

KitNewCare Case Study: Automatic Computer Shutdown

Site: Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain.

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Why did you start?

Problem Description

In the Nephrology unit, computers used in clinical and administrative work were routinely left switched on for extended periods, including outside of working hours. While some devices required continuous operation to support on-call services, others did not require 24-hour use.

This resulted in:

- unnecessary energy consumption
- avoidable operational costs
- increased environmental impact associated with electricity use

Specific Aims

To reduce the environmental impact of computer use in the Nephrology Unit through the implementation of an automatic computer shutdown system.

What did you do?

Context

The intervention was implemented within the Nephrology unit of a university hospital participating in the KitNewCare project. The unit relies on multiple computers to support clinical care, including use during dialysis sessions, routine clinical activity, and on-call services.

Intervention

As a first step, computers within the unit were categorised according to their functional use and required availability:

- **On-call doctor computers**, which required continuous operation (24 hours a day) to support clinical activity
- **Dialysis nurse computers**, which were required during active dialysis sessions and could be switched off after the final shift
- **On-call nurse computers**, which also required continuous availability
- **Computers used during standard working hours**, which did not require operation outside of defined daytime schedules

Based on this classification, an automatic shutdown schedule was developed and implemented to align computer operation with actual usage requirements. Devices not required for continuous operation were automatically powered down outside of working hours, while maintaining the ability to be switched on at any time if needed. 16 computers in the department were identified as appropriate for automatic shutdown.

Staff were trained prior to implementation to ensure awareness of the new system and its implications for workflow. The intervention was implemented through centrally configured automatic shutdown schedules, rather than relying on manual switching by staff, while still allowing computers to be switched on at any time if required.

Measures

Patient Outcomes

No direct patient outcomes were measured. The intervention did not affect clinical care delivery and maintained full operational availability of systems required for patient care.

Environmental sustainability

Electricity consumption was measured using a plug-in energy meter (kWh meter) on the affected computers before and after the change.

Economic sustainability

Financial savings were calculated using kWh saved and hospital electricity tariffs.

Social Sustainability

Implementation success was assessed by comparing expected and actual computer usage patterns following the introduction of automatic shutdown, alongside qualitative analysis of staff feedback to identify barriers and enabling factors.

What did you find?

Results

Environmental sustainability

For most devices, operation was reduced from continuous use (24 hours per day) to approximately 8 hours per day, with slight variation depending on function (e.g. 9 hours for administrative computers and 10 hours for specific clinical systems).

This resulted in estimated annual energy savings of 1,111.36 kWh, corresponding to a reduction of 310.07 kg CO₂e per year. Associated water deprivation savings were 132.70 m³. The annual savings per computer are 19.38 kg CO₂e.

Economic sustainability

The reduction in energy consumption resulted in a corresponding decrease in energy-related costs. Based on an electricity cost of €0.035137 per kWh, this equates to an estimated annual saving of approximately €39.06 per year, €2.44 per computer.

Using a representative EU average electricity price for non-household consumers (approximately €0.18 per kWh), the same reduction in energy use would correspond to an estimated annual saving of approximately €200, or around €12.5 per computer. This highlights the influence of local energy prices on financial outcomes and the potential for greater cost savings in other European settings. Electricity tariffs in healthcare settings may vary depending on procurement arrangements and consumption levels, with some large organisations benefiting from lower negotiated rates.

Social sustainability

The intervention was implemented within routine clinical practice without affecting access to computer systems required for patient care.

The ability to switch computers on at any time ensured that clinical workflows were maintained while reducing unnecessary continuous operation.

What does this mean?

Summary

The implementation of an automatic shutdown system for computers in the Nephrology unit reduced unnecessary energy consumption by aligning device operation with actual usage requirements. The classification of computers according to operational need was important in ensuring that energy savings were achieved without compromising clinical functionality.

The intervention is now being scaled across other departments within the organisation.