Wireless Capability In The Hybrid Suite

In the surgical community today, an increasing number hospitals and surgical facilities are looking to modernize their operating rooms by building hybrid suites – operating rooms that combine the advanced imaging capabilities of a catheterization lab with the sterility of a traditional OR. As more imaging and surgical equipment is brought into the OR, however, the operating environment can become cluttered with wires. These wires may hinder the efficiency of the OR as well as the mobility of the equipment. So, as more equipment is brought into the space, more facilities may look to wireless capability as a solution.

Recently, NDS Surgical Imaging (NDSsi) added wireless technology to its portfolio of surgical imaging technology that allows the seamless and un-tethered use of the different clinical devices, camera carts and displays. These items can now move freely from one side of the patient to the other depending upon the procedure requirements without having disconnect and reconnect hazardous and unsterile cabling that is often times laying right on the floor.

Here, *Surgical Products* speaks with Jens Ruppert, Vice President and General Manager, Surgical Business Unit at NDS Surgical Imaging (NDSsi), about the importance of wireless technology in the hybrid OR, as well as any modern OR today, and what to consider when implementing this technology in your surgical facility.

SP: *Can you please provide background on the wireless technology NDS provides in the hybrid OR?*

JR: NDSsi conducted in-depth research into the room design and requirements of the modern OR globally. By developing ZeroWire, NDSsi solved the challenge of delivering HD surgical video wirelessly in a high-reliability product. The signal range of the ZeroWire transmitter to receiver (30 feet), and the UWB frequency band (3.1 to 4.8 GHz) allow flawless video transmission with equal quality to a wired solution, while avoiding interference with other devices such as surgical knives.

The combination of ZeroWire transmission, ConductOR switching/routing and

Radiance HD displays provides an optimum visualization system at the heart of the hybrid OR.

SP: *Why is having wireless capability beneficial in the hybrid OR?*

JR: As more imaging and surgical equipment is brought into the OR, the convenience and flexibility of a wireless solution keeps clutter to a minimum, and OR efficiency at a maximum.

Wired systems are not energy-efficient, and do not offer the flexibility of mobility. Wired systems are also difficult to install and service, require more maintenance, and contribute to OR clutter.

An important hybrid OR attribute is lower cost. Wireless technology fits into this category by providing a solution without having to install cable, which adds to material and labor cost.

Another attribute is better quality of care. Wireless technology has the ability to merge minimally invasive and interventional medical imaging technologies. For example a “Radiance” monitor could accept video from a hard wired input from an endoscopic camera on a surgical cart and video from a mobile C-Arm via wireless connection in a non planned emergency situation in which connection time is crucial.

By reducing the cleaning time between procedures, our wireless technology allows faster turnaround of ORs. Additionally, ZeroWire is improving safety by eliminating the hazards caused by long cables connecting OR equipment and laying on the floor. The surgical team also benefits from the increased mobility and flexibility of a wireless solution.

SP: *Can you discuss of the limitations associated with wired systems?*

JR: Because of the many different image formats and physical media types not all cables could be routed within a boom. Wireless technology does not have this restriction. Cable on the OR floor is dangerous and unsanitary.

SP: *What differences are there between the needs of a hybrid OR and that of a traditional OR that make wireless capability important in the hybrid suite?*

JR: The hybrid OR is bringing together different types of equipment that would traditionally be located in other suites. This provides a much faster procedure for patient and staff. But it also presents technology challenges and space challenges to keep the OR running efficiently. Wireless systems are mobile and flexible enough to move around the patient, and to conform to the restrictions of each individual room.

Flexibility is important in equipping mobile imaging modalities with wireless transmitters to enable compatibility within various hybrid suites. This also provides redundancy by not having to dedicate a single mobile medical imaging modality to

one particular OR.

SP: *What is your role as a manufacturer in working with the hospital to plan/design/construct the hybrid suite?*

JR: NDSsi provides image presentation, informatics and proprietary wireless technology to surgical facilities. Our market knowledge and reputation enables us to continue to provide high-quality innovative products.

NDSsi works closely with OEMs, distributors and IT resellers to make sure that NDS products are truly compatible with the equipment in the hybrid OR. We look at the technical specs of the imaging equipment in the OR and recommend our "Radiance" displays, wireless and other equipment that are best choices in terms of best performance, price and added safety in the Hybrid OR.

SP: *If a hospital is planning a hybrid OR and are considering implementing a wireless system, what should they consider when making purchase decisions?*

JR: Considerations should include: Image quality, interference from and to other devices within the hospital, latency, connection integrity, reliability, ease of installation, compatibility, flexibility and mobility of the system, product support, company reputation, ongoing maintenance costs, total cost of ownership, price and support of future technologies.

Facilities have to make sure they use a technology that operates in a frequency range that doesn't interfere with WLAN, cell phones and mobile phones that are usually used in hospitals.

A low RF output power is desired so the device doesn't increase radiation level in the OR. There should be no visual difference in image quality and latency between the wireless and the wired cable communication.