



NephroFlow®

Adopter

AZ Sint-Lucas (Ghent)

Type of organisation

Hospital

Country

Belgium

Technological supplier

Nephroflow

Name of the Solution

Nephroflow

Website: <https://nephroflow.com>

Video presentation: <https://vimeo.com/182435418>

NephroFlow is the first dialysis information system that effectively bridges treatment planning and monitoring processes with an intelligent mobile workflow in the dialysis room. The AZ Sint-Lucas in Ghent took the initiative and the resulting system transformed the way the nephrology ward delivers instructions to nurses, captures results during sessions and facilitates communication between the different team members.

NephroFlow eliminates virtually many of the nurses administrative activities which took a mean time spent of 60,5 min per shift.

THE PROBLEM THIS SOLUTION TRIES TO SOLVE

Hemodialysis is a complex recurring technical medical procedure that requires meticulous planning from both a medical and operational perspective. The majority of European dialysis centers have implemented some form of information system to store physician prescriptions, medication lists and to capture the outcome of each dialysis session.

Despite a basic level of computerization, delivering instructions to nurses and capturing critical parameters and events during the treatment relies on a cumbersome paper based workflow. The process of printing instructions, writing down session results and manually entering these results in the dialysis information system hinders dialysis centres in delivering cost-effective and qualitative treatments to their patients:

- Preparing, executing and completing a session requires a lot of manual interpretation.
- Bed-side charting is very labour-intensive.
- Communication between nurses and nephrologists about important events can be nontransparent.
- Nephrologists providing remote support for nurses in satellite centers require tedious briefing when they are consulted.
- Manual calculation of treatment parameters by nurses based on physician instructions is error-prone.

The motivation for the start of the project was the non-existence of an existing solution in the nephrology software market. In need of a new dialysis information system, AZ Sint-Lucas in Ghent approached a young web and mobile app development company (Typework) to tackle the aforementioned issues by creating a completely paperless dialysis workflow that integrates seamlessly into the electronic dialysis records.

The beneficiaries of the project were the different actors of the care team, including nurses, nephrologists, technicians, dietitians, social workers and administrative staff.

INNOVATIVE IT SOLUTION THAT WAS IMPLEMENTED

NephroFlow is innovative because **it is the first dialysis information system that effectively bridges treatment planning and monitoring processes with an intelligent mobile workflow in the dialysis room.** The true innovation of the system lies in the mobile and process driven approach that was developed during over two years of intensive co-creation with end users. Every care protocol in the dialysis room was transformed into a mobile workflow, supporting real time event registration, quality measurement and control processes and a vast array of efficiency gains through smart use of mobile technology.

The resulting system completely transformed the way the nephrology ward delivers instructions to nurses, captures results during sessions and facilitates communication between the different team members.

Critical treatment data can now be consulted and registered at the source, which introduces a continuous feedback loop allowing the hospital to constantly measure and improve the quality of delivered care.

CURRENT IMPACT ON THE PATIENTS / END USERS

The impact of NephroFlow on nursing staff was measured through an extensive study that compared workflow efficiency, safety according to international standards and perceived quality of care before and after the implementation of the solution. A set of questionnaires and time registration tables compared the time spent on administrative tasks and the perceived efficiency, safety and quality of care by health workers before and after introduction of the platform.

Analysis of time registrations by nurses revealed a mean time spent of 60,5 min per shift in performing following administrative activities before implementation:

- Printing and organizing paper files for use during dialysis treatment (3 min)
- Manual check and registration of dialysis parameters (35 min)
- Input of patient treatment information in the main medical files during and after treatment (11min)
- Maintenance of written patient briefing for colleagues (11min)

Time registrations after implementation showed that NephroFlow eliminates virtually all of these activities by providing mobile bedside registrations integrated in the mobile care protocol workflows and by automatically capturing dialysis parameters through a direct dialysis machine integration.

The resulting time gain provides nurses with more time to provide care to patients and greatly increases work satisfaction. Satisfaction with distribution of administrative tasks during treatment shifted from 24% dissatisfaction and 46 % satisfaction to 0% and 76 % respectively. The percentage of nurses who regularly or occasionally needed help from a colleague to complete all their tasks was reduced from 78 to only 54%. Digitalizing all treatment parameters and information led to perceptions of easier access to relevant patient data, with 96 % claiming to find data easily to very easily whereas this was only 67 % before. Safety regarding correct registration of administered medication has improved with 36% (54% to 90%). Digital registration also indirectly fulfilled requirements imposed by international accreditation bodies. Overall perceived patient safety augmented from 94 to 98 %, which is attributed to the reduced risk of errors typically related to copying parameters and manual calculations. Finally, there was a reduction from 70% to 18% in nurses' perception of administrative tasks getting in the way of patient care. The latter implies an augmentation of the quality of care for the patient, in accordance to the finding in former research that time spent for patients was one of the important criteria for quality of care perceived by patients themselves.

CURRENT SUCCESS

There are currently three dialysis centres in Flanders that rely completely on our platform to implement their dialysis work processes. There are over 50 nurses and 5 nephrologists that use NephroFlow as their primary work instrument on a daily basis. Together this care team treats a population of around 150 patients three times per week on average.

The impact of NephroFlow on the organisation can be described as follows:

- Greatly improved time-efficiency of the provided treatments, resulting in more time for the patient
- Reduced costs as less steps and no papers are required in the dialysis room
- Increased flexibility in staffing requirements (less overtime, less fill-ins to cover for sick colleagues)
- Reduced training time for nurses
- Reduced error margins while registering treatment data
- Introduction of an instrument to measure and improve the quality of delivered care
- Instant compliance with multiple accreditation requirements such as medication covigilance and compliance, patient safety and identification.

The project has transformed into a funded startup company, with a team of 5 full time equivalents and multiple investors on board.

The system has been in production in three dialysis centers since Augustus 2016 and is ready for implementation in new centers in Flanders. Domestic sales have started in Q4 2016 and multiple site visits have been performed by different Flemish general hospitals. First new customers are expected to sign in Q2 2017. In parallel business development has started in the Netherlands, Germany, France and Italy. Distributors have been signed in UAE, Hong Kong, Malaysia and Singapore.

We are currently on the verge of signing a larger funding round that will enable us to boost our internationalisation efforts and focus on improving the product and introducing remote patient monitoring features for home dialysis patients.

HOW THE PROJECT CAN / WILL SCALE WITHIN OR OUTSIDE THE ADOPTER ORGANISATION

The increasing cost associated with an ageing population and a high prevalence of end stage renal disease in the western world poses great stress on the national healthcare systems. More and more patients develop chronic conditions such as diabetes and hypertension, which are some of the most common causes of renal failure.

Every year European healthcare systems spend between €40,000 to €80,000 per patient on dialysis. This adds up to an average of around 2% of national healthcare budgets. This budget is used to treat less than 0.1% on the total population, a figure that is set to double in next 5 years.

Different national programs have been developed to help reduce the cost of dialysis treatments and to increase the transparency and quality of delivered care. NephroFlow can help by improving the efficiency of dialysis in an in-centre setting and by providing centres the tools to measure and (peer) review their performance.

There is no work instrument comparable to NephroFlow on the market at this point in time, and dialysis processes are similar in Europe. If this market demand can be filled in through the right distributor in each country, we can scale this solution throughout Europe and beyond.