

## Goal-directed dialysis – individualizing the prescription Can HD learn from PD?

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Maintenance hemodialysis (HD) has been introduced as a breakthrough treatment for irreversible renal failure in the 1960s, following the pioneering efforts of Dr Willem Kolff. The first carefully selected patients received highly individualized care, with longer treatment time and mostly with home HD. The astounding live demonstration of HD treatment in front of the US Congress House Ways and Means by Shep Glazer provoked an amendment to the Social Security Act introducing Medicare entitlement for end-stage renal disease patients in the USA from 1972. The resulting expansion of HD launched dramatic changes in practice, including a shift from home towards predominantly in-center dialysis and an inevitable standardization of the procedure. The conventional 4 hours thrice weekly prescription regimen was set as a compromise to deliver optimal quality of care at acceptable cost and within organizational limits of dialysis centers.

### Dialysis adequacy

Standardization of HD therapy provided benchmarks for each dialysis center to achieve. The target urea clearance was defined in the appropriate guidelines based on the randomized clinical trials which showed no major survival benefit from a higher than recommended dialysis dose. The goal was set to achieve at least a minimum Kt/V of 1.2 in maintenance HD patients. Nevertheless, the key elements that matter in dialysis by far surpass the single index and incorporate a myriad of issues such as fatigue, cardiovascular disease, vascular access, and mortality in HD patients, as well as infection, technique survival, and life participation in peritoneal dialysis (PD) patients.

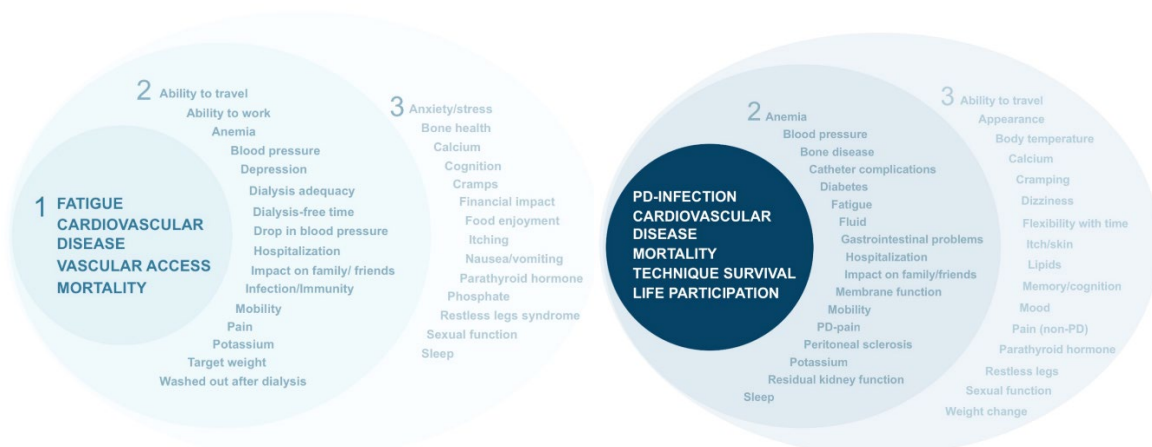


Figure 1. Important outcomes in dialysis

Thus, in January 2018, Kidney Disease: Improving Global Outcomes (KDIGO) convened a Controversies Conference focused on dialysis initiation, including the choice of modality, access, and prescription, and establishing the need to move further from a “one-size-fits-all” approach to dialysis. This initiative returned the focus to providing more individualized care that incorporates patients' personal goals and preferences, while still maintaining best practices for quality and safety, thus emphasizing the concept of shared decision-making.

Hemodialysis-related KDIGO recommendations translated into 2020 ISPD Practice Recommendations, which defined the three pillars of contemporary PD care as: maintaining the quality of life and enabling people to meet their life goals, minimizing symptoms and treatment burden, and ensuring high-quality care. A flexible, individually tailored dialysis schedule and remote monitoring should allow patients to pursue their education and employment, have more time for themselves, and reduce illness intrusion into their lives. A similar degree of flexibility could also be achieved with home HD treatment.

### **Incremental dialysis**

The concept of incremental dialysis has been employed in PD practice for over a decade with favorable results in terms of gradual adaptation to treatment, less peritoneal glucose exposure, fewer mechanical side effects, reduction in treatment cost, and possibly even better preservation of renal function and lower peritonitis rate. Incremental PD relies on regular assessment of residual kidney function (RKF) and related progressive adjustment of PD prescription to achieve optimal toxin clearance and fluid removal. Thus, in PD patients, RKF is closely monitored and has exhibited a major positive impact on patient survival in the ADEMEX and CANUSA studies. Such practice is not routinely pursued in HD patients, even though there is evidence that preserving RKF also improves survival, nutritional status, anemia, and volume in this population. However, the standard assessment procedure based on 24-hour urine collection is rather challenging for the patients and the staff, and emerging new serum biomarkers of kidney function are expected to facilitate this process.

The currently available data on incremental HD mainly derive from observational studies and are generally favorable in terms of preservation of RKF, shorter time-to recovery after a dialysis session, and survival. However, the recently published results from a prospective study by Vilar et al. found no difference in the quality of life, cognitive function, mood, blood pressure control, RKF preservation, and survival between the patients initiating HD with incremental (twice weekly) or conventional (thrice weekly) regimen after 12 months follow-up. Nonetheless, the trial was small, and the drop-out rate was high, thus justifying more research on this matter. Namely, the ‘RandomizEd clinicAL trial on the efficacy and saFety of incremental haEmodialysis’ (REAL LIFE) set up by the EUDIAL Working Group is expected to provide reliable data on the impact of individualized HD prescription on RKF.

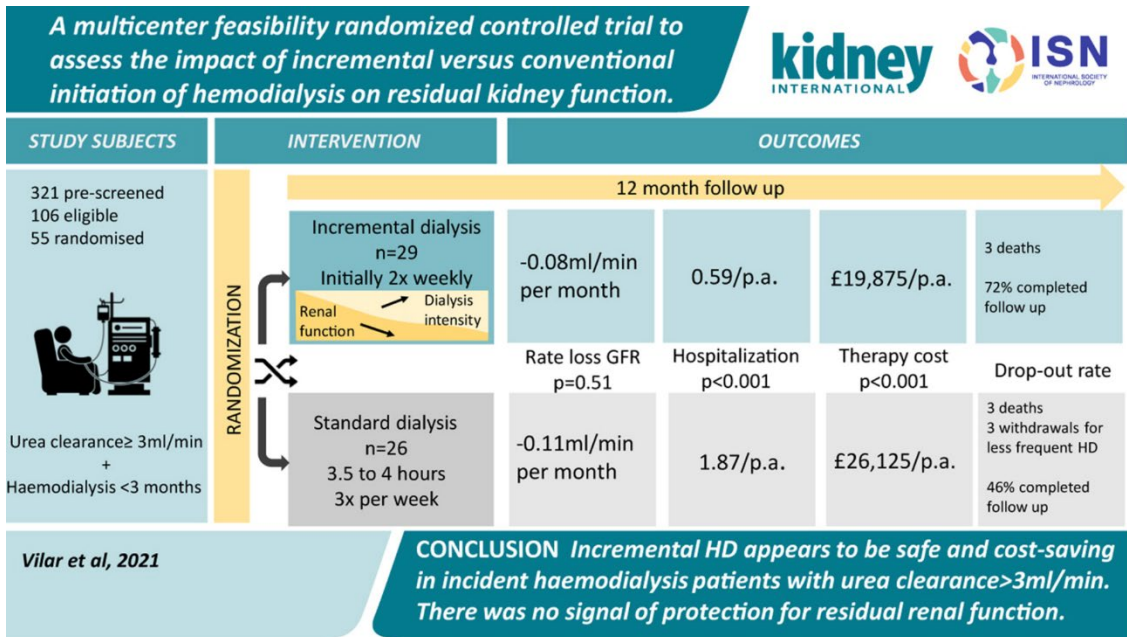


Figure 2. The effect of incremental HD on residual renal function

### Assisted dialysis

Home assistance PD programs involving healthcare technicians, community nurses, or trained family members have been promoted and implemented in several countries in recent decades. The aim was to improve the accessibility of home dialysis, enhance patients' quality of life and decrease treatment costs compared to in-center HD. Despite the initial confidence, experience from France shows a decline in family-assisted PD early after program initiation, followed by the uptake in nurse-assisted PD reflecting the adoption of the economic incentive. Implementation of assisted HD has been hindered by technological and reimbursement impediments, but recent technological advances could facilitate this transformation.

### Key points

1. HD and PD have significantly evolved since their introduction as maintenance therapies for end-stage kidney disease.
2. Achieving dialysis adequacy has far surpassed the concept of mere urea clearance and nowadays relies on shared decision-making to meet patients' personal needs and life goals on top of reducing symptoms and improving survival.
3. Flexible dialysis regimens help to preserve RKF in PD patients, but more studies are needed to explore this topic in maintenance HD patients.
4. A shift towards home-based dialysis requires the availability of new technologies and healthcare policy transformation but might reduce treatment costs and improve patient's quality of life.

### Further reading

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