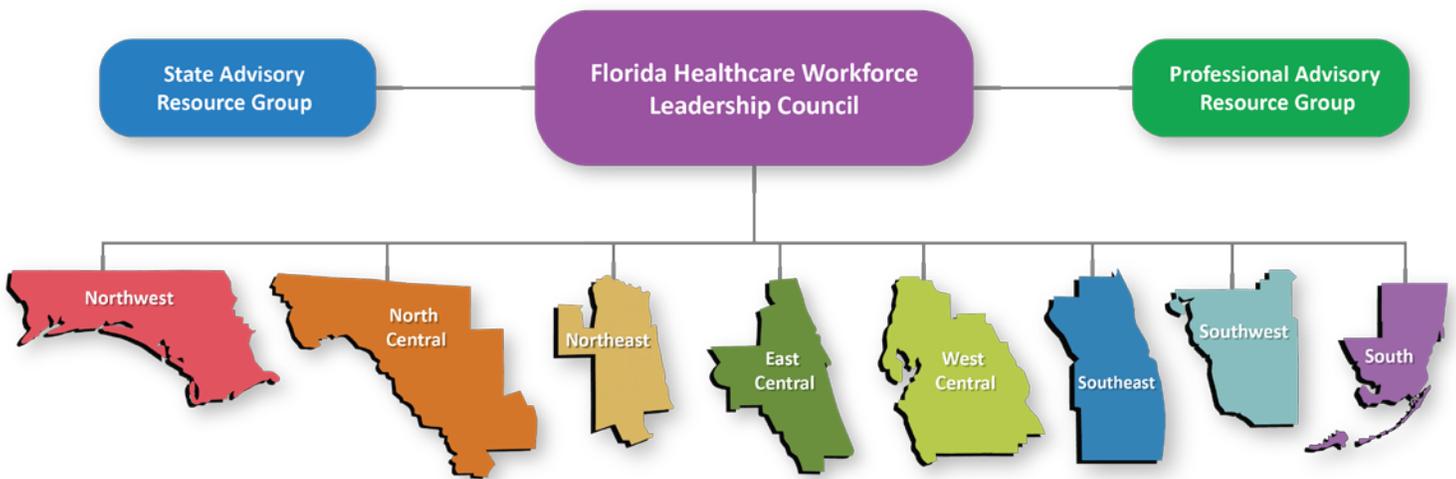


May 2016



Florida Healthcare Workforce

Realizing the health industry workforce needs of today and tomorrow.



With the vision of Florida as the global leader for talent in the healthcare industry, the Florida Center for Nursing is proud to establish the Florida Healthcare Workforce Leadership Council in partnership with GuideWell, through a CareerSource Florida funded grant.

Comprised of expert healthcare industry practitioners and administrators in Florida, the overall goal of the Leadership Council is to develop recommendations for statewide policy that will facilitate a sufficient supply of highly skilled talent to meet the demand of Florida's current and future healthcare workforce needs.

Led By:



GUIDEWELL

Funded By:



Acknowledgements

We would like to thank the Florida Healthcare Workforce Leadership Council, and State and Professional Advisory Resource Groups for their valuable time and contribution to this initiative. A special thanks to those who reviewed the draft report and provided their insightful responses.

LEADERSHIP COUNCIL MEMBERS			
Mary Lou Brunell – Co-lead Executive Director Florida Center for Nursing	Dr. Prakash Patel – Co-lead Chief Operating Officer GuideWell	Renee Thigpen - Chair Chief Human Resources Officer NCH Health Care System Representing: Florida Hospital Association	
Joshua Ashby Chair LeadingAge Florida	Dominic Calabro President & Chief Executive Officer Florida TaxWatch	Dr. Bill D’Aiuto President Elect Florida Dental Association	
Tom Feeney President and CEO Associated Industries of Florida	Dr. Randy Glisson Doctor of Chiropractic Medicine Lake Healthcare Center Representing: Florida Chiropractic Association	Dr. Leonard Hock President FMDA – The Florida Society for Post- Acute and Long-Term Care Medicine	Suzanne Kelley Board Chair Florida Pharmacy Association
Bobby Lolley Executive Director Home Care Association of Florida	Kathleen Miller Sr. Manager, Talent Acquisition Florida Blue	Jay Millson Executive Vice President Florida Academy of Family Physicians	Rene Pabon Regional Health & Wellness Director Walmart
Dr. Robert Rowe Exec. Director, Brooks IHL, Brooks Rehabilitation Representing: FL Physical Therapy Association	Gail Sadler President/CEO Association of Nurse Practitioners in Business, Florida	Jessica Schreppele Business Relations Representative Florida Department of Education Representing: Florida Rehabilitation Association	Richard Shriver Board Liaison CareerSource Florida
Pauline Taylor Chief Operating Officer Hospice of St. Francis Representing: FL Hospice & Palliative Care Assoc.	Susan Towler Vice President Florida Blue Foundation	Mark Wilson President & Chief Executive Officer Florida Chamber of Commerce	Florida Department of Health Vacant
PROFESSIONAL ADVISORY RESOURCE GROUP			
Steve Baumer President/Chief Operating Officer LeadingAge Florida	Audrey Brown President/Chief Operating Officer Florida Association of Health Plans	Rachael Bjorklund Director of Public Affairs Hospital Corporation of America	Doreen Cassarino Co-chair Florida Coalition of Advanced Practice Nurses
Jose D. Castillo III Liaison Florida Association of Nurse Anesthetists	Ian Cordes Executive Director FMDA – The Florida Society for Post-Acute and Long- Term Care Medicine	Drew Eason Executive Director Florida Dental Association	Tad Fisher Chief Executive Office Florida Physical Therapy Association
Willa Fuller Executive Director Florida Nurses Association	Thanh Hogan Division Director, Ancillary Services, UF Health Representing: FL Society of Health-Systems Pharmacists	Paul Ledford President and CEO FL Hospice and Palliative Care Association	Debra Minor Brown Chief Operating Officer FL Chiropractic Association
Christopher Seymour Executive Director Florida Society of Ophthalmology	Elena Vizvary President Florida Occupational Therapy Association		
STATE ADVISORY RESOURCE GROUP			
Curtis Austin President Florida Association of Postsecondary Schools	Dr. Karina Barrett Associate Vice Chancellor Academic and Student Affairs The Florida College System	Amy Beaven STEM and Health Initiatives Director State University System of Florida	Elizabeth Dudek Secretary of the Agency Agency for Healthcare Administration
Lucy Gee Division of Medical Quality Assurance Dept. of Health	Dr. Christy England-Siegerdt Associate Vice Chancellor for Academic Policy and Research State University System of Florida	Adrienne Johnston Chief, Bureau of Labor Market Statistics Dept. of Economic Opportunity	Dr. Ed Moore President Independent Colleges and Universities of Florida
Madeline Nobles Division Director, Statewide Community Based Services Dept. of Elder Affairs	Marie Prosper Associate Director Research Programs/Services Florida Center for Nursing		

FHW TEAM: Karin Kazimi, Project Director and Carla Sampson, Graduate Research Associate

Emerging & Evolving Roles and Occupations within the Healthcare Industry: *Florida's Perspective*

Contents

Executive Summary.....	5
Key Findings & Implications.....	6
Overview	7
Definitions for Emerging & Evolving Roles and Occupations.....	7
Methodology.....	7
Drivers for Emerging & Evolving Roles and Occupations.....	8
Technology Development.....	8
Scientific Development	9
Legislative Mandates/Incentives.....	10
Patient Expectations and Behavior.....	10
Discussion of Findings	11
Six Priority Roles and Occupations.....	12
1. Community Health Worker	12
2. Care Coordinator.....	12
3. Health Data Analyst.....	13
4. Medical Coder (ICD -10)\ Medical Records and Health Information Technician.....	13
5. Medical Scribe.....	13
6. Health and Wellness Coordinator or Health Coach.....	13
The Emerging Roles and Evolving Occupations by Profession.....	14
Evolving Healthcare Executive Roles.....	19
Implications.....	22
Summary	23
Appendix A: Results from Survey of Florida Healthcare Workforce Leadership Council, State and Professional Advisory Resource Groups (FHW Survey).....	24
Appendix B: Glossary of Emerging or Evolving Occupations	33
Glossary of Evolving Healthcare Executive Roles	39
Appendix C: References.....	41
Table 1: Emerging Occupations in Health Information Management and Informatics.....	14
Table 2: Evolving Allied Health Professional Roles and Occupations	15
Table 3: Emerging Allied Health Professional Roles and Occupations	18
Table 4: Evolving Healthcare Executive Roles	19

Executive Summary

This report is a discussion of the emerging and evolving roles and occupations within the healthcare industry in Florida. Information was obtained from:

- Literature and industry publication review
- Survey of Florida Healthcare Workforce (FHW) initiative members
- Discussions with FHW Regional Council members about healthcare workforce needs.

The transformation of healthcare delivery and payment models is influencing the direction, required talent, and organizational structure of healthcare organizations. As the industry innovates to keep pace with the changes and improve the quality of healthcare delivery, existing healthcare roles and occupations evolve, and new roles and occupations emerge as shaped by:

Technology Development	<ul style="list-style-type: none"> ▪ Support required for adoption of the electronic health record (EHR), the associated computer hardware, software, and database architecture, telecommunications requirements, interoperability, and system security ▪ Job opportunities for technicians who work <i>in the system</i> (Health Information Management (HIM) and Health Information Technology (HIT)), as well as <i>on the system</i> (Health Informatics) to optimize capability and ensure availability ▪ Heightened significance and relevance of HIM competencies for organizational performance ▪ Specialized health information roles are blending competencies from IT with those of clinicians
Scientific Development	<ul style="list-style-type: none"> ▪ Bioinformatics emerging and rapidly expanding scientific discipline serving as a foundation for precision medicine ▪ Occupations such as bioinformaticists, bioinformatics analysts, molecular biology technologists, and genetic counselors will be on the rise
Legislative Mandates/Incentives	<ul style="list-style-type: none"> ▪ Institute for Health Improvement’s Triple Aim includes focus on the individuals and families, emphasizes primary care service delivery and population health management, cost control and healthcare system integration ▪ Healthcare system reorganizing to adapt to new payment models and lower-cost service delivery settings, quality measurement, and required reporting ▪ New occupations and roles to provide care and health education within communities; help medically underserved populations navigate the complex healthcare system and improve health literacy; and coordinate patient transition along the continuum of care for the treatment episode
Patient Expectations and Behavior	<ul style="list-style-type: none"> ▪ Greater access to health information and understanding of quality outcomes by patients ▪ Patients seeking a high-touch experience and value for their high-deductible insurance plans ▪ Emergence of new occupations to support patient experience and patient engagement in order to improve patient satisfaction score ▪ Change to all-inclusive brand management to develop and protect the image of and promote loyalty to the healthcare organization

Key Findings & Implications

- Florida healthcare job market reflects the changing healthcare landscape causing existing occupations to evolve with newly refined competencies and to become interdisciplinary.
- Important change drivers include *technology and scientific development, legislative mandates and incentives, patient expectations and behavior*.
- Emerging & evolving roles and occupations are mostly in allied health professions, health information management, and among healthcare executives.
- The report identifies six priority occupations for Florida:
 - **Community Health Worker**
 - **Care Coordinator RN**
 - **Health Data Analyst/Health Informaticist**
 - **Medical Records and Health Information Technician**
 - **Medical Scribe**
 - **Health and Wellness Coordinator**
- Florida healthcare workforce academic pipeline requires alignment with changing occupations that break down pre-existing boundaries between the professions.
- Academic programs must draw on practitioner input for curriculum content, competency development, and experiential learning, and also respond quickly to meet industry demand.

Emerging & Evolving Roles and Occupations within the Healthcare Industry: *Florida's Perspective*

Overview

The transformation of healthcare delivery and payment models is influencing the direction, required talent, and organizational structure of healthcare organizations. In addition, technology and scientific development, changing patient expectation and behavior, regulatory and legislative mandates combine to set the stage for innovation as the industry adapts to keep pace with the changes and improve the quality of healthcare delivery. Some of the manifestations of these innovations are emerging roles and evolving occupations. This report is a discussion of the emerging and evolving roles and occupations within the healthcare industry in Florida.

Definitions for Emerging & Evolving Roles and Occupations

For data collection and analysis on occupations in the US, the 2010 Standard Occupational Classification (SOC) system is used by the US Department of Labor Bureau of Labor Statistics (BLS) to categorize jobs consistently. Although the BLS has criteria for new or emerging occupations, there is a time lag to recognize these roles. For recognition by the BLS, an emerging occupation must satisfy two conditions simultaneously: it must involve work that is “significantly different” than that described for an occupation AND “not reflected” in the existing SOC system. In addition, the new occupation must bear evidence of growth and professional organization to support identification¹. Thus, these criteria do not keep step with the pace of change in the healthcare workforce. Instead, this report uses the definitions for emerging and evolving roles and occupations as presented in the *2015 Supply/Demand Workforce Gap Analysis on Health-Related Programs as Part of the Environmental Scan of The Board of Governors' Health Initiatives Committee* from the State University System of Florida, Board of Governors².

Emerging roles and occupations are newly forming positions that involve new skills and competencies in the workforce. Just becoming recognized, these positions may lack consensus on the scope of the occupation or role, the essential skills and competencies, or formal certifications.

Evolving roles and occupations are positions that currently exist, but changes in necessary skills and competencies are redefining the position to adapt to wider changes in the industry – typically scientific or technology development. Another trend is for occupations to evolve across previously existing silos such that they are more interdisciplinary than before.

Methodology

Peer-reviewed literature and web searches, industry publication reviews, a survey of 41 members of the Leadership Council, and State and Professional Advisory Resource Groups of the Florida Healthcare Workforce initiative (FHW Survey) and discussions with Regional Council members about healthcare workforce needs inform this report. The full survey results are included as [Appendix A](#).

In the initial review of the literature, there were several general descriptions for emerging or evolving roles and occupations. These descriptions include the following terms: boundary spanners; professional domain/boundary revision; professional role/responsibility reallocation/shifting; inter-professional collaboration/teams; scope of practice expansion; task shifting and sharing. Regardless of the descriptive term, the factors driving these changes include the Triple Aim and the Health Information Technology for Economic and Clinical Health (HITECH) Act. To explore predictions as to how technology adoption and reimbursement changes would affect existing occupations and roles, the search was expanded to industry workforce publications, including publications from national healthcare search firms and professional associations.

These main drivers are discussed in the following sections of the report with examples of the types of positions developing as a result. A list of the evolving and emerging positions is also presented by profession. For more information, a complete glossary of the occupations and roles discussed in this report is available in [Appendix B](#).

Drivers for Emerging & Evolving Roles and Occupations

Technology Development

The development of health information technology and its adoption as mandated by the HITECH Act, generated several emerging roles and evolving occupations to support the electronic health record, the associated computer hardware, software, and database architecture, telecommunications requirements and interoperability, as well as system security. In addition, there was a transition in the US on October 1, 2015 to ICD-10, which is the 10th amendment of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO). ICD-10 introduced 69,000 medical codes enabling descriptions that are more precise and result in a higher level of detail in electronic health records.

These developments create job opportunities for technicians who work *in the system* and the wealth of information it hosts, as well as *on the system* to optimize capability and ensure availability³. Jobs for technicians *in the system* include roles in Health Information Management (HIM) and Health Information Technology (HIT). Jobs for technicians *on the system* describe roles in Health Informatics.

The information in the system, no longer on paper medical records, establishes new career pathways and specializations for the medical records clerical staff in HIM. These HIM specialties include Privacy and Security, Electronic Health Record, Clinical Documentation Improvement, Information Governance, and ICD-10 Coding.

Technology Development

- **Health Data Analyst**
- **Health Information Management specialties:**
 - **Privacy and Security**
 - **Electronic Health Record**
 - **Clinical Documentation Improvement**
 - **Information Governance**
 - **ICD-10**

Further, the significance and relevance of HIM competencies for organizational performance is elevated and a number of specialized health data analysts are emerging⁴. The trend also indicates that these health information roles are blending competencies from Information Technology (IT)

with those of clinicians⁵. For example, the Clinical Health Analyst or Clinical Health Informaticist combines the competencies of a registered nurse with an IT technician or IT analyst.

Telehealth, the cost-effective technology enabled alternative to traditional face-to-face, in person medical care⁶, will require clinicians with the skills to correctly diagnose, treat, monitor, and consult with patients using interactive technologies. Use of these technologies can ameliorate the challenges of healthcare access in rural Florida, if supported by the telecommunications infrastructure and related occupations. These technologies present a new medium for care delivery allowing existing clinicians to consult with patients they are unable to touch.

Clinicians are now able to expand their reach using mobile technologies as they instruct and supervise existing or emerging technicians in the field. Another example is the tele-ICU or eICU, an offsite hub for patient assessment and vital sign monitoring, demonstrating that the technology supplement may provide additional support in light of workforce concerns, without compromising the quality of care delivered.

Scientific Development

An emerging, rapidly expanding scientific discipline is **Bioinformatics**. The field solves problems related to the collection, processing, analysis, and retrieval of data on the structure and function of biological systems by combining the domains of biology, informatics, computation, and data science. Related fields include genomics (analysis of genetic material and genes) and medical or biomemmedical informatics (use of biomedical data to improve health). This discipline serves as a foundation for precision medicine – targeted treatments and disease prevention protocols based on individual genetic composition.

Although these treatments have largely focused on cancers, a 2016 initiative at the National Institutes of Health (NIH) saw an investment of \$130 million dollars into the Precision Medicine Initiative Cohort Program⁷. National research and information sharing will focus on all diseases. As the science continues to develop, it is expected that occupations such as bioinformaticists, bioinformatics analysts, molecular biology technologists, and genetic counselors will be on the rise.

Scientific Development

- **Bioinformaticists**
- **Genetic Counselors**
- **Molecular Biology Techs**

Legislative Mandates/Incentives

The Institute for Health Improvement (IHI) Triple Aim of improving population health, and the patient experience (quality plus satisfaction) while reducing the cost of healthcare, is represented in the mandates of the Patient Protection and Affordable Care Act (PPACA). The Triple Aim includes a focus on individuals and families, an emphasis on primary care service delivery and population health management, as well as controlling costs and integrating the healthcare system⁸.

In response, the healthcare system is reorganizing to adapt to new payment models and lower-cost service delivery settings, quality measurement and required reporting⁹. New occupations and roles have evolved to provide care and health education within communities; help medically underserved populations navigate the complex healthcare system and improve health literacy; and coordinate patient transition along the continuum of care for the treatment episode.

Some example occupations include community health workers, community dental health coordinator, community paramedics, health educators and coaches, care coordinators and population health executives.

Legislative Mandates/Incentives

- **Care Coordinator**
- **Community Dental Health Coordinator**
- **Community Health Worker**
- **Community Paramedic**
- **Health Educator**
- **Health Coach**

Patient Expectations and Behavior

The factors that seek to improve healthcare delivery and outcomes provide greater access to health information and quality outcomes to providers. The same drivers allow patients more access to information about providers, and their comprehension of quality indicators is changing patient behavior. The rise of consumerism translates to patients that seek a high-touch experience and value for their high-deductible insurance plans. New healthcare occupations are emerging to support the patient experience and proactively seek patient feedback in order to improve patient satisfaction scores¹⁰. Healthcare marketing has become all-inclusive brand management to develop and protect the image of, and promote loyalty to, the healthcare organization.¹¹

Some example occupations include patient engagement officer, patient experience coordinator, chief experience officer, and vice president of brand management.

Patient Expectations & Behavior

- **Patient Engagement Officer**
- **Chief Experience Officer**
- **VP Brand Management**

Discussion of Findings

The survey of the FHW Leadership Council, and State and Professional Advisory Resource Groups identified the following roles as emerging in the state of Florida:

- **Community Health Worker**
- **Community Dental Health Coordinator**
- **Healthcare Navigator**
- **Care Coordinator**
- **Chief Population Health Manager/Officer**
- **Health Coach**
- **Health Promotions Manager/Specialist**
- **Health Informaticist/ Informatics Analyst**
- **Medical Coder (ICD-10)**
- **Medical Scribe**

Discussions with Regional Councils generated the following future occupational needs:

- **Registered Nurse Case Manager**
- **Health and Wellness Coordinator**
- **Social Worker**
- **Health Data Analyst**
- **Medical Coder (ICD-10)**
- **Telehealth trained clinicians**

Although there appears to be little overlap between the positions listed, the literature review illustrates a rational link. Recalling that the new roles are emerging in response to technology and scientific development, legislative mandates or incentives, and patient expectation and behavior (as discussed in the previous section) the roles identified by Florida representatives do overlap with national trends. This overlap results in six priority roles and occupations:

- 1. Community Health Worker/Healthcare Navigator**
- 2. Care Coordinator/ RN Case Manager**
- 3. Health Data Analyst/Health Informaticist**
- 4. Health Information Technician/Medical Coder (ICD -10)**
- 5. Medical Scribe**
- 6. Health and Wellness Coordinator/Health Coach**

These roles and the literature guided overlaps are discussed in the following sections.

Six Priority Roles and Occupations

1. Community Health Worker

The **emerging** occupation of Community Health Worker has many different job titles including *lay health worker, health or patient navigator, peer health advisor, community health advocate or representative (in Native American communities) or promotoras de salud (in Hispanic communities)*. This occupation serves to improve healthcare access and quality. The ideal job candidate is a trusted community member or has an intimate understanding of the community served. This existing relationship allows the community health worker to be an intermediary between health and social services and the community^{12,13}.

Despite a lack of consensus on the job title, the job responsibilities of the community health worker can increase access to healthcare and health insurance benefits, improve health and wellness, health literacy, the quality and cultural competence of service delivery, and ultimately affect population health positively by working within communities.

2. Care Coordinator

The **evolving** role of Care Coordinator develops from the registered nurse case manager and falls within that area of responsibility. Case Management nurses work to keep their patients (typically with a similar diagnosis) healthy and out of the hospital over the long term. They also work with insurers to ensure that patients receive cost-effective care.

In the role of Care Coordinator, the registered nurse or nurse practitioner manages a single patient's care by deliberately connecting the patient to all other needed health professionals and medical resources to help the patient along the care continuum and ensure optimal outcomes for that episode of care. This comprehensive coordination includes review of prescribed medications, exercise regimen, and diet protocol¹⁴.

Transitional Care Coordinators help patients in the shift between different levels of care at the same facility or between different types of care at different facilities. One critical aspect of transition is information sharing. These professionals ensure that the providers and caregivers have the information necessary for optimal care¹⁵. The literature indicates that some facilities use Transitional Care Coordination teams that pair nurses with social workers, or staff with experience in social services¹⁶. The teaming may suggest further blending of these professional competencies in the future to address needs beyond clinical care and cost containment.

3. Health Data Analyst

The **emerging** occupation of Health Data Analyst surfaces from the wealth of health information now available in electronic health records. These analysts extract and analyze health care quality data to satisfy internal quality improvement objectives and external regulatory reporting. Other specialized analysts and informaticists are emerging as seen in Table 1.

Medical coders and medical scribes, two roles suggested by the FHW survey and discussions with the Regional Councils, serve as a foundation for the emerging health information management and informatics roles. Medical coders and medical scribes bear a critical responsibility for the information available for analysis.

4. Medical Coder (ICD -10)\ Medical Records and Health Information Technician

The occupation of medical coder is **evolving**. While medical coders already exist, the occupation title is changing to medical records and health information technician due in part to the creation of Registered Health Information Technician (RHIT) certification.

In addition, the conversion from ICD-9 and its 13,000 medical codes to ICD-10 in October 2015 introduces 69,000 codes enabling descriptions that are more precise and a higher level of detail in the electronic health records. The position retains the base function of medical record review and diagnostic and procedure coding to ensure that facilities can bill payers and receive correct reimbursements.

5. Medical Scribe

The role of the medical scribe is **emerging** from mandated use of the electronic health record. This occupation documents the encounters between medical practitioners and patients in real-time under the direction of the practitioner¹⁷. This relieves the clinician of the administrative burden to capture and enter information accurately so that they can interact more with the patient, improving quality of healthcare experience and patient satisfaction. The scribe has the responsibility for data entry and organization of healthcare data thus maximizing the productivity of clinicians.

6. Health and Wellness Coordinator or Health Coach

The **emerging** roles of Health and Wellness Coordinator and Health Coach arise from the increasing importance of health promotion activities, preventative care, and health literacy in population health improvement. The health and wellness coordinator is typically facility bound to support the development of health and wellness programs for employees, including incentive/motivational programs. This coordinator leads seminars, lectures, and workshops addressing a variety of health and wellness topics including nutritional and fitness topics, time and stress management, and relaxation techniques.

A health coach/concierge works with individual patients, motivating them to achieve health goals with lifestyle and behavior changes.

The Emerging Roles and Evolving Occupations by Profession

The following tables list additional evolving occupations and emerging roles in the healthcare workforce, other than those previously discussed:

Table 1: Emerging Occupations in Health Information Management and Informatics

Emerging Occupation	Description
Bioinformatician/Bioinformaticist/ Bioinformatics Analyst/Scientists/Specialist	Conducts research using computational methods and scientific reasoning to predict the structure and function of newly discovered protein sequences. Designs and develops tools (e.g. databases, programs and algorithms) to analyze genomic data.
Clinical Documentation Specialist¹⁸	Applies a blend of knowledge from anatomy and physiology, pathophysiology, and pharmacology, knowledge of official medical coding guidelines, healthcare finance to analyze and benchmark clinical documentation program performance.
Clinical Health Informatics Business Specialist/Clinical Informaticist/ Applied Clinical Informaticist¹⁹	Applies informatics and information technology to healthcare services delivery; combining the skills of a registered nurse with IT technician, and assist clinical staff with IT systems, data interpretation, and patient records management. Clinical informatics includes a wide range of topics from clinical decision support to visual images (e.g. radiological, pathological, dermatological, ophthalmological, etc.); from clinical documentation to provider order entry systems; and from system design to system implementation and adoption issues.
Cybersecurity Specialist²⁰	Detects and protects computer systems and data from vulnerabilities due to malicious access.
Electronic Health Records (EHR) Analyst	Analyzes patient care information in EHR and works collaboratively to resolve identified problems and facilitate corrections to the EHR. Provides end-user training and develops documentation in HIM Section. Assists with EHR compliance with Joint Commission and all levels of regulatory guidelines.
Health Informaticist/ Health Informatics Analyst	Designs and develops information systems and applications that improve quality, effectiveness, and efficiency of health care services delivery, management, and planning.

Table 2: Evolving Allied Health Professional Roles and Occupations

Evolving Roles and Occupations in Allied Health	Occupation Summary	Description of Change
Exercise Physiologist	Creates exercise and wellness programs for individuals with chronic disease to improve health.	Increased industry attention to preventative care and the role of exercise in wellness, and improve patient health literacy.
Health Educator²¹	Provides and manages health education programs that help individuals, families, and their communities maximize and maintain healthy lifestyles.	Increased industry attention to population health, preventative care and health literacy.
Health Planner	Appraises the health needs of certain populations and communities, analyze and evaluate programs and policies, to develop plans to carry out public health objectives.	PPACA mandated community health needs assessments.
Health Promotions Manager/Specialist	Plans and implements evidence-based health promotion strategies and initiatives.	Increased industry attention to population health, preventative care and health literacy.
Managed Care-Pharmacist	Ensures that medications are used appropriately to improve patient health and has a role in patient safety initiatives, clinical program development, communications with patients and prescribers, drug benefit plan design, and business and cost management.	Patient safety and clinical program improvement, business and cost management.

Evolving Roles and Occupations in Allied Health	Occupation Summary	Description of Change
Certified Medical Assistant ²²	Credentialed medical assistant that must graduate from an accredited post-secondary program, recertified in 5-year intervals. Clinical competencies for the CMA include patient care, specimen collection (including venipuncture) and diagnostic testing (electrocardiography, respiratory testing, and chemistry, immunology, and microbiology).	Diagnostic testing and patient liaison.
Medical Laboratory Technologist	Conducts tests and procedures ordered by healthcare personnel, but the lab tests and procedures tend to be more complicated than the ones medical technicians perform.	Science and technology advancements allow more tests to be conducted.
Medical Physicist ²³	<p>Consults with physician colleagues in radiation oncology and nuclear medicine departments to plan patient treatments and accurately measure radiation output.</p> <p>Helps develop new instrumentation and technology for use in diagnostic radiology including: magnetic and electro-optical storage devices for the manipulation of x-ray images, quantitative analysis of both static and dynamic images using digital computer techniques, radiation methods for the analysis of tissue, and CT and MRI.</p>	<p>Increased use of diagnostic imaging and pace of technology development creates need for trained technicians and image storage.</p> <p>Train the technicians/technologists working with radiation, and on new services or better use of their data storage systems.</p>
Mental/ Behavioral Health Specialist ²⁴	Identifies, triages, and manages patients as part of a primary care team for target populations.	Inclusion in primary care teams.
Molecular Biology Technologist ²⁵	Have experiences in general molecular biology techniques including DNA/RNA tests.	Development of precision therapies.

Evolving Roles and Occupations in Allied Health	Occupation Summary	Description of Change
Patient Access Representative	Enrolls new patients and provides information about the facility and its policies.	Greater emphasis on patient experience and satisfaction.
Patient Advocate/Navigator/Liaison /Representative²⁶	Facilitates patient and family health and treatment activities between all involved parties, serves as an information resource, and works in partnership with the healthcare organization and the community. <i>(Usually (but not always) a licensed clinical professional and often focus on specific populations and diagnoses),</i>	Greater emphasis on patient experience and satisfaction.
Patient Experience Coordinator²⁷	Works to improve patient satisfaction by improving interactions with patients and potential patients, including access to online tools, records, and other information.	Increased use of technology for communication and mediated interactions with the facility, and greater emphasis on patient experience and satisfaction.
Physician Liaison/ Representative Physician Relations Manager ²⁸	Develops the relationship and maintain communications between physicians and the healthcare organization/healthcare system to maintain and grow the patient base.	Increased emphasis on care coordination to reduce readmissions and associated penalties.
Telehealth-trained Physician Assistant	Trained in skills to correctly diagnose, treat and consult with patients, and provide sustained care, using interactive technologies within their scope of practice.	Setting change for care delivery Competencies to diagnose and treat patients remotely while mediated by technology.
Telehealth-trained Physical Therapist	To manage patient treatment programs using interactive technologies within their scope of practice.	Setting change for care delivery.

Table 3: Emerging Allied Health Professional Roles and Occupations

Emerging Role	Description
Certified Chiropractic Physician’s Assistant²⁹	Conducts initial examinations, case history discussions, and therapeutic procedures under the indirect supervision of a chiropractic physician.
Community Dental Health Coordinator³⁰	Enables people in underserved communities to manage their oral health by focusing on oral health education and disease prevention. CDHCs are typically recruited from the same types of communities in which they will serve, to reduce cultural, language and other barriers that might otherwise reduce their effectiveness. Their connections to the communities help establish trust and make them role models.
Community Paramedic^{31,32}	Fills a gap in rural areas that either have limited primary care services or lack them entirely. Also in urban areas by ensuring health needs are met for those patients who would frequently seek care in the emergency care system.
Genetics Counselor^{33,34}	Helps patients to understand how their genomic variation affects their health and family planning.
Patient Care/Primary Care Technician³⁵	Works remotely, under the online supervision of primary care physicians or nurse practitioners (NPs), and trained and equipped to manage stable chronic disease patients, treat minor illnesses and injuries, and provide basic preventive services.
Patient Engagement Officer	Facilitates the inclusion of patients in the development of new products and services.
Rural Health Care Coordinator³⁶	Provides care coordination services while compensating for the challenges of the rural communities (long travel distances, low health literacy, limited food and pharmacy options, unmet healthcare needs etc.).

Evolving Healthcare Executive Roles

New leadership roles are also appearing among healthcare leaders. Technology development and deployment, penalties for hospital readmissions and weak patient satisfaction scores are important drivers. Thus, the emphasis in the evolving healthcare executive roles is on patient experience and population health. In turn, this shift leverages data and health information technology to provide information for organizational strategic direction and performance assessment. New leaders reflect this need, and include transformation champions in the C-Suite to drive innovations throughout the organization, and remain competitive in the new health industry landscape.

Table 4: Evolving Healthcare Executive Roles

Evolving Healthcare Executive Roles	Role Description
Chief Clinical Transformation Officer³⁷	Acts as the administrative leader across a broad range of transformation initiatives, and often shares joint responsibility for clinical transformation with a high-profile physician leader.
Chief Data [Analytics] Officer³⁸	Manages data and leverages analytics tools to improve care, enhance profitability, increase engagement, and focus research—the ideal CDO has both industry expertise and a decade or more of experience in data analytics.
Chief Experience Officer/ VP or Director Patient Experience³⁹	Responsible for the strategy guiding the “user experience” of the organization, including the user interface design of products and services and might include oversight of communications with the organization and its various stakeholders such as: marketing communications, community relations, internal/HR relations, investor relations. This officer has ultimate responsibility for executing the patient experience mission to ensure positive interactions, improve patient satisfaction, and improve metrics such as CMS Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey.
Chief Health Information Officer⁴⁰	Similar to the Chief Data Officer, the CHIO tackles the interoperability problem between the different information systems enterprise-wide and centralizes control of the data to leverage the information for population health initiatives and improved health outcomes.
Chief Medical Informatics Officer/Director of Medical/Health Informatics	Serves as the link between medical and IT departments at a health care organization.

Evolving Healthcare Executive Roles	Role Description
Chief Nursing Information Officer⁴¹	Similar to the Chief Medical Informatics Officer, serves as liaison between informatics and clinical departments and advocates for system changes, giving nurses a voice at the senior executive level on clinical information technology initiatives.
Chief Population Health Manager	Leads the development and implementation of a health system’s population health management strategy.
Chief Strategy Officer/Director/Manager	Leads the healthcare organization in the development, execution, support, and communication of long-range strategy.
Head of Technology Innovation⁴²	Leads the team responsible for operational and strategic technology leadership in teaching and learning, business operation and information access.
VP of Brand Management⁴³	Replaces the role of VP Marketing to reflect attention to changing consumer awareness and preference for a connection with the organization’s social impact and mission. Brand (visual identity presented – logo, name, graphics - as well as the identity or associations perceived) becomes a critical aspect of the organizational strategy, cohesively leveraged for social impact. Brand management is managing the psychological associations of the organizational stakeholders.
VP of Clinical Informatics⁴⁴	Develops plans and strategies for assuring physician and all healthcare providers’ acceptance and ongoing use of the EMR, and supervises a staff responsible for order set design; Clinical Decision Support, EMR training, and Clinical Documentation Improvement. Working closely with the entity Clinical Informaticists, the role demands multiple skill domains including clinical operations, education, consulting, leadership, technology expertise, performance improvement, patient safety, and management.
VP of Clinical Transformation	Oversees all health system-wide value improvement activities and efforts including developing and implementing the population health plan, prioritizing the tactics and providing the leadership to ensure implementation of the plan. Investigates patient outliers and reduces number of outliers via improvements in clinical care.

Evolving Healthcare Executive Roles	Role Description
	Reports to the Chief Clinical Transformation Officer.
VP of Cost Containment	Responsible to address cost containment issues across all operational areas including IT, claims, clinical functions (Utilization Review and Case Management), bill review, network management, and finance. The role is an important and highly visible role, both internally and externally to the healthcare organization.
VP of Medical Management	Coordinates the medical management, quality improvement, and credentialing functions for the assigned health plan based on, and in support of the company's strategic plan.

Implications

The emerging and evolving occupations bear significant consequences for both the current and potential healthcare workforce and the development of the healthcare workforce academic pipeline in Florida. In addition to the development of educational programs, skills and competencies require alignment with these changing occupations that break down pre-existing boundaries between the professions. Academic programs must be a match for the current job demands and draw on practitioner input for curriculum content and competency development, and experiential learning.

Some accrediting agencies have already mandated input from practitioners in accreditation criteria that seek to assure curricula and competence relevancy, and drive alignment with professional reality.⁴⁵ In theory, all accredited programs must meet standards requiring that education is current, has input from employers and program alumni, and stays current with evolving issues in the profession^{46,47}. However, the academic pace of curriculum change is often slow and not in step with industry developments or strategic direction due to the interval between full accreditation reviews. Educational programs should view competency validation and curriculum review as something other than an accreditation requirement.

Job ready graduates must leave their programs with critical thinking skills. These skills are necessary so that they can adapt to the changes in the work environment, independently seek new information, and further their education beyond continuing education requirements attendant to licensure. In the FHW survey, computer literacy and critical thinking emerged as the top skills required for these emerging and evolving roles and occupations (See [Appendix A](#) for a complete list). This finding is in keeping with national trends. In addition, the “soft” skills (effective communication, empathy, people skills, customer service) appeared frequently in these open-ended responses. The responses may reflect that new roles are customer facing, and team-oriented. This also validates patient experience and perception as an important consideration as these roles continue to evolve and emerge.

The Triple Aim’s focus on population health management, patient experience, and cost control has resulted in workforce innovations to meet these objectives. However, some workforce researchers have suggested that another element be added to the Triple Aim. This fourth aim, resulting in the Quadruple Aim⁴⁸, is about improving the work conditions for the current workforce that will provide the needed patient-centered care. The suggestion draws attention to increasing levels of stress and burnout that exacerbate healthcare workforce shortages. In addition to retention issues, a lack of attention to workforce wellbeing reduces the attractiveness of healthcare careers for millennials, restricting the future workforce pipeline even further. Some roles, such as medical scribes and certified medical assistants, have emerged or evolved in response to this need, however even more evolution may be seen in the future.

The development of emerging & evolving roles and occupations can be most readily observed in allied health professions, health information management, and among healthcare executives. Still more innovation is possible, but state regulation and oversight needs to incorporate and be responsive to evolving and emerging roles so that they do not present barriers to the innovations that can improve the quality and accessibility of healthcare. It is noted that the impact of medical tourism was oddly absent from the input of FHW members. It is possible that positioning Florida as a medical tourism destination may result in emerging roles that offer concierge roles to patients in advance of travel and their companions or families for the duration of their stay.

Summary

The changing healthcare landscape is reflected in the healthcare job market, causing existing occupations to evolve with newly refined competencies and to become interdisciplinary. Newly emerging roles may still lack consensus on scope, or body of knowledge and certifications, aspects that are critical for identification as an emerging occupation to meet the criteria for inclusion in the SOC Taxonomy. However, these roles appear as the industry innovates in response to the changes mandated by legislature, technology and scientific development, and consumerism.

Based on an in-depth literature review and input from the members of the Florida Healthcare Workforce Initiative, this report identified emerging roles and evolving occupations within the healthcare industry in Florida. The **FHW survey** results are included as [Appendix A](#), and [Appendix B](#) lists a glossary of the occupations.

The report identifies six priority occupations for the state of Florida:

- 1. Community Health Worker**
- 2. Care Coordinator RN**
- 3. Health Data Analyst/Health Informaticist**
- 4. Medical Records and Health Information Technician**
- 5. Medical Scribes**
- 6. Health and Wellness Coordinator**

The implications of these occupations are summarized by the following comment received on the survey of the FHW Leadership Council, State and Professional Advisory Resource Groups:

"As we broaden the definition of a healthcare worker the clear lines of what can be done by certain individuals will undoubtedly be challenged and blurred. We should expect that and educate to that reality."

Appendices:

- A. FHW Leadership Council, State and Professional Advisory Resource Groups Survey Analysis
- B. Glossary of Emerging Roles and Evolving Occupations
- C. List of References

Appendix A: Results from Survey of Florida Healthcare Workforce Leadership Council, State and Professional Advisory Resource Groups (FHW Survey)

Method:

FHW Staff developed a Qualtrics survey in January 2016. The final survey was emailed to the Leadership Council, State and Professional Advisory Resource Group members in February 2016 to gather preliminary input. Forty-one of the 43 members (excluding the staff liaisons) responded to the request for input (95% response rate). The text of the survey questions and responses received are included in this Appendix.

For this survey, please consider the following definitions for “emerging “and “evolving occupations”.

Emerging roles and occupations - newly forming, involving new skills and competencies in the workforce, and are becoming recognized.

Evolving roles and occupations - currently exist but are being redefined by changes in necessary skills and competencies.

There are several general descriptions for emerging/evolving roles occupations. These include the following terms:

- Boundary spanners
- Professional domain/boundary revision
- Professional role/responsibility reallocation/shifting
- Inter-professional collaboration/teams
- Scope of practice expansion
- Task shifting and sharing
- New healthcare/health professions occupations

The following questions seek to get your input on this topic.

Question 1: What are job titles for emerging/evolving occupations and roles that you have come across?

Most common emerging and evolving roles

Role/Occupation	Count
Healthcare Navigators	8
Care Coordinators	4
Medical Scribes	4
Health Informaticist/ Informatics/Informatics Analysts	4
Chief Population Health Manager/Officer	3
Community Dental Health Coordinator	3
Community Health Worker	3
Health Coach	3
Health Promotions Manager/Specialist	2
Medical Coders	2

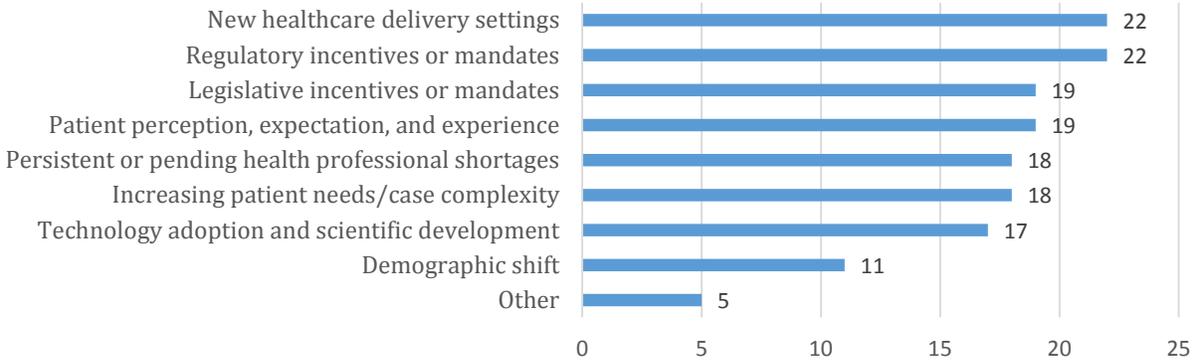
(All roles listed in alphabetical order by category)

Category	Role/Occupation
Nursing	Nurse Care Managers within Primary Care Settings Care Coordinators Case Managers/ POD (Place of Delivery) Case Managers Nurse Navigators Telemedicine Transitional Care Coordinator
Medicine	Evidence Based Medical Staff Director Telemedicine
Allied Health	Advanced Dental Hygiene Practitioner Community Dental Health Coordinator Community Health Worker Community Paramedic Health & Wellness Coordinator Health Coach Health Educators Health Planners Health Promotions Manager/Specialist Healthcare Navigators Managed Care- Pharmacist Medical Assistant/Phlebotomist/EKG Tech (Blended Role) Medical Laboratory Scientists (<i>all Specialties – Ongoing Shortage</i>) Medical Physicist Mental Health Specialist Molecular Biology Technologists (Specialists) Rural Health Coordinator Telemedicine (Practitioners for all disciplines) Tobacco Prevention Specialist

Category	Role/Occupation
	Tobacco Program Manager
Healthcare Executives	Chief Experience Officer/ Director of Patient Experience Chief Population Health Manager/Officer Chief Strategy Officer Transformation Officer VP of Brand Management VP of Cost Containment
Health Information Management/ Information Technology	Business Intelligence Data Analyst Clinical Health Informatics Business Specialists Clinical IT Cybersecurity Specialists EHR Analyst (EPIC Beaker (Lab) & EPIC Radiant (Radiology)) Health Data Analysts Health Informaticist/ Informatics/Informatics Analysts Medical Coders Medical Scribes Revenue Cycle Analyst/Coordinator
Others	Account Care Consultants (at table with stakeholders building future models) Front Desk Representatives/ Schedulers Film Library Clerks Patient Access Representatives Patient Engagement Officer Patient Experience Coordinator Physician Representative Public Members
Other Comments	<ul style="list-style-type: none"> • The nursing profession is constantly changing for instance there was a time when a Licensed Practical Nurse could do what a Registered Nurse is now doing but currently LPN's are limited to their specialty training. • I am seeing more desire to designate more individuals to prescribe, direct care...such as from physicians to ARNPs. There appears to be less desire to provide hands on care by professionals, leaving care to individuals without necessary training. • Expertise on the coding, billing and operations side of the business for Revenue Cycle operations. • Computer literacy is now needed in jobs that did not require it in the past, especially in healthcare as a result of electronic medical record keeping. As the population ages we should see more "emerging occupations" like "home" healthcare. • With the implementation of ICD 10 and additional requirements imposed by Medicare and other insurance providers, there is an increased need for nurses that have the ability to work with physicians to improve their documentation. • Various titles being applied to individuals providing "non-medical" care, most often associated with "personal care aides or homemaker companions".

Question 2: From your perspective, what are the critical facilitators and barriers to emerging/evolving roles and occupations in the state of Florida? (Select all that apply)

Facilitators and barriers to emerging/evolving roles & occupations in the state of Florida



Other Facilitators or Barriers

1. Difficulty in adding any new content in nursing curriculum or even in their clinical experiences.
2. Reimbursement.
3. In some fields - not necessary.
4. Aging population, availability of training for re-tooling of the available skill sets.
5. The entrenchment of the status quo, [institutional] or otherwise, and the reluctance to change/adapt.

Question 3: What do you think are skillsets or competencies necessary for these emerging/evolving roles and occupations?

Competency/Skill Deficiency	Count
Computer literacy/basic computer skills/systems navigation	14
Critical thinking	10
Customer service	4
Analytical thinking/skills	3
Cross cultural competency/diversity	3
Effective communication	3
Leadership	3
Analytical skills to troubleshoot, identifying and resolving data quality and reporting issues	2
Electronic medical records	2
Empathy and compassion	2
LEAN techniques	2
Multi lingual abilities	2
People skills	2
Teamwork	2
Sharing of information/privacy and security	2
Business rules and corresponding terminology or business etiquette	2

Other Comments listed once (categorized)

Education	Advanced degree College educated Higher education in sciences and math
Knowledge Areas	Health policy ICD-10 coding Large revenue cycle operations for large hospitals Overall health system knowledge- especially payer's side, cost/benefit of delivery models
Personal Qualities	Ability to learn quickly as regulatory changes and technology advances Ethics Integrity and honesty Logical thought processes Mindfulness and emotional intelligence
Resources	Broader access to training and instruction for home health care - change the setting On the job training sites

Skills or Experience	<p>Community health mindset</p> <p>Coordination of an interprofessional team</p> <p>Data entry accuracy</p> <p>EMR proficiency</p> <p>Experience with dealing with the mentally ill</p> <p>High functioning in meticulous laboratory manual skills</p> <p>Increased knowledge of healthcare resources outside of current setting</p> <p>Interview techniques for providers</p> <p>Multitasking</p> <p>Organizational skills</p> <p>Patient experience</p> <p>Soft skills</p> <p>Strategic thinking</p> <p>Technical skills</p> <p>Understanding of regulations</p> <p>Understanding pertinent data architecture</p>
-----------------------------	---

Other Suggestions
<ul style="list-style-type: none"> • Motivational interviewing, behavior activation, treating-to-target, communication, and referrals using EHR, empowering patients for self-management. • Attitude towards profession; Professional boundary; Overcoming objection • Knowledge of the "star ratings" and how all involved in the medical community can be affected. • Background education and institutional memory. • Emerging – Community Paramedic - applying paramedic protocols to chronic disease. Maintenance instead of acute illness; Community Health Worker (CHW)- health literacy for the CHW and health training techniques for patients. Evolving - prescription assistance, end of life / CCM CPT codes. • It varies based on the specific role! Some of the emerging occupations are entry-level positions and some are "C Suite" level positions requiring significantly different skills, experiences, training, etc.

Question 4: Where do you anticipate gaps in educational programs or job certifications for these emerging/evolving roles and occupations?	
<i>(categorized)</i>	
Educational Programs	
Availability & Sufficiency	<ol style="list-style-type: none"> 1. There does not seem to be any local educational institutions that instruct in these fields. 2. I do not believe we have sufficient training or training sites. 3. Lack of teachers, resources, and funding. 4. There are no formalized certificate or degree programs for some of the emerging/evolving occupations and roles. There are multiple definitions or characterizations of some the roles. 5. Educational programs across the whole medical spectrum...i.e. physicians, dentists, advanced practice nurses, nurses, pharmacists, pharmacy technicians, physician assistants, etc. on "boundaries" w/respect to "state practice acts". 6. Not enough nursing programs, basic skills training. 7. Not many educational programs are offering training for many of these emerging occupations. 8. Being able to keep up with the demand or need of health care services and professionals. 9. Community paramedicine schools exist in at least one other state and could be a model for FL. 10. Establish curriculum framework for any new program of study that emerges.
Quality & Currency	<ol style="list-style-type: none"> 1. Just in a simple lack of quality training and education programs that provide practical, up-to-date information and experience. 2. Inflexibility in changing established curriculum. 3. Inadequate education programs to generate enough high quality graduates eligible for national certification (via Board examination) both at the community college and university levels.
Suggested Content	<ol style="list-style-type: none"> 1. MAs need training in new areas as they are the staffing now for these areas in many medical offices (chronic disease services). 2. Customer service; ICD - 10 Code Schooling; financing for insurance payments/plan set up. 3. Cybersecurity Population Health Management, Soft skills (e.g. active listening, coaching techniques, customer service). 4. Managed/alternate delivery model knowledge, patient education and influence of behavioral outcomes. 5. Specialty skills such as knowledge of ETL (SSIS), OLAP (SSAS), and OLAP [Businesss Intelligence/Analytical] tools such as Qlik View, Tableau, PowerPivot/Powerview, etc.
Job Certifications	
	<ol style="list-style-type: none"> 1. CHW [Community Health Worker] certification is coming.

Other Comments

- Too soon to know.
- As we broaden the definition of a healthcare worker the clear lines of what can be done by certain individuals will undoubtedly be challenged and blurred. We should expect that and educate to that reality.
- Lack of clarity on how public and community health professionals can be used to improve health outcomes through education, policy, prevention, and screenings.
- Regulatory and legislative agendas need to synchronize so the caregiver is trained and empowered to discuss health issues such as end of life without fear of regulatory and litigation concerns.
- It is difficult to determine; our spend is currently high for known positions however we need to start looking at the pipeline to determine what our future needs will look like such as home health providers.
- Willingness to do the job for the likely low pay
- Willingness to learn and adopt to new concepts. Keeping up with technology. Constant education using different approaches.
- Years ago, it was more difficult to become a nurse and then a nursing shortage happened and made things easier because of need. Now there are ample nurses and the schools continue to graduate Registered Nurses that feel most jobs are beneath them.
- Word of mouth since advertising is expensive.
- Unknown

Question 5: Other comments or descriptions for these emerging/evolving roles and occupations?

- Anything that can be done to **empower patients** to be better stewards for their own health is critical.
 - Critical to drive interdependent **partnerships between academia** (high school and college/technical) and the **business community** (payers, delivery, suppliers, and employee benefits groups) to achieve cost and delivery outcomes.
 - Provide **more funding and resources** to local community, businesses and schools.
 - Front Desk **personnel in outpatient facilities need to be skilled** in many different areas, Finance, database entry, HIPAA, sensitivity, customer service and bilingual languages.
 - Roles needed for improving **chronic disease management in primary care** but hard to recruit nurses to these roles
 - **Shortage is both acute and appears to extend well into the future** as current professionals retire.
 - We talk a lot about technology needs but I believe that most healthcare workers are very proficient with their smart phones, so the greater need is the **healthcare sectors catching up with the technology curve and instituting the technology**
 - With professions like dentistry in Florida - there is no shortage of dentists. It's **maldistribution**. New providers are no more likely to go to areas where dentists are in demand than a dentist without sufficient funding.
 - I am aware of these emerging occupations through my professional service at the national level, so I am not aware of healthcare providers within Florida utilizing many of the emerging occupations that I listed.
-

Appendix B: Glossary of Emerging or Evolving Occupations

Healthcare Executive Roles listed separately from [page 40](#)

Applied Clinical Informaticist

See Clinical Health Informatics Business Specialists

Behavioral Health Specialist

Identifies, triages, and manages patients as part of a primary care team; provides skill training through psychoeducation and patient education strategies. Develops specific behavioral change plans for patients and behavioral health protocols for target populations.

Bioinformatics⁴⁹

An emerging, rapidly expanding scientific discipline that addresses problems related to the collection, processing, analysis, and retrieval of data on the structure and function of biological systems. The following fields are closely related⁵⁰:

- **Cheminformatics:** Transform data into information into knowledge to make good decisions faster in the field of drug lead identification and optimization.
- **Comparative genomics:** The study of the human genome by comparisons with model organisms
- **Computational Biology:** To study biological, behavioral, and social systems through the application of theoretical methods, mathematical modeling, and computational techniques
- **Genomics:** To analyze the entire genome of a species.
- **Mathematical Biology:** To tackle biological problems with theoretical methods
- **Pharmacoinformatics:** To study the aspects of bioinformatics dealing with drug discovery.
- **Medical informatics/ biomedical informatics:** An interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving, and decision making, motivated by efforts to improve human health.
- **Pharmacogenetics:** To study how the actions of and reactions to pharmaceuticals vary with the patient's genes
- **Pharmacogenomics:** To predict the effect of a drug individual patients (drug targeting)
- **Proteomics:** To study structure, location, and function of protein and identification and classification of all proteins that is involved in a cell, tissue, organ that can be studied in order to provide accurate and comprehensive data about that system.

Bioinformatician

Bioinformaticist

Bioinformatics Analyst/Scientist/Specialist

Conducts research using computational methods and scientific reasoning to predict the structure and function of newly discovered protein sequences. Designs and develops tools (e.g. databases, programs and algorithms) to analyze genomic data.

Care Coordinator

Helps patients manage their care by deliberately connecting them to needed doctors, specialists and other medical resources (i.e. nutritionists, social workers etc.). They often keep track of

medications, diet, and exercise. Registered Nurses or Advanced Practice Registered Nurses who have completed evidence based training.

Certified Chiropractic Physician’s Assistant

Works under the indirect supervision of a chiropractic physician or physicians and conducts initial examinations, case history discussions, and therapeutic procedures (except manipulations and adjustments) as a licensed graduate of an approved program.

Certified Medical Assistant

Credentialed medical assistant (CMA) that must graduate from an accredited post-secondary program and is recertified in five year intervals. Clinical competencies for the CMA include patient care, specimen collection (including venipuncture) and diagnostic testing (electrocardiography, respiratory testing, and Clinical Laboratory Improvement Amendments (CLIA) waived tests – urine, blood, chemistry, immunology, and microbiology). The CMA curriculum also includes topics to prepare the CMA to serve as the communication liaison between the clinician and patient.

Clinical Documentation Specialist

Applies a blend of knowledge from anatomy and physiology, pathophysiology, and pharmacology; knowledge of official medical coding guidelines, healthcare finance to analyze and benchmark clinical documentation program performance. Works with large hospitals and healthcare facilities to help maintain proper records, as well as provide primary healthcare providers with easy access to any needed documents.

Clinical Health Informatics Business Specialists

Clinical Informaticist

Applied Clinical Informaticist

Operational Informatics

Applies informatics and information technology to healthcare services delivery; combining the skills of a registered nurse with IT technician, and assist clinical staff with IT systems, data interpretation, and patient records management.

Clinical informatics includes a wide range of topics from clinical decision support to visual images (e.g. radiological, pathological, dermatological, ophthalmological, etc.); from clinical documentation to provider order entry systems; and from system design to system implementation and adoption issues.

Community Dental Health Coordinator

Enables people in underserved communities to manage their oral health by focusing on oral health education and disease prevention. CDHCs are typically recruited from the same types of communities in which they will serve, often the actual communities in which they grew up. This all but eliminates cultural, language, and other barriers that might otherwise reduce their effectiveness. Their connections to the communities help establish trust and make them role models. When disease requires treatment, the CDHC can link patients with dentists who can provide that treatment, and can help obtain other services—such as childcare or transportation—that patients may need in order to receive care.

Community Health Advisor/Advocate/Representative/Worker

Lay Health Worker

Patient Outreach Worker

Peer Advisor/ Peer Health Educator

Promotores de Salud

Facilitates access to services and improve the quality and cultural competence of service delivery via this frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community.

Community Paramedic

Fills a gap in rural areas that either have limited primary care services or lack them entirely (or long travel times to nearest facility) by providing care for patients at home or in other non-urgent settings outside of a hospital under the supervision of a physician or advanced practice provider. Community paramedics also serve in urban areas by ensuring health needs are met by other means for those patients who would frequently seek care in the emergency care system.

Cybersecurity Specialist⁵¹

Detects and protects computer systems (hardware, software, peripherals, and mobile devices) and data from vulnerabilities from malicious access with intent to destroy, steal, or threaten sensitive information, or disrupt service delivery. A credential is available (CISSP) but healthcare professionals must also have skills relevant to healthcare (e.g. GAAP, HIPAA, and HITECH).

Electronic Health Records (EHR) Analyst

Analyzes patient care information in the Electronic Health Record (EHR) and works collaboratively to resolve identified problems and facilitate corrections to the EHR. Provides end-user training and develops documentation in HIM Section. Assists with EHR compliance with Joint Commission and all levels of regulatory guidelines.

Exercise Physiologist

Creates exercise and wellness programs for individuals with chronic disease in locations varying from health/sports medicine clinics to hospital to corporate wellness programs.

Genetics Counselor

Helps patients to understand how their genomic variation affects their health and family planning, by explaining what testing may or may not reveal. The role combines biology with psychology.

Health & Wellness Coordinator

Supports the overall direction and development of the Health and Wellness programs for employees, including incentive/motivational programs. Conducts health promotion activities including seminars, lectures, and workshops addressing a variety of health and wellness topics including nutritional topics, time and stress management, and relaxation techniques. Facilitates fitness assessments and orientations to gym equipment, providing personal training, nutritional advice, and workout plans.

Health Coach/Concierge

Motivates patients to achieve their health goals through lifestyle and behavior changes.

Health Data Analyst

Collects, analyzes, and interprets health care quality data to support quality improvement initiatives and regulatory reporting requirements.

Health Educator

Provides and manages health education programs that help individuals, families, and their communities maximize and maintain healthy lifestyles. Collects and analyzes data to identify

community needs prior to planning, implementing, monitoring, and evaluating programs designed to encourage healthy lifestyles, policies, and environments. May serve as resource to assist individuals, other health professionals, or the community, and may administer fiscal resources for health education programs.

Health Informaticist

Health Informatics Analyst

Designs and develops information systems and applications that improve quality, effectiveness, and efficiency of health care services delivery, management, and planning.

Health Information Technician

See Medical Coder

Health Planner

Appraises the health needs of certain populations and communities, analyze and evaluate programs and policies, and use this information to develop plans to carry out public health objectives. May conduct research projects and investigative studies, compile and document data and information, and develop recommendations and reports related to certain issues.

Health Promotions Manager/Specialist

Plans and implements evidence-based health promotion strategies and initiatives. Works with health promotion and informatics team to assess population-based priorities and strategies; analyze, determine and communicate priority needs; and ensure the development and implementation of measurable and practical strategies. Foster local partnerships to engage key decision-makers and generate sustainable outcomes.

Lay Health Worker

See Community Health Advisor

Managed Care- Pharmacist⁵²

Ensures that medications are used appropriately to improve patient health. In addition to distributing and dispensing drugs, this pharmacist also has a role in patient safety initiatives, clinical program development, communications with patients and prescribers, drug benefit plan design, and business and cost management.

Medical Coder (ICD-10)

Medical Records and Health Information Technician

Health Information Technician

Reviews medical records and assigns the latest codes to diagnoses and procedures so facilities can bill payers and receive correct reimbursements.

Medical Scribe

Charts encounters between medical practitioners and patients in real-time and organizes the healthcare data to maximize the efficiency and productivity of clinical care.

Medical Laboratory Technologist

Conduct tests and procedures ordered by healthcare personnel, but the lab tests and procedures tend to be more complicated than the ones medical technicians perform. They also have a tendency to specialize and work in places like blood banks and microbiology labs.

Medical Physicist

Consults with physicians colleagues in radiation oncology and nuclear medicine departments to plan treatments patient treatments and accurately measure radiation output from radiation sources. Investigates related equipment performance and quality control in imaging systems, designs radiation installations and control of radiation hazards. Assists with development of new instrumentation and technology for use in diagnostic radiology including: magnetic and electro-optical storage devices for the manipulation of x-ray images, quantitative analysis of both static and dynamic images using digital computer techniques, radiation methods for the analysis of tissue, and CT and MRI.

Mental Health Specialist

See Behavioral Health Specialist

Molecular Biology Technologist

Conducts experiments using specialized equipment, analyze data, and record results. This technologist must have experience in general molecular biology techniques including DNA/RNA extraction, modification, polymerase chain reaction (PCR), high throughput automation of RNA and DNA, transformation, clone selection, and propagation.

Operational Informatics

See Clinical Health Informatics Business Specialists

Patient Access Representative (Front Desk Representative)

Enrolls new patients and provides information about the facility and its policies. Is the first administrative point of contact with the facility, and processes information for admission, transition, and insurance billing.

Patient Advocate/Liaison

Facilitates patient and family health and treatment activities between all involved parties (facilities, insurance companies, etc.). They serve as an information resource and work in partnership the healthcare organization with the community. They are usually (but not always) a licensed clinical professional and often focus on specific populations and diagnoses.

Patient Engagement Officer

Facilitates the inclusion of patients in the development of new products and services.

Patient Experience Coordinator

Works to improve patient satisfaction by improving interactions with patients and potential patients, including access to online tools, records, and other information (Also see Chief Experience Officer).

Patient Navigator

See Patient Advocate

Patient Outreach Worker

See Community Health Advisor

Patient Representative

See Patient Advocate

Patient Care Technician/Primary Care Technician

Works remotely, under the online supervision of primary care physicians or nurse practitioners (NPs), and trained and equipped to manage stable chronic disease patients, treat minor illnesses and injuries, and provide basic preventive services. **Suggested** to employ a community recruitment model (See community health workers and community dental health coordinator) and deployed in underserved neighborhoods and communities to reduce emergency room usage, decrease preventable hospitalizations, and in the end, delay disease progression and complexity.

Peer Advisor/ Peer Health Educator

See Community Health Advisor

Physician Liaison

Physician Representative

Physician Relations Manager

Develops the relationship and maintain communications between physicians and the healthcare organization/healthcare system to maintain and grow the patient base.

Promotores de Salud

See Community Health Advisor

Revenue Cycle Analyst/Coordinator

Works closely with different functional units (including billing, charge capture, coding, edit/denial management, and/or self-pay management) and analyzes data to assist revenue cycle leaders in revenue management. Captures key performance indicators and other suggestions for improvement and decision support.

Rural Health Care Coordinator

Provides care coordination services while compensating for the challenges of the rural communities (long travel distances, low health literacy, limited food and pharmacy options, unmet healthcare needs etc.). Also see Care Coordinator.

Transitional Care Coordinator

Helps patients move through different levels and types of care at different facilities, ensures that doctors, therapists and other caregivers have the information necessary to deliver care to the patient. Some programs have care transition teams that pair a nurse with a social worker, while others recruit a nurse who also has a social work degree. *The New York Academy of Medicine recommends that care transition coordinators have at least a bachelor's degree in nursing, gerontology, public health, or social work. Alternatively, a coordinator could have a bachelor's degree in psychology, sociology or a related field and two years' experience in public or private social service, preferably in a health-care setting. Advanced degrees, such as a registered nurse or a master's degree in social work, are also desirable.*

Telehealth-trained physician, nurse practitioner/physician assistant/physical therapist, or registered nurse

Trained in skills to correctly diagnose, treat and consult with patients, and provide sustained care, using interactive technologies within their respective scope of practice.

Glossary of Evolving Healthcare Executive Roles

Chief Clinical Transformation Officer

Acts as the administrative leader across a broad range of transformation initiatives, and often shares joint responsibility for clinical transformation with a high-profile physician leader.

Chief Data [Analytics] Officer

Manages data and leverages analytics tools to improve care, enhance profitability, increase engagement, and focus research—the ideal CDO has both industry expertise and a decade or more of experience in data analytics.

Chief Experience Officer/ VP or Director Patient Experience

Responsible for the strategy guiding the “user experience” of the organization, including the user interface design of products and services and might include oversight of communications with the organization and its various stakeholders such as: marketing communications, community relations, internal/HR relations, investor relations. This officer has ultimate responsibility for executing the patient experience mission to ensure positive interactions, improve patient satisfaction, and improve metrics such as CMS Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey.

Chief Health Information Officer

Similar to the Chief Data Officer, the CHIO tackles the interoperability problem between the different information systems enterprise-wide and centralizes control of the data to leverage the information for population health initiatives and improved health outcomes.

Chief Medical Informatics Officer/Director of Medical/Health Informatics

Serves as the link between medical and IT departments at a health care organization.

Chief Nursing Information Officer

Similar to the Chief Medical Informatics Officer, serves as liaison between informatics and clinical departments and advocates for system changes, giving nurses a voice at the senior executive level on clinical information technology initiatives.

Chief Population Health Manager

Leads the development and implementation of a health system’s population health management strategy.

Chief Strategy Officer/Director/Manager

Leads the healthcare organization in the development, execution, support, and communication of long-range strategy.

Head of Technology Innovation

Leads the team responsible for operational and strategic technology leadership in teaching and learning, business operation and information access.

VP of Brand Management

Replaces the role of VP Marketing to reflect attention to changing consumer awareness and preference for a connection with the organization’s social impact and mission. Brand (visual identity presented – logo, name, graphics - as well as the identity or associations perceived) becomes a critical aspect of the organizational strategy, cohesively leveraged for social impact. Brand management is managing the psychological associations of the organizational stakeholders.

VP of Clinical Informatics

Develops plans and strategies for assuring physician and all healthcare providers’ acceptance and ongoing use of the EMR, and supervises a staff responsible for order set design; Clinical Decision Support, EMR training, and Clinical Documentation Improvement. Working closely with the entity Clinical Informaticists, the role demands multiple skill domains including clinical operations, education, consulting, leadership, technology expertise, performance improvement, patient safety, and management.

VP of Clinical Transformation

Oversees all health system-wide value improvement activities and efforts including developing and implementing the population health plan, prioritizing the tactics and providing the leadership to ensure implementation of the plan. Investigates patient outliers and reduce number of outliers via improvements in clinical care. Reports to the Chief Clinical Transformation Officer.

VP of Cost Containment

Responsible to address cost containment issues across all operational areas including IT, claims, clinical functions (Utilization Review and Case Management), bill review, network management, and finance. The role is an important and highly visible role, both internally and externally to the healthcare organization.

VP of Medical Management

Coordinates the medical management, quality improvement, and credentialing functions for the assigned health plan based on, and in support of the company’s strategic plan.

Appendix C: References

-
- ¹ National Center for O*NET Development. (2006). *New and emerging (N&E) occupations methodology development report*. Retrieved from http://www.onetcenter.org/dl_files/NewEmerging.pdf
- ² State University System of Florida, Board of Governors. (2015). *Supply/Demand workforce gap analysis on health-related programs as part of the environmental scan of the Board of Governors' health initiatives committee*
- ³ Legg, M., & Lovelock, B. (2009). *A review of the Australian health informatics workforce*. Health Informatics Society of Australia: Melbourne, Australia.
- ⁴ American Health Information Management Association. (2005). *Embracing the future: New times, new opportunities for health information managers – Summary findings from the HIM workforce study*. Retrieved from http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_027397.hcsp?dDocName=bok1_027397
- ⁵ Burning Glass. (n.d.) *Health Informatics 2014*. Retrieved from <http://burning-glass.com/research/health-informatics-2014/>
- ⁶ Malvey, D., & Slovensky, D. J. (2014). *mHealth: Transforming healthcare*. Springer
- ⁷ National Institutes of Health. (n.d.) *About the precision medicine initiative cohort program* Retrieved from <https://www.nih.gov/precision-medicine-initiative-cohort-program>
- ⁸ Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: care, health, and cost. *Health Affairs*, 27(3), 759-769.
- ⁹ Rosenbaum, S. (2011). The Patient Protection and Affordable Care Act: implications for public health policy and practice. *Public Health Reports*, 126(1), 130–135. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3001814/>
- ¹⁰ Rupp, S. (2014). What is patient engagement: health IT leaders define the term. *Electronic Health Reporter*. Retrieved from <http://electronichealthreporter.com/what-is-patient-engagement-health-it-leaders-define-the-term/>
- ¹¹ The Institute for Health Care Consumerism. (n.d.). *Health care consumerism and the chief engagement officer: a powerful combination*. Retrieved from http://www.theihcc.com/en/communities/employee_communication_education/health-care-consumerism-and-the-chief-engagement-o_hnnk253y.html
- ¹² American Public Health Association. (n.d.) *Community Health Workers* Retrieved from <https://www.apha.org/apha-communities/member-sections/community-health-workers>
- ¹³ Brooks, B. A., Davis, S., Kulbok, P., Frank-Lightfoot, L., Sgarlata, L., & Poree, S. (2015). Aligning provider team members with polyvalent community health workers. *Nursing administration quarterly*, 39(3), 211-217.

-
- ¹⁴ Commission for Case Manager Certification. (n.d.). Care Coordination: case managers “connect the dots” in new delivery models. *CCMC Issue Brief* Vol 1. Issue 2. Retrieved from <https://ccmcertification.org/sites/default/files/downloads/2011/4.%20Care%20coordination,%20case%20managers%20connect%20the%20dots%20-%20volume%201,%20issue%202.pdf>
- ¹⁵ American Nurses Association. (2012). *The value of nursing care coordination* Retrieved from <http://www.nursingworld.org/carecoordinationwhitepaper>
- ¹⁶ Myers, C. (n.d.). What is a care transition coordinator? *Houston Chronicle* Retrieved from <http://work.chron.com/care-transition-coordinator-30984.html>
- ¹⁷ Scribe America. (n.d.). *What is a medical scribe?* Retrieved from http://www.scribeamerica.com/what_is_medical_scribe.html
- ¹⁸ Association of Clinical Documentation Specialists. (n.d.). *About the certified clinical documentation specialist (CCDS) credential.* Retrieved from <http://www.hcpro.com/acdis/certification.cfm>
- ¹⁹ American Medical Informatics Association. (n.d.). *Clinical informatics.* Retrieved from <https://www.amia.org/applications-informatics/clinical-informatics>
- ²⁰ Burning Glass. (n.d.) *Job Market Intelligence: Cybersecurity Jobs, 2015.* Retrieved from http://burning-glass.com/wp-content/uploads/Cybersecurity_Jobs_Report_2015.pdf
- ²¹ U.S. Department of Labor Bureau of Labor Statistics. (n.d.). *Occupational employment and wages May 2015 21-1091 Health Educators.* Retrieved from <http://www.bls.gov/oes/current/oes211091.htm>
- ²² Balasa, D. A. (2008). New roles for the certified medical assistant to enhance quality and effectiveness of care. *Medical Practice Management*, 1-3. Retrieved from <http://www.aama-ntl.org/docs/default-source/legal/jmpm-new-roles-cma.pdf?sfvrsn=2>
- ²³ American Association of Physicists in Medicine. (n.d.) *Medical Physicist.* Retrieved from https://www.aapm.org/medical_physicist/
- ²⁴ Society for Human Resource Management (n.d). *Behavioral Health Specialist.* Retrieved from https://www.shrm.org/templatestools/samples/jobdescriptions/pages/cms_010205.aspx#sthash.Rb6ejnQf.dpuf
- ²⁵ Biotech Careers. (n.d.). *Molecular Biology Technician.* Retrieved from <http://biotech-careers.org/job/molecular-biology-technician>
- ²⁶ The Beryl Institute. (n.d.) *Patient advocate: a critical role in patient experience.* Retrieved from https://c.ymcdn.com/sites/theberylinstitute.site-ym.com/resource/resmgr/White_Paper_Exec_Summ/Executive_Summary_-_PAC_Whit.pdf
- ²⁷ Wicklund, E. (2016). Patient experience officers on the rise. *mHealth News* Retrieved from <http://www.mhealthnews.com/news/patient-experience-officers-rise?single-page=true>

-
- ²⁸ American Association of Physician Liaisons. (n.d.) *FAQs* Retrieved from <http://www.physicianliaison.com/FAQs>
- ²⁹ Florida Board of Chiropractic Medicine. (2014). *Certified chiropractic physician's assistant* Retrieved from <http://floridaschiropracticmedicine.gov/licensing/certified-chiropractic-physicians-assistant/>
- ³⁰ American Dental Association. (n.d.) *About Community Dental Health Coordinators*. Retrieved from <http://www.ada.org/en/public-programs/action-for-dental-health/community-dental-health-coordinators>
- ³¹ Pearson, K. B., Gale, J. A., & Shaler, G. (2014). *Community Paramedicine in rural areas: State and local findings and the role of the state Flex program*. Retrieved from <https://www.naemt.org/Files/MobileIntegratedHC/CP%20Policy%20Brief.pdf>
- ³² U.S. Department of Health and Human Services, Health Resources and Services Administration, Office of Rural Health Policy. (2012). *Community Paramedicine Evaluation Tool*. Retrieved from <http://www.hrsa.gov/ruralhealth/pdf/paramedicevaltool.pdf>
- ³³ U.S. Department of Labor Bureau of Labor Statistics. (n.d.). *Occupational outlook handbook. Genetic Counselors*. Retrieved from <http://www.bls.gov/ooh/healthcare/genetic-counselors.htm>
- ³⁴ Eisenstein, M. (2015). Genetics: Fluent in DNA. *Nature*, 526(7571), 151-152. News Retrieved from <http://www.nature.com/naturejobs/science/articles/10.1038/nj7571-151a>
- ³⁵ Kellermann AL, Saultz JW, Mehrotra A, Jones SS, Dalal S. (2013). Primary care technicians: a solution to the primary care workforce gap. *Health Affairs* (Millwood). 2013;32(11):1893-98
- ³⁶ Rural Health Information Hub. (n.d.) *Barriers to care coordination in rural areas*. Retrieved from <https://www.ruralhealthinfo.org/community-health/care-coordination/1/barriers-in-rural-areas>
- ³⁷ AMN Healthcare. (n.d.) *Emerging roles in healthcare 2014*. Retrieved from http://www.amnhealthcare.com/uploadedFiles/MainSite/Content/Workforce_Solutions/Survey-Emerging-Roles-in-Healthcare-2014.pdf
- ³⁸ Information Week Healthcare. (2014). *CDOs: right for healthcare C-suite?* Retrieved from <http://www.informationweek.com/healthcare/leadership/cdos-right-for-healthcare-c-suite/d/d-id/1317830>
- ³⁹ Rice, S. (2014). How a hospital's chief experience officer tackles barriers to better quality. *Modern Healthcare*. Retrieved from <http://www.modernhealthcare.com/article/20141213/MAGAZINE/312139987>
- ⁴⁰ Sullivan, T. (2015). Will CHIOs become more common? *Healthcare IT News*. Retrieved from <http://www.healthcareitnews.com/news/will-chios-become-more-common>
- ⁴¹ Advisory Board Company. (2014). *The Emerging Role of the Chief Nursing Information Officer* Retrieved from <https://www.advisory.com/es-es/international/research/global-ehealth-executive-council/research-notes/2014/the-emerging-role-of-the-chief-nursing-information-officer>

-
- ⁴² Sherman, R. (2014). C-Suite competencies in an era of health reform. *Emerging RN Leader* Retrieved from <http://www.emergingrnleader.com/c-suite-competencies-era-health-reform/>
- ⁴³ Kylander, N., & Stone, C. (2012). The role of brand in the nonprofit sector. *SSIR* Spring 2012. Retrieved from http://ssir.org/articles/entry/the_role_of_brand_in_the_nonprofit_sector
- ⁴⁴ Health Research & Educational Trust. (2014). Building a leadership team for the health care organization of the future. Chicago, IL: Health Research & Educational Trust. Retrieved from <https://www.spencerstuart.com/~media/pdf%20files/research%20and%20insight%20pdfs/healthcareleadershipteamaha-13aug2014.pdf>
- ⁴⁵ Joint Review Committee on Educational Programs in Nuclear Medicine Technology. (2010). *Accreditation standards for nuclear medicine technologist education (October 2014 update)*. Retrieved from http://jrcnmt.org/sites/jrcnmt/uploads/documents/Accred_Policy_Documents/Final_Standards_rev10_2014.pdf
- ⁴⁶ Council on Academic Accreditation in Audiology and Speech-Language Pathology. (2014). *Standards for accreditation of graduate education programs in audiology and speech-language pathology (2008, revised 2014)*. Retrieved from <http://caa.asha.org/wp-content/uploads/Accreditation-Standards-for-Graduate-Programs.pdf>
- ⁴⁷ Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). (n.d.) *Health Informatics 2010 Master's Degree Standards and Interpretations for Accreditation of Master's Degree Programs in Health Informatics* Retrieved from http://www.cahiim.org/documents/2012_HI_Masters_Stndrds.pdf
- ⁴⁸ Bodenheimer, T., & Sinsky, C. (2014). From *Triple to Quadruple Aim: Care of the patient requires care of the provider*. *Annals of Family Medicine*, 12(6), 573-576.
- ⁴⁹ American Medical Informatics Association. (n.d.) *The science of informatics*. Retrieved from <https://www.amia.org/about-amia/science-informatics>
- ⁵⁰ Safdar, M. (2010). *Bioinformaticist-vs-Bioinformatician-Definition-Differences-and-Career-Outlook*. Retrieved from <http://www.biotecharticles.com/Bioinformatics-Article/Bioinformaticist-vs-Bioinformatician-Definition-Differences-and-Career-Outlook-215.html>
- ⁵¹ Landi, H. (2015). Healthcare industry faces shortage in experienced cybersecurity experts. *Healthcare Informatics*. Retrieved from <http://www.healthcare-informatics.com/news-item/healthcare-industry-faces-shortage-experienced-cybersecurity-experts>
- ⁵² Academy of Managed Care Pharmacy. (2013). *Roles of pharmacists in managed health care organizations*. Retrieved from http://www.amcp.org/professional_development/student_pharmacists/role_of_pharmacists/
-



Realizing the health industry workforce needs of today and tomorrow.

For more information, visit our website

www.FLHealthcareWorkforce.org

or contact:

Mary Lou Brunell, Executive Director, Florida Center for Nursing

MaryLou.Brunell@ucf.edu | 407.823.0980

Karin Kazimi, Project Director

Karin@FLHealthcareWorkfore.org | 407.823.1138