Business Brief

Health and Life Sciences

Enabling the Future of Telehealth Solutions

With expanding medical treatment options, a shortage of healthcare workers, and an aging population, managing healthcare costs is an urgent need. Telehealth is a chief enabler of cost-efficient delivery of clinical services, offering the promise of improved access and greater convenience for both patients and providers.

Seeking healthcare through electronic information and telecommunication technologies, as illustrated in Figure 1, has gained wide public acceptance, particularly as the COVID-19 pandemic has led patients to request remote access to medical providers. More than 85 percent of those patients report that telehealth makes it easier to get the care they need.[1] In conjunction with this trend, provider adoption of telehealth solutions is expected to drive over 22 percent CAGR through 2028.[2]

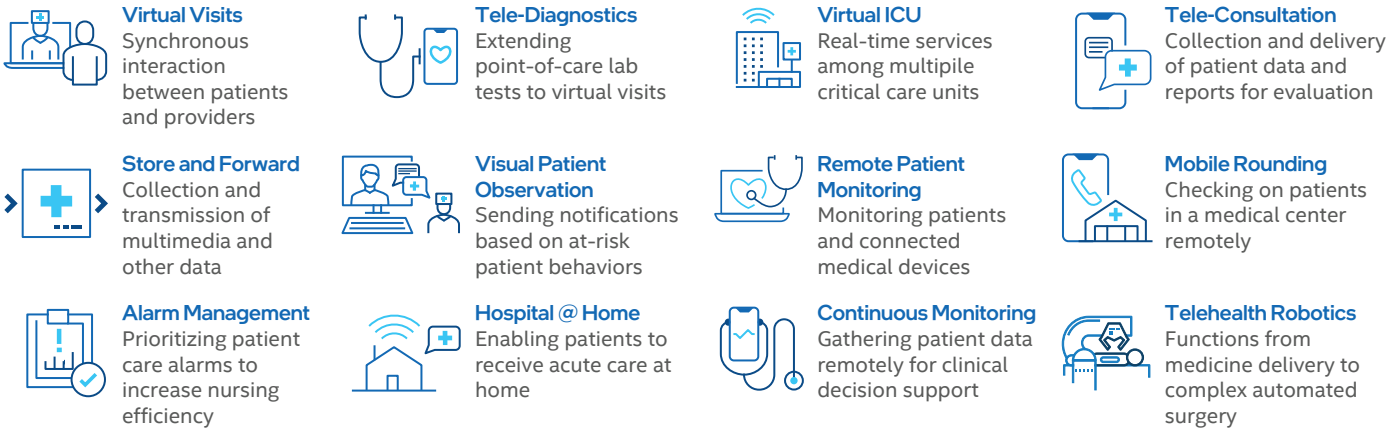

Figure 1. Evolving telehealth use cases.

Global Technology Leadership in the Healthcare Ecosystem

Intel guides and enables the telehealth ecosystem with a range of programs, including the **Intel® Partner Alliance**, **Intel® AI Builders**, **Intel® IoT RFP Ready Kits**, and **Intel® IoT Market Ready Solutions**. Intel helps providers optimize solutions along key quality vectors, including compliance with security and privacy requirements, integration with infrastructure and electronic health records (EHR) systems, and end-user experience and usability. Success stories of telehealth solution providers collaborating with Intel to produce optimized, forward-looking products include:

- **Medical Informatics Corp. (MIC) Sickbay platform** collects patient data across heterogeneous ICU equipment and makes it available from any provider device; this flexible remote monitoring was critical for caregivers as Houston Methodist Hospital rapidly scaled up ICU capacity in response to COVID-19.
- **Capsule Technologies Medical Device Information Platform** captures streaming clinical data from connected systems and transforms it for usages such as clinical documentation, alarm management, patient surveillance, decision support, predictive analytics, and clinical research.
- **Banner Health** uses Intel® NUC Mini PCs and VeeMed software to transform hospital room televisions into an in-room telehealth solution so nurses and doctors can safely check in on highly contagious patients.

Intel provides go-to-market assistance for providers to accelerate uptake of their products and solutions in the marketplace. For example, joint marketing collateral with Intel or opportunities to participate in key industry events can help providers send a strong signal of solution quality. Intel also does partner and solution matchmaking within the community.

Hardware Building Blocks

Partners that collaborate with Intel to bring solutions to market draw on a wide universe of Intel hardware technologies, including those shown in Figure 2. Hardware-based security built into Intel® platforms helps providers meet HIPAA regulations and protect workloads.

- **Intel visual intelligence** technologies transform outputs from camera sensors into higher-level information that can drive complex processes and decision making. **Intel® RealSense™ technology** provides hardware and software packages for stereo-camera-based depth perception.
- **Intel network connectivity solutions** provide connection technologies for use separately or together. **Intel® Wi- Fi 6**-enabled endpoint devices and wireless networks accelerate Wi-Fi connectivity to support emerging usages. Intel technologies are enabling greater performance, scalability, and reliability for 5G networks. And **Intel® Ethernet** delivers speeds from 1 to 100 Gbps, with optimized interoperability, reliability, and performance.
- **Intel devices** enhance cost and operational efficiency by matching the right capabilities to the use case. **Intel® NUCs** are low-cost, small-footprint mini PCs well suited to small form-factor devices for clinical or home-healthcare use. **All-in-one (AIO) computers** based on Intel® Core™ processors streamline a powerful PC into a compact, high-performance touchscreen to increase efficiency.
- **Intel processors** provide flexible performance at the level needed for any scale of solution. **Intel Atom® processors** enable ultra-lightweight, low-power designs for the network edge. **Intel Core processors** come in a range of footprints and enable everything from video chats to telehealth robots. **Intel® Xeon® processors** deliver high performance at server scale for managing large amounts of data generated in telehealth solutions.

Figure 2. Intel hardware technologies for telehealth.

Telehealth Remote Monitoring Reference Implementation

This software configuration enables containerized telehealth application designs that can provide a real-time audio-visual framework by leveraging the Intel® Collaboration Suite for WebRTC to connect, view, and e of devices.

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Software Development Platforms and Tools

Intel-optimized libraries, frameworks, and reference architectures help providers accelerate the development of telehealth solutions. Examples include:

Intel® Distribution of OpenVINO Toolkit
provides optimized capabilities for advanced computer vision and real-time video analytics based on visual deep learning.

Intel® Smart Edge
is a multi-access edge (MEC) platform for on-premise enterprise deployments that delivers low latency, simplicity, and a future-ready, open architecture for any type of network.

Intel Collaboration Suite for WebRTC
supports real-time communication (RTC) for telehealth solutions, accelerated by Intel hardware, without requiring additional clients or plug-ins.

Open Visual Cloud
is a set of open-source software stacks and reference samples that helps accelerate the development of visual applications plug-ins.

Intel® oneAPI toolkits
enable fast and efficient development with cross-architecture libraries and tools.

Looking Ahead

Through technology leadership from the datacenter to the cloud to the network edge, Intel is helping drive the future of the telehealth technology ecosystem.

To learn more, visit **intel.com/health**

[1] Grandview Research, February 2021. "Telemedicine Market Size, Share & Trends Analysis Report By Component, By Technology, By Application (Teleradiology, Telepsychiatry), By Delivery Mode, By Type, By End-use, By Region, And Segment Forecasts, 2021 - 2028." **https://www.grandviewresearch.com/industry-analysis/telemedicine-industry.**

[2] Sykes Enterprises, March 2021. "How Americans Feel About Telehealth: One Year Later." **https://www.sykes.com/resources/reports/how-americans-feel-about-telehealth-now/.**

Intel technologies may require enabled hardware, software or service activation.

All product plans and roadmaps are subject to change without notice.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

No product or component can be absolutely secure.

Your costs and results may vary.

Intel Wi-Fi 6: Intel® Wi-Fi 6 (Gig+) products support optional 160 MHz channels, enabling the fastest possible theoretical maximum speeds (2402 Mbps) for typical 2x2 802.11 AX PC Wi-Fi products. Premium Intel® Wi-Fi 6 (Gig+) products enable 2–4X faster maximum theoretical speeds compared standard 2x2 (1201 Mbps) or 1x1 (600 Mbps) 802.11 AX PC Wi-Fi products, which only support the mandatory requirement of 80 MHz channels.

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