

CONNECTED HEALTHCARE

The Nonin Onyx II, Model 9560 is the world's first Bluetooth-enabled fingertip pulse oximeter. It allows patients to accurately monitor vital signs and remotely connect with their clinicians — gaining independence to go about their daily activities. It is also certified as compliant to the Continua Version One Design Guidelines.



*Health alliance design
guidelines promote
interoperability.*

by **rick crosen**

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of the board of directors for Continua Health
Alliance, Beaverton, Ore.*

In the next few years, technology will fundamentally transform healthcare delivery around the world. Technological advancements are ushering in a new era of connected personal health solutions that could radically improve healthcare while reducing costs. These solutions will need to be broadly deployed to help address today's most pressing healthcare challenges: improving outcomes and enhancing access while reducing the skyrocketing costs associated with unhealthy lifestyles, chronic diseases, and an aging population.

Currently, 125 million Americans have at least one chronic condition, and half of those suffer from two or more. Expenditures for individuals with chronic diseases such as diabetes, congestive heart failure, and chronic obstructive pulmonary disease account for more than 75 percent of total U.S. medical care costs, according to the Centers for Disease Control and Prevention.

Connected health solutions can transform healthcare by empowering individuals to take more control of their own health and fitness. Remote patient monitoring, for example, can enhance care for the elderly or those with chronic diseases while reducing associated costs. These integrated personal health systems connect people with healthcare providers, care teams, and family members to

help them better manage chronic diseases and live independently as they age.

Healthcare professionals can reach beyond hospital and clinic walls using new technologies that collect, analyze, and transmit health information via handheld medical devices. Devices such as blood pressure cuffs, glucose device readers, fingertip pulse oximeters, and weight scales transmit vital data to healthcare professionals, enabling them to assess their patient's condition more quickly and accurately. Alerting healthcare professionals to problems early and enabling them to intervene more quickly can deliver big dividends, including potentially reducing the number of unnecessary emergency room visits, hospital admissions, or even preventable deaths.

Additionally, connected health solutions empower patients and their loved ones to assume greater responsibility for managing chronic conditions, which possibly can improve adherence to treatment plans. For patients with access issues, these systems can offer significant advantages by augmenting face-to-face encounters with healthcare professionals and facilitating their access to care.

Connected personal health solutions can allow people to age independently and securely in the comfort of their own homes. Individuals can maintain contact with professional caregivers and loved ones without giv-

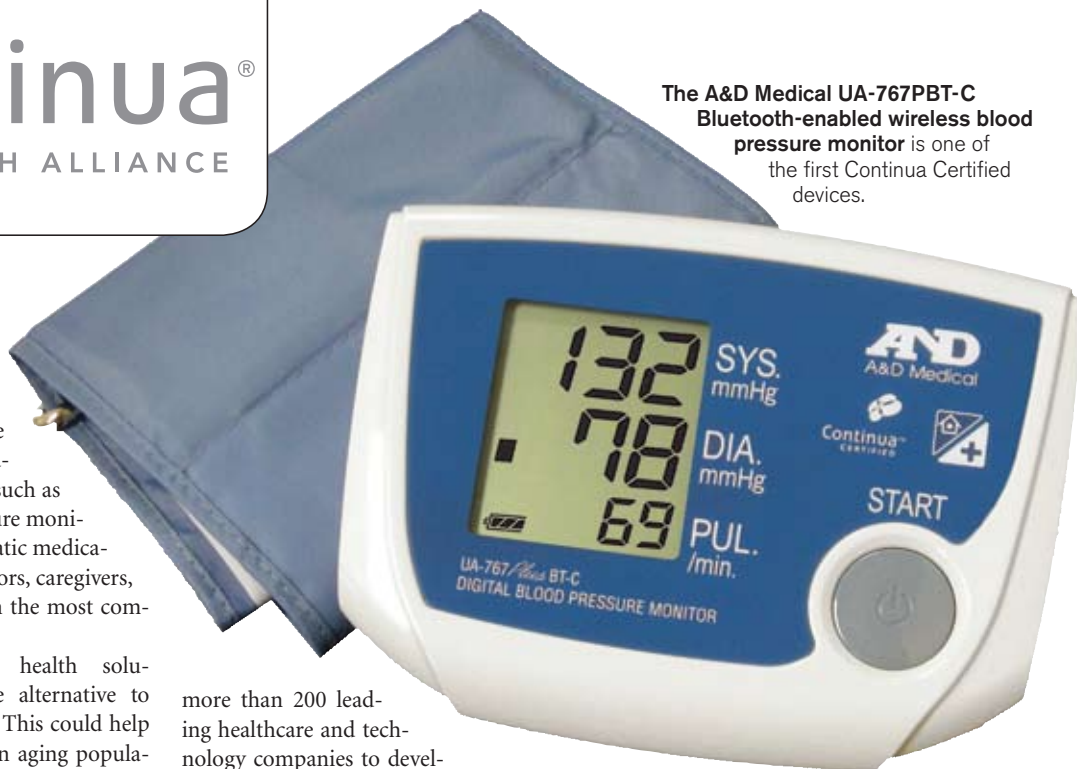
QUALITY & STANDARDS



Continua[®]
HEALTH ALLIANCE

The Continua Certified logo signifies that a product has achieved certification and thus will communicate effectively in the Continua ecosystem. To achieve certification, a product must successfully complete rigorous testing by an independent test lab.

The A&D Medical UA-767PBT-C Bluetooth-enabled wireless blood pressure monitor is one of the first Continua Certified devices.



ing up their independence, dignity, or security. Family members living thousands of miles away can check the well-being of their aging relatives by monitoring devices such as motion detectors, bed-pressure monitors, and fall sensors. Automatic medication reminders can help seniors, caregivers, and loved ones manage even the most complex medication regimes.

Additionally, connected health solutions can provide a viable alternative to costly assisted-care facilities. This could help improve quality of life for an aging population while alleviating some of the burden on our social and healthcare systems.

Another way connected personal health solutions help address today's daunting healthcare challenges is by empowering individuals to take a more active role in their own health. Health-conscious consumers are beginning to turn to personal health records such as Google Health and personal health application platforms like Microsoft HealthVault as a way to manage their health and fitness data. Additionally, they are using innovations such as pedometers that connect to other consumer electronic devices such as cell phones, MP3 players, and netbooks to gather trend data about their activities and transmit it to their personal fitness diaries. A host of other devices such as blood pressure cuffs, heart rate straps, and weight scales can link patients, trainers, and physicians so fitness levels can be tracked easily and accurately.

The need for interoperability

Interoperability is crucial to spur widespread adoption of connected personal health solutions. A wide range of devices from different vendors can work together to create integrated systems — that's where Continua Health Alliance comes in. This non-profit, open industry alliance has brought together

more than 200 leading healthcare and technology companies to develop guidelines, based on existing industry standards, which outline how to build connected health devices that will work together as integrated solutions.

Continua released its Version One Design Guidelines earlier this year, an important milestone toward the establishment of a diverse ecosystem of personal connected health solutions. These guidelines create a framework for the development, testing, and implementation of interoperable, connected health devices. They specify how systems and devices can provide interoperability and connectivity with other Continua devices. Moreover, Continua is working to ensure that the personal health data collected by these devices can be integrated with electronic and personal health record (EHR/PHR) systems.

Continua Version One Design Guidelines include the following devices: glucose meters, weight scales, thermometers, pulse oximeters, blood pressure monitors, cardiovascular fitness monitors, and strength fitness equipment, as well as independent living monitors that track medications and activities. Future iterations of the guidelines will encompass additional devices such as medication monitors, insulin pumps, and electrocardiograms. As the new guidelines are completed and more Continua Certified products are avail-

able, more complex systems and expanded care scenarios will evolve.

The role of standards

By leveraging existing industry standards to establish common building blocks, Continua guidelines foster interoperability among multivendor devices, services, and products.

The guidelines allow device manufacturers and solutions vendors to streamline integration and reduce costs. Designers are freed up to focus on product differentiation, where the most value is added, and concentrate on developing products rather than the communication chain. Moreover, vendors can collaborate to provide integrated solutions that give healthcare companies and patients the flexibility to select the best mix of products and services to meet specific needs.

For connectivity, Continua utilized the Bluetooth Health Devices Profile for wireless communication and USB Personal Healthcare Devices for wired communication. These personal area network (PAN) standards provide the means to collect data from devices outlined in Continua's Version One Design Guidelines. The PAN interface defined in the guidelines describes the con-

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The A&D Medical UC-321PBT-C Bluetooth-enabled wireless weight scale is another Continua Certified device.

nection between PAN devices, such as sensors and actuators, and the Application Hosting Devices (AHD), such as mobile phones, PDAs, computers, and custom-built boxes.

At the application level, Continua has selected the ISO/IEEE 11073 Personal Health Device family of standards. These standards include a common base protocol framework that defines the way to communicate standard items such as date, timestamp and manufacturer. They also include device specialization standards that define nomenclature and data structures unique to each device.

Continua is working to ensure that personal data collected by connected health devices can be integrated with EHR/PHR systems. Wide area network (WAN) devices serve as senders and are used in back-end services such as weight loss and disease

management services. The xHRN (health record network) interface defined in the Continua guidelines describes the connection between EHR/PHR systems, which ultimately receive data from Continua devices. Electronic health records hold the promise of aggregating this data in one central location to offer a broad overview of a

person's health status.

Continua has selected the Integrating the Healthcare Enterprise (IHE) Cross-Enterprise Document Reliable Interchange (XDR) profile as the means to establish the communication between WAN devices and xHR systems. Continua selected the Health Level 7 (HL7) Personal Health Monitoring (PHM) Report document format to ensure consistent data encoding.

While the industry builds upon the Version One Design Guidelines, Continua is already at work defining the next generation of guidelines that will enable an increased array of features and benefits. Two low-power radio standards will be incorporated in the next version. Bluetooth low-energy wireless technology is slated to enable low-power mobile devices used to track an indi-

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vidual's health and fitness levels, untethering them from wires. ZigBee Health Care technology will enable fixed-location sensors and devices that can be used to monitor individuals at home or in networked environments such as assisted care facilities.

Continua Certified devices

To ensure positive user experiences, Continua has created a stringent product certification program that features a recognizable logo. The logo signifies that a product has achieved certification and thus will communicate effectively in the Continua ecosystem. To achieve certification, a product must successfully complete rigorous testing by an independent test lab; only then can the device bear the Continua Certified™ logo.

There are currently five Continua Certified products available from three Continua members. The availability of these products signals not only the emergence of solutions but the beginning of an ecosystem that will fuel the use of connected health solutions. Among the first Continua Certified devices are wired and wireless pulse oximeters from Nonin Medical, and a wireless blood pressure cuff and wireless weight scale from A&D Medical. These personal connected health devices all make the sharing of health and care statuses more convenient for users, prompting increased involvement and interaction with the healthcare process.

Conclusion

Connected health systems provide a compelling way to address some of the most daunting challenges facing health systems around the world. Continua's standards-based, interoperable solutions encourage individuals to take more control of their own health and fitness. At the same time, they can connect people with their healthcare providers, care teams, and family members to help them better manage chronic diseases and live independently as they age. ■

For more information, take the ☎ at www.appliancedesign.com/taxi or visit: www.continuaalliance.org

appliance DESIGN

1. DO YOU WISH TO START/CONTINUE A FREE SUBSCRIPTION TO APPLIANCE DESIGN?

YES no

WOULD YOU LIKE TO RECEIVE THE FREE APPLIANCE DESIGN E-NEWSLETTER?

YES no

Please check your preferred format:

- Digital Version of Appliance DESIGN (FREE)
 Print Version of Appliance DESIGN (FREE)

IAM INTERNATIONAL APPLIANCE MANUFACTURING

2. DO YOU WISH TO START/CONTINUE A FREE SUBSCRIPTION TO IAM?

YES no

WOULD YOU LIKE TO RECEIVE THE FREE IAM E-NEWSLETTER?

YES no

Please check your preferred format:

- Digital Version of IAM (FREE)
 Print Version of IAM (FREE)

3. _____
 Your Signature (required) Date

4. Print Name _____ Zip/Postal Code _____
 Title _____ Country _____
 Company _____ Work Phone _____
 Address _____ Work Fax _____
 City _____ State _____ E-Mail _____

5. CHECK THE JOB FUNCTION BELOW THAT IS THE CLOSEST MATCH TO YOUR PRIMARY JOB FUNCTION. (Check one only)

- | | |
|--|---|
| 14 <input type="checkbox"/> Product Design Management | 24 <input type="checkbox"/> Other Design Engineering/ Management Function not listed |
| 15 <input type="checkbox"/> Product Design Engineering | 07 <input type="checkbox"/> Purchasing/Procurement Management |
| 16 <input type="checkbox"/> System Design Management | 25 <input type="checkbox"/> Purchasing/Procurement Engineering |
| 17 <input type="checkbox"/> System Design Engineering | 03 <input type="checkbox"/> Corporate/Administrative and/or Financial Management (Owner, President, VP., Chief) |
| 19 <input type="checkbox"/> Research & Development Management | 08 <input type="checkbox"/> Marketing/Sales/Advertising/Services Management |
| 20 <input type="checkbox"/> Research & Development Engineering | 89 <input type="checkbox"/> Other (specify) _____ |
| 21 <input type="checkbox"/> Technical Engineering (including Management) | |
| 22 <input type="checkbox"/> Application Engineering | |
| 18 <input type="checkbox"/> Draftsman | |
| 23 <input type="checkbox"/> Application Management | |

6. CHECK THE ONE CATEGORY THAT BEST DESCRIBES THE PRIMARY BUSINESS ACTIVITY AT YOUR LOCATION (Check one only) Manufacturers of Consumer, Commercial and Business Appliances (including Corporate Headquarters, R&D/Testing Labs, Design/Engineering Facilities)

- | | |
|---|--|
| 19 <input type="checkbox"/> Refrigeration Equipment | 10 <input type="checkbox"/> Business Appliances |
| 20 <input type="checkbox"/> Air Conditioning | 04 <input type="checkbox"/> Electric Housewares and Portable Appliances |
| 02 <input type="checkbox"/> Heating Equipment | 08 <input type="checkbox"/> Other Consumer Appliances |
| 03 <input type="checkbox"/> Household Cooking Equipment | 88 <input type="checkbox"/> Other Appliance-Related Manufacturers (Must indicate product manufactured) (specify) _____ |
| 05 <input type="checkbox"/> Household Laundry Equipment | |
| 07 <input type="checkbox"/> Water Processing Appliances | |
| 09 <input type="checkbox"/> Commercial Appliances & Vending Machines | |
| 12 <input type="checkbox"/> Medical, Laboratory, Test and Measurement Equipment | |
| 06 <input type="checkbox"/> Consumer Electronics Equipment | |

Non-Manufacturing

- 18 Product Development & Industrial Design Firm
 89 All Others Not Classified Above (specify) _____

7. IN THE PERFORMANCE OF YOUR JOB, WHICH OF THE TYPES OF PRODUCTS LISTED BELOW DO YOU RECOMMEND, SPECIFY, APPROVE OR PURCHASE (Check ALL that apply)

- | | |
|--|---|
| 33 <input type="checkbox"/> Motors, Fans, Blowers, Pumps, Motor Controllers | 43 <input type="checkbox"/> Plastics, Elastomers |
| 45 <input type="checkbox"/> Heating Elements/Igniters | 37 <input type="checkbox"/> Seals, Gaskets & Gasketing Equipment |
| 47 <input type="checkbox"/> Connectors, Cords, Wire, Cable, Terminating Machines | 36 <input type="checkbox"/> Coatings, Paints, Finishing & Finishing Equipment |
| 34 <input type="checkbox"/> Controls, Sensors, Thermostats | 35 <input type="checkbox"/> Decorative Products (Trim, Nameplates, Glass, Labels, Graphic Overlays) |
| 28 <input type="checkbox"/> Switches, Relays, Thermal Cutoffs, Circuit Breakers, Fuses | 38 <input type="checkbox"/> Software |
| 29 <input type="checkbox"/> Displays, Indicators, Lamps, LEDs | 32 <input type="checkbox"/> Assembly Equipment & Tools, Welders, Clinching Machines, Brazing Machines, Fasteners, Dispensing Equipment, Adhesives & Tapes |
| 39 <input type="checkbox"/> Microcontrollers, Integrated Circuits, & Other Electronic Components | 42 <input type="checkbox"/> Test & Measurement Equipment, Testing & Certification Labs/Services |
| 46 <input type="checkbox"/> Solenoids, Valves, Actuators | 48 <input type="checkbox"/> Other (specify) _____ |
| 31 <input type="checkbox"/> Metal parts (Stampings, Castings, Powder Metal Parts, Springs, Hinges) | 49 <input type="checkbox"/> None of the above |
| 44 <input type="checkbox"/> Plastic Molding/Forming Services | |
| 30 <input type="checkbox"/> Metals (Steel, Aluminum, Copper, Precoated/Prefinished Metals) | |

8. CHECK THE PUBLICATION(S) LISTED BELOW THAT YOU RECEIVE PERSONALLY.

- 1 Appliance 3 Machine Design 7 None of the above
 2 Assembly 8 Design News

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