End-stage renal disease (ESRD) is the final common
pathway for a variety of renal and urological diseases. Renal replacement therapy (RRT) is employed to sustain
life when renal function reaches end-stage, i.e. 5%
normal. Renal transplantation is regarded as the best
RRT in terms of restoration of renal function, survival
rate, rehabilitation and quality of life. However
transplantation is limited by the scarce supply of organs. This results in an increasing size of dialysis population
worldwide. Both peritoneal dialysis (PD) and
haemodialysis (HD) are effective modes of dialysis
therapy. Since the invention of PD in 1976, there has
been a rapid growth in the utilization of PD. By the end
of 1997 the chronic PD population worldwide was an
estimated 115,000, representing 14% global dialysis
patients. In Hong Kong, 80% of our prevalent ESRD
patients on dialysis are on PD. This utilization rate
ranks second in the world, just next to Mexico. Majority
of patients on PD are on continuous ambulatory
peritoneal dialysis (CAPD). The patients have to perform
3 to 4 bag exchanges at home every day. For patients
on haemodialysis, the usual regime is 2 to 3 sessions
per week, 4 to 6 hours for each session, either in the
hospital or satellite dialysis centre.

Though dialysis maintains life, patients face life-long
physical, psychological and social problems related to
their illness and treatment. Dialysis can only replace part,
but not all, of the renal functions. It cannot correct the
co-morbid diseases and it itself incurs its own complications. Anxiety, depression, fear, emotional
fluctuation and various psychological stresses are
common amongst ESRD patients especially at the early
phase of treatment. Dialysis treatment also causes a
significant change in daily living, disruption in work
schedule and shift in social role which in turn imposes
financial, housing, marital and employment problems. Psychological adaptation and social adjustment are
important challenges to renal patients on dialysis
therapy.

In order to provide comprehensive and holistic care to
the ESRD patients, a renal rehabilitation program was
established in Queen Elizabeth Hospital in July 1996. The program was run by a multi-disciplinary team
comprised of renal physicians, renal nurses, clinical
psychologists, medical social workers and community
social workers from Patient Resources Centre, pharmacists, renal dietitians, occupational therapists,
physiotherapists and the patient support group. The aim
is to achieve full physical and psychosocial rehabilitation
with good quality dialysis life. Apart from the day to day
service, the program stresses on two major areas: pre-
dialysis education and comprehensive care during the
CAPD preparatory and training period.

Pre-dialysis Education
Success of a comprehensive renal replacement program
depends heavily on patients' acceptance of their disease,
their positive motivation and active participation in the
treatment. This is related to patients' feeling of control
or lack thereof. Enhancement of patient's knowledge
about their illness and treatment plan can improve their
sense of control, stress adaptation and psychological
adjustment and in turn their compliance to RRT.

Early or timely referral of pre-dialysis ESRD patients to
nephrologists allows early patient’s education and
preparation as well as better pre-dialysis renal care. On
the other hand, studies have confirmed that late referral
is associated with increase need for emergent dialysis
and temporary central venous catheterization and higher
incidence of uremia-related complications, such as
severe hypertension or fluid overload. This is associated
with prolonged hospitalization at the start of dialysis and
has detrimental consequence on initial morbidity and
mortality. Economic evaluations of Canadian and U.S.
data also suggested that early referral would result in
cost saving.

In Queen Elizabeth Hospital, pre-dialysis education
classes (PEC) are organized to provide patient education
and psychological guidance. The aim of PEC is to
provide basic knowledge to renal patients early in their
courses of diseases before RRT is anticipated. This
allows patients to make an informed choice of their
preferred treatment modality. This also permits early creation of a permanent peripheral vascular access for hemodialysis or insertion of Tenckhoff catheter for PD in a timely fashion to ensure a smooth transition to RRT. Patients with a creatinine of around 500 µmol/L are recruited into the class. Two integrated talks on 2 consecutive Saturday afternoons are arranged. These classes are held regularly every 4 months. During the classes, the renal physicians and renal nurses discuss on natural history and clinical features of ESRD, treatment plan and principles and options of dialysis. Staff from other paramedical departments emphasizes on the importance of exercise, diet and drug compliance. Medical and community social workers introduce the available community resources to kidney disease patients. ESRD patients on dialysis or renal transplantation are invited to share their experiences and give their psychological support.

CAPD Preparatory and Training Period

Four weeks after insertion of Tenckhoff Catheter, the patient will have the comprehensive CAPD training program by a designated renal nurse. Home blood pressure monitoring are taught. Exercise program is arranged by the physiotherapists. Device modification, home environment modification and enhancement of activity of daily living are provided by the occupational therapists. For patients with employment problem, vocational counseling, job skills training and job matching services are provided in the integrated vocational rehabilitation program. Dietitian and pharmacist will counsel patients according to their individual needs. Medical social worker will attend to issues related to financial assistance, community care services and illness adjustment. There are small peer group meeting with volunteers from patient support group to provide in-depth experience sharing and psychological support to patients and care-givers. Difficult cases are referred to the clinical psychologist for further counseling.

Study on Pre-dialysis Classes (PEC)

Since the organization of PEC, we have two groups of patients, who did (Group A) and did not (Group B) attend the PEC respectively. It would be interesting to note the impact of PEC on the clinical outcome of the two groups, in terms of initial morbidity and mortality after commencement of RRT.

A total of 12 pre-dialysis education classes (PEC) were organized in Queen Elizabeth Hospital from November 1996 to October 2000. One hundred and ninety-four patients and their families have attended these classes.

The break-in period is defined as the time between catheter insertion and routine catheter use. The treatment strategy used during the break-in period actually depends primarily on whether dialysis is needed for the treatment and support of the patients at the time of catheter insertion. If the patient is asymptomatic with acceptable blood chemistry, patient is instructed to come back to our dialysis unit weekly for flushing of the newly inserted Tenckhoff catheter and blood testing for renal chemistry. This minimizes the manipulation of the catheter and allows better wound healing as well as reduces the risk of future leakage. The indications to start dialysis in this phase include fluid overload, electrolytes imbalance and severe acid-base decompensations. Patients were either maintained on intermittent HD by temporary dual-lumen catheter or low volume intermittent PD using the cycler machine. Hence the number of intermittent HD and PD sessions reflects the need for emergent dialysis. Hospitalization rate in the break-in period for the two groups was compared. After the commencement of PD, rate of peritonitis and exit site infection is measured to evaluate the effect of PEC on morbidity of ESRD patients at 3 and 6 months. Since patients are encouraged to contact their designated train-nurse or dialysis center in their early days on PD, the number of non-scheduled follow-up (NSFU) can also reflect their morbidity.

Results

Group A comprised 107 patients (44M and 63F) while group B included 285 patients (147M and 138F). The mean age of group A and group B are 57.5±15.3 and 59.6±14.8 years old respectively.

Questionnaires were used to assess the knowledge of patients before and after PEC. Twelve true/false questions on the concepts of renal health were asked before and after PEC. The two scores were compared and the difference was statistically significant. This suggested that PEC indeed improves the knowledge of renal patients.

The hospitalization rate and the number of intermittent HD and PD sessions required in the break-in period among both groups of patients are shown in Table 1.

Table 1. Morbidity during the break-in period

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization days</td>
<td>12.2±13.6</td>
<td>20.5±16.1</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>HD session</td>
<td>4.6±6.6</td>
<td>6.7±8.2</td>
<td>0.02*</td>
</tr>
<tr>
<td>PD session</td>
<td>3.5±2.8</td>
<td>3.2±3.0</td>
<td>0.48</td>
</tr>
</tbody>
</table>

*statistically significant
The requirement of intermittent HD was statistically significantly higher in group B patients although the number of PD session was similar. Patients from group B also had a significantly higher hospitalization rate (8 days more) in the break-in period (p<0.001).

The hospitalization days, peritonitis and exit site infection rate, scheduled follow-up (SFU) and non-scheduled follow-up (NSFU) of group A and B patients at 3 and 6 months after commencement of PD were shown in Table 2. The hospitalization, peritonitis and exit site infections rate were not different significantly between the 2 groups. The NSFU episodes showed a trend of decrease both in 3 and 6 months in group A patients after commencement of PD, although it did not reach the statistically significant level.

**Discussion**

Early or timely referral and commencement of RRT improves the morbidity and decreases mortality for patients suffered from ESRD unequivocally. Nevertheless, it is very difficult to persuade our renal patients to have early dialysis as long as they remain asymptomatic. The stress associated with the uncertainty about change in lifestyle after dialysis is another major obstacle. To improve compliance and confidence on nephrologists, patient education certainly is one of the important measures. We believe that improvement in the knowledge of illness and treatment modalities can alleviate stress associated with uncertainty. The delivery of this knowledge should be early in the course of the kidney disease because of its chronic and relentless nature of the illness. From the current study, we demonstrate that pre-dialysis education class (PEC) can improve the knowledge of patients suffering from ESRD. The effect of PEC persists as long as 6 months after commencement of PD.

Female ESRD patients are more willing to attend the PEC. One of the plausible explanations is that female patients possess a more positive attitude towards chronic illness. They are more readily to accept the fact of ESRD and prepare early for the life on dialysis. Alternatively, this can be explained by the fact that female patients may be easier to attain family support than the male counterparts when facing chronic illness. Further studies directing towards the psychological and social aspects of female renal patients may be warranted to clarify the issue.

For those patients who have attended the PEC (group A), the hospitalization days are significantly lower during the break-in period. They received less intermittent HD sessions while the requirement of intermittent PD is similar to those without the prior history of PEC (group B). This suggests that they are referred early to renal specialists. Peritoneal access is available when peritoneal dialysis therapy is indicated in this group of patients. Nevertheless, it will be even better if these patients can be seen by nephrologists at an even earlier stage in the courses of their illness so that they can have an expectant management during the break-in period. This can improve the catheter wound healing and reduce the risk of future leakage of Tenckhoff catheter. Obviating the need of intermittent PD also save the productive power of the patient and health care resources.

After the commencement of PD, the effect of PEC seems diminished. The hospitalization, peritonitis, and exit site infections rate all showed no statistically significant difference. This is expected because both groups of patients underwent the same comprehensive PD training programme 4 to 6 weeks after the break-in period. Training is still a crucial component in the process of self-care dialysis. It is interesting to see that the number of NSFU episodes was slightly less in group A patients although the difference did not reach statistically significant level. This may imply that group A patients are better equipped and more ready to master the PD exchange technique.

**Table 2. Morbidity at 3 and 6 months after commencement of PD**

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalization days</td>
<td>1.92±4.81</td>
<td>3.35±7.98</td>
<td>0.08</td>
</tr>
<tr>
<td>Peritonitis episodes</td>
<td>0.08±0.30</td>
<td>0.13±0.39</td>
<td>0.18</td>
</tr>
<tr>
<td>Exit-site infection</td>
<td>0.15±0.45</td>
<td>0.20±0.45</td>
<td>0.32</td>
</tr>
<tr>
<td>SFU</td>
<td>3.31±0.95</td>
<td>3.16±1.06</td>
<td>0.20</td>
</tr>
<tr>
<td>NSFU</td>
<td>0.27±1.23</td>
<td>1.07±1.42</td>
<td>0.06</td>
</tr>
<tr>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalization days</td>
<td>1.96±8.89</td>
<td>3.55±9.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Peritonitis episodes</td>
<td>0.04±0.21</td>
<td>0.10±0.31</td>
<td>0.10</td>
</tr>
<tr>
<td>Exit-site infection</td>
<td>0.12±0.36</td>
<td>0.21±0.46</td>
<td>0.09</td>
</tr>
<tr>
<td>SFU</td>
<td>1.95±0.85</td>
<td>1.86±1.07</td>
<td>0.44</td>
</tr>
<tr>
<td>NSFU</td>
<td>0.47±0.88</td>
<td>0.75±1.46</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Although 75.4% of the group B patients also had their follow-up in the Specialist Outpatient Clinic, they are not referred to the PEC. Majority of them are followed up by non-nephrology specialists. This reflects that late nephrology referral is indeed a common health problem.

**The Overall Rehabilitation Status of ESRD Patients**

The employment status and recovery of social life are good indexes of rehabilitation status for patients of chronic illness. The employment status and the social status of ESRD patients of the working age (age 21-55) on peritoneal dialysis, haemodialysis and renal transplantation (TX) cared by Queen Elizabeth Hospital and its satellite centre, Yaumatei Renal Dialysis Centre, are shown in Figure 1 and Figure 2. The transplanted patients have the best employment status and social rehabilitation. Unemployment is a problem for all types of patients. Amongst all, HD patients are having the highest unemployment rate. This may reflect the advantage of the more flexible CAPD treatment enabling them to better secure the job and attain normal social activities.

![Figure 1](image1.png)  
*Figure 1. Employment status of patients on renal replacement therapies (working age group: age 21-55).*

![Figure 2](image2.png)  
*Figure 2. Social status of patients on renal replacement therapies (working age group: 21-55).*
End-stage renal disease (ESRD) is the end road for many renal diseases. It, in turn, is associated with various medical complications in other organs requiring multiple drug therapy. Medication is an essential part of treatment both before and after long term renal replacement therapy. Poly-pharmacy is a common phenomenon because of the co-existing morbidities. ESRD patients, especially those elderly, have difficulty in identifying the drugs and understanding the function of individual medications. As part of the renal rehabilitation program in Queen Elizabeth Hospital, the pharmacist attended most of the new patients who were prepared for continuous ambulatory peritoneal dialysis, haemodialysis and after renal transplantation individually for education and counseling.

**Result of the Drug Education Program**

From January 1997 to June 2002, 189 patients were counselled (160 patients on haemodialysis or continuous ambulatory peritoneal dialysis and 29 patients after renal transplantation). All patients were interviewed individually with or without their helper. They were educated about the indications, administration method and side effects of their current medications.

**Group 1. Dialysis patients (n=160)**

<table>
<thead>
<tr>
<th>Age of patients</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patients</td>
<td>95.0%</td>
<td>83.8%</td>
<td>70.0%</td>
<td>31.9%</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of drugs prescribed*</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patients</td>
<td>82.5%</td>
<td>67.5%</td>
<td>51.3%</td>
<td>36.9%</td>
<td>24.4%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

*excluding CAPD fluid

**Group 2. Post renal transplant patients (n=29)**

<table>
<thead>
<tr>
<th>Age of patients</th>
<th>&lt;30</th>
<th>&lt;40</th>
<th>&lt;50</th>
<th>&lt;60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patients</td>
<td>17.2%</td>
<td>55.2%</td>
<td>86.2%</td>
<td>96.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of drugs prescribed</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of patients</td>
<td>96.6%</td>
<td>93.1%</td>
<td>86.2%</td>
<td>69.0%</td>
<td>48.3%</td>
<td>31.0%</td>
</tr>
</tbody>
</table>

**Discussion**

For patients on haemodialysis or continuous ambulatory peritoneal dialysis (Group 1), 70% were aged ≥60 and 31.9% were aged ≥70. Most elderly patients had poor memory and did not know much about their drug treatment. Careful counseling and repeated explanation were required. Most of the patients (82.5%) had ≥5 drugs and over one third of patients (36.9%) were given ≥8 drugs. Poly-pharmacy was common which may affect the patient compliance. Anti-hypertensive agents was the most difficult class of drug to educate, this may be due to the ease in blood pressure monitoring at home, and patients tended to manipulate their own treatment by altering the drug dosage, frequency or even totally omitting the treatment.

For patients having renal transplantation (Group 2), they were younger (96.6% were <60). Poly-pharmacy was still very common with 96.6% and 69.0% of patients given ≥5 and ≥8 drugs respectively. Post renal transplant patients were more eager to know their own drug treatment than dialysis patients, probably due to the younger age and their attitude towards the disease state.

In conclusion, individual counseling is time consuming but useful. 'Hidden messages' can be revealed from patients. To secure the continuous correct usage of drugs, follow-up assessment by pharmacist is desirable.
Role of Dietitian in Renal Rehabilitation
Katherine CHENG, Lily KWA
Department of Dietetics, Queen Elizabeth Hospital

Dietitian plays an important role in medical nutrition therapy of renal patients throughout the disease process from pre-dialysis stage, dialysis stage with either haemodialysis or continuous ambulatory peritoneal dialysis and the post renal transplantation period. Dietary intervention aims to minimize the consequences of declining renal function, thereby maintaining the patient's well being. Goals of dietary management include maintaining good nutritional status, preventing or minimizing uremic toxicity and the metabolic derangements of renal failure, and retarding the rate of progression of renal failure.

Medical nutrition therapy includes assessment and intervention. At the initial assessment, dietitian obtains a diet history with special focus on nutrients that affect the condition and evaluate nutritional status by anthropometry and biochemical measurements. Treatment goals will be set and a nutrition prescription will be given to patient. At each subsequent visit, the dietitian will monitor the dietary intake and biochemistry, discuss the result with the patient and modify dietary plan as needed. To ensure successful dietary compliance, patient must undergo extensive training in principles of nutritional therapy and the design and preparation of diets and receive continuous encouragement. To achieve optimal result, patient's spouse or family members should work closely with the patient to provide moral support and assist with acquisition and preparation of food. Regular follow up visits are highly recommended in order to improve health status, control of condition and quality of life through close monitoring of clinical and nutritional status.

Dietetic counseling has been the integrated part of the renal rehabilitation program in Queen Elizabeth Hospital (QEH) since 1997. In the pre-dialysis classes, initial dietetic advice was given to the renal patients preparing for dialysis. When reaching end-stage renal failure, all new dialysis and renal transplant patients in QEH and 88% of the new dialysis patients in Yaumatei Renal Dialysis Centre (YMTRDC) attended the dietitian individually either during the training period of continuous ambulatory peritoneal dialysis or shortly after starting haemodialysis or after renal transplantation. Follow up sessions were arranged when necessary depending on the progress of the biochemistry. For old cases, dietetic counseling session was arranged during the medical clinic follow up sessions. Improvement in nutritional status and blood biochemistry was observed in 70% of the patients after dietetic counseling.

At the end of 2002, a patient satisfaction survey on the dietetic service was performed. Results indicated that 96% of the patients found that the dietetic advice was useful and 85% followed the advice given. In this survey, 86% of patients revealed that they had improvement in the nutritional status and blood biochemistry after the dietetic counseling.
Role of Medical Social Worker in Renal Rehabilitation

Sharon S. M. LAW
Medical Social Services Unit, Social Welfare Department, Queen Elizabeth Hospital

The interdisciplinary renal team of Queen Elizabeth Hospital composes of doctors, nurses, medical social workers and staff from other supporting departments. The role of the medical social worker is multifaceted. We assess the family’s coping strategies, support network, learning styles and abilities and financial situation. Equally important, we communicate this information to the team and identify intervention strategies that will provide the family with comprehensive care for their medical and psychosocial need.

Our main effort is to maintain patients and their families with a quality life on dialysis. To that end, we provide counseling and identify community services/resources to patients and families to cope with renal disease and changes in family, home, workplace and community. That includes helping them to adapt to dialysis treatments, adjust emotionally to chronic renal failure, and cope with financial and accommodation concerns.

We perform psychosocial assessment on patients and establish ongoing relationship by seeing them regularly throughout the course of treatment. The patients and their families have many concerns especially in the initial stage of dialysis such as financial, caring and emotional aspects. There is no question that dialysis does carry financial implication. Amongst the end-stage renal disease patients, 53% of all the attendance is related to financial problems. That includes costs of medical treatment and monthly consumable items. For patients having financial hardship, they can apply for Disability Allowance although screening and assessment will be carried out before patients are considered eligible for such allowance. The Comprehensive Social Security Assistance allows those without work to have a safety net.

In addition to their financial concern, many people on dialysis, especially the aged, do face caring problem. It attributes to 21.8% of the service to ESRD clients. We try to facilitate family members to help keep the change of caring system and living environment for patients to minimal. Some families may mobilize their members, no matter living together or living apart, to look after patients but some may look for external assistances such as matching community care services, finding a maid, identifying relatives from China, or placing them in a residential home. It is important for the families to involve patients in working out their caring arrangement so that they can feel a part of decision and accept readily.

Patients may experience emotional stresses/problems arising from alteration of social and role responsibilities, dependence/independence issue, loss of sense of well-being, uncertainty about future and change in employment/income/financial security. These emotions may be triggered by lack of information, social support and inability of self-care. Therefore, it is necessary to help patients foster coping skills, release stressful emotions, develop healthy emotional responses (avoid performing a sick role) and re-establish a balance in their life. Involvement of families during the helping process is essential. Besides, self-management and empowerment can help patients regain control over certain aspects of their lives and health. The adjustment problem accounts for 19.2% of our service.

Throughout the process of social counseling and intervention, it is essential to respect the dignity of the patients, and be sensitive to and respectful of their wishes. Early education about renal disease, its treatments and productivity can help in their overall adjustment on dialysis including both emotionally and physically. Furthermore, patients easily feel vulnerable, out of control and low self-esteem. Immediate and constant comfort and encouragement especially from families and professional staff can generate positive impact on their adjustment. These elements can structure a supportive social environment that can improve how they feel and their ability to function.

In the helping process, we need to have a sense of reflection "If we were patients or their families, how would we react". It can let us take a more empathetic attitude and adopt a more flexible approach in our intervention. Life after renal failure can be very challenging both physically and psychologically. It is hoped that our effort will facilitate patients and their families to overcome these challenges with a view to achieving a fulfilling and meaningfully life.
Role of Occupational Therapy in Renal Rehabilitation

Rosalia K. Y. LEE, K. F. LEUNG
Department of Occupational Therapy, Queen Elizabeth Hospital

End-stage renal disease (ESRD) is a chronic illness in which functional capacities in performing self-care, domestic and work activities decline as the disease progress. Continuous ambulatory peritoneal dialysis (CAPD), haemodialysis and renal transplantation are all effective treatments for ESRD. Renal rehabilitation for these patients involves a multidisciplinary team in which occupational therapist is a member. In Queen Elizabeth Hospital, occupational therapists serve about 100 renal patients each year. The service offered varies according to the patients' needs and the stages of their illness.

The procedures of CAPD require fine manipulation of small, sterilized parts such as caps, catheter tubes and pegs of the dialysis package. These patients, especially the elderly, suffer from generalized weakness and reduced dexterity and finger sensation. The main concern of occupational therapy is to help them to carry out the exchange procedures independently. At this stage, we concentrate on providing necessary adaptations to the handles and knots of the dialysis package. We may give suggestions in building up the handles, changing the orientation of the handles and knots to meet the capacity of the patients or teaching proper body mechanics to facilitate stronger pinch. We will also work with the renal nurses to propose simplified operational procedures.

The next concern of occupational therapy is to help maintaining the activities of daily living (ADL) of the patients. We provide ADL training, recommend assisting devices for daily activities, and advise on energy conservation techniques to maximize utilization of the patients' potential for independent ADL. For those who are cared by the family members, we will provide advices and training to the carers to help relieving their burden in performing ADL for the patient. We will also conduct brief screening on home safety. Recommendation on home modification and/or reduction of home hazard will be provided when needed.

The younger patients have less difficulty in handling the CAPD procedures and ADL. However, they face difficulty in employment although many of them have regained working capacity of varying degree. Their main barrier is the need of regular dialysis for 3 to 4 times in a day. They will be arranged to join the Patient Retraining and Vocational Resettlement Service jointly organized by our occupational therapy department and the Employee Retraining Board. It is an integrated program providing vocational counseling, job skills training and job matching services.

In the period from 1995 to October 2002, 72 patients from our renal unit were referred for Patient Retraining service. 24 of them had undergone renal transplant surgery, 45 were on CAPD and 3 received other treatment. They were relatively young in age, ranging from 21 to 58 with a mean of 39 years. 42 of them (60%) had the education level of Form 3 or below and 23 (30%) completed secondary school. About half of them had been unemployed for more than 1 year and up to 6 years before seeing us. After attending the vocational counseling and skill training, 43 of them (about 60%), found either a part-time or a full-time job. Those required 4 CAPD exchanges per day usually worked as part-time. The categories of job involved were very diverse including accounting clerk, general clerk, security guard, convenience shop assistant or courier service. Among the 20 patients who worked for full time, the average salary was HK$7,329. For the part-time jobs, the mean salary was HK$3,344. Some patients quitted the job within 3 months due to various reasons. The average 3 months sustain rate was about 72%. Details are tabulated in Table 1. The experience of these patients indicated that many ESRD patients retain varying degree of working capacity and are productive members of the society when suitable assistance is given.

The mission of Occupational Therapy is to help our client to lead a meaningful life of their choice by maximizing their residual capacity to contribute to their self-care, work and leisure. At the moment, we could only afford to provide brief service on ADL and work. We wish we could extend our services to help our clients and their carers to restructure their living so as to achieve a more meaningful and happy life.

Table 1. Number of subjects who can find a job and the 3 months employment rate

<table>
<thead>
<tr>
<th>Subjects</th>
<th>No of subjects</th>
<th>No. of subject employed</th>
<th>No. of subject employed at 3 months after discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal transplant</td>
<td>24</td>
<td>19 (80%)</td>
<td>13 (54%)</td>
</tr>
<tr>
<td>CAPD</td>
<td>45</td>
<td>24 (53%)</td>
<td>18 (40%)</td>
</tr>
</tbody>
</table>
Role of Patient Resource Centre and Patient Support Group in Renal Rehabilitation

W. Y. LAM
Patient Resource Centre, Queen Elizabeth Hospital

Contemporary medical treatment is an effective means to prolong the life of end-stage renal disease (ESRD) patients. The side effects of treatment, however, are known to exploit the quality of life of patients and instigate negative influences on their other aspects. A holistic care for ESRD patients and caregivers is therefore crucial and necessary to fulfill their needs at different stage. In Queen Elizabeth Hospital, the Department of Medicine, QEH Renal Support Group and Patient Resource Centre jointly provide different psychosocial support and educational services to enhance patients' understanding on their illness and treatment thus empowering them to master their own life.

During the pre-treatment phase, a two-day dialysis class is arranged to patients and their caregivers to prepare them to receive treatment and provide an introduction on community resources for seeking assistance. It provides a comprehensive support to boost the confidence of patients and caregivers. Peer counselor serves as a model to evaluate their strength and confidence to face the future changes, clear their misconceptions, comfort their frustration and provide practical tips for them. In addition, a training class is designed for patients and their caregivers who are going to receive Continuous Ambulatory Peritoneal Dialysis (CAPD). It helps patients to acquire skills on the procedure and self-caring techniques.

In the treatment and rehabilitation phase, individual and social supports are important to patients. The role of QEH Renal Support Group is to promote the idea of mutual support and self-help, through which patients can share their common experience and practical tips and ultimately they can build up their own community social network. The group has two volunteers stationing in both QEH Renal Dialysis Centre and Yaumatei Renal Dialysis Centre during follow-up days to recruit new members and promote their services and activities. Besides, a supporting network is established to provide individual care and facilitate information delivery for group members constantly by phone calls. Psychosocial activities are organized, such as health talks, sports training sessions, social gatherings and other community activities, so as to promote a healthy life style and enhance the quality of life of group members.

Regular meetings are organized between medical volunteers, group committee members and the social workers of Patient Resource Centre (PRC) to evaluate the needs of patients and the future orientation of the group. PRC performs as the supporting role for the group, by providing volunteer training and supervision of volunteers; and offering professional advice, financial supports, facilities and venues for patient group activities.

Through the collaboration between medical volunteers, patient support group and PRC, a seamless psychosocial service could be provided to fulfill the needs of patients and caregivers in physiological and psychosocial aspects. Furthermore, it can fully utilize the resource through this collaboration.
Role of Physiotherapy in Renal Rehabilitation
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The Need for Exercise
Patients with renal disease require different treatment to maintain normal body functions. Dialysis is important in regulating the body homeostasis and thus the general well-being of the patients. Furthermore a normal physical fitness is essential for the patients to perform independent daily activities and self care tasks.

Cardiopulmonary fitness level in dialysis patients is reported to be low in many studies (Painter et al 1986, Goldberg et al 1983, Zabetakis et al 1982, Shalom et al 1984 & Robertson et al 1990). Evans et al (1985) showed that over 80% of dialysis patients were limited in vigorous activities and 62% to 79% in tasks requiring only minimal energy expenditure, such as walking for several blocks or climbing stairs. Even after transplant, 40% of patients reported limitation in these simple physical tasks. The symptoms of easy tiring and fatigue were prevalent (67% to 82% of dialysis patients and 43% of transplant recipients).

The limitation of exercise capacity is multi-factorial. Cardiac and muscle dysfunction may impair delivery and utilization of oxygenated blood thus their exercise capacity. High level of uraemic toxins and anaemia affect the physical activity of renal patients in general. Autonomic dysfunction also limits the cardiac performance. Finally, muscle fatigue can lead to physical inactivity. waynx et al (1990) found that muscle weakness explained the impaired exercise tolerance for end stage renal failure patients with anaemia. Painter et al (1986) also reported that the VO2 max (maximal oxygen consumption) of dialysis patients was only half of the expected for the same age.

Various studies (Goldberg et al 1983, Ross et al 1989, Shalom et al 1984 & Zabetakis et al 1982) showed that conditioning exercise program was beneficial and could increase the exercise capacity in dialysis patients. Geoffrey et al (1992) reported that exercise training performed either during or in between haemodialysis sessions improved VO2 max. Patricia (1994) reported an increase in exercise tolerance by approximately 25% with exercise. Exercise training can also increase skeletal muscle strength, increase joint flexibility and improve sense of balance and decrease risk of fall. Regular exercise increases the functional capacity, thus enhancing independence of the patients which is one important component in rehabilitation.

Regular exercise also helps in reducing the cardiovascular risks, improving the haematocrit and better controlling the blood pressure. With regular exercise, most patients experience sense of increased energy, feeling of well-being and improvement in psychological profiles such as anxiety, hostility and depression. The quality of life is, as a result, improved.

According to the Life Option on Advisory Committee, a well-designed exercise regime with multidisciplinary contribution is ideal for the rehabilitation of dialysis patients.

Planning of Exercise
Planning of exercise program depends on the patients’ medical condition and ambulatory status. For those patients with satisfactory ambulatory ability, independent exercise with regular follow-up is appropriate. Home exercise or community-based programs are all possible choices. Education is an important component for an effective program. It should include information on how to start, the expected progress and the signs and symptoms of discomfort during exercise. An effective communicating channel must be established with the medical team. Follow-up on the progress, response and symptoms should be included in any independent exercise program.

The exercise program for the non-ambulatory patients must be planned and designed carefully according to the change in efforts and physical ability.

Exercise is not recommended for patients immediately after dialysis. It is because fluid lost may produce extra stress to the cardiovascular system and upset the stability of blood pressure. Excessive exercise may produce undesirable effects on the cardiovascular system.

1. Types of Exercise
Several types of exercise are suitable for dialysis patients, including flexibility, strengthening, and cardiovascular exercises.
Flexibility Exercise
Gentle muscle stretching improves the range of motion of the body and major joints. Increased flexibility improves functional performance and prevents musculo-skeletal injury. The combination of flexibility and strengthening exercises improve patients' ability to perform activities of daily living, such as reaching, fending and carrying.

Strengthening Exercises
Specific muscle groups strengthening exercise increases muscle mass and muscle strength. Muscle strength is increased or maintained with two to three sessions of exercise per week. Cuff weights, sandbags or elastic bands can be used to train the muscle. Exercise with low resistance but high number of repetition is recommended but not for high resistance. Simple and easily available equipment is more appropriate for patient training.

Cardiovascular Exercise Training
Cardiovascular activities require the movement of large muscle groups in rhythmic manner. The goal of cardiovascular exercise training is to achieve and sustain an activity of increased energy requirements (approximately 40% to 85% of peak capacity) for increasing periods of time. Cardiovascular benefits can also be obtained from short periods of sustained aerobic activity (10 minutes) several times a day. For optimal cardiovascular conditioning, it is recommended to build up the sustained activity gradually with close monitoring by the physiotherapist. Unaccustomed exercise type and unsupervised progress may be more harmful and should be avoided. Careful screening and evaluation of risk factors by the physician is essential prior implementation of any exercise program. Patients should always be advised to start slowly and proceed gradually.

2. Assessment
Assessment is important in the planning and adjustment of exercise program and the monitoring of patient's progress. An assessment includes the medical history, social history and physical examination.

Medical History
It includes the diagnosis of the renal disease and other concomitant medical conditions such as hypertension, heart disease or anemia. The effect of medications like Erythropoietin or Beta-blocker must be taken into account.

Social History
A detail assessment of the social background including the occupation, education level, family support is vital for planning a tailor-made rehabilitation program.

Physical Examination
Musculo-skeletal assessment
Muscle strength can be measured by Oxford manual muscle testing and hand held dynamometer. Hand held dynamometer provides more objective outcome measurement.

Cardio-pulmonary Assessment
Six minute walk test is an universal accepted field test. It is safe, simple and well tolerated by most patients, even frail elderly. It was first described by McGavin and colleagues in 1977. Participants are instructed to 'walk continuously as quickly as possible' up and down one of two hallways (at least 100 feet). Pace should be adjusted but running is not allowed. Perceived exertion (PE) ratio scale developed by Borg can be used to assess the subjective effort of the patient during exercise. Six minute walk test in addition to PE measurement reinforce the assessment on the effort domain. It is reliable and feasible for many patient populations including the renal patients. Criteria for terminating the test include dizziness, angina, fatigue, severe musculoskeletal pain as in leg claudication, signs of vascular insufficiency, progressive fall in systolic blood pressure of 20 mmHg or more in the presence of increasing heart rate and workload.

3. Exercise Approach

Department Based Exercise Program
It is more flexibility in time allocation, space and equipment resources utilization. The professional advice can be given to all patients in the initial phase of the program by the physiotherapists. The exercise program is conducted under supervision. The proper program should include the warm-up exercise, the graded strengthening, aerobic exercise depending on the individual and the cooling down exercise. The utilization of upper and lower limb ergometers can provide appropriate loading to individual patient.

Home Based Exercise Program
It is a continuum of the department-based training program. Without succession of home exercise regime, the benefits of physical training will decrease soon. In order to have an effective home based program, encouragement and support from both the therapist and family members are essential. Patient's motivation is also a vital successful factor. Utilization of simple exercise equipment such as sand bag, cuff weight, light resistance rubber band or cycle exerciser enhances the training effect and maintain the patient's motivation. Home based program shall include a warm-up component, both strengthening and aerobic training and cool down exercise as in the department based program. Clear instructions on self-monitoring the exercise intensity and regular follow-up on the changes in physical parameters by the physiotherapist will make the program a success. The use of exercise log book can facilitate the monitoring of exercise effect both by the physiotherapist and patient.