

73 Regional anticoagulation with citrate
Avoiding systemic anticoagulation with (low molecular weight) heparin.



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37 Cloud-based modular signage systems
Hospitals need easy-to-follow signage. Modular signage systems use recycled materials and cloud-based services facilitate updating of signage. *Possible suppliers: Modulex.*



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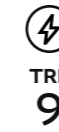
Home Care

22 Low climate impact coolant (propane)
Refrigerant agents are impactful greenhouse gases, cooling units and heat pumps using natural refrigerant propane drastically lower emissions. *Possible suppliers: Enrad.*



TRL
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42 Low temperature district heating and cooling
If and where available in the vicinity of the HD facility. *Possible suppliers: Ectogrid.*



TRL
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24 High-efficiency healthcare ventilation systems
Innovative air ventilation system achieves ultra-clean conditions using 30% less energy than standard laminar airflow systems. *Possible suppliers: Avidicare.*



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45 Building automation and monitoring, reducing energy consumption
Possible suppliers: Schneider Electric.



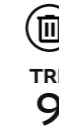
TRL
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25 Sustainable ergonomic work lighting
Efficient lighting solutions with long lifespans and recyclable materials can also increase patient and staff well-being, as well as health outcomes. *Possible suppliers: Chromaviso.*



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46 Nitrous Oxide destruction
Destructors eliminate the leakage of nitrous oxide within the hospital department, avoiding wastage and reducing costs. *Possible suppliers: Medicvent, Medclair.*



TRL
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27 Life cycle of the entire HVACR equipment
Monitoring of HVACR systems to identify hidden losses, plan predictive maintenance and optimize consumption, leading to 10-30% energy-saving. *Possible suppliers: Climacheck.*



TRL
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60 Shower with recirculating water
Smart showers recirculating water within the system and controlling the flow and temperature to minimise waste. *Possible suppliers: Orbital systems.*



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28 Sustainable flooring for healthcare facilities
Renovation methods use reinforced and water-based floor lacquers, allowing to renovate flooring without dismantling the existing ones. *Possible suppliers: Hallbar Teknik.*



TRL
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63 Waste collection system
Touchless waste inlets connect to an underground network, directing each waste stream to its corresponding container at the collection station. *Possible suppliers: Envac Group.*



TRL
9

29 Ventilation system with low energy consumption
Specialized equipment for hospital wards can control ventilation, cooling, heating and lighting via active supply air diffusers, reducing energy use. *Possible suppliers: Lindinvent.*



TRL
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31 Sustainable furniture for public spaces
Healthcare interior design with sustainable and natural materials increases well-being among patients and caregivers, reducing hospital footprint. *Possible suppliers: Green furniture.*



TRL
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33 Sustainable wash basins
Environmentally certified washbasins use pore-free and non-toxic materials that are easy to clean, maintain and renew. *Possible suppliers: Noas Sweden.*



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9

35 Sharing marketplace for furniture and resources
Sharing marketplaces allows to share medical and non-medical equipment. Both internal and cross-organisation marketplaces are available. *Possible suppliers: Flow2.*



TRL
9

36 CO2 cleaning for chillers
The cleaning of ventilation and refrigeration systems increases the efficiency and safety of existing systems, extending their lifetime. *Possible suppliers: Oconordic.*



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Legend

HD - Hemodialysis

PD - Peritoneal Dialysis

RO - Reverse Osmosis

HVAC - Heating, Ventilation, Air Conditioning



Waste



Water



Energy



Transport



Utilities
Side



Patient
Side



Building
& Utilities



Interior



Increased
Patient
Mobility

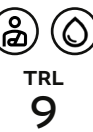


Decreased
Staff
Mobility

List of Innovations

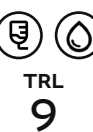
Dialysis Installation

01 Adjusting dialysis fluid flow to blood flow
This feature in Fresenius 5008 and 6008 HD machines optimizes dialysate consumption and is likely to be included in future generations of hemodialysis equipment.



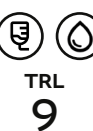
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02 RO water reclaim
Re-injection of RO reject water and surplus permeate in the feed water.



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03 Upgrade of water treatment system
Next generation RO plant fully automated and with far less reject water.



TRL
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04 Reuse of RO reject water
Store excess RO water for use in other 'grey water' systems.



TRL
7-9

07 Forward osmosis membranes (Aquaporin) to produce dialysate from tap water and regenerate dialysate
Testing required to validate the technology for this application.



TRL
4-5

08 Central acid delivery
Central unit providing acid concentrate to HD machines instead of 1 canister per session.



71 Dry acid concentrate powder
Central acid delivery using dry powder concentrate.
Possible suppliers: Fresenius (Granumix), Bbraun (Ecomix).



Operational Practices

09 Central bicarbonate delivery
St. Luc hospital's central bicarbonate system (1990-2000) needs testing and piloting for potential reimplementation, replacing single-use cartridges.



Building Related

23 Non toxic replacement of formalin for structural and molecular preservation in tissue samples
Suitable for kidney biopsies. *Possible supplier: Addax Bio.*



10 Reuse of spent dialysate as fertilizer/irrigation
Spent dialysate can be treated for fertilizer material and greywater use, requiring medicine removal, carbon, ozone, or biological treatment.



05 Portable hemodialysis device based on dialysate regeneration
Technology (Neokidney device of Nextkidney) is being tested allowing for small device in home care situation.



26 Antiviral Healthcare uniform
Antiviral fabrics have organic antimicrobial capability and are made from sustainable and biodegradable natural fibers.
Possible suppliers: Health Textiles.



11 Removal of residues from spent dialysate
Goal zero discharge of pharmaceuticals from dialysis dept. Search for effective elimination techniques for waste of pharmaceuticals.



06 Portable peritoneal dialysis device based on continuous flow PD with dialysate regeneration
WEAKID (CORDIAL programme) and AWAK-PD are at the phase of clinical validation.



30 Patient privacy long-lasting screens
Compared to standard curtains and solutions, screens are easier to customise, clean and have a longer lifespan.
Possible suppliers: Silentia.



12 Reuse of dialysers
Cleaning devices restore dialysers for re-use by removing contaminants from the membrane and headers. A pilot test is underway in the Netherlands. *Possible supplier: NovaFlux.*



13 Online production of hemodialysate at home
A system that includes a backflow preventer, filters, optional softener, booster pump, portable RO unit, distribution ring, extra filters, and requires regular water quality monitoring.



39 Waste bag system
Cassette-based systems offer time-saving handling, low material consumption and low transportation costs compared to the traditional waste bag. *Possible suppliers: Paxxo.*



49 Bio-based on-site wastewater treatment
Bio-purification plants use microorganisms and aquatic plants to naturally purify wastewater, requiring minimal maintenance and no chemical additives. *Possible suppliers: Alnarp Cleanwater.*



14 Online production of peritoneal dialysate at home
See innovation n.13 for production of hemodialysate at home. Concentrate of electrolytes and glucose required.



40 Biodegradable polymer for single used items
Alternative fully biodegradable polymers can be used for disposable items such as shoe and hair covers, aprons, bed sheets, and carrier bags. *Possible suppliers: Gaia BioMaterials.*



50 Air and water treatment with Ozone
Ozone oxidation technology is a time/cost-saving method of treating air and water. It also avoids the use of chemicals, leaving no harmful byproducts. *Possible suppliers: Mellifiq.*



15 Online production of peritoneal dialysate at home using distillation
A solar-powered toolkit could be included for remote areas.



41 Alternative bio-based hazardous waste bins
Hazardous waste containers made of renewable raw materials, as wood, can drastically reduce CO2 emissions.
Possible suppliers: FrostPharma, Woodsafe.



51 On-site system for Infectious Waste Decontamination and Wastewater Purification
Intelligent shredders process hospital waste, transporting it to an on-site plant for decontamination. *Possible suppliers: Pharmafilter.*



16 Blood withdrawal at patients' home/transfer of blood via mail
Special mail packing such as used for population screening.
Possible suppliers: Dianet.



43 Non-alcoholic hand sanitizer
Alternative alcohol-free cleaning and disinfection solutions minimize the use of plastics and chemicals.
Possible suppliers: Hygene of Sweden.



56 Use of robots in dialysis
Robotics support the automation of hospital handling of goods and provide centralized sterilization systems for distributing sterile instruments. *Possible suppliers: Gibotech.*



17 Laboratory Point-of-Care determination at home
Remote monitoring of treatment results by direct streaming with electronic patient dossier.



44 Anti-waste glove dispenser
Alternative dispensers are designed to dispense one glove at a time. This reduces the risk of gloves falling out of the box and being wasted. *Possible suppliers: Dmedical.*



65 Biotechnologies for waste/wastewater treatment
Biological odor control in the waste area avoids using chemicals, ozone or costly refrigeration. Biotechnologies are also used in wastewater treatment plants. *Possible suppliers: Bioteria.*



18 Blood pressure determination at home. Results shared with electronic patient dossier
Setting up communication with patients in combination with enhanced self monitoring reducing travel of patients.



55 Autoclaves with efficient use of energy and water consumption
Possible suppliers: Getinge.



66 Pre-heating of process water
High-efficiency dialysis systems use renewable energy for water heating, with digital data acquisition for monitoring and optimization. *Possible suppliers: GreenTec.*



20 Microclinic instead of in-center HD
The use of microclinics may reduce the overall HD related transport.



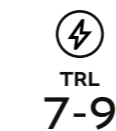
68 Digital solutions for external patient and material transport
Possible suppliers: QRaGo.



67 Centralised monitoring of water/energy use
Performance Systems allow digital monitoring of water and energy production and consumption, suggesting strategies to minimise resource waste. *Possible suppliers: GreenTec.*



21 Solar-assisted hemodialysis
Use of renewable (solar) energy, especially for remote microclinics, reducing both travel and energy consumption.



72 On-site infectious waste treatment
This waste management equipment is designed to shred and decontaminate infectious waste, allowing it to be handled as urban waste. *Possible suppliers: Steridas, Tesalys.*

