

mHealth Task Force

FINDINGS AND RECOMMENDATIONS

*Improving care delivery through enhanced communications
among providers, patients, and payers*

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Executive Summary

In June 2012 Federal Communications Commission (FCC) Chairman Julius Genachowski assembled a group of the nation's leading wireless healthcare technology experts from industry, government, and academia for a summit on mHealth.ⁱ The goal was to assess the opportunities and challenges facing the adoption of wireless health technologies.

The outcome of this event was the creation of a Task Force by the participants to develop concrete recommendations to accelerate the adoption of mHealth technologies. Chairman Genachowski asked Dr. Julian Goldman of CIMIT/MGH/Partners HealthCare, Robert Jarrin of Qualcomm Incorporated, and Douglas Trauner of Health Analytic Services, Inc. (TheCarrot.com), to volunteer to lead this effort.

Over the summer of 2012, the mHealth Task Force set its priorities and conducted extensive industry outreach, while adding members along the way. Throughout this process, the Co-chairs held numerous working group meetings, created a shared online collaboration environment, and interviewed many stakeholders across the spectrum of healthcare, health IT, and communications.

While mHealth traditionally stands for "mobile health," this Task Force adopted the term more broadly to refer to mobile health, wireless health, and e-Care technologies that improve patient care and the efficiency of healthcare delivery.ⁱⁱ

This Task Force report sets goals and recommendations for the FCC, other federal agencies, and industry to help leverage communication technologies to improve healthcare quality, access and efficiency.

This report is delivered with the overarching goal that by 2017 mHealth, wireless health and e-Care solutions will be routinely available as part of best practices for medical care. FCC leadership as well as interagency collaborations will be needed to address technical and policy barriers, including developing appropriate reimbursement and financial incentives.

The report recommendations are organized within the following five goals:

- Goal 1:** FCC should continue to play a leadership role in advancing mobile health adoption.
- Goal 2:** Federal agencies should increase collaboration to promote innovation, protect patient safety, and avoid regulatory duplication.
- Goal 3:** The FCC should build on existing programs and link programs when possible in order to expand broadband access for healthcare.
- Goal 4:** The FCC should continue efforts to increase capacity, reliability, interoperability, and RF safety of mHealth technologies.
- Goal 5:** Industry should support continued investment, innovation, and job creation in the growing mobile health sector.

Introduction

Healthcare delivery is at a critical juncture in the U.S. both in terms of quality and cost. The U.S. ranks 37th in the world for healthcare system performance,ⁱⁱⁱ yet spends more on healthcare per capita and more on healthcare as percentage of its GDP than any other nation.^{iv} The Institute of Medicine recently reported that the total waste in the healthcare system could be as high as \$765 billion annually and studies have estimated that there are over 75,000 preventable deaths per year.^v The report goes on to describe how advances in mobile communications have dramatically changed numerous sectors of the U.S. economy, and even society more broadly.

The U.S. is currently transitioning from paper-based health records to Electronic Health Records (EHRs) and secure healthcare communications technologies. In parallel, mobile health technology is playing an increasing role in providing access to quality care for all Americans. Access and availability of high capacity wired and wireless telecommunications services are critical to the success of an improved healthcare delivery system.

mHealth can improve patient care and create cost savings by capturing information for providers and allow them to rapidly analyze large amounts of information to better understand a person's health trends over time. mHealth also offers the promise of giving patients easier access to their health information, and it allows the mining of data to improve cost transparency, increasing efficiencies across the continuum of care, and enabling more accurate diagnosis and treatment.

Specific examples of mHealth (including wireless health and e-Care solutions) include:

- Medical devices that act as remote patient monitors used in clinical, home, mobile, and other environments.
- Mobile medical and general health software applications that allow patients to upload or download health information at any time.
- Medical body area network sensors that capture and wirelessly forward physiological data for further analysis.
- Medical implant devices that allow neuromuscular microstimulation techniques to restore sensation, mobility, and other functions to paralyzed limbs and organs.
- Medical device data systems that allow for the transfer, storage, conversion, or display of medical data through wired or wireless hubs, smartphones, or broadband enabled products.
- Mobile diagnostic imaging applications that allow doctors the flexibility to send or review medical images from virtually anyplace, and at any time.
- Patient care portals that can be accessed anywhere for self-reporting and self-management.

- Accessible clinical decision support tools that allow doctors to help patients in real time with diagnosis, treatment options and necessary medical calculations at the point of care.
- Broadband enabled health information technology infrastructure that allows healthcare providers to share rich electronic health information with other providers regardless of their provider organization and geographic area.

Surveys show that doctors view mobile health favorably. According to a report, 40% of physicians surveyed said they could eliminate 11% to 30% of office visits through the use of mobile health technologies like remote monitoring and that such shifts could rewrite physician supply and shortage forecasts for the next decade and beyond.

Studies support positive findings for improved care-coordination. For example the Department of Veterans Affairs has carried out and studied a national home telehealth program that involves the systematic implementation of health informatics, home telehealth, and disease management technologies. The VA found that implementing telehealth to coordinate patient care demonstrated a 25% reduction in number of bed days of care, 19% reduction in number of hospital admissions, mean satisfaction score rating of 86% after enrolment into the program and substantially less cost per annum per patient. However, obstacles continue to exist.^{vi}

The Task Force identified several major barriers to broad adoption and innovation of wireless health technology, including:

- **Lack of access to fixed and mobile broadband coverage for providers and patients, particularly in rural areas.**
- **Future bandwidth constraints brought on by increased overall usage as well as data intensive medical applications.**
- **Patient safety, privacy, and interoperability issues between healthcare solutions.**
- **Reimbursement regulations and policies that do not incentivize the adoption of mHealth solutions.**
- **The broadband adoption gap for both fixed and mobile broadband services.**
- **The absence of secure messaging between health information systems.**

The Task Force addresses these barriers in this report.

The FCC plays an essential role in enabling new healthcare technologies that rely on wireless communications and broadband connectivity. Since the publication of the National Broadband Plan in 2010, the FCC has moved forward with many of the healthcare section's important recommendations, such as a partnership with the Food and Drug Administration, dedicating spectrum for Medical Micropower Networks, and setting precedent as the first agency in the world to allocate spectrum for Medical Body Area Network, or MBAN, devices.

Modernizing the healthcare ecosystem is a national priority that requires close collaboration and prioritization among all stakeholders, particularly with federal agencies within the Department of Health and Human Services (HHS)^{vii}, the Veterans Administration (VA), the National Science Foundation (NSF), the National Institutes of Health (NIH), the Department of Defense (DoD), the Department of Commerce (DoC), the United States Department of Agriculture (USDA), and the National Institute of Standards and Technology (NIST). Such collaboration is critical to reducing the barriers for adoption and the ongoing success of innovative healthcare solutions such as mHealth, wireless health, and e-Care.

The following recommendations are a result of the collective efforts of the mHealth Task Force and reflect the need to facilitate e-Care solutions including, but not limited to "mobile Health."

mHealth Task Force Recommendations

Goal 1: FCC should continue to play a leadership role in advancing mobile health adoption.

1.1. The FCC should fill the open position for FCC Healthcare Director.

The FCC should appoint a Healthcare Director responsible for supporting the regulatory needs of the healthcare technology sector and working toward the goal of improving healthcare delivery. This office should provide a single point of contact for addressing healthcare related barriers and opportunities. The Healthcare Director should serve as an important liaison with other federal agencies and should schedule regular meetings with HHS and other federal stakeholders to field questions and discuss identified barriers and gaps.

The members of the mHealth Task Force should be contacted if and when the position is posted and assist the FCC in conducting outreach to attract talented applicants.

1.2. The FCC and other agencies should improve educational outreach activities to healthcare organizations.

Many non-profit healthcare foundations, research institutions and small companies are unfamiliar with the processes and legal procedures that must be followed to revise the Code of Federal Regulations in order to introduce innovative technologies.

The FCC and other agencies should highlight available resources to help non-traditional constituents most effectively work with those agencies. This should include an easy to navigate set of educational materials on the FCC's website designed for an average consumer. Administrative rules and procedures should be reviewed with the goals of ease of use, logical processes, and flexibility.

1.3. The FCC should develop and launch a healthcare website.

The FCC should have a section under the FCC public website dedicated to healthcare, wireless health, health IT nomenclature (*see also: 2.6*), medical spectrum, and the National Broadband Plan (NBP) Chapter 10 on healthcare. The section on Chapter 10 of the NBP should provide status updates to track FCC's efforts to implement the various recommendations. This site should profile the FCC's ongoing work and efforts in those related fields.

This proposed FCC health website should also include links to other federal healthcare websites, initiatives and policies related to mobile health and serve as a clearinghouse for the public and industry. Additionally, this website should include the various efforts and projects FCC is undertaking with other federal entities to address healthcare barriers.

1.4. The FCC should continue to seek public input and further its engagement with the mHealth Task Force.

The mHealth Task Force has identified several opportunities and barriers to mHealth adoption with actionable recommendations for the FCC and other agencies. The FCC should continue working with the Task Force to build upon its initial findings. Examples of further collaboration include:

- Establish the mHealth Task Force as a formal interagency external working group.
- Seek additional input from the private sector through engagement with public private partnership initiatives established by the NIH and FDA.

Goal 2: Federal agencies should increase collaboration to promote innovation, protect patient safety, and avoid regulatory duplication.

2.1. The Secretary of HHS should convene a formal working group as permitted under the FDA Safety and Innovation Act (FDASIA) of 2012.

Under Section 618 of the 2012 FDA Safety and Innovation Act, the Secretary of HHS acting through FDA, ONC, and FCC, shall post on the web sites of those agencies a report that contains strategy and recommendations on health IT including mobile medical applications.

The Act allows the Secretary of HHS to convene a working group of external stakeholders and experts to provide appropriate input. FDA, ONC, and FCC should encourage the Secretary to convene the working group and leverage the findings and recommendations of the mHealth Task Force.

2.2. FCC and FDA should continue to accelerate their ongoing collaboration and provide regulatory clarity on overlapping issues.

The FCC and FDA signed a joint Memorandum of Understanding (MoU) in 2010 to improve the efficiency of wireless medical device regulation. Since then, the agencies have worked together in a variety of ways to implement the MoU and advance mobile health, including engaging the public through a workshop in late July 2010. The FCC and FDA should continue to seek more public engagement with their ongoing efforts related to converged medical devices. The agencies should also move quickly on specific actions, including:

- Continuing to provide expertise on converged medical devices (Example: FCC's involvement in finalizing FDA's 2007 Draft Radio-Frequency Wireless Technology in Medical Devices guidance document).
- Extending the work initiated under the NBP (Example: the agencies should jointly develop and deliver an update to the work performed in furtherance of the healthcare recommendations in the NBP).

2.3. FCC, ONC, and CMS should seek a closer collaboration related to ongoing health IT and information exchange efforts.

The FCC should be consulted and be invited to have representation during ongoing rulemaking efforts, including ONC federal advisory committee meetings, related to the Medicare and Medicaid EHR incentive program and the development of standards and certification criteria for EHR technologies.

As demonstrated in the CMS Final Rule for Stage 2 of the EHR Incentive Payment Program, some healthcare providers may qualify for exclusion of a measure if they lack a certain threshold of broadband capacity.

To set the threshold, CMS used the FCC's 3 Mbps threshold as criteria for excluding eligible medical providers from meeting certain requirements, based on a number of patient encounters in counties that do not meet a percentage of housing units with 3 Mbps broadband capacity.^{viii}

The FCC may play a helpful role in framing this or other healthcare provider exclusions based on broadband availability by sharing information on broadband access with ONC and CMS.

Furthermore, FCC, ONC, and CMS should share data on providers that qualify for exemptions with the goal of improving broadband coverage. As CMS continues the rulemaking process for the EHR Incentive Payment Program, the agencies should proactively identify opportunities.

2.4. The FCC and CMS should seek to share and acquire more data from each other on the broadband needs of healthcare providers as well as other health related services.

FCC and CMS should explore how to share data on rural healthcare providers that lack broadband connectivity.

Shared information on broadband could help both agencies to jointly develop creative programs that target medical shortage areas. The agencies should then focus outreach in identified areas to inform eligible entities about the availability of program funds and seek to simplify the application process for interested entities.

An Example: Presently the CMS, through its Center for Medicare and Medicaid Innovation (CMMI), is looking to transform Medicare, Medicaid, and the Children's Health Insurance Program (CHIP) through non-traditional programs and model projects that may include the use of health IT. The FCC should coordinate with CMS and the CMMI on how programs can be leveraged to fund broadband services for connectivity (FCC) and funding for mHealth solutions (CMMI) which can serve to test innovative health IT incentives or reimbursement mechanisms for mHealth, wireless health, and e-Care solutions.

2.5. The FCC should explore how to share specific health data between federal agencies to improve population health.

The FCC, USDA, DoC, and HHS should explore how best to utilize wireless coverage data, census data, and health data statistics to develop solutions that improve access and services for rural, suburban, and urban populations alike. The agencies should utilize existing data to determine if areas with poor connectivity also experience poorer health outcomes. Shared information can help federal agencies identify available programs and funding for underserved populations and locations. Other agencies that should collaborate include NIH, HRSA, AHRQ, CDC, and the US Census Bureau.

Additionally, FCC, USDA, DoC, and HHS should work together to audit and verify the data reported on the National Broadband Map. This information is increasingly important as eligible providers seek to achieve the meaningful use of certified EHRs and future patient engagement requirements.

2.6. The FCC and other agencies should standardize health technology nomenclature across federal agencies.

There is no common nomenclature for terms such as mHealth and e-Care across federal agencies (ONC, FDA, CMS, NSF, HRSA, NIH, etc.). In the NBP, the FCC provided a glossary for some popular yet undefined terms. The absence of a common nomenclature is a barrier to effective collaboration and is especially problematic when terms are used inconsistently in regulatory development and policy implementation.

Federal agencies should collaborate with the FCC to develop a common nomenclature. We recommend that once agreed upon, the glossary of common nomenclature be published online for agencies as well as the public to use as a reference. Maintenance and updating should be done through federal agency consensus and public comment process.

2.7. FCC should provide expertise and resources to ONC for the adoption of secure health messaging and communication standards.

Facilitating communication between healthcare providers and patients continues to be a challenge for improving the delivery and coordination of care. Paper, mail, and fax continue to be the predominant means of communication among healthcare organizations, providers, and patients.

ONC (with input from other agencies like the FCC) should support the broad adoption of simple, secure, scalable, standards-based means of sending authenticated messages and encrypted health information directly to known, trusted recipients over the Internet. For example, the ONC initiated Direct Project is part of the Nationwide Health Information Network and provides standards, services, reference implementation, workgroups, models, and documentation. FCC and ONC should provide expertise and applicable resources to support existing, emerging, and future requirements.

Goal 3: The FCC should build on existing programs and link programs when possible in order to expand broadband access for healthcare.

3.1. Update the Rural Health Care Program.

3.1.1. The FCC should work to expand awareness and explore whether wireless technology can be supported in the Rural Health Care program.

The now concluded Rural Health Care Pilot Program has helped offset the cost of telecommunications, Internet access, and other advanced services for certain healthcare providers. The Commission will benefit greatly from the lessons learned and value derived from the original Pilot projects as it moves forward to reform the Rural Health Care Program.

FCC should work to expand awareness through outreach and promote the range of innovative technologies it funds to its target populations. The FCC should continue to design the program so as to enable healthcare providers to use technology flexibly to improve the delivery of hcare. The FCC should consider new and different combinations of its programs for use by Rural Health Care Program facilities so that they may achieve sustainability over time and provide the most functionality at the lowest cost.

3.1.2. The FCC should permit consortium applications for the Rural Health Care Program.

While the traditional Rural Health Care Program permits groups of healthcare providers to apply as a consortium, a separate application is still required for each healthcare provider site. In 2006, the FCC launched the Rural Health Care Pilot program, which allows applicants to apply for the program as consortia of healthcare providers, with a single application for each consortium. The consortium approach generated many benefits, including greater efficiencies, cost savings, and telehealth applications.

As it considers various reforms to the Rural Health Care support mechanism, the FCC should allow groups of geographically dispersed sites to file a single consortium application. Such applications could yield higher bandwidth and lower prices for rural providers linking with urban care centers for improved service quality.

3.2. Modernizing the Lifeline Program for Broadband.

3.2.1. The Lifeline program should support fixed and mobile broadband services.

One-third of Americans do not have broadband at home and tens of millions of Americans do not have smartphones. In the Lifeline program, the FCC has adopted a goal of ensuring the availability of broadband service for low-income consumers.

To further that goal, the FCC should continue on its path to reform the Lifeline program, which starts with a pilot program to support fixed and mobile broadband in 2012. Enabling more Americans to have access to the Internet at home and greater mobile connectivity can facilitate engagement with healthcare providers, drive mHealth solutions, and lower costs.

3.2.2. As the Lifeline program transitions to support broadband, the FCC should add healthcare delivery as a goal for the program.

The Lifeline program has traditionally subsidized telephone service for low-income Americans. The program will launch a broadband pilot in 2012 that would subsidize broadband service (fixed and mobile) for low-income Americans. If the program transitions to support mobile broadband, the FCC should consider adding healthcare delivery as a program goal – and in fact, Lifeline currently utilizes Medicaid participation as a determinant for proving poverty level eligibility.

Mobile broadband and smartphones can enable a myriad of mHealth solutions that can help Lifeline Medicaid beneficiaries have better access to healthcare. Extending Lifeline to aim for healthcare delivery also creates an opportunity for the FCC to partner with other agencies such as HRSA, IHS, and CMS to deliver mHealth solutions to those populations that have fewer resources and experience greater health disparities.

Goal 4: The FCC should continue efforts to increase capacity, reliability, interoperability, and RF safety of mHealth technologies.

4.1. FCC should make available more licensed spectrum for mobile broadband.

Additional licensed mobile spectrum will help meet future overall spectrum demands and ensure reliable mobile broadband connectivity for spectrum-intensive healthcare services such as live video, remote monitoring, radiological imaging, and other medical applications.

FCC has identified future mobile broadband constraints and should factor into its findings spectrum-demanding healthcare data transmission including the anticipated increase of mHealth products and services.

With the anticipated increase in demand for wireless spectrum, the FCC should evaluate implementation plans to accommodate additional wireless use projections.

4.2. FCC should work with international counterparts to allocate and when needed, harmonize spectrum for services, such as MedRadio.

The U. S. is the first country in the world to allocate spectrum for Medical Body Area Networks (MBAN). FCC already has initiated discussions with Mexican regulators and other international counterparts on the need for international harmonization of MedRadio spectrum to encourage the proliferation of these services and products. Harmonization of spectrum for medical uses across international borders will both allow consumers to safely use devices across borders and provide for better economies of scale for device and radio manufacturers.

4.3. FCC should solicit input from the medical community to assess 2-5 year needs to support medical imaging and video communications given future healthcare needs, especially with regard to the Medicare and Medicaid EHR Incentive Program requirements.

Transmission of medical images (e.g. CT, PET, MRI, ultrasound, digital angiography) using disks is a barrier to efficient and effective care. Patients are burdened with requesting image disks from referring providers and mailing the files to consultants. Healthcare facilities are importing data from hundreds of thousands of patient provided image disks annually.

National IT infrastructure should accommodate current and future medical image transmission needs to enable more timely and reliable healthcare delivery. The FCC could solicit comment from the medical community, especially the American College of Radiology and American College of Cardiology to better understand the bandwidth and clinical use requirements for transmission of medical images.

4.4. FCC should encourage and lend its expertise for the creation and implementation of wireless test beds.

Testing and evaluating innovative wireless healthcare devices is complex and expensive, in part due to the scarcity of complete wireless test environments and expertise. A more effective approach to using spectrum for test-bed environments is needed. The FCC should finalize its proposal to streamline its experimental licensing program, including licensing for medical device experimentation, which will enable industry to form wireless test beds and publicly share their results. Access to FCC expertise for guidance is also necessary (e.g., beyond consultation received via the OET Laboratory Division Knowledge Database).

Specifically, we recommend that the FCC encourage and lend its expertise to the following initiatives:

- Creation of national centers with equipment, expertise, licenses, and support staff.
- Identification of tools and consensus standards to monitor and assess the performance of wireless technologies in healthcare environments.
- Easier access to spectrum or rules for healthcare that feed the quest for interoperability (e.g., separate medical spectrum with more capability, rules for more protections on critical care spectrum, emergency situations communications).
- Encouragement for innovation of technology and other tools such as standards or publications.
- Encouragement of newer technology (e.g., cognitive radio) and applications that are built on a risk management approach.

4.5. FCC should modify SAR testing requirements to account for intermittent data transfer in converged medical devices.

Medical devices which utilize intermittent data reporting capabilities (i.e., transmit infrequently) should be addressed in the upcoming RF safety proceeding. The RF exposure levels for these devices should be assessed within the context of their usage.

- 4.6. **FCC should evaluate and make recommendations to address the issues of affordable connectivity and compatibility to simplify the installation of telehealth devices in home environments with alternative services such as VoIP.**

Many medical devices have relied upon modem connections over the POTS network for inexpensive transmission of health related information. As more consumers migrate to VoIP, broadband, or wireless providers, the cost and complexity increases for installing and maintaining home health monitoring equipment.

Goal 5: Industry should support continued investment, innovation, and job creation in the growing mobile health sector.

- 5.1. **Industry should continue to develop and deploy innovative cost effective and clinically relevant mHealth and e-Care solutions.**

The passage of the HITECH Act and the Patient Protection and Affordable Care Act combined with the general availability of broadband and the adoption of user-friendly consumer electronic devices like smart phones and tablets PCs has invigorated mHealth investment and innovation.

Investment in medical devices, health sensors, and software applications that are increasingly using wireless functionality to improve healthcare access and delivery is growing at a record pace in 2012 with over \$750M in venture capital investments.^{ix}

Industry should continue to take advantage of this unprecedented convergence of medical science, communications technology, and healthcare financial reform.

- 5.2. **Industry should adopt standards-based technologies to transmit authenticated messages and encrypted health information.**

Per agency recommendation 2.7, Industry should pursue a health communication infrastructure as ubiquitous and convenient as e-mail using simple, secure, scalable, standards-based technologies.

5.3. Industry should provide access and documentation for secure and trusted application interfaces (API's) for health data service such as certified EHRs, EHR modules, and health information exchanges.

The cost, risk, and ongoing maintenance of integrating with 3rd party devices and software solutions are barriers to the investment and adoption of clinically and operationally effective health solutions. Industry (device and software vendors) should encourage trusted 3rd party health data integrations by providing access and documentation to simple, secure, scalable, standards-based API's.

5.4. Industry should seek collaborative opportunities for informal and formal private public partnerships with federal partners.

The mHealth Task Force serves as a model example of industry, academic, public, and private sector collaboration. We encourage other federal agencies to assemble relevant stakeholders for information and idea exchange.

Conclusions

The FCC plays an essential role in enabling the country's health information technologies, specifically mobile health, wireless health, and e-Care solutions. Critical to the success of an improved healthcare system is access, availability, interoperability and capacity of wired and wireless services that are defining the future delivery of healthcare.

The mHealth task force has laid out the above findings and recommendations with goals that are actionable by the FCC, other federal agencies, and industry alike. It is our intent to continue the work started by the Task Force and help improve best practices for care delivery through enhanced communication and appropriate financial incentives.

The members of the mHealth Task Force would like to thank FCC Chairman Julius Genachowski and the FCC for their openness and continued leadership in this evolving but nonetheless important area.

Endnotes

ⁱ [FCC Chairman Genachowski Hosts mHealth Summit to Foster Innovation in Wireless Health Technology: http://bit.ly/FCCmHealthSummit](http://bit.ly/FCCmHealthSummit)

ⁱⁱ The FCC National Broadband Plan defines e-Care as, “The electronic exchange of information—data, images and video—to aid in the practice of medicine and advanced analytics. Encompasses technologies that enable video consultation, remote monitoring and image transmission (“store-and-forward”) over fixed or mobile networks.” at Page 218.

ⁱⁱⁱ Measuring the Performance of the U.S. Health Care System
Christopher J.L. Murray, M.D., D.Phil., and Julio Frenk, M.D., Ph.D., M.P.H.
N Engl J Med 2010; 362:98-99 January 14, 2010

^{iv} World health statistics 2011. Geneva: World Health Organization.

^v “Best Care at Lower Cost: The Path to Continuously Learning Health Care in America”, September 2012, Mark Smith, Robert Saunders, Leigh Stuckhardt, J. Michael McGinnis, Editors; Committee on the Learning Health Care System in America; Institute of Medicine at S-8.

^{vi} Healthcare unwired, PricewaterhouseCoopers’ Health Research Institute, [Sept. 2010: http://www.healthcareitnews.com/sites/healthcareitnews.com/files/resource-media/pdf/pwc_healthcare_unwired.pdf](http://www.healthcareitnews.com/sites/healthcareitnews.com/files/resource-media/pdf/pwc_healthcare_unwired.pdf).

^{vii} Including the Food and Drug Administration (FDA), the Office of the National Coordinator for Health Information Technology (ONC), the Center for Medicare and Medicaid Services (CMS), the Health Resources and Services Administration (HRSA), National Institutes of Health (NIH).

^{viii} As noted in the Eighth Broadband Progress Report, the FCC continues to assess broadband deployment using a speed tier that approximates the 4 Mbps/1 Mbps speed benchmark. However, the FCC relies on data from NTIA's State Broadband Initiative (SBI), and the SBI data are collected by pre-determined speed tiers, none of which are 4 Mbps/1 Mbps. The closest tier to the FCC's speed benchmark lies at 3 Mbps download and 768 kbps upload speeds (3 Mbps/768 kbps). The FCC uses the 3 Mbps/768 kbps tier as a proxy for the 4 Mbps/1 Mbps speed benchmark in making its statutory assessment of deployment.

^{ix} Rock Health healthIT funding database: <http://rockhealth.com/resources/funding-database/>

Appendix I - Barriers & Opportunities

The following section was developed by the mHealth Task Force to stimulate, collect, and organize discussions around key subject areas. The content of this section is broader than the recommendation in the final report. It is included here to document the work of the Task Force and to serve as a basis for future activity.

i. Wireless Medical Device Connectivity

1. Network technology selection

- a. Are the most appropriate wireless technologies being used for the various medical use cases? For example:
 - i. Is WLAN the correct technology for hospitals? For the home? Office?
 - ii. Performance challenges for device roaming within hospitals
 - iii. Resolving device location in hospitals

2. Device coexistence

- a. How is the high concentration of wireless devices impacting communication reliability? What will long term impact be with the projected increase of devices?

3. SARs Testing

- a. SARs testing for devices that operate intermittently.

4. Wireless test beds

- a. Availability of wireless test beds to improve research, development and deployment.

ii. Rural Provider Access to Broadband Coverage

1. FCC Rural Healthcare Pilot Program
2. Leverage both wired technology & commercial wireless networks

iii. Patient Access to Broadband Coverage and devices

1. Elderly & low-income
2. Universal access for mobile healthcare services

iv. M2M access to devices, software & services

1. Electronic Interfaces for system communication between devices, software & services
2. Remote device, software & services management
 - a. Complexity of connecting telehealth systems in homes

v. Patient Safety, Privacy and Security

1. Patient safety
2. Secure communications
3. Patient identification

vi. Ubiquitous mobile spectrum

1. Traveling patients
 - a. International
 - b. Transitions of care - home / ambulance / hospital only
 - c. Clarification on use cases
 - d. Path to commercialization

vii. Patient Medical Devices and mobile medical spectrum

1. MBAN
2. WMTS
3. MedRadio

viii. Secure Messaging - Nationwide Health Information Network (NHIN)

1. Secure health messaging adoption
2. ONC Project Direct
3. Patient / Provider messaging
4. Provider / Provider messaging across delivery networks

ix. Reimbursement

1. Reimbursement for cost reducing e-Care services
2. ONC include mHealth and other health IT services in Meaningful Use

x. Interstate Licensing for Providers

1. Physicians

2. Nurses

xi. Administrative

1. Industry and intra-agency health IT and mHealth Summit meetings

xii. Define common nomenclature across FCC/ONC/FDA/CMS

mHealth Task Force Co-Chairs

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Julian M. Goldman, MD is Medical Director of Biomedical Engineering for Partners HealthCare, a practicing anesthesiologist at the Massachusetts General Hospital, and Director of the Program on Medical Device Interoperability at MGH and CIMIT (Center for Integration of Medicine and Innovative Technology). Dr. Goldman founded the Medical Device "Plug-and-Play" (MD PnP) Interoperability research program in 2004 to advance innovation in patient safety and clinical care through interoperability . The program was the recipient of the 2007 CIMIT Edward M Kennedy award for Healthcare Innovation. Dr. Goldman completed clinical training and a fellowship in medical device informatics at the University of Colorado and served as a Visiting Scholar in the FDA Medical Device Fellowship Program. He is Chair of ISO Technical Committee 121, Chair of the Use Case Working Group of the Continua Health Alliance, User Vice Chair of ASTM Committee F29, and served on the NSF CISE Advisory Committee and CDC NCPHI Board. His awards include the AAMI Foundation/Institute for Technology in Health Care Clinical Application Award, the International Council on Systems Engineering Pioneer Award, and the American College of Clinical Engineering award for Professional Achievement in Technology..

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Robert Jarrin is a Senior Director of Government Affairs for Qualcomm Incorporated. He is based in Washington, D.C. and represents Qualcomm on U.S. domestic regulatory matters relating to wireless health and life sciences. Jarrin's areas of responsibility include wireless health policy, FDA regulatory oversight of converged medical devices, healthcare legislative affairs, CMS telehealth reimbursement and the regulation of health information technology.

Externally, Jarrin is a member of the mHIMSS Advisory Council, leads the American Telemedicine Association (ATA) Policy A-Team on Telehealth and Meaningful Use, is the U.S. Chair for the European-American Business Council (EABC) eHealth Policy Group, serves on the Scientific Advisory Board of Medical Automation, has served as Co-Chair of the U.S. Policy Working Group for the Continua Health Alliance and is seated on the Board of Directors for Vida Senior Centers, the oldest Latino non-profit organization in the District of Columbia.

Douglas Trauner
Chief Executive Officer, Health Analytic Services, Inc. (TheCarrot.com)



Mr. Trauner founded Health whAnalytic Services, Inc. in 2007 and launched the outpatient care-coordination platform of TheCarrot.com in 2008. TheCarrot.com is an award-winning, mobile and online service that helps healthcare providers coordinate discharge planning, chronic care services and patient self-management. Its clinically validated platform offers solutions for reducing readmissions, managing post-discharge care and enhancing wellness. Mr. Trauner is a frequent speaker on the subject of patient engagement and privacy. He previously co-founded PM Squared, Inc., a health care information company providing financial and actuarial services, which was acquired by United Healthcare. Mr. Trauner has an engineering degree from the University of California at San Diego.

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