Compromising a Medical Mannequin

Glisson, et al 's report "Compromising a Medical Mannequin" gives a cushioned glimpse of contributory negligence in the medical industry. This report draws our attention towards the sensitivity of the things at stake if this happens in real world.

The proof of concept was demonstrated by undergrad student's university level and not professionals with not much of real-world experience, metaphorically urges to pause and rethink the current modus operandi in designing network-based devices in medical industry.

As network equipment security can be implemented better when OSI Layers are traversed in a bottom-up fashion (Physical to Application). The principle of layering is to ensure independence of each layer by defining services provided by a layer to the next higher layer, independent of how these services are performed. (Zimmermann H.,1980)

Table below the Medical Mannequin from a Networking point of view:

OSI Layer	**Mitigation Options**
Physical Layer	Using hardcoded/pre-defined Wi-Fi networks to do any maintenance activity.
Data Link Layer	Whitelisting MAC addresses of the end points instead of blacklisting ensures more granular control.
Network Layer	Using hardcoded/pre-defined subnets based on the type of activity. (i.e., Provisioning / Maintenance subnets should be different from general use networks). Also, by using IPsec to ensure the data is not transferred in plain text)
Transport Layer	Employing applications that run on connection-oriented protocols to ensure confirmed acknowledgement for data pushed to the devices. (i.e. TCP)
Session Layer	Ensuring the number of sessions are limited to the least to avoid flooding. (e.g., 1-2)
Presentation Layer	Encryption to ensure that transfers during maintenance and information collection procedure are not carried over the air in non-binary format.
Application Layer	Designing system around open-source products/kits to ensure longer support from the Community than relying on any Company/organization (e.g., Adobe Flash).

References:

Glisson, W., Andel, T., McDonald, T., Jacobs, M., Campbell, M. & Mayr, J. (2015) **Compromising a Medical Mannequin.** Healthcare Information Systems and Technology (Sighealth)

Zimmermann H., (1980)"OSI Reference Model - The ISO Model of Architecture for Open Systems Interconnection," in *IEEE Transactions on Communications*, vol. 28, no. 4, pp. 425-432, April 1980, doi: 10.1109/TCOM.1980.1094702.