

**Current Status of the Implication of the  
Clinical Practice Pattern in Hemodialysis  
Prescription in Regular Hemodialysis  
Patients in Qalyubia Governorate  
(Sector A2)**

*Thesis*

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Degree in Internal Medicine

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## List of Abbreviations

Abbrev.	Full term
<b>ABD</b>	Adynamic bone disease
<b>ACEIs</b>	Angiotensin-converting enzyme inhibitors
<b>ADPKD</b>	Autosomal dominant polycystic kidney disease
<b>AGE</b>	Advanced glycation endproduct
<b>AHA</b>	American Heart Association
<b>AJKD</b>	American Journal of Kidney Diseases
<b>ANZSN</b>	Australian and New Zealand Society of Nephrology
<b>ARBs</b>	Angiotensin receptor blockers
<b>AV fistula</b>	Arterio venous fistula
<b>Aranesp®</b>	Therapy
<b>BAP</b>	Bone alkaline phosphatase
<b>BNP</b>	B-type natriuretic peptides
<b>BP</b>	Blood pressure
<b>BUN</b>	Blood urea nitrogen
<b>CAPN</b>	Canadian Association of Pediatric Nephrologists
<b>CARI</b>	Caring for Australian with Renal Impairment
<b>CDC</b>	Centers for Disease Control and prevention
<b>CHF</b>	Congestive heart failure
<b>CHOIR</b>	Correction of Hemoglobin and Outcomes in Renal Insufficiency
<b>CHr</b>	Reticulocyte Hb content
<b>CKD 5D</b>	Chronic kidney disease stage 5 on dialysis
<b>CKD</b>	Chronic kidney diseases
<b>CKD-MBD</b>	Chronic Kidney Disease-Mineral and Bone Disorder
<b>CMB</b>	Calcium mass balance
<b>CPG</b>	Clinical guidelines
<b>CREATE</b>	Cardiovascular Risk Reduction by Early Anemia Treatment with Epoetin Beta
<b>CSN</b>	Canadian Society of Nephrology
<b>cTns</b>	Cardiac troponins
<b>CUA</b>	Calcific uremic arteriolopathy
<b>CVD</b>	Cardiovascular disease
<b>DCa</b>	Dialysate calcium concentration

<b>DFO</b>	Desferrioxamine
<b>DOPPS</b>	Dialysis Outcomes and Practice Patterns Study
<b>EBPG</b>	European Best Practice Guidelines
<b>eKt/V</b>	The Equilibrated Kt/V
<b>EPO</b>	Erythropoietin
<b>ERA– EDTA :</b>	European Renal Association - European Dialysis and Transplant Association
<b>ERBP</b>	European Renal Best Practice
<b>ERT</b>	Evidence review team
<b>ESA</b>	Erythropoietin stimulating agent
<b>ESRD</b>	End stage renal disease
<b>FBC</b>	Full blood count
<b>FDA</b>	US Food and Drug Administration
<b>FGF</b>	Fibroblast growth factor
<b>GFR</b>	Glomerular filtration rate
<b>GN :</b>	Glomerulo nephritis
<b>GRADE</b>	Grades of Recommendation, Assessment, Development, and Evaluation
<b>Hb</b>	Hemoglobin
<b>HBV</b>	Hepatitis-B virus
<b>HCV</b>	Hepatitis C virus
<b>HD</b>	Hemodialysis
<b>HDF</b>	Hemodiafiltration
<b>HDP</b>	Hemodialysis Product
<b>HEMO study</b>	The Hemodialysis study
<b>HIV</b>	Human immunodeficiency virus
<b>IL-1</b>	interleukin-1
<b>iPTH</b>	Intact parathyroid hormone
<b>K/DOQI</b>	National Kidney Foundation Kidney Disease Outcome Quality Initiative
<b>KDIGO</b>	Kidney Disease Global Outcomes Improvement initiative
<b>KHA</b>	Board of Kidney Health Australia
<b>LVH</b>	Left ventricle hypertrophy
<b>MOH</b>	Egyptian Ministry of Health
<b>nPCR</b>	Normalized Protein Catabolic rate

<b>NT-proBNP</b>	N-terminal prohormone of brain natriuretic peptide
<b>PAD</b>	Peripheral arterial disease
<b>PCI</b>	Percutaneous coronary intervention
<b>PRCA</b>	Pure red cell aplasia
<b>RA</b>	Renal Association
<b>RCTs</b>	Randomised control trials
<b>ROD</b>	Renal osteodystrophy
<b>SCD</b>	Sudden Cardiac Death
<b>SHPT</b>	Secondary hyperparathyroidism
<b>SLE</b>	Systemic lupus erythematosus
<b>spKt/V</b>	Single- pool Kt/V
<b>SRI</b>	The solute removal index
<b>stdKt/ V</b>	standard Kt/V
<b>t-PA</b>	Tissue plasminogen activator
<b>TREAT</b>	Trial to Reduce Cardiovascular Events with
<b>TSAT</b>	Transferrin saturation
<b>URR</b>	Urea reduction ratio
<b>USRDS</b>	United States Renal Data System
<b>VC</b>	Vascular calcification
<b>VDR</b>	Vitamin D receptor
<b>VDRA</b>	Vitamin D receptor activators
<b>WGs</b>	Work groups
<b>β2m</b>	Beta 2-microglobulin

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## **INTRODUCTION**

**E**nd-stage renal disease (ESRD) is defined as irreversible decline in a person's own kidney function, which is severe enough to be fatal in the absence of dialysis or transplantation. ESRD is included under stage 5 where it refers to individuals with an estimated glomerular filtration rate (eGFR) less than 15 mL per minute per 1.73 m<sup>2</sup> body surface area, or those requiring dialysis irrespective of glomerular filtration rate decline. (*NKF. (K/DOQI), 2010*)

ESRD has become a public health concern worldwide as the total number of ESRD patients requiring renal replacement therapy has been growing dramatically (**Bello AK, Nwankwo E, El Nahas AM, 2005**)

ESRD is one of the main health problems in Egypt. Currently, hemodialysis (HD) represents the main mode for treatment of chronic kidney disease (CKD) stage 5, previously called ESRD or chronic renal failure. (**Ahmed AM, Allam MF, Habil ES, et al., 2010**).

**A**ppropriately 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*)

CKD is at least 3-4 times more frequent in Africa than in developed countries (**Naicker S, 2009**)

Patient registry and a statistical evaluation of patients with ESRD is useful to clarify the characteristics of ESRD patients and dialysis therapy, as well as the complications or results based on scientific evidence, to improve the quality of dialysis therapy and provide socioeconomic health administration information for a future health plan (**Jin DC, 2011**)

According to the United States Renal Data System annual report 2011 (USRDS) the prevalence of ESRD varies worldwide. It can be high as in Taiwan

2447 patients per million populations (pmp), Japan 2205 pmp, and United States 1811 pmp and it can be low as in Philippines 110 pmp, Bangladesh 140 pmp and Russia 173 pmp. In developing countries like Egypt, there is an increase in prevalence and incidence of ESRD exerting a great burden on health system. (**USRDS, 1998**).

The prevalence of ESRD in Egypt increased from 225 (pmp) in 1996 to 483 pmp in 2004 (**Adel Afifi et al, 1996-2008**).

The main cause of ESRD in Egypt is hypertension followed by diabetes and still unknown causes represent about 15%. The main problem in developing countries is lack and inaccuracy of data registry. Also there are no available epidemiological reports for different parts of the country. (**MMJ,2011**)

**S**tudies 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 ( **Schuster MA et al., 1998** ).

In recent years, specific clinical guidelines have been developed to optimize the quality of anemia management secondary to CKD. As a result, the National Kidney Foundation Kidney Disease Outcome Quality Initiative (K\DOQI) guidelines and the Renal-European Dialysis and Transplantation Association best practice guidelines have been published in USA & Europe. Therefore; clinical practice guidelines help individual physician and physicians as group to improve their clinical performance and thus raise standard of patient care towards optimum levels. They may also help to insure that all institutions provide an equally good base line standard of care (**Cameron,1999**).

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*)

Dialysis Outcomes and Practice Patterns Study (DOPPS) has observed a large variation in anemia management among different countries. The main hemoglobin concentration in HD patients varied widely across the studied countries ranging between 8g/dl to 11g/dl. The percentage of prevalent HD patients receiving erythropoietin stimulating agents 'ESA' has increased from 75% to 83%. The percentage of HD patients receiving iron varies greatly among DOPPS countries ranging from 38% to 89% (*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, constraints of public health policies, community standards, budgetary limitation and methods of feeding back information concerning current practice. (*Cameron, 1999*)

There are challenges in implanting clinical guidelines in medical practice. Overall DOPPS data which show that, despite the availability of practice guidelines for treatment of renal anemia, wider variation in anemia management exists as gap between what is recommended by the guidelines and is accomplished in every day clinical practice. 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, constraints of public health policies, community standard, budgetary limitation and methods of feeding back information concerning current practice (*Cameron, 1999*).

**Although** HD 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. (*MOHP, 1999*)