AV-over-IP in the OR: Separating Myths from Reality

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Hospital IT directors and biomedical engineers face mounting pressure to modernise operating room technology; however, misinformation about AV-over-IP creates unnecessary confusion during procurement decisions. Let's examine what's true about IP-based OR video integration versus the marketing hype.

Myth #1: "Use Your Existing Network Infrastructure"

The Reality: AV-over-IP requires a dedicated 10-gigabit networking infrastructure, not your hospital's existing data network. Surgical video streams demand enormous bandwidth—uncompressed 4K video consumes roughly 12 Gbps per feed. Mixing this traffic with electronic health records, pharmacy systems, and administrative data creates network congestion that compromises both patient care and video quality.

Smart hospitals architect separate VLANs or entirely isolated networks for OR video distribution. This protects critical hospital systems while ensuring surgeons receive artefact-free imaging during procedures.

Myth #2: “All AV-over-IP Solutions Are Identical”

The Reality: Multiple competing protocols exist within the AV-over-IP ecosystem, each optimised for different use cases. Some prioritise ultra-low latency for live surgical guidance, while others focus on bandwidth efficiency for multi-room distribution. Common standards include SDVoE, SMPTE ST 2110, and proprietary manufacturer protocols.

Before issuing RFPs, define your specific requirements: Will you need sub-10ms latency for robotic surgery? How many concurrent 4K streams must traverse the network? Understanding these technical needs prevents costly compatibility issues down the line.

Myth #3: “Fiber Optic Cables Are Mandatory”

The Reality: AV-over-IP operates effectively on copper Ethernet infrastructure, though distance limitations apply. Cat6A cabling supports 10-gigabit transmission up to 100 meters—sufficient for most OR configurations. Fiber becomes necessary for longer runs between equipment rooms and surgical suites, or when electromagnetic interference poses concerns near MRI environments.

Many hospitals successfully deploy hybrid approaches: fiber backbones connecting equipment closets, with copper distribution to individual displays and sources within each operating room.

Myth #4: “IP-Based Systems Always Deliver Superior Quality”

The Reality: AV-over-IP represents growing technology with specific strengths, not a universally superior solution. Traditional matrix-based AV systems excel in scenarios requiring guaranteed zero-latency performance and absolute signal reliability. IP solutions shine when flexibility, scalability, and remote management capabilities outweigh those concerns.

Compression artefacts remain a legitimate consideration. While modern codecs minimise quality loss, surgeons performing microsurgery or interventional procedures may notice subtle image degradation that traditional AV systems avoid entirely.

Where AV-over-IP Genuinely Excels

- Scalability and Futureproofing: Adding new displays or sources requires simple network connections rather than costly matrix switcher replacements. Hospitals planning expansion phases appreciate this flexibility.
- Remote Capabilities: IT teams can monitor, troubleshoot, and update OR systems without entering sterile environments. Video streams distribute easily to conference rooms, training centers, or specialist consultations at remote facilities.
- Centralised Management: Single interfaces control multiple operating rooms, simplifying staff training and reducing operational complexity.

Making the Right Choice for Your OR

Budget constraints often drive technology decisions, but total cost of ownership tells the complete story. While AV-over-IP systems may require higher initial network investments, operational savings through reduced cabling, simplified maintenance, and phased upgrade paths frequently justify the expense over five- to seven-year planning horizons.

Consider your hospital's specific context: Are you retrofitting existing ORs or designing new construction? Do procedures require absolute zero-latency performance, or can 20-30ms delays be acceptable? How important are remote consultation and teaching capabilities?

Partner Selection Matters

Choose integration partners who understand both traditional AV and modern networking—not vendors pushing single solutions regardless of fit. Request proof-of-concept demonstrations using your actual video sources and display requirements. Insist on detailed network architecture documentation and ongoing support commitments.

The future belongs to hybrid approaches combining the reliability of traditional AV with the flexibility of IP-based distribution. Smart hospitals evaluate both technologies objectively, selecting solutions that genuinely improve patient care rather than following industry trends.

Ready to explore OR integration options? Esbee Dynamed's technical team helps hospitals navigate these complex decisions with evidence-based recommendations tailored to your clinical workflows and budget realities.

Esbee Dynamed specialises in OR integration and connected surgical instrument tracking solutions. To learn how we can support your operating theatre, contact our team.

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