

Borrowing from Cell Phone Technology

Stephen Swift, Senior VP & GM, Medical Products, Microsemi Corporation



Stephen Swift, senior VP & GM of Medical Products at [Microsemi Corporation](#) [1], was a part of the staff written article, "[Portability Is the Name of the Game](#) [2]." He took time to present a full array of responses that were not able to be included in the article, so they are presented here.

Q: *How are advances in electronic components helping the industry move to portable healthcare?*

Swift: Portable electronics for healthcare applications need to be small and reliable, with a slick user interface that is more or less intuitive to use. Electronic components are becoming smaller and systems are consuming less power, which translates to a smaller battery capacity, longer time between recharges, and a reduced overall device size. Slick GUIs, like we find on the iPhone and iPad, make devices easy to approach, understand, and use. Advances in electronic components are reducing the cost of sensors and transducers, thus making useful functions possible and affordable. For example, up until a few years ago, energy harvesting based and/or continuous-monitoring wireless sensors were not viable for consumer medical applications.

Q: *How are consumer electronics impacting the design of electronic medical devices?*

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Swift: The biggest impact for all electronic medical devices is coming from innovations in cell phones. Display technology, rechargeable batteries, low-power electronics, small packaging, touch screen user interfaces—these are all cell phone driven advances. Cell phone technology has also led to data connectivity like never before. Cell phone technology provides convenient and affordable connectivity between wireless healthcare applications, “the cloud,” and healthcare providers. This aligns well with requirements to support EMRs (electronic medical records) in efforts to reduce costs and overheads while increasing accuracy and speed of delivering high quality healthcare. The ability to process “Big Data” in the cloud will push connectivity even further.

Q: *What is the biggest limitation currently holding back medical electronics from developing further?*

Swift: Medical devices are highly regulated, and take time to mature commercially. Medical devices is a growth segment long-term, but investors need to be patient. Unlike the cell phone industry, medical devices provide relatively low manufacturing volume. Economies of scale are elusive at relatively low volume, despite some of the technological advances provided by the cell phone industry. As an added negative impact, there is cost pressure to contain healthcare spending in all countries, and this is translating to increasing cost pressure on device manufacturers and component suppliers.

Q: *What advances need to be made in power solutions for portable technology to advance further?*

Swift: Batteries need to be reliable, energy dense, small, and quickly rechargeable, with low series impedance. Cell phones and electric automobiles are driving advances in battery chemistries, which are headed in the right direction. But electronics can be ultra-low power to the extent that they can harvest or scavenge energy from their environment, either to replace the battery entirely or at least reduce its size by supplementing the power the battery provides.

Q: *How are electronics impacting traditional non-electronic medical devices?*

Swift: Some OEMs are finding innovative ways to deploy electronics with traditionally non-electronic devices. For example, using a radio transponder at the tip of a surgical instrument for triangulation in endoscopic procedures; using a sensor and radio telemetry to measure and report pressure in orthopedic implants.

Q: *How are advances in electronic components impacting the functionality and capabilities of implantable devices?*

Swift: The constant mantra with medical devices is smaller, lighter, and cheaper. MEMS sensors will be important advances in that they can gather physiological information to increase the specificity and functionality of medical devices.

Q: *Where are medical electronics headed over the next five to ten years?*

Swift: Smaller, lighter, cheaper, but the advances don't come freely or cheaply, particularly when the economies of scale are so elusive with relatively small production volumes.

Q: *Any thoughts/comments on medical electronics or another related area that you*

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would like to share with medical device manufacturers to aid them?

Swift: Medical device OEMs, the healthcare community, insurance agencies, and governments need to comprehend the increasing cost of research and development of electronic technology, and ensure that there is an adequate return on the investment of time and money to develop it.

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[1] <http://www.microsemi.com/>

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