

# **Current Status of the Implication of the Clinical Practice Pattern in Hemodialysis Prescription in Regular Hemodialysis Patients in Egypt – Cairo - Sector (C)**

*Thesis*

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

قَالُوا سُبْحٰنَكَ لَا عِلْمَ لَنَا اِلاَّ مَا  
عَلَّمْتَنَا اِنَّكَ اَنْتَ الْعَلِیْمُ الْحَكِیْمُ

صدق الله العظيم

البقرة  
الآية  
٣٢



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# LIST OF ABBREVIATIONS

<b>Abbrev.</b>	<b>Full term</b>
<b>AV</b>	Arteriovenous access
<b>BFR</b>	Blood flow rate
<b>BMI</b>	Body mass index
<b>BP</b>	Blood pressure
<b>BUN</b>	Blood Urea Nitrogen
<b>CAPD</b>	continuous ambulatory peritoneal dialysis
<b>CAPR</b>	Cardiopulmonary recirculation
<b>CKD</b>	Chronic kidney disease
<b>CMS</b>	US Centers for Medicare and Medicaid Services
<b>CPG</b>	clinical practice guidelines
<b>CRP</b>	C- reactive protein
<b>CVC</b>	Chronic venous catheter
<b>CVD</b>	Cardiovascular disease
<b>DFR</b>	Dialysate flow rate
<b>DM</b>	Diabetes mellitus
<b>DOPPS</b>	Dialysis outcome and practice pattern study
<b>ERA-EDTA</b>	The European Renal Association-European Dialysis and Transplantation association
<b>ESRD</b>	End stage renal disease
<b>GFR</b>	Glomerular filtration rate
<b>GraDe</b>	Grades of recommendation assessment, Development, and evaluation
<b>HBV</b>	Hepatitis B Virus
<b>HCV</b>	Hepatitis C Virus

## **LIST OF ABBREVIATIONS (Cont....)**

<b>Abbrev.</b>	<b>Full term</b>
<b>HD</b>	Hemodialysis
<b>HDF</b>	Hemodiafiltration
<b>HF</b>	Hemofiltration
<b>HTN</b>	Hypertension
<b>IPD</b>	Intermittent peritoneal dialysis
<b>K/DOQI</b>	Kidney Disease Outcome Quality Initiative
<b>KDIGO</b>	Kidney disease improving global outcomes
<b>KOA</b>	The mass transfer area coefficient
<b>MIA</b>	Malnutrition -Inflammation atherosclerosis (MIA) Syndrome
<b>MICS</b>	‘malnutrition–inflammation complex syndrome’
<b>MOH</b>	Ministry of health
<b>NKF</b>	National Kidney Foundation
<b>PEM</b>	Protein energy malnutrition
<b>QIP</b>	Quality improvement programs
<b>RRT</b>	Renal replacement therapy
<b>SRI</b>	Solute removal index
<b>TMP</b>	Transmembrane pressure
<b>TNF <math>\alpha</math></b>	Tumor necrosis factor
<b>UF</b>	Ultrafiltration
<b>UKM</b>	Urea kinetic modeling
<b>UpostHD</b>	Urea posthemodialysis
<b>UpreHD</b>	Urea prehemodialysis
<b>URR</b>	Urea reduction ratio
<b><math>\beta</math>2M</b>	Beta 2 microglobulin
<b>(<math>K_{uf}</math>)</b>	The ultrafiltration coefficient



## Abstract

**Introduction:** Studies examining the link between research evidence and clinical practice have consistently shown gaps between the evidence and current practice . **Aim of the Work:** To study the pattern of current clinical practice in hemodialysis prescription in regular hemodialysis patients in Egypt and to compare this pattern with standard international guidelines in hemodialysis prescription, stressing on anemia, bone disease management and adequacy of dialysis. **Patients and methods:** A retrospective study was carried out including all 339 Patients. **Results:** of this study demonstrated that there were many causes for ESRD in the study population, where HTN 36.1%, DM 18%, and in 11.8% the cause was unknown, this results agrees with most of the studies where HTN & DM were the main causes of renal failure. **Conclusion:** The mean value of HD period is 4.7 ( $\pm$  3.9) years. The mean value of patients dry weight was 70.7 ( $\pm$  7) Kg. **Recommendations:** The developed practice guidelines should be reviewed and updated, if needed, yearly.

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**Key words:** anemia, end-stage renal failure (ESRD),

## **INTRODUCTION**

Studies examining the link between research evidence and clinical practice have consistently shown gaps between the evidence and current practice. Some studies in the United States suggest that 30%-40% of patients do not receive evidence-based care, while in 20% of patients care may be not needed or potentially harmful. However, relatively little information exists about how to apply evidence in clinical practice, and data on the effect of evidence-based guidelines on knowledge uptake, process of care or patient outcomes is limited (*Locatelli et al., 2004*).

Appropriately then, the care of dialysis patients has been the prime focus of nephrology, particularly after the widespread availability of maintenance dialysis when it became evident that mortality of dialyzed patients was high and their quality of life far from adequate (*Eknoyan et al., 2002*).

Guidelines practiced on anemia and actual practices are much different with different places and patients according to treatment. Moreover, in individual countries and individual units within countries local circumstances relating to economic conditions; organization of health care delivery or even legal constraints may render the immediate implementation of best practice guidelines difficult or impossible. Nevertheless, they

provide a goal against which progress can be measured. *(Locatelli et al., 2004)*

Compliance with clinical guidelines is an important indicator of quality and efficacy of patient care, at the same time their adaptation in clinical practice may be initiated by numerous factors including; clinical experts, patient performance, constrains of public health policies, community standard, budgetary limitation and methods of feeding back information concerning current practice. *(Cameron, 1999)*

End-stage renal disease (ESRD) is one of the main health problems in Egypt. Currently, hemodialysis represents the main mode for treatment of chronic kidney disease stage 5 (CKD5), previously called ESRD or chronic renal failure.*(Afifi, 1999)*

Although hemodialysis is often used for treatment of ESRD, no practice guidelines are available in Egypt. Healthcare facilities are seeking nowadays to develop practice guidelines for the sake of improving healthcare services. *(Ministry of Health and Population, 1999).*

## **AIM OF THE WORK**

To study the pattern of current clinical practice in hemodialysis prescription in regular hemodialysis patients in Egypt and to compare this pattern with standard international guidelines in hemodialysis prescription, stressing on anemia, bone disease management and adequacy of dialysis.

## **HEMODIALYSIS PRESCRIPTION**

Uremia is a quite complex syndrome encompassing a metabolic disorders and accumulation of various sized uremic toxins (*Vanholder et al., 2003*); that it would be impossible for intermittent renal replacement therapy (RRT) to replace the homeostatic role of the kidneys. Hence, the importance of providing at least adequate dialysis. (*Eknoyan, 2005*)

Eradication of uremic symptoms was supposed to predict good long term results of dialysis-low morbidity and mortality. This approach of assessing adequacy is subjective, requires very careful monitoring of patients, and is time consuming (*Twardowski, 2003*).

Hemodialysis (HD) therapy has been one of the true success stories in the annals of medical science. Before the availability of this treatment, the diagnosis of kidney failure was a death sentence (*Butman and Nissenson, 2005*).

Unfortunately, despite major advances in the technology of HD and in the management of its complications, the morbidity and mortality of patients on dialysis remain high, at a time that the incidence and prevalence of kidney failure persistently are increasing. Hence, the early and continued concern with the adequacy of dialysis (*Eknoyan, 2005*).

Optimal care of the patient receiving long-term HD requires broad knowledge of the HD technique and appropriate prescription according to patient- and device-dependent variables (*Ikizler and Schulman, 2005*).

**Table (1): Elements of Hemodialysis Prescription.**

Dialyzer
Time & frequency
Blood flow rate
Dialysate flow rate
Ultrafiltration rate
Dialysate composition
Anticoagulation

*(Brenner and Rectors, 2008)*

### **1-Dialyzers**

#### **Types of dialyzers and its choice**

The dialyzers are calssified either according to it's synthetic material into: cellulose, modified cellulose or synthetic polymers Or according to it's hydrokinetics into High-Flux &Low-Flux Dialyzers. All dialyzers in clinical use are of the hollow-fiber type with membranes of cellulose, modified cellulose or synthetic polymers. (*Ronco and Clark, 2005*).

A biocompatible dialysis membrane is one in which minimal reaction occurs between the humoral and cellular components of blood as they come into contact with the surface of the dialyzer (*Hakim, 1993*).

Unsubstituted Cellulosic membranes have the propensity to activate the complement system. This activation of complement is partially responsible for the subsequent activation of neutrophils and other leukocytes, making these membranes bioincompatible (*Chenoweth, 1984*), whereas substituted cellulosic or synthetic membranes have more biocompatible characteristics. (*Ambalavanan et al., 1999*)

High-flux membranes have ultrafiltration coefficient

( $K_{uf}$ ) values  $> 12$  mL/h/mm Hg, and as high as 80 mL/h/mm Hg. Low-flux membranes have  $K_{uf}$  values  $< 12$  mL/h/mm Hg. The  $K_{uf}$  is calculated in milliliters of ultrafiltrate per hour per mm Hg (mL/h/mm Hg) of transmembrane pressure (TMP) (*Chelamcharla et al., 2005*)

The efficiency and flux are not related to each other. Thus, high efficiency membranes can be either high flux (large surface area and large pores) or low flux (large surface area but small pores), and low efficiency membranes can also be either low flux or high flux (*Ambalavanan et al., 1999*).