

# Healthy Living

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## Apple iPhone 4S Bluetooth 4.0 paving way for mobile health devices

Mark Lyall · Friday, October 14th, 2011



Apple release of **iPhone 4S** has created excitement among the smart phone users. Apple fans queued up in front of Apple store, some dressed as Steve Jobs, dedicated the 4S to Steve Jobs referring it as “for Steve”. Along with iPhone 4S, Apple released **iOS 5** for the **iPhone**, **iPad** and **iPod Touch** which has added features. However, there is one new feature, which brings body area network technologies to the consumers is **Bluetooth 4.0** with Apple being the first consumer device maker to begin

embedding Bluetooth 4.0 in their products.

### Medical Applications

With the latest software from the iOS line touting over 200 new features, Apple has created a viable consumer base for developers of applications in the largely unexplored realm of **body computing and wearable sensor networks**. By embedding Bluetooth 4.0 i.e. BLE in their iPhone, 4S device will prove to be a huge stimulus for developers of emerging mobile health devices incorporating low energy technology.

Bluetooth 4.0 enabled devices are backwards compatible, thus BLE will not be replacing the existing Bluetooth protocol used for most wireless interaction on mobile devices for higher latency activity. “Closed Bluetooth”, “Bluetooth High speed”, and “Bluetooth Low Energy” in one unique feature. Moreover, set up time is < 3ms and power consumption is < 15mA.

### Potential to revolutionize health care devices

Bluetooth technology allows devices to communicate and transfer key information wirelessly. Bluetooth 4.0 standard contains many vital features that will certainly increase adoption of the standard among medical device manufacturers like **bluetooth devices to maintain power for weeks to months without a charge**.

MICU or NICU, or any other ICU unit, will be without a jumble of wires connected to the patients. Instead, they will have small bluetooth sensors attached to them, synced wirelessly to display monitors next to them.

Transporting patients to imaging rooms and other locations would not be required, cutting down the risk of bacterial infections from the lengthy wires with no risk of people tripping on wires. These are just a few of the potential benefits.

The Bluetooth Special Interest Group (SIG), a consortium of industry supporters responsible for developing the standard, was mandated to build a standard to incorporate use of medical devices, since device to device communication is an everyday occurrence in hospitals and doctors' offices. The specification is now complete with 30-40 vendors already qualified to support it, **with the following critically useful features:**

### **1-Integration The Health Device Profile**

The recently released Health Device Profile (HDP) is specifically tailored for medical applications by incorporating IEEE standards for their medical devices (e.g. pulse-ox, glucose meters, etc), which allow transition their device connectivity easily onto the Bluetooth HDP. The HDP allows standardization of the data format, increasing interoperability, leading to a flourishing market of health related devices using wireless communication.



### **2-Bluetooth advantages- cost and power consumption**

While Wi-Fi connectivity is ubiquitous throughout hospitals and now most offices, the power needed to maintain a wi-fi connection precludes its use in tiny medical devices with minimal capacity for battery storage. More expensive devices, such as cell phones, can afford to maintain a cellular connection, such as 3G or EDGE, but this cost would prevent widespread adoption in small, potentially disposable medical devices.

### **3-Manager devices**

The vision of HDP is that a nearby manager device ("sink") would be responsible for aggregating and transmitting information collected from one or more Bluetooth devices. Thus, a device by the bedside could collect information from multiple patient sensors and transmit it over the hospital Wi-Fi network to doctors and nurses. A nearby mobile device, such as a smartphone, would be the aggregating device and a continuous reading of, say, movement (i.e. exercise) or heart rhythm data, could be collected and forwarded to the cloud for review by the physician.

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Continuous improvement in features that being integrated in smartphones with iPhone 4s leading the way will definitely enhance the adaptability of the technology for medical or healthcare applications.

Via

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