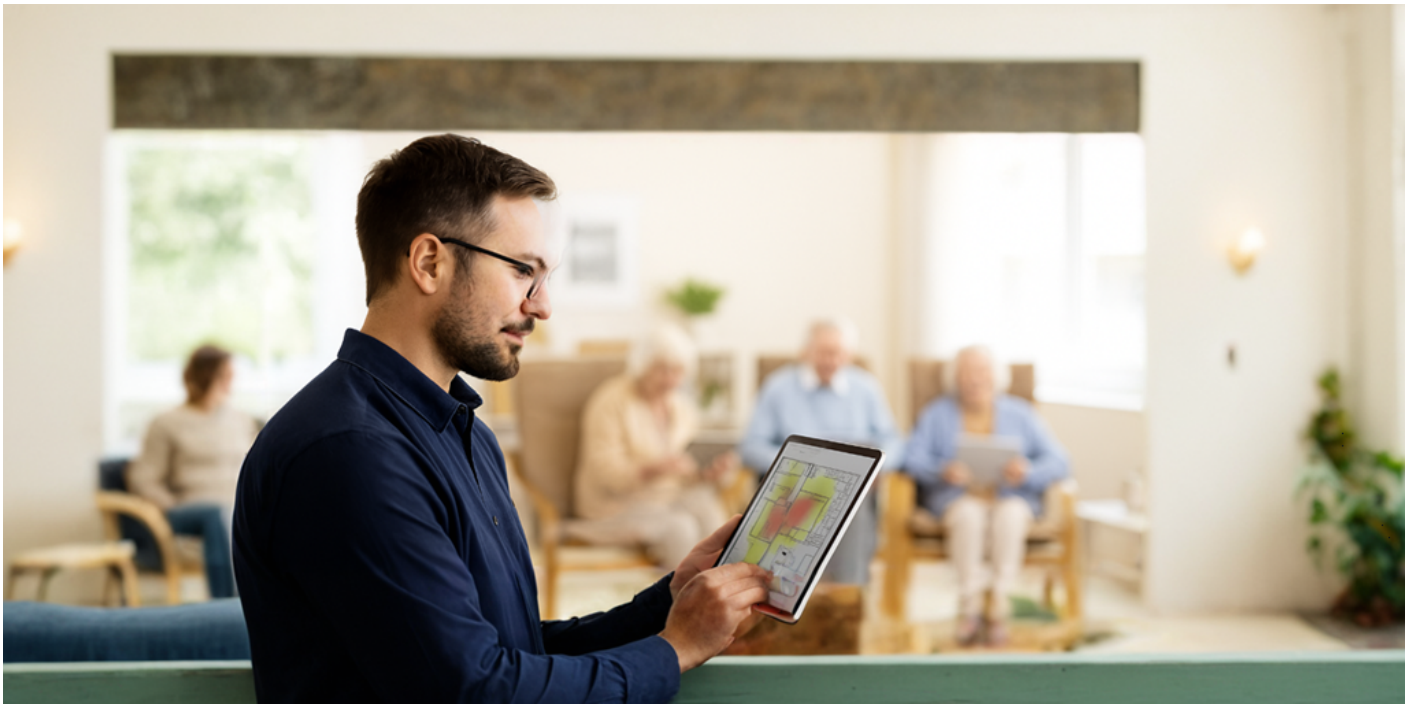
Designing Wireless Networks for Care Homes and Assisted Living Environments



https://www.linkedin.com/pulse/designing-wireless-networks-care-homes-assisted-jarryd-de-oliveira-oeqce

Designing Wi-Fi for care homes and assisted living facilities is a unique challenge that sits somewhere between hospitality and healthcare.

It requires the welcoming ease of a hotel experience and the reliability and security of a medical environment.

These facilities support vulnerable residents, medical staff, visitors and increasingly connected systems, meaning the wireless design must deliver both comfort and clinical dependability.

Balancing Comfort and Critical Connectivity

In a modern care environment, the wireless network underpins everything: medication administration, nurse call systems, building management controls, CCTV, smart TVs and resident

tablets.

At the same time, it’s a lifeline for residents to stay connected with family through video calls, smart speakers and digital health monitoring devices.

This creates a design challenge that blends performance, safety and simplicity.

A good starting point is to design for **room-level coverage**, not just hallway or blanket coverage. Every resident’s room should have strong, reliable signal and low latency for both personal and medical devices. At the same time, **corridor coverage** is critical for roaming devices such as VoIP handsets or mobile care applications used by staff.

Design Fundamentals: Predictive and Validation-Based

As with hospital or hospitality designs, proper **surveying and validation** are key.

Predictive modelling tools like Ekahau or Hamina should be used to simulate wall materials and attenuation, but post-install validation with a Sidekick or analyzer remains essential. Confirm that each AP provides the required primary signal strength of around **-65 dBm** with a **10 dB SNR margin**, ensuring a minimum of two APs are heard above -70 dBm to support seamless roaming and redundancy.

In many care facilities, walls vary from plasterboard to reinforced concrete or fire-rated partitions, creating inconsistent attenuation.

Without proper surveying, signal reflections and dead zones can easily appear.

Validation ensures consistent coverage for Wi-Fi calling, resident medical monitoring and alarm systems, where dropouts are not an option.

SSID and Security Best Practices

Ease of use and security often appear to conflict, especially for elderly residents and visiting family members. Dynamic Pre-Shared Keys (DPSK) provide an ideal middle ground, combining enterprise-grade encryption with a simple connection process. Each resident or room can be issued a unique key that isolates their devices, eliminating the risk of residents accessing each other’s data while avoiding the complexity of certificate-based onboarding.

For staff networks and medical systems, use WPA3-Enterprise with RADIUS or SAML authentication to enforce proper segmentation.

Guest access should be designed for frictionless onboarding, for example, a captive portal that isn’t required for residents but is enabled for visitors.

Radio and Channel Planning

Care homes are dense environments with overlapping coverage between rooms, so attention to channel reuse and transmit power is critical.

Following something like the "**WLAN Pros extended checklist"**, keep 2.4 GHz to 20 MHz channels and **limit SSID count to four or fewer** to preserve airtime. Use 5 GHz as the primary band for most client devices and 6 GHz (Wi-Fi 6E/7) for new-generation systems and medical applications that benefit from low latency and interference-free operation.

Avoid the temptation to “overpower” APs, in most care homes, 8–10 dBm is sufficient for room-to-room propagation without excessive co-channel contention.

If recurring DFS events occur in 5 GHz, exclude affected channels and redistribute APs accordingly.

Coverage Considerations for the Elderly

Residents often use tablets or voice assistants that connect over 2.4 GHz, which has better penetration through walls but is prone to interference. Design for **dual-band operation**, ensuring that critical systems (like nurse call panels) are fixed to 5 GHz while IoT or personal devices have appropriate access on 2.4 GHz.

Remember that many medical devices and fall-detection sensors still rely on 2.4 GHz and that stability and channel isolation matter more than raw throughput.

For environments supporting dementia or assisted-living residents, network design should prioritize **seamless roaming** to prevent device disconnections during movement. Combining 802.11k/v/r (Fast Transition and Neighbor Reports) can enhance performance for supported clients, but validate against older medical or voice devices before enabling 11r globally.

Integration with Modern Healthcare Technologies

New technology in care environments increasingly relies on continuous connectivity, wireless medication carts, body-worn sensors, smart beds and nurse call integration platforms.

Many of these systems operate on cloud-based dashboards that require low-latency, stable connections. A well-engineered Wi-Fi 6 or Wi-Fi 7 network provides the multi-link capability, high throughput and spectral efficiency these applications demand.

Wi-Fi 7 introduces **Multi-Link Operation (MLO)**, which allows devices to use multiple bands simultaneously, improving reliability for medical telemetry and video monitoring. Its **4K-QAM modulation** and **OFDMA improvements** also enhance spectral efficiency in congested environments. For large campuses or multi-building estates, **6 GHz** provides additional capacity free from legacy interference, ideal for next-generation clinical and IoT systems.

Network Segmentation and QoS

Separate traffic logically using VLANs, typically isolating residents, staff, medical systems, building management and guest access. Implement **Quality of Service (QoS)** policies to prioritize voice, video and emergency alerts above general traffic.

A misconfigured network where streaming video competes with nurse call data can have severe real-world consequences.

At the switching layer, ensure that APs receive sufficient power (802.3at or bt) and that upstream links are multi-gigabit capable if possible.

This becomes especially important with Wi-Fi 7 APs operating across 2.4 GHz, 5 GHz and 6 GHz simultaneously.

Operational Simplicity and Maintainability

IT management in care environments is often handled by third-party support teams or stretched in-house IT staff.

Simplify wherever possible:

- Use consistent SSID naming and VLAN mapping.
- Keep firmware across all APs uniform.
- Employ cloud management or controller monitoring for proactive alerts.
- Document AP placement, switch ports and IP allocations (as per the **Wi-Fi Client Connection Checklist** and **How to NOT have a Wireless Problem** guidance).

Final Thoughts

Designing wireless for care homes isn’t just about connectivity, it’s about enabling dignity, safety and independence.

The residents depend on that connection for communication, entertainment and wellbeing.

The staff depend on it for timely alerts, voice communication and accurate medical record access. A well-designed network quietly supports all of this, providing reliability that goes unnoticed because it simply works.

As Wi-Fi 7 and technologies like DPSK become mainstream, care facilities can finally achieve the balance between security, usability and performance.

The design goal should always be the same: **a network that feels invisible, because it never fails when it’s needed most.**

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