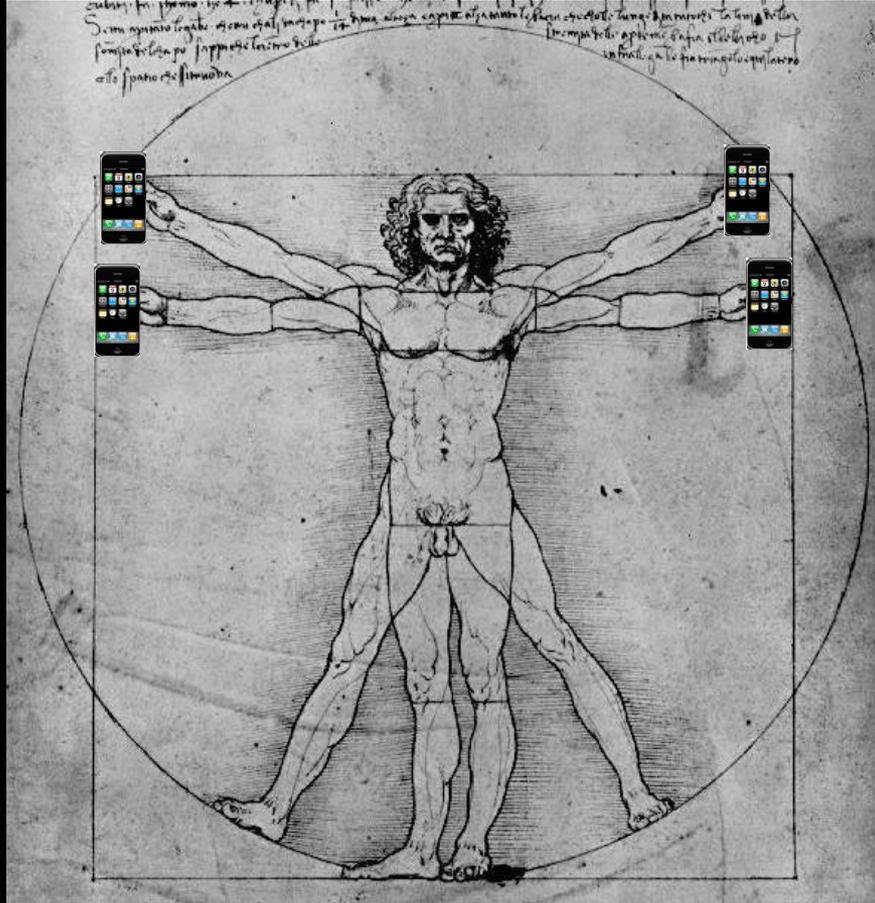


# The Future of Health in a Mobile world



# The market for *connected* wearable devices will reach more than 100 million units annually by 2016

Business Wire 9/2011

Newly emerging connected devices span a broad range from heart rate monitors, to wearable blood glucose meters, to vision, hearing and movement assist devices - all enabling greater detail to track, monitor and care – often through connections provided by mobile phones

The market is now reaching a key growth period with support and commitment to standardized specifications. The professional healthcare market is also starting to look at the potential for embedded wireless communication in wearable devices for in-hospital and remote patient care

## Two questions relate to wireless medical devices

How to get the information from the sensor that is in or on the body ?

How to get the information to a remote clinician or MIS ?

# A number of wireless protocols are jostling for position in this emerging market

Current FDA approved wireless protocols that relate to the collection of information from the body sensors include:

- 802.15.1 (Bluetooth®)
- 802.153a (ultrawide band or UWB)
- 802.15.4 (Zigbee®)
- RF identification (RFID)

# The major wireless contenders

**Bluetooth** is one of the best known local area wireless network protocols – and more than 40 million Bluetooth-enabled health and medical devices already in the market.

- The newly ratified Bluetooth 4 protocol has been optimised for ultra low power – meaning worn or implanted wireless devices can run for very long periods of time
- Most mobile phones already have Bluetooth built in
- Bluetooth is probably perfect for devices that we wear, are embedded or that we carry around with us

## **Zigbee** is slugging it out with Bluetooth

- Low power like Bluetooth but even longer battery life (BT4 to be compared)
- Very robust and has demonstrated superb tolerance to extreme interference
- Mesh network – meaning multiple paths to connect in the event of a failure
- Probably ZigBee will be used devices - the ones that tend to stay within a building, either a home or hospital

## **802.15.6 Body Area Network** is the dark horse contender

- Being developed by IEEE & optimized for low power devices
- Designed for operation on, in or around the human body to serve medical & other applications
- On par with Bluetooth bandwidth and range, but at much lower power consumption and less interference
- Backers of 802.15.6 say products based on it could ship in 2012.

# A number of wireless protocols are jostling for position in this emerging market

Current FDA approved wireless protocols that relate to Remote transmission of data, include:

- 47 CFR Part 15 (Federal Communications Commission (FCC Part 15) devices
- Wireless Medical Telemetry Service (WMTS) cellular (mobile) telephones
- Wireless modems for laptop computers
- Wireless local area networks ('Wifi' - WLAN 802.11.a/b/g)
- **Wireless handheld computers and personnel digital assistants (PDAs) eg iPhone**

# What about iPhones, iPads, Apps (& Androids)?

- ➔ Powerful manufacturers
- ➔ Standard, robust, FDA approved\* platform
- ➔ Reliable upgrade path
- ➔ Intuitive to use
- ➔ Wide spread user base
- ➔ Sexy as Hell



# What about iPhones, iPads, Apps (& Androids)?

To date these apps range from home use advisers, guides and “toys”, which may or may not have real health care implications, to serious medical devices which have clear health care functions, despite in at least some cases, pretending they do not really, perhaps in an attempt to avoid the FDA.

The key questions are what kinds of apps are medical devices, and among those, which will the FDA focus on for regulatory action?



"Smartphones are incredibly powerful devices capable of saving lives, saving money, and improving healthcare in a dramatic fashion, and we carry these massively powerful computers in our pockets."

Dr. Peter Bentley, the inventor of iStethoscope app, which has been downloaded by more than three million people



Thank You !

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