

Submission No. : DA01-0001

Session Title : Dialysis 1 (Hemodialysis)

Session Topic : Unresolved Issues in the Care of HD Patients

Date & Time, Place : June 15 (Sat) / 08:30-10:00 / Room 3 (GBR 104-105)

---

## **Hemodiafiltration and Expanded Hemodialysis: A Look Towards the Future**

**Hideki Kawanishi**

*Tsuchiya General Hospital, Japan*

---

The goal of blood purification in the context of treating patients with kidney failure or end-stage renal disease is to remove uremic toxins from the blood. Uremic toxins are waste products that accumulate in the body when the kidneys are no longer able to filter and excrete them effectively. Several techniques and approaches have been developed to achieve this goal, including hemodialysis (HD) and the removal of middle molecule solutes (MM). As these technologies evolved, the field of middle molecule (MM) removal expanded considerably. In a recent comprehensive review, MM was operationally defined as solutes falling within the molecular weight range of 0.5-58 kDa. This contemporary framework further subdivided middle molecules into distinct categories, including "small-middle" (0.5-15 kDa), "medium-middle" (15-25 kDa), and "large-middle" (25-58 kDa). Notably, this revised classification aligns the upper limit of middle molecules (58 kDa) with the limit of glomerular filtration. The removal efficiency of Hemodiafiltration (HDF) is primarily determined by the volume of replacement fluid, although removal characteristics vary depending on the dilution method employed. Post-dilution HDF, when combined with a protein-non-leakage hemodiafilter, demonstrates efficacy in the removal of small-middle molecules such as  $\beta_2$ -microglobulin ( $\beta_2$ MG). In contrast, for the targeting of medium to larger-middle molecules, a protein-leakage type hemodiafilter is preferred. However, the drawback of excessive albumin leakage in post-dilution HDF arises due to the challenges in effectively separating albumin from larger-middle substances. In such instances, pre-diluted HDF, capable of discriminating between albumin and larger-middle molecules, is the preferred choice. Subsequently, medium cutoff (MCO) membranes (average pore size around 5 nm) were developed and are widely used. Terminology of expanded HD is also used in some cases to indicate that MM removal is more efficient than conventional HD. The new definition of MM requires standards based on a set range of substances to be removed.



**APCN & KSN 2024**

June 13(Thu) - 16(Sun), 2024 Coex, Seoul, Korea



*Promoting Sustainable Kidney Health:  
The Asia-Pacific and Beyond*

**Keywords:** middle molecule, HDF, expanded HD, MCO membranes