



Kaiser Foundation Health Plan  
Program Offices

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Federal Communications Commission  
445 12th St., S.W.  
Washington, D.C. 20554

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**RE: *FCC Seeks Comment and Data on Actions to Accelerate Adoption and Accessibility of Broadband-Enabled Health Care Solutions and Advanced Technologies*: GN Docket No. 16-46**

Kaiser Permanente offers the following comments on the ***Request for Comment Regarding the Requirements for Actions to Accelerate Adoption and Accessibility of Broadband-Enabled Health Care Solutions and Advanced Technologies***, published in the Federal Register on May 10, 2017.<sup>1</sup>

The Kaiser Permanente Medical Care Program is the largest private integrated healthcare delivery system in the U.S., with over 11.8 million members in eight states and the District of Columbia.<sup>2</sup> Kaiser Permanente is committed to providing high-quality, affordable health care services and improving the health of our members and the communities we serve.

Kaiser Permanente strongly believes in the value that broadband-enabled technologies can provide for enhancing patient care and the reduction in costs for our members. Currently, Kaiser Permanente has over 400,000 medical devices within our organization and we are continuing to evaluate broadband solutions that can be integrated for improved care for our members.

### **General Comments**

We provide comments as responses to the questions presented in the Request for Comment (“RFC”). We hope our feedback will help FCC to determine whether policy changes may be warranted.

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<sup>1</sup>82 FR 21780

<sup>2</sup> Kaiser Permanente comprises Kaiser Foundation Health Plan, Inc., the nation’s largest not-for-profit health plan, and its health plan subsidiaries outside California and Hawaii; the not-for-profit Kaiser Foundation Hospitals, which operates 39 hospitals and over 600 other clinical facilities; and the Permanente Medical Groups, independent physician group practices that contract with Kaiser Foundation Health Plan to meet the health needs of Kaiser Permanente’s members.

**OBJECTIVE I: PROMOTING EFFECTIVE POLICY AND REGULATORY SOLUTIONS THAT ENCOURAGE BROADBAND ADOPTION AND PROMOTE HEALTH IT**

*Question 1. We request suggestions regarding ways in which the FCC, based on its authority, can further accelerate broadband adoption in the health care context and promote broadband-enabled health IT solutions, either on its own or working in collaboration with other agencies, and, at the same time, ensure that such services and technologies are fully available and accessible to all Americans, including those living in rural and remote areas, low density populations, Tribal lands, and in underserved urban areas of our country. We also seek comment on what impediments to these efforts exist, and how the FCC can address them.*

Kaiser Permanente offers the following recommendations for how the FCC can further accelerate broadband adoption in the health care context and promote broadband-enabled health IT solutions:

- Reduce the cost of deploying fiber to the last mile and encourage existing and new providers to utilize shared infrastructure. For example, use existing telephone and electric utility poles to hang fiber for consumer applications.
- Lower the regulatory barriers for new broadband service providers to enter rural areas with competitive products and services, utilizing new or existing infrastructure, with the goal of improving service, and reducing costs and complexity for consumers and care providers.
- Accelerate the adoption of 5G through incentives and allocation of new spectrum to service providers deploying in rural areas.
- Simplify the permit process for new radio and antenna locations in rural areas, and ensure that adequate coverage and bandwidth will be available for health care facilities.
- Provide guidance on reduction of interference between adjacent Access Points operating in the unlicensed 802.11 bands to improve Signal-to-Noise Ratio and optimize channel and bandwidth utilization by clients on separate networks.
- Consider extending 802.11 with additional licensed or unlicensed channels dedicated to health care institutions.

*Question 2. We request information and data on the types, impact, scale, and benefits of broadband enabled services and technologies used for the delivery of health care. How is broadband currently being used to augment or transform existing health care delivery? What types of health care settings are using broadband-enabled services and technologies besides large medical hospitals? What variety of medical issues are they used for? Where are these health care settings located? What are some of the future plans for using broadband-enabled health services and technologies – not just by clinicians and hospitals but also by other participants in the broader health ecosystem?*

Software-defined wide area network (SD-WAN) allows healthcare organizations (and other organization types) to leverage several different network transport methods (e.g., MPLS, cable modem, DSL, LTE, microwave, satellite) to form a secure and easy to

manage solution for network connectivity. In the past, using multiple different transport methods meant a complicated mix of routers, modems, and firewalls to deliver service, which made operations difficult and adversely impacted reliability. SD-WAN technology creates a consistent network overlay across all these transport types to provide easy management, visibility to traffic flows, and automatic selection of the best network path. This technology is a major benefit for healthcare organizations, especially those with remote area locations because it establishes a consistent architecture to deliver reliable and cost effective network connectivity to the sites that in turn will enable greater use of cloud resources and broadband-enabled health services and technologies.

*Question 3. We are also interested in learning how health technologies and services can take advantage of new technological applications and emerging communications networks. For example, what impact will the Internet of Things (IoT) have on broadband-enabled health technologies and services such as telehealth and telemedicine? To what extent will pervasive connectivity and a fully connected environment around individuals (e.g., IoT) shift the point of care delivery? How might the demands on broadband networks evolve in this new environment? What, if any, changes are anticipated in existing broadband-enabled health services and technologies—operating over current mobile networks—when 5G (Fifth Generation Mobile and Wireless Networks) becomes available? To what extent might telehealth and telemedicine be impacted by the availability of 5G networks? What medical device innovations are anticipated to be developed using 5G networks?*

**Imaging** - A significant benefit of digital medicine is remote access to images and the ability to rapidly share information across geographic areas, thereby compressing time and distance. A physician in one part of the country (or world) can transmit medical images or test results to another doctor for a second opinion. Doctors can gain access to a much broader scope of clinical expertise and the health care system can use these technologies to reduce disparities based on geography, income, or class status.

**Diagnostics** - Advancements in diagnostic capabilities and new applications will expand the use of monitoring devices and wearable medical equipment. For patients suffering from serious or chronic health issues such as cardiovascular disease, diabetes or cancer, remote monitoring devices can track vital signs and glucose levels and electronically transmit this information to health care providers. Remote monitoring capabilities are being used today with existing 4G networks and devices; upgrading to 5G will facilitate machine type communications and help expand monitoring and provide real-time analytics that can improve health outcomes.

**Data analytics and treatment** - The opportunity to mine and analyze health data will grow as the digital infrastructure becomes more powerful. Having the ability to assess data in real time will enable rapid learning on treatment effects. Physicians can aggregate and analyze information in new and ingenious ways using innovative data analytics tools to select treatments likely to be most effective. Alerts can inform physicians (or even patients themselves) when vital signs fall outside acceptable ranges.

With rapid connectivity, intelligent management, and data capabilities, the 5G network offers new functionality for health care delivery, including imaging, diagnostics, data analytics, and treatment. These enhanced capabilities generate better data and more precise analytics, thus greater context for interpreting information. Some critical, higher risk medical functions require high reliability and availability with latency intervals no more than a few milliseconds. In addition, the use of 5G technologies has the potential to safeguard quality, and reduce overall medical costs.

Some examples are:

- The use of sensors and remote monitoring devices help patients living in isolated areas gain access to top medical care. Using video conference facilities or telemedicine can reduce the geographic divide and bring high quality care to underserved communities.
- Home health therapies represent a way to deliver quality care without patients having to travel great distances to hospitals or medical facilities. These therapies can transmit medical information electronically and contact remote doctors to provide advice on diagnosis and treatment, thus improving access and reducing costs.
- By reducing unnecessary hospitalizations, health care IT has the potential to lower costs and optimize resource use without compromising quality care. Not every medical problem warrants a visit to a doctor's office or hospital. Routine problems can be diagnosed at a distance, which will offer patients greater alternatives to conventional, facility-based care.
- Voice recognition software can streamline administrative operations. A study of this technology in hospitals found that it helped health professionals "provide care without being interrupted with data entry and querying tasks." The software enables people to record medical information without having to stop to enter data.<sup>1</sup>

*Question 4. What technical issues concerning the variety of broadband-enabled health care solutions and technologies are appropriate and necessary for the FCC to consider with respect to efforts to accelerate broadband adoption and promote health IT solutions? Are there issues of concern with respect to access, availability, interoperability, capacity, reliability, privacy, security, and speed? If so, please describe them. Does consideration of any of these issues vary depending on the technology platform—e.g., digital subscriber line (DSL), cable, fiber, wireless, or satellite?*

Currently, broadband providers are subject to Title II utility restrictions for broadband Internet traffic and not able to prioritize (or restrict) network flows types as they see fit across their networks. This regulation was finalized in 2015, but recently started on a path to revert to the less restrictive Title I regulations. A potential benefit to the move back to Title I could be an increase in the development of fee-based service level agreements for consumer broadband services; however, health applications could be put at higher risk of failure or degradation. Without network providers enforcing network

traffic parity, medical communication flows could be de-prioritized in lieu of a network provider's preferred traffic types. Because of this, rural and/or safety net providers (and the patients they serve) are likely to be disadvantaged by inequitable broadband traffic rules.

In addition, non-regulated companies like Google, Microsoft, Amazon, and Facebook that have growing "network provider-like" infrastructure and cloud networks should be subject to the same regulations as traditional network providers. These non-regulated companies may host and store much of the medical device processing and data storage in the future. If these companies meet the definition criteria as a "network provider," they should be subject to a comparable regulatory framework. It is essential that network traffic across the Internet is open so that all traffic types can flow unencumbered.

**OBJECTIVE II: IDENTIFYING REGULATORY BARRIERS (AND INCENTIVES) TO THE DEPLOYMENT OF RADIO FREQUENCY (RF)-ENABLED ADVANCED HEALTH CARE TECHNOLOGIES AND DEVICES**

*Question 10. We seek information on the types of broadband-enabled health technologies and medical devices that are currently in the market. In addition, what emerging types of broadband enabled health technologies and medical devices are likely to be available to consumers soon? What are the future trends in this market area?*

One example of a future trend is wideband medical radar, which uses radio waves instead of sound or radiation, for medical imaging (Medical radar uses electromagnetics like a microwave oven or cell phone, but at extremely low power). The system is designed to use multiple antennas at frequencies of 4GHz to 10GHz. Because it uses radio waves, this technology would most likely need FCC approval. The FCC process to approve these advanced RF devices should be straightforward and well defined to accelerate their introduction into the marketplace.

*Question 11. What, if any, technical issues or concerns exist for patients and other users of medical devices when such devices are used in hospital settings? Do these concerns vary depending on the type and size of the hospital setting? Are these concerns exacerbated when medical devices are operating in large or busy hospital environments (which may include a wide variety of wireless technologies, some of which may be unrelated to clinical care); if so, what are those concerns, how can they be addressed?*

Medical devices, like other computer systems, can be vulnerable to security breaches, potentially impacting the safety and effectiveness of the device. Risks increase for networked medical devices (i.e., devices connected to the Internet, cloud, hospital systems, and to other medical devices. Patients must be protected from cyber-attack that can impact. And vulnerable medical devices also connect to a huge array of sensors and monitors, making them potential entry points to larger hospital networks. That in turn could mean the theft of sensitive medical records, or a ransomware attack.<sup>ii</sup>

*Question 12. Similarly, what, if any issues or concerns exist for patients and other users of medical devices when such devices are used primarily in potentially uncontrolled, non-hospital settings (e.g., in homes, aircraft, cruise ships, or other close quarter, multi-unit dwellings, etc.), where non-health related wireless technologies that also emit radio frequencies (e.g., baby monitors, wireless home security systems, Wi-Fi routers, etc.) may proliferate? And to what extent might similar issues or concerns exist for emerging and future technological innovations (e.g., electric automobiles, smart cars, smart homes, etc.)?*

Currently most broadband companies do not provide a Service Level Agreement (“SLA”) for home broadband service, so the user has no real reliability expectation and service providers can perform maintenance at any time for any duration. If outages occur or are frequent, there is no recourse for the consumer other than switching providers, which may not be an option in rural or underserved areas with a single provider. If broadband service is unreliable, then consumer acceptance and adoption of broadband-enabled health technologies will lag. This also limits a provider’s ability to reliably use these technologies to provide care from home or remote areas.

**OBJECTIVE III: STRENGTHENING THE NATION'S TELEHEALTH INFRASTRUCTURE THROUGH THE FCC'S RURAL HEALTH CARE PROGRAM AND OTHER INITIATIVES**

*Question 17. We seek comment and suggestions on how the FCC can further promote and help enable the adoption and accessibility of broadband-enabled health technologies, like telehealth and telemedicine, in rural and other underserved areas. Are there other initiatives or actions beyond the RHC Program that the agency, or the Task Force on behalf of the agency, could pursue in order to promote and help enable the adoption and availability of broadband enabled health technologies in rural and underserved areas of the country?*

The FCC can further promote the adoption and accessibility of broadband-enabled health technologies, like telehealth and telemedicine, in rural and other underserved areas in the following ways:

- Accelerate adoption of 4G and 5G to enable services that may be available within the community such as medical imaging.
- The FCC’s Rural Health Care (“RHC”) Program should extend to mobile clinics and health kiosks.
- Encourage health care facilities to upgrade aging infrastructure and adopt modern applications, systems, security, and protocols, and provide incentives to health care organizations, service and system providers.
- Extend the RHC Program to cover ambulances and first responders with mobile broadband so information will be available to first responders, to the receiving health care facility, and to experts providing remote consultation using video and interactive media.

- Extend the RHC Program and encourage health care facilities to deploy a Distributed Antenna System (“DAS”) that will provide wireless broadband access to patients, guests, and providers.

**OBJECTIVE IV: RAISING CONSUMER AWARENESS ABOUT THE VALUE PROPOSITION OF BROADBAND IN THE HEALTH CARE SECTOR AND ITS POTENTIAL FOR ADDRESSING HEALTH CARE DISPARITIES**

*Question 24. We seek suggestions on how the Commission can effectively increase consumer awareness about the value proposition of broadband in the health care sector? Are there any practical efforts that the Commission can undertake to accelerate consumer adoption of broadband, and in particular, broadband-enabled health services and technologies, especially among underserved populations? How might the Commission ensure that certain groups—e.g., rural consumers, those living on Tribal lands, older Americans, people with disabilities, military veterans, non-English speakers, and the economically disadvantaged—are fully aware of the availability and benefits of broadband-enabled health services and technologies? Are there any states, cities, and organizations engaged in similar efforts that could lead to potential partnerships?*

Kaiser Permanente recommends the Commission partner with health organizations, county health services/clinics to provide education and materials that highlight examples and benefits of broadband adoption, and encourage the use of multiple languages. There are cultural, socio-economic, and demographic differences in communities that enable disproportionate access and use of digital health technologies. For example, it is important to understand and address issues within the non-English speaking communities and how their access and use can be improved. Spanish language access is different from English speakers’ access where the focus is on English. This non-English language effort should be directed to vendors and equipment manufacturers, government officials and staff, clinicians, and patients. There is also a financial impact on the disproportionate access and use of digital health technologies. Wifi technology is not found in every household, only those who can afford the total cost of ownership.

Kaiser Permanente also recommends the Commission partner with health organizations, county health services/clinics to develop public policy aimed at helping clinicians in the community to adopt connected systems (e.g. for accessing lab and imaging results in real-time, and for accessing specialists with video and interactive media, which will lead to faster diagnosis, faster treatment, and lower costs. Recent advances in Surface Computing makes high-end teleconsultation and telepresence viable options for many providers.

*Question 29. Are there any practical issues (e.g., the lack of a home computer) that may be impeding consumer awareness and adoption of broadband-enabled health technologies? What efforts can be undertaken to help alleviate some of these issues?*

As we stated above, most broadband companies do not have SLAs for home broadband service; however, SLAs would be helpful for adoption of certain health technologies as

explained above. FCC should advance a framework for establishing such SLAs for broadband health applications in home and mobile locations.

**OBJECTIVE V: ENABLING THE DEVELOPMENT OF BROADBAND-ENABLED HEALTH TECHNOLOGIES THAT ARE DESIGNED TO BE FULLY ACCESSIBLE TO PEOPLE WITH DISABILITIES**

*Question 33. We seek suggestions as to how the Commission can effectively raise awareness among people with disabilities about the value proposition of broadband in health? How can the Commission help to enable the adoption and accessibility of such services and technologies among people with disabilities, especially given our authority?*

Kaiser Permanente recommends expanding the use of IEEE 802.11 for vehicle communication to powered wheel chairs and other mobility systems for people with disabilities to allow for connected devices (on the user, and other communication devices, e.g., video with a provider, family members, and caregivers).

**OBJECTIVE VI: HIGHLIGHTING EFFECTIVE TELEHEALTH PROJECTS, BROADBAND-ENABLED HEALTH TECHNOLOGIES, AND MHEALTH APPLICATIONS ACROSS THE COUNTRY AND ABROAD—TO IDENTIFY LESSONS LEARNED, BEST PRACTICES, AND REGULATORY CHALLENGES**

Kaiser Permanente deploys over 400,000 medical devices, with over 60,000 wired and wirelessly connected, including systems for Congestive Heart Failure, Durable Medical Devices for home use, arrhythmia monitoring, video visits, diabetic monitoring, and specialty teleconsultation. Diagnostic imaging consumes one-third of available bandwidth; this proportion is expected to increase over time. A large increase in bandwidth demand is anticipated during the next few years due to the introduction of more devices, ranging from infusion pumps to ultrasound machines, and vital signs monitors.

We offer the following recommendations:

- Promote the adoption of GSM/4G technology by medical device vendors for mhealth applications.
- Encourage the development of standards for data transmission and security.
- Encourage strong data encryption at rest and during transmission.
- Simplify service access and auto-provisioning by consumers and care providers).
- Ensure that enough channels (bandwidth) are allocated to Wireless Medical Telemetry Service (“WMTS”) band to maintain adequate S/N ratio for high-density deployments.
- Health care organizations should be encouraged to develop processes for standardized spectrum management. The FCC should develop standard templates for spectrum management and make them available to use by health care facilities.



**OBJECTIVE VII: ENGAGING A DIVERSE ARRAY OF TRADITIONAL AND NON-TRADITIONAL STAKEHOLDERS TO IDENTIFY EMERGING ISSUES AND OPPORTUNITIES IN THE BROADBAND HEALTH SPACE.**

*Question 42. We seek comment on how to promote small and diverse investors, innovators, and entrepreneurs in the broadband health sector to better ensure that the benefits of broadband-health technologies and services are available to all Americans.*

To help bring the benefits of broadband-health technologies and services to all Americans, FCC should develop a range of public support programs to ensure broadband access in disadvantaged communities. For example, low income communities could be given subsidized gigabytes and wifi access as demonstrated in the subsidized utility model.

*Question 43. We seek to engage all potential stakeholders in this national broadband health effort. Commenters should identify any additional stakeholders that are not specifically referenced in this Public Notice. We also encourage parties to identify any other relevant issues (not covered in this Notice) for the Task Force, given its charge and objectives.*

Other potential industries/stakeholders that have implemented technologies to help inform the FCC task force's future work:

- End users of the applications (e.g., clinicians, medical device engineer professionals, compliance professionals, consumers.)
- Cybersecurity experts
- Privacy/security experts
- Consumers of the technology (separate from consumer advocates)
- Representatives from a variety of "environments" – socio-economic, racial, cultural, demographic
- Social networks (e.g., Facebook, Twitter, LinkedIn, Snap).
- Media streaming services (e.g., YouTube, Netflix, and Amazon).
- Colocation interconnections, peering services(e.g., Equinix).
- Cloud and service providers
- HIT vendors (e.g., Apple, Qualcomm, Intel, Cisco, Medical Device Manufactures).
- Health care systems and academic health care centers and labs (e.g., UCLA, WINMEC).
- Trade organizations and advocacy groups (e.g., AHA, ASHE, ACCE) and other organizations/ research groups (e.g., AAMI, ANSI, Chambers of Commerce, state regional and local government entities?).

**CONCLUSION**

We hope FCC carefully considers our comments and recommendations for the future of broadband-enabled technology. Please feel free to contact me (510-271-5639; email

Jamie.ferguson@kp.org) or Lori Potter (510-271-6621; email [lori.potter@kp.org](mailto:lori.potter@kp.org)) with any questions or concerns.

Sincerely,

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<sup>i</sup> “How 5G technology enables the health internet of things,” Center for Technology Innovation at Brookings, accessed May 8, 2017, <https://www.brookings.edu/wp-content/uploads/2016/07/How-5G-tech-enables-health-iot-west.pdf>.

<sup>ii</sup> “Medical Devices Are the Next Security Nightmare,” Wired, accessed May 8, 2017, <https://www.wired.com/2017/03/medical-devices-next-security-nightmare/>.