

## 1. The Value of Medication Reconciliation

Howe Sound Pharmacy

*Leader: John Shaske*

*Team members: Christopher Yearwood, Cheryl Pacheco, Jason Mim*

Objective: Systematically establish a qualitative measure of the severity of medication discrepancies.

Methods: Two patient cohorts were examined, long term care patients and hemodialysis outpatients. Information collected from the interview, and relevant facility and provincial medication databases, were compared with our reference patient profile. Discrepancies were assigned a severity rating using a potential-to-harm (PTH) scale. The PTH scale was devised to gauge the severity of each discrepancy in an objective and reproducible manner. Discrepancies were divided into short-term and long-term potential outcomes and ranked the severity on a scale of 1 (low risk of harm) to 3 (high risk of harm).

Results/Discussion: Analysis of the data is underway. Preliminary results indicate that there is a considerable lack of patient information synchronization. This suggests a need for training and new systems with respect to medication reconciliation thereby working towards seamless patient care and cost savings to the health care system.

## 2. Evaluation of an Anemia Management Protocol in Chronic Dialysis Patients

Royal Jubilee Hospital, Vancouver Island Health Authority

*Leader: Dan Martinusen*

*Team members: Heather Chui, John Antonsen*

Anemia therapies include expensive erythropoietic stimulating agents (ESA) and iron products. Hence, efforts to optimize their use are a priority. We implemented an anemia management protocol for chronic dialysis patients and now report how it performed.

A retrospective review of 118 patients initiated on the protocol compared pre and post-implementation: proportions of patients below, within and above the target hemoglobin range, hemoglobin, iron indices, ESA and parenteral iron doses.

The proportion of patients within the target hemoglobin range (110-120g/L) increased after protocol (29% vs. 44%,  $p=0.02$ ). Proportionally fewer patients were below target (44% vs. 26%,  $p=0.006$ ) and the same proportion were above (27% vs. 30%,  $p=0.77$ ). Mean hemoglobin (106.5 g/L versus 111 g/L,  $p=0.069$ ), percent transferrin saturation (23.4% versus 27.8%,  $p<0.001$ ) and ferritin (165.9mcg/L versus 261.1mcg/L,  $p<0.001$ ) increased after protocol implementation. The hemoglobin rise was not statistically significant. Iron usage increased and overall ESA usage remained the same.

### 3. Chinese Nutrition Educational Materials for Renal Patients: A 2010 Update

Providence Health Care

*Leader: Winphia Koo*

*Team members: Jiak Chin Koh*

In September 2007, we published the article “Chinese Nutrition Educational Materials for Renal Patients” in the *Journal of Renal Nutrition* to feature eight Chinese handouts that we developed for the renal program at St. Paul’s Hospital, Vancouver, British Columbia. Since then, we have received numerous requests from dietitians and nephrologists around the world to share our resources.

In response to local and international demand, and an increasing number of Chinese patients in our renal program, we have developed seven additional Chinese resources. We also partnered with British Columbia Provincial Renal Agency (BCPRA) who provided financial and technical support to professionally review and redesign the handouts. A selected number of these resources are now available for public access on the BCPRA website. To support nutrition counselling that is culturally friendly to Chinese patients, our fifteen handouts are also accessible to renal dietitians across British Columbia through the provincial renal database PROMIS.

### 4. Building Community Capacity to Improve Early CKD Care in Northern British Columbia

CKD Clinic, Northern Health Authority

*Leader: Sushila Saunders*

*Team members: Sara Cormier, Julie Gonzalez, Deidra Goodacre, Tina Lemoine*

CKD clinics are experiencing greater demand for multidisciplinary renal team consultation and increased wait times for CKD services as a result. Often, smaller communities encounter access care issues. In the Northern Renal Program (NRP), the CKD restructuring project is attempting to address these issues by bridging the gap between smaller communities in Northern British Columbia and the Prince George CKD clinic. This poster will examine a multidisciplinary, shared care model between the Quesnel Chronic Disease Management Team and the Prince George CKD clinic. The Quesnel CDM team, consisting of two nurses and one dietitian, provide group education sessions and one-on-one health counselling to stable, stage 2-3 CKD patients. Quesnel GP’s refer to this team to provide educational and clinical support to their patients. The Prince George CKD clinic provides renal care expertise through email, telephone consultation and educational workshops to support this team and maximize community capacity in Quesnel.

### 5. HELPING ALICE GET HER GAME BACK...A Tale of Dialyzer Membrane Sensitivity

Vancouver Community Dialysis Unit, Providence Health Care

*Leader: Elizabeth Fraser*

There is an intimate relationship between a patient’s blood and the surfaces it touches in any hemodialysis procedure. Ongoing study in biocompatibility of all hemodialysis components has resulted in reducing serious patient reactions during treatments, but some reactions persist.

When Alice, a hemodialysis patient with known dialyzer membrane sensitivity, faced a non supply of her current effective dialyzer, the trials of other dialyzer types created treatments described by her as “being in wonderland”. How do you advocate for a patient whose symptoms do not fit the usual definition of a dialyzer reaction?

This poster illustrates how a community hemodialysis unit recognized and worked to limit Alice’s symptoms of dialyzer membrane sensitivity, with its ensuing problems of dialysis system clotting, hypotension, morning cough, and vocalized desperation. A cautious nephrology team maintained safe hemodialysis therapy for Alice until her effective dialyzer was back in supply, and Alice was back in the game!

## 6. Emergency Preparedness: Development of a Nutrition Survival Kit for Pediatric Dialysis Patients

BC Children's Hospital

*Leader: Nonnie Polderman*

Preparation for unexpected interruptions in access to care during natural disasters and pandemics is vital for individuals dependent on dialysis. An often overlooked component of such planning is the development and provision of appropriate dietary resources aimed at prolonging the metabolic safety margin for such patients while off dialysis for indeterminate periods of time. While emergency diet plans are available for adult dialysis patients, similar age-appropriate information and resources are lacking for the pediatric population who face such an interruption in access to their dialysis care centre or treatment.

As part of an Emergency Preparedness initiative, our goal was to develop an age-appropriate (infants, toddlers and children); metabolically ‘safe’; and replenishable end stage renal diet ‘kit’ with supplies to last a minimum of 72 hours.

Contents for the survival kits were determined using nutrition guidelines for acute renal failure. Menus were developed based on the assumption of no available heating, cooking or refrigeration. The kits were distributed complete with accompanying emergency contact information, suggested menus, and shopping lists for replenishment of supplies following use or outdating. Supplies within each kit provided a minimum of 3 days’ worth of water, meals, snacks and supplements. Each kit was enclosed in a hard plastic waterproof container.

The target population for the initial education and roll-out of these kits has been patients receiving in-centre hemodialysis with future plans to expand this project to all of our ESRD and then CKD populations following appropriate modification of contents of the kits.

No Home. No Heat. No Hydro. No H<sub>2</sub>O. No Hemo? ... No problem!

## 7. Pain is Under-Recognized and Under-Treated in Hemodialysis Patients

St. Paul's Hospital, Providence Health Care

Leader: *Marianna Leung*

Team members: *Monica Beaulieu, Lee Er, Clifford Chan-Yan, Ronald Werb, Beverly Jung, Fong Huynh, Mercedeh Kiaii*

Effective pain management improves patient's quality of life and is an integral component of patient care. Pain is commonly experienced by hemodialysis (HD) patients but is often under-recognized and under-treated.

The aim of this study was to (1) describe the prevalence, severity, and management of pain in HD patients, (2) determine if there are factors that differentiate those with and without pain.

We performed a prospective cohort study, surveying patients at an urban in-centre dialysis unit. All patients in the HD unit were approached to participate. Patients who reported pain were interviewed using Short-Form Brief Pain Inventory (SF-BPI) and Short Form McGill Pain Questionnaire (SF-MPQ)

161/233 patients participated in the study (63% male, 40% Caucasian, 29% Asian). 34% (57/161) of patients reported pain. Patients with pain had slightly longer HD duration (40.6 vs. 27.2 mos;  $p=0.14$ ) and more cardiovascular diseases (57% vs. 41%;  $p=0.02$ ).

Of the 54 patients with pain on the SF-BPI, 46.3% patients rated their pain at its worse as severe (pain score of  $\geq 7$ ). The most common descriptors of pain were aching and tiring-exhausting.

30% of patients had no treatment prescribed for their pain. Of the 70% (38/54) who were treated, 82% was pharmacologic and 18% non-pharmacologic. Of treated patients, 33% patients reported that their pain was not relieved effectively.

In conclusion, in a cohort of in-centre HD patients, 34% reported pain. Of patients with pain, 30% are untreated and a large number of treated patients still report pain. Practitioners caring for HD patients should have a systematic program for pain assessment and management in their units.

## 8. Evaluation of Anemia Management by Algorithms in Non-Dialysis Chronic Kidney Disease Patients

St. Paul's Hospital, Providence Health Care

Leader: *Marianna Leung*

Team members: *Jenelle Rogers, Monica Beaulieu, Adeera Levin, Shelley Burnett, Anita Zienkiewicz*

Background: Anemia commonly develops in patients with chronic kidney disease (CKD) and is strongly associated with adverse clinical outcomes including hospitalization, cardiovascular disease, and mortality. There are currently no published studies evaluating the efficacy of a nursing-driven anemia management protocol in patients with CKD not receiving dialysis.

**Objectives:** To evaluate the efficacy and medication utilization with the anemia protocol as compared to individualized dosing by nephrologists.

**Methods:** Retrospective review of 390 and 434 non-dialysis CKD patients receiving treatment for anemia during the pre-protocol and protocol study periods, respectively. All hemoglobin (Hgb) and transferrin saturation (Tsat) levels, as well as all iron and erythropoiesis stimulating agent doses were also collected for six months during the study periods.

**Results:** The anemia management protocol was non-inferior to individualized dosing in maintaining Hgb levels within target range of 110-120 g/L (0.9%, 95% CI -2.5 to 4.4): 33.3% for the pre-protocol study period versus 34.2% for the protocol study period. Criteria for non-inferiority were not met for maintaining Tsat levels within target range of 22 to 50% (1.9%, 95% CI -3.4 to 7.2): 58.8% for the pre-protocol study period versus 56.9% for the protocol study period. There was no statistically significant difference in the mean dose of epoetin (3270 units vs. 3529 units,  $p=0.85$ ), darbepoetin (18.8 mcg vs. 20.4 mcg,  $p=0.59$ ) or iron (1044 mg vs. 1042 mg,  $p=0.98$ ) between the pre-protocol and protocol study periods. There was no statistically significant difference in the number of dose changes of epoetin (0.4 vs. 0.5,  $p=0.11$ ), darbepoetin (0.6 vs. 0.6,  $p=0.83$ ) or iron (0.3 vs. 0.3,  $p=0.55$ ) between the pre-protocol and protocol study periods.

**Conclusion:** The nursing driven anemia management protocol is non-inferior to nephrologist dosing in managing Hgb levels. It is reasonable to use an anemia management protocol in patients with CKD not receiving dialysis.

## 9. Pharmaceutical Costs Associated with Childhood Chronic Kidney Disease

BC Children's Hospital

*Leader: Kelvin Lou*

*Team members: Janis Dionne, Colin White, Kathleen Collin, Lee Er, Ognjenka Djurdjev*

**Objectives:** To calculate the total drug costs for children with CKD registered with the BC PRA in 2009 and describe the costs by categories of CKD management. To identify areas of inefficiency in current prescriptive practices.

**Methods:** Medication costs were calculated using PROMIS and McKesson catalog. Adherence and daily pill burden was determined using medication reconciliation records.

**Results:** The time adjusted pharmaceutical cost of our cohort (N=137) was \$311,687 with a cost per patient per year (CPPY) of \$2,265. The largest expense category was growth and nutrition. Unexpectedly high costs were identified in electrolyte supplementation, ocular disease, and neurologic medications. The average daily pill burden was 9.0 [2-23]. The average adherence score (CMA=0.83) indicated missed medications >1 day per week.

**Conclusion:** The pharmaceutical cost of childhood CKD is similar to adult studies but the drug categories differ with the largest costs in growth and nutrition.

## 10. The Effect of a Multidisciplinary Care Clinic on Outcomes in Pediatric Chronic Kidney Disease

BC Children's Hospital

*Leader: Salma Ajarmeh*

*Team members: Lee Er, Genevieve Brin, Ognjenka Djurdjev, Janis Dionne*

**Objectives:** To describe the effect of multidisciplinary care (MDC) on the clinical outcomes of children with chronic kidney disease (CKD) in British Columbia.

**Methods:** A retrospective cross sectional study that included a standard care cohort from 2003 (n=73) and MDC cohort from 2009 (n=125). Data analyzed included patients' demographics, laboratory results, blood pressure and growth parameters.

**Results:** Patient demographics were similar but CKD stage is lower in 2009 ( $P < 0.005$ ). Hemoglobin level was significantly higher in 2009 (130 g/L vs. 122 g/L,  $P < 0.05$ ). Calcium level was significantly higher in 2009,  $P < 0.001$ . More patients reached K/DOQI targets for Ca ( $p < 0.005$ ) and PTH ( $p = 0.06$ ) in 2009. Albumin level was significantly higher in 2009 (44 g/L vs. 38 g/L,  $p < 0.001$ ). 17% of the patients were hypertensive in 2009 compared to 30% in 2003 ( $P < 0.05$ ).

**Conclusions:** The multidisciplinary care clinic improved the outcome of children with CKD especially in anemia, bone metabolism and blood pressure control.

## 11. How to Tame a Dragon: Implementing a New Nursing Model in a Busy Hospital-Based Hemodialysis Unit to Improve Communication, Patient Care and Safety

St. Paul's Hospital, Providence Health Care

*Leader: Lora J. Jensen*

*Team members: Leilani L. Ocampo, Luisito M. Sera Josep*

Our increasingly busy hospital-based hemodialysis unit was becoming an unruly dragon with its increasing patient numbers and acuity, large staff size, frequent incident reports, poor communication, lack of accountability, team work and patient care plans, and inconsistent patient care and follow-up. Due to the large patient and staff numbers and their variable shifts it was impractical to implement true primary nursing. In order to tame this ruthless dragon our unit implemented a modified primary nursing model. This new model assigns each part-time and full-time registered nurse (approximately 69 RNs) to four chronic patients (total of approximately 261 patients) for whom they are responsible to perform a detailed chart review and audit every six weeks. Benefits of our new nursing model are already evident. In a recent survey, two months after implementation, respondents have confirmed early detection of errors/omissions, timelier follow-up of laboratory results, and improved communication across the health care team.

## 12. Buttonhole Cannulation: A Provincial Approach

Interior Health Authority

*Leader: Vascular Access Educators Group*

*Team members: Rick Luscombe, Angela Romyn*

The buttonhole method is an alternative to the rope ladder method for cannulating fistulas. The buttonhole method is being used inconsistently across HD centres in BC. The purpose of the Buttonhole Cannulation initiative was to develop an evidence-based, provincial guideline on its use with supporting patient and nurse education materials. Health authorities/local dialysis centres are responsible for implementing the guideline and educational materials.

## 13. Highlighting Collaborative Learning and Sharing in a Provincial Renal Educators Group

Province-wide

*Leader: Wanda Dean*

*Team members: BC Renal Educators Group*

Developing consistency in nephrology nursing practice across the province of British Columbia historically has been difficult due to geographical challenges and at times, competing priorities.

The purpose of this poster presentation is to highlight the British Columbia Renal Educators Group (BCREG). The BCREG began informally in 2002 with educators in different parts of the province keeping in touch. As the number of educator positions increased, the need to formalize became apparent and the British Columbia Provincial Renal agency moved to incorporate funding for the group into their operating budget in 2006.

Currently the group meets monthly via teleconference and twice annually for a face-to-face meeting. Annual work plans are developed and committees are formed around the project work. An important focus for the group is around guideline development with the intent to standardize hemodialysis nursing practice provincially. Resource sharing, mentorship and support for group members are vital components of the group.

## 14. Patients Receiving In-Centre Hemodialysis Show Significant Interest in Receiving In-Hospital Nocturnal Hemodialysis

St. Paul's Hospital, Providence Health Care

*Leader: A. Daniel Malebranche*

*Team members: Mercedeh Kiaii, Mhairi Sigrist, Monica Beaulieu*

Introduction: Most hemodialysis is scheduled as four hour sessions provided three times weekly during the day. Studies have shown that longer hemodialysis sessions are associated with increased quality of life and decreased morbidity and mortality. In-centre nocturnal hemodialysis is one way to provide longer dialysis sessions for patients, however this has not been offered yet in British Columbia. The purpose of this study is to evaluate the interest among current daytime in-centre dialysis patients at St Paul's Hospital in in-centre nocturnal dialysis. The ultimate goal is to establish an in-centre nocturnal hemodialysis program at St. Paul's

Methods: A bedside survey was verbally administered to a random sample of patients during their dialysis session. Information was collected regarding age, gender, years on dialysis, interest in the program (reasons for and against), employment status, living arrangement and ethnicity.

Results: 149 of 283 in-centre dialysis patients at St. Paul's Hospital were approached for the survey and all participated. Of the 149 patients from which the data was collected, 47 were interested in nocturnal (in-centre) dialysis (31.5%). Interested patients tended to be younger, with an average age of 62 versus 70 (not statistically significant), and were more likely to be male (79% vs. 60% in the non-interested group). Patients with a longer dialysis vintage (4.6 yrs vs. 3.7 yrs, not statistically significant) were more interested in nocturnal dialysis. Patients working during the day were tended to be more interested in a nocturnal protocol, (20% daytime workers in the interested compared to 10% in the not interested group). Similarly, those who lived alone were more likely to be interested in participating (45% versus 23% in the non interested group). Caucasians comprised the largest group interested in overnight dialysis (45%) while Asians were the largest group in the not interested cohort (39%).

Conclusion: There is a significant interest in hospital based nocturnal dialysis at St. Paul's Hospital. Interested patients differed from non-interested patients in a number of respects. This protocol is thought to be more suitable for patients with daytime commitments such as employment or those without family responsibilities.

Currently a pilot protocol is in progress with the objective of providing nocturnal hemodialysis to the group of patients identified by this survey. Evaluation of this program is ongoing.

## 15. Predictors of Failed AVF Maturation at Vancouver General Hospital

Vancouver General Hospital, Vancouver Coastal Health Authority

Leader: Jennifer Hanko

Team members: Nadia Zalunardo, Guiyun Li, Jacek Jastrzebski

Introduction: The native arteriovenous fistula (AVF) is the preferred vascular access for haemodialysis; however, the high primary failure rate (or failure to mature (FTM)) is a major barrier to increasing AVF prevalence. The objectives of this study were to determine the predictors of AVF FTM in our population and to determine the utility of an existing predictive model based on age, race, and history of ischemic heart disease (IHD) and/or peripheral vascular disease (PVD) (Lok et al, JASN 2006).

Methods: All AVFs created from January 1, 2005 to December 31, 2009 at Vancouver General Hospital were considered and followed until August 31, 2010. Only the first fistula created during the study period was included in patients with multiple procedures. Primary AVF failures within 14 days of surgery were excluded. For comparison with the Lok prediction model, we further excluded AVFs first used more than 6 months after creation. Logistic regression was used to determine predictors of FTM.

Results: There were 401 AVFs created during the study period, of which 264 (77.6%) were eligible for analysis. The mean patient age was 63.3 years, 64.7% were male, 48.9% were white, 49.6% had diabetes, 20.8% had IHD, 9.1% had PVD, 12.9% had cerebrovascular disease, 32.5% were current/previous smokers, and 22.7% had

BMI  $\geq 30$ . AVFs were placed on the left in 81.4%; 3.8% were brachiobasilic (BB), 35.2% brachiocephalic (BC), and 61.0% radiocephalic (RC).

FTM occurred in 36.0%, with no change over time. Significant predictors of FTM in multivariable analysis included: diabetes (OR: 1.92; 95% CI: 1.07-3.46), current/previous smoking (OR: 2.32; 95% CI: 1.24-4.34), male gender (OR: 0.52; 95% CI: 0.28-0.98), and fistula type (BB compared to RC: OR 2.7 with 95% CI: 1.01 – 7.47; BC compared to RC: OR 0.43 with 95% CI: 0.23-0.80). Right sided AVFs, non-white race, IHD, and PVD had a non-significantly increased risk of FTM.

The AVF FTM rates predicted by Lok's model (N = 186) and observed in our patients is shown in Figure 1. Lok score was predictive in the 'very high' risk (Lok score  $\geq 8$ ) patient group but was not predictive in the lower risk groups (P = 0.27).

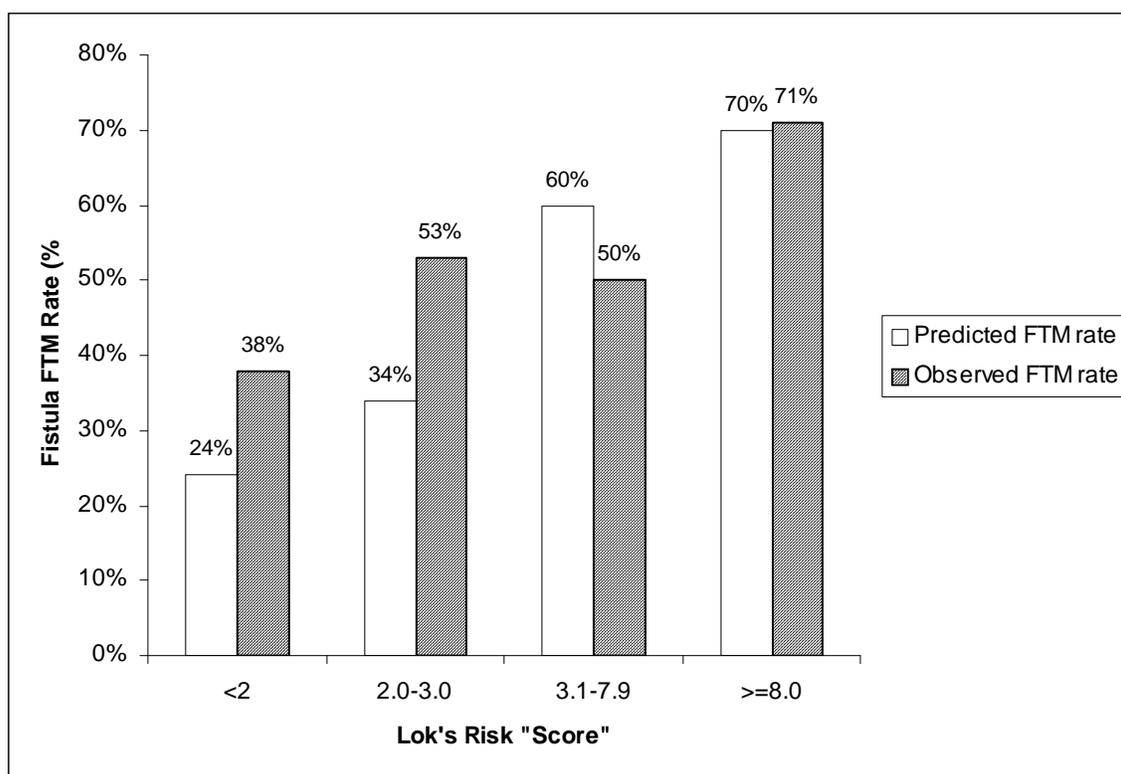


Figure 1: Comparison of predicted FTM rates (based on Lok's study) to observed FTM rates in VGH patients.

Conclusion: AVF failure to mature is common, occurring in about one third of first AVF creations. The predictors of FTM were diabetes, smoking history, and male gender. Brachiocephalic AVFs were less likely to fail than other types. Application of an existing predictive model was not helpful in identifying those at low versus moderate/high risk of failure in our population.

## 16. Involved Care Project

Interior Health Authority

*Leader: Dawn Pethybridge*

*Team members: Sherry Lynn Picheniuk, Charlene Kearsley, Sharlene O'Neill, Beth Warlow*

“Combining the will of the patient with the skill of the team”

Overview: In 2008, the HHD nurse trainers and management of the in center dialysis unit at Penticton Regional Hospital (PRH) met to evaluate the successes and challenges of the home hemodialysis (HHD) program in the South Okanagan. The challenged expressed by the group were:

- Limited number of HHD nurse trainers which led to an inability to provide training in a timely fashion
- Training regime for patients seemed rushed and artificially simplified
- Patients who were expressing interest in going home almost always moved from in center dialysis, where nurses did everything for the patients, to expectation of self care

The team identified the ability to use the physical structure of the unit, which is divided into two separate care areas, was an opportunity to create an independent care unit on one side that would house more independent patients and provide a segway for patients wishing to train for HHD. The team went further to suggest that every patient in the in-center unit should complete the self assessment and be encouraged to complete as much of their care as possible regardless of physical location in the unit and the Involved Care Unit was born.

Involving the Staff: Nurses had input into the philosophy and missions statement, patient assessment tools, communication tools, scheduling and timekeeping concerns. Philosophy of promoting independence was discussed and case scenarios presented to aid staff in being navigators for self care.

Involving the Patients: The concept of increased involvement in care was presented at the patient wellness group, patient council, in the unit newsletter and letters to family. Patients were then given a letter and a self assessment tool which the coordinator reviewed with each patient individually. Short and long term goals for each patient were developed face to face with patients. Patients who wish to work towards home dialysis as an ultimate goal were also identified.

Getting Started: Involved Care went live February 8, 2010. To date, 38 patients have identified learning goals ranging from doing their own vital signs and weights to machine checks and troubleshooting. 8 pts set up their own machines and do their own vascular access. Several patients who originally identified very modest learning goals are now almost totally independent. As well, 2 patients have entered the program from the community through the pre-renal clinic and are training to go home.

Evaluation: Navigator meetings are being held monthly to evaluate patient progress and communication and troubleshooting issues. These meetings are held a week before general staff meetings so that information can be communicated to all staff and input sought. A formal evaluation including a patient satisfaction survey will be completed at six months.