HAS CPD* BEEN AS EFFECTIVE AS HEMODIALYSIS?

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INTRODUCTION

Since its inception in 1976(1), continuous ambulatory peritoneal dialysis (CAPD) and its variants CCPD and APD* have progressively developed into accepted ESRD treatment modalities. By the end of 1987 over 40,000 patients worldwide were maintained on this form of therapy, representing nearly 20% of all dialysis patients(2). Marked variations exist in the application of CPD with less than 10% of patients in Japan, Germany and Italy on this modality compared to over 40% of patients in the United Kingdom, New Zealand, Finland, Venezuela and Mexico. In the United States 17% of patients were on CPD at the end of 1987(2).

Much has been learned about CPD in the past 12 years. Many patients have been on CPD for over 5 years demonstrating the long term viability of the peritoneal membrane. Complication rates have steadily declined.

*For purposes of this presentation, CPD will be used to include continuous ambulatory peritoneal dialysis, continuous cycling peritoneal dialysis (CCPD) and automated peritoneal dialysis (APD).
For example, peritonitis rates have decreased 29% between 1982 and 1986, exit-site/tunnel infection rates 33%, and CAPD related hospital days 50%(3). Despite these encouraging trends, it has been difficult to determine if CPD is comparable to hemodialysis as an ESRD treatment. Unfortunately, no controlled trials have been performed to help answer this question and it is unlikely that any will. What follows is an overview of the available literature in this area focusing on those studies where attempts are made to evaluate equivalent or matched patients on these modalities or where adjustment for modality selection bias is attempted. While not optimal from a scientific standpoint, such approaches do permit some conclusions to be drawn regarding the relative efficacy of CPD and HD as ESRD modalities.

**PHYSIOLOGICAL DIFFERENCES BETWEEN CPD AND HD**

There are major differences in the physiology of solute and water removal between CPD and HD. CPD relies on the "peritoneal membrane" as a dialyzing surface. This structure is poorly defined consisting of at least two cell layers (the capillary endothelium and the peritoneal mesothelium) separated by an interstitium. Solute traverse endothelial and mesothelial intercellular channels with the former the major barrier to large solute transport. Transport of small solutes is limited by stagnant layers of dialysate in the peritoneal cavity and can be enhanced by increasing dialysate flow rate(4). Ultrafiltration of fluid during CPD proceeds because of the high osmotic gradient created by the glucose containing dialysate (1.5%, 2.5% or 4.25%