

# [Anemia in continous ambulatory peritoneal dialysis nursing essay](https://assignbuster.com/anemia-in-continous-ambulatory-peritoneal-dialysis-nursing-essay/)

Mr. Wong was a 46-year old man. He defaulted current follow up and 2 days continuous ambulatory peritoneal dialysis (CAPD). On admission, his blood pressure (BP) was 197/106mmHg, pulse was 108/min, oxygen saturation was 94% in room air, body temperature was 36. 5 degree Celsius, body height was 1. 78 m, and body weight was 82. 3 kg (body mass index was 26. 0kg/m2). Glasgow Coma Scale (GCS) was E4; V5; M6 (E4: Open eyes spontaneously; V5: Oriented, converses normally; M6: Obey commands). His chief complaints were fatigue, shortness of breath, dyspnea on exertion at this admission.

From this preliminary data, the following literature review and nursing assessment was trying to understand anemia in CAPD client.

## Literature review

## Demographics of the end-stage renal disease population

The World Health Organization (WHO) had already recognized that renal disease was a public health issue. In 2000, there were about 1. 5 million patients globally on dialysis; in 2010, this number was projected to increase to 2. 5 million, a 7% increase year on year. A similar trend was being observed in Hong Kong. The incidence of end-stage renal failure (ESRF) requiring replacement therapy had increased significantly around the world. Data from the United States Renal Data System (USRDS) for the year 2005 showed that Taiwan had an annual incidence of 404 new cases per million population (pmp), the highest in the world. In Hong Kong, the annual incidence was 173 new cases pmp in 2005, taking the 13th place in the USRDS data. The prevalence was 965 uremic patients pmp requiring treatment in Hong Kong in 2005. For the age group of 20-44, Hong Kong ranked number 4 with 88 new cases pmp. For the age group of 45-64, Hong Kong ranked number 5 with 289 new cases pmp (USRDS, 2007). This signified that renal disease was common in our relatively younger population. Prevalence and incidence in 2007 were respectively 1026 and 164 pmp according to the Hong Kong Renal Registry. Prevailing causes of chronic kidney disease (CKD) in Hong Kong were diabetes (23%), glomerulonephritis (GN, 34%) and hypertension (7%) for existing renal replacement therapy (RRT) patients surveyed in 2007 (Lam, 2009). This had prompted the development of strategies aimed at preventing the development and progression of asymptomatic CKD. Rising demand for dialysis therapy and its associated costs were placing an unsustainable financial burden on public sector health care budgets in countries all over the world, which carried profound implications for health care financing in the near future. The predicted dialysis cost globally would increase to about US$1. 1 trillion for the decade of 2001-2010, compared with about US$500 billion spent for the last decade worldwide. An ideal renal replacement therapy should have optimal survival, lowest possible risk for comorbidity, highest level of quality of life and, equally important, acceptable cost for society. Viable solutions were urgently needed in managing the treatment of end-stage renal disease (ESRD) and controlling spending on ESRD without compromising the quality of patient care. The policy model used in Hong Kong was using CAPD first, was also being considered by other countries as an appealing cost-effective modality. The overall survival of peritoneal dialysis (PD) patients in PWH was very respectable, with a 2-year patient survival of 91% and technique survival of 82%. With an increasing number of elderly ESRD patients, the 2-year and 5- year patient survival rates for the elderly group in PD program were 89. 3% and 54. 8%, respectively, which were comparable to the rate of survival in the non-elderly group. There were good reasons for why the PD program was successful in Hong Kong (Li, 2008).

## Anemia in ESRF

Anemia meant there was a low supply of red blood cells (RBC) in the body. Red blood cells carried oxygen from your lungs to all your organs and tissues. They provided energy for our daily activities. Anemia was a major complication of stages 2-5 CKD affecting more than 50% ESRD patients before treatment. Anemia especially hemoglobin (Hb) below 11 g/dL could have a devastating impact secondary to chronic renal failure had been associated with cardiovascular complications including left ventricular hypertrophy and congestive heart failure (CHF), reduced cognitive function, decreased quality of life and, more importantly, mortality (Tang, Fung, Chu, Lee, Cheuk, Yim, Chan, Tong, 2007; Silverberg, Wexler, Blum, Schwartz and Iaina, 2004). Furthermore, correction of anemia would eliminate the need of regular blood transfusion, which increased the risk of transfusion-related viral transmission and sensitization for subsequent transplantation (Lai, 2009; Nissenson and Fine, 2008). Therefore, early treatment of anemia would stop the progression of CKD and CHF. It was because their kidneys failed to make enough of a certain hormone, which called erythropoietin (EPO). EPO helped bone marrow make RBC. There was anemia if Hb level was lower than the normal range (which was 12. 0 for women and 13. 5 for men). Erythropoiesis-stimulating agents (ESAs) act like the natural hormone EPO, which helped our body to make red blood cells. Short-acting ESAs are more effective when given subcutaneously (as an injection under the skin) rather than by intravenous (through the blood tubes during dialysis). Examples of short-acting ESAs were epoetin alfa and epoetin beta. Long-lasting ESAs were equally effective regardless of how they were given. Darbepoetin was an example of a long lasting ESA (National Kidney Foundation (NKF), 2006). Recombinant human erythropoietin (rHuEPO) including Eprex and Recormon had been widely used for treatment of renal anemia. However, up to 25% of dialysis patients were relatively resistant to replacement requiring higher doses to reach target Hb concentration (11 g/dL), and 5-10% fail to respond even on high doses of ESAs (Lam, 2009). The National Kidney Foundation’s 2007 Update of the Kidney Disease Outcomes Quality Initiative (KDOQI) Clinical Practice Guidelines and Recommendations for Hemoglobin Target advised that the hemoglobin target should generally be in the range of 11 -12 g/dL. The Hb target should not be greater than 13. 0 g/dL was based on analysis of all-cause mortality and adverse cardiovascular events in patients with CKD assigned to Hb targeted greater than 13. 0 g/dL compared with lower Hb targeted for ESA therapy (NKF, 2007).

## Nursing assessment

## Past medical history

Autosomal dominant polycystic kidney disease (ADPKD)

## Current medication (appendix 1)

## Allergies

Mr. Wong had no known drug or food allergies

## Past surgical history

Right nephrectomy and left nephrectomy were done on 25th February 2003 and 14th September 2005 respectively in Prince of Wales Hospital

## Social history and family history

He was a lorry driver before being diagnosed chronic renal failure. He was a form 3 graduate. He denied ever smoking, drinking and using illegal drugs. He lived alone in a renting apartment for over 5 years. He did not attend any regular classes or exercise for his leisure time, but he liked horse racing. Both parents of Mr. Wong had expired. He denied his parents had any chronic diseases. He also denied having any siblings. He devoiced in 2005 and he did not have any contact with his ex-wife and 16-year old daughter. During this admission, no relatives or friends visited him.

## Review of system

Constitutional: Mr. Wong stated he was well-rested. He denied any weight change, chills or fever. He was alert and oriented to time, place and person. He could answer questions well. Speech was clear and appropriate. Emotion was calm but with tired-looking (Jarvis, 2007 and Phillips, 2009).

Vital signs: On admission, his BP was 197/106mmHg, pulse was 108/min, oxygen saturation was 94% in room air, body temperature was 36. 5 degree Celsius, body height was 1. 78 m, and body weight was 82. 3 kg (body mass index was 26. 0kg/m2). GCS was E4; V5; M6 (Jarvis, 2007 and Phillips, 2009).

Skin: He complained pruritus over the trunk but no change in pigment or color, no change in mole. Both ankle edema observed but no rash or bruising observed. Cold extremities noted with poor circulation. Skin tone with ashen appearance also noted (Jarvis, 2007 and Phillips, 2009).

Head: no headache, head injury, dizziness or vertigo (Jarvis, 2007 and Phillips, 2009).

Eyes: he did not wear glasses. No difficulty with vision (no decreased acuity, blurring, blind spot), no eye pain, no diplopia, no redness or swelling, no watering or discharge (Jarvis, 2007 and Phillips, 2009).

Ears: he reported no recent change in hearing. No earaches, ear discharge, tinnitus or vertigo (Jarvis, 2007 and Phillips, 2009).

Nose and sinuses: no nose bleed, nasal obstruction, allergies or hay fever, or change in sense of smell (Jarvis, 2007 and Phillips, 2009).

Mouth and throat: no bleeding gums, sore throat, toothache, dysphagia, hoarseness (Jarvis, 2007 and Phillips, 2009).

Neck: no pain, limitation of motion, lumps or swelling, enlarged or tender nodes, stiff neck (Jarvis, 2007 and Phillips, 2009).

Breasts: no lumps, pain, or nipple discharge (Jarvis, 2007 and Phillips, 2009).

Respiratory: he complained shortness of breath, dyspnea on exertion for any physical movement at this admission. No history of lung diseases including asthma, emphysema, bronchitis, pneumonia, tuberculosis. No cough, production of sputum, hemoptysis, toxin or pollution exposure (Jarvis, 2007 and Phillips, 2009).

Cardiovascular: no complain of chest pain or palpitation. No heart murmur and jugular vein distention. Pallor fingers and toes; bilateral ankle edema observed. Hypertension was measured (Jarvis, 2007 and Phillips, 2009).

Gastrointestinal: no change in appetite, food intolerance, dysphagia, heartburn, indigestion, pyrosis, nausea and vomiting, history of abdominal disease (ulcer, liver, gallbladder, jaundice, appendicitis, and colitis), constipation or diarrhea, tarry stool, rectal bleeding (Jarvis, 2007 and Phillips, 2009).

Urinary: anuria observed. No pain in flank, groin, suprapubic region, or low back (Jarvis, 2007 and Phillips, 2009).

Male genital system: no penis or testicular pain, sores or lesions, penile discharge, lumps, hernia. He stated no any sexual activity for over 5 years (Jarvis, 2007 and Phillips, 2009).

Musculoskeletal: He complained left hip stiffness and occasional pain for 3 year. No history of arthritis or gout. No joint swelling, deformity, limitation of motion than usual. No muscle pain, cramps, weakness, gait problems (Jarvis, 2007 and Phillips, 2009).

Neurologic: no history of seizure, stroke, fainting, or blackout. In motor function, there was no weakness, tic, or tremor, paralysis, or coordination problems. In sensory function, there was no numbness and tingling (paresthesia). In cognitive function, there was no memory loss and he was oriented. In mental status, there was no nervousness, mood change, depression, or any history of mental health dysfunction or hallucinations (Jarvis, 2007 and Phillips, 2009).

Hematologic: no bleeding tendency of skin or mucous membrane, excessive bruising, lymph node swelling (Jarvis, 2007 and Phillips, 2009).

Endocrine: no history of diabetes or diabetic symptoms (polyuria, polydipsia, polyphagia). No history of thyroid disease, intolerance to heat and cold, change in skin pigmentation or texture, excessive sweating, abnormal hair distribution, nervousness, tremors, and need for hormone therapy. He complained loss of appetite but no regular body weight measurement that did not conclude any relationship between appetite and weight (Jarvis, 2007 and Phillips, 2009).

## Functional assessment (including activities of daily living)

Barthel Index (BI) measured the individual’s performance on 10 activities of daily living (ADL) functions including personal hygiene, bathing self, feeding, toilet, stair climbing, dressing, bowel control, bladder control, ambulation and chair/bed transfer range. Mr. Wong scored 100 that he was totally independence. The BI was found to be reliable and repeatable in skilled and unskilled hands (Shah, Vanclay and Cooper, 1989).

Perception of health: he had acquired chronic renal failure for over 7 year. He accepted this chronic illness and learnt how to live with it. He could perform CAPD and self injection of Recormon tactfully by himself (Jarvis C, 2007 and Phillips, 2009).

Self-esteem, self-concept: He was a form 3 graduate. He was a lorry driver before being diagnosed chronic renal failure. He did not have any social welfare subsidy by the government. He used his own saving for daily living. He did not have any religious belief as he knew no one could help (Jarvis C, 2007 and Phillips, 2009).

Activity, exercise: he was totally independence of his daily living. He did not attend any regular classes or exercise for his leisure time, but he liked horse racing. He engaged in horse racing (Jarvis C, 2007 and Phillips, 2009).

Nutrition: he did not like to take the diet and snack provided by the hospital. He did not cook the meal by himself; he usually had the meal in the fast food shop when he felt hungry but not at regular time. He denied any food allergy or intolerance and intake of caffeine (coffee, tea, soft drinks). He said he did not have any food restriction as he ate whatever he liked (Jarvis C, 2007 and Phillips, 2009).

Interpersonal relationship: He lived alone in a renting apartment for over 5 years. Both parents of Mr. Wong had expired. He denied his parents had any chronic diseases. He also denied having any siblings. He devoiced in 2005 and he did not have any contact with his ex-wife and 16-year old daughter. During this admission, no relatives or friends visited him. He refused to disclose the contact telephone number of his ex-wife and daughter as he did not want to be their burden (Jarvis C, 2007 and Phillips, 2009).

Coping and stress management: he thought divorce and renal chronic disease were the greatest stress in his life. He was clam to face his incidence and did not take any decision. Divorce was handled by his ex-wife. His health care treatment plan was decided by nephrologists and medical physician (Jarvis C, 2007 and Phillips, 2009).

Personal habit: he denied ever tried any tobacco, alcohol and street drug including marijuana, cocaine, crack cocaine, amphetamines, and barbiturates (Jarvis C, 2007 and Phillips, 2009).

## Identifying client’s health problems and evaluation

Anemia: Mr. Wong was suffering anemia. 2 pint of blood was transfused to him immediately. Also, injection of Recormon 4000 units once weekly resumed. Pre-transfusion Hb was 5. 9 g/dL while post-transfusion Hb was 6. 1 g/dL. Blood transfusion seemed not to be effective. The complete blood count provided information about the severity of anemia. However, physician forgot to take folate, vitamin B12 blood sampling (NKF, 2007), which were essential in blood production. Patient with inflammatory state always had an elevated ferritin level in the presence of low transferring saturation (TSAT) (Levy, Brown, Daley, Lawrence, 2009). As Mr. Wong had an elevated ferritin 1015 pmol/L but there was no any information about TSAT, C-reactive protein. Further investigation should be ruled out any inflammation that causing anemia. Furthermore, Mr. Wong missed the ESAs before hospitalization. It should reinitiate Recormon or other ESAs at a higher dose; typically 25% higher than the pre-hospitalization dose (Krishnan and Adams, 2004) rather than just resume the previous dosage.

Fluid overload: Mr. Wong another health problem was fluid overload. Using CAPD Baxter ultra bag (low calcium) 4. 25% dextrose 2. 5 litres 1 bag per day and CAPD Baxter ultra bag (low calcium) 2. 5% dextrose 2. 5 litres 3 bags per day rather than original CAPD regime to treat fluid overload. During the dwell phase, ultrafiltration occurred as a consequence of the osmotic gradient between the relatively hyperosmolarity of the dialysate solution and the peritoneal capillary blood. Higher concentration of dextrose increased the osmotic gradient that increased ultrafiltration. Also, shortening the dwell time would result in removal of increased ultrafiltrate volume compared to long dwells (Kelley, 2004 and Maaz, 2004). It was because higher dextrose acted as an osmotic agent to draw the overloaded fluid gradually. Eventually, hypertension would be improved. Strict intake and output, daily body weight and low salt diet should be implemented.

Non-compliance: Mr. Wong was non-compliance to his treatment as he defaulted follow up, CAPD and injection of ESA secondary to lack of financial support. The health care team should refer him to the medical social worker for arrangement of placement and financial security. His non compliance also included imbalance diet; home helper might be arranged for his low salt, low phosphorus diet.

Avoidance coping strategy: The avoidance coping strategy of Mr. Wong caused this hospitalization. He did not think much until he used up all his saving that he could not live in the apartment anymore. Therefore, he could not perform CAPD and injection of Recormon. He did not seek help until he could not tolerate. This avoidance act made him nearly death (National Institutes of Health Clinical Center, 1996). As he did not get support from his family, the health care team could refer community support group to him. Also, the health care team should establish good rapport with him and reinforce positive coping strategies. If Mr. Wong discharged, community care service should refer to encourage client participation and compliance. On the other hand, Mr. Wong was lack of competence of self care even he could perform aseptic CAPD by himself. However, he could not detect any signs and symptoms of CKD complications and leading to hospitalization. There was lack of communication or trust between health care team and Mr. Wong as he did not seek help until his physical condition could not tolerate anymore.

Elevation of parathyroid hormone: Mr. Wong had elevated plasma levels of intact parathyroid hormone (PTH) of 146 pmol/L. Calcitriol or 1 of its analogs (doxercalciferol, alfacalcidol, or paricalcitol) should be used to reverse the bone features of PTH overactivity in order to reduce the serum levels of PTH to a target range of 16. 5 to 33. 0 pmol/L. Severe hyperparathyroidism (persistent serum levels of intact PTH > 88. 0 pmol/L), parathyroidectomy might be considered. Therefore, regular blood monitoring at least every month after initiation of therapy for the first 3 months, then every 3 months thereafter should be suggested (NKF, 2003). However, there was no current medication to treat his PTH.

Aluminum toxicity: Mr. Wong complained left hip stiffness and occasional pain for 3 year. He might suffered from aluminum toxicity, which occurred in dialysis patients or CKD patients with GFR <30 mL/min/1. 73 m2 (Stages 4 and 5 CKD) because aluminum that was absorbed from the gut or entered the body from dialysate or another parenteral route was not excreted or was inadequately excreted by the diseased kidneys. When aluminum accumulated in dialysis patients, it was only slowly removed by dialysis because 90% of aluminum was bound to plasma proteins (primarily transferrin). The aluminum entering the body accumulated in various tissues, including bone, brain, parathyroid glands, and other organs. Such accumulation of aluminum could produce toxicity with several distinct syndromes, depending on the rate and magnitude of aluminum loading. The first to be described was dialysis encephalopathy (or dialysis dementia). Aluminum was then recognized as the cause of both " fracturing dialysis osteomalacia" (aluminum-related bone disease) and a microcytic anemia developing without iron deficiency. Patient with aluminum related disease such as aluminum bone disease insidious bone pain (soft tissue calcification) (Michael and Garcia, 2004). This aluminum toxicity was due to ingestion of Alutab (aluminum hydroxide) tablet which was a phosphate binder to improve the skin pruritus. However, serum aluminum levels never be monitored, even the x-ray hip never be done to rule out any deformity of hip.

Low quality of life: According to the study of Ching, Pun, Wong and Chan, 2000, Mr. Wong might have low quality of life (QOL) as he lack of family support with divorce, physically disability, unemployment leading low self esteem and social isolation. Mr. Wong’s situation was congruent with the study. Summarized the study, patients with end-stage renal disease (ESRD) could sustain life through peritoneal dialysis or hemodialysis. In Hong Kong, a home-based therapy, CAPD was the main form of peritoneal dialysis therapy for patients with ESRD. It encouraged self-care and freed patients from hospital based treatment. However, with organ shortage in renal transplantation, peritoneal dialysis might mean a never-ending treatment for these patients. Chronic renal failure patients had been reported to have the worst QOL among patients with different chronic illnesses. QOL was generally defined as life satisfaction or satisfaction of needs. It encompassed multifaceted elements that act on one’s external and internal well-being. Satisfaction was a sense of feeling from one’s subjective point of view. As regarded to home-based dialysis, family members could provide both caring and financial support to the patients. Our patients’ divorce rate was four times higher than that of the general population in Hong Kong though the study did not reveal exactly when the patients divorced, before or after started on dialysis. This finding supported that married patients had a better social and economic support than divorced or separated patients. Besides, role difference might enable a better acceptance of female patients on their disease and living conditions than male patients. Health and functioning got the lowest score among all subscales of QOL. Own health was perceived to be the most important item but it ranked low in the satisfaction ranking. The dissatisfaction on health could be attributed to the irreversibility of their disease and the dependency on dialysis. Besides, anemia, hypoalbuminia and inadequate dialysis might also affect patients’ well being. Being asked on sex-related questions often embarrassed Chinese patients. Sex was a cultural taboo for Chinese, especially in the poorly sexual functioning dialysis patients. Dialysis patients often had a decline in sexual activity and functioning. Sex-life got the lowest importance ranking among all life items. It seemed that sex-life was perceived as a luxury for dialysis patients taking into account of their poor health and physical functioning status. In this study, the working group had a significantly higher QOL score than the unemployed. However, 46% of CAPD patients in working age were unemployed. Job readjustment may be necessary in order to fit in their change in life style. In this study, the median family income was HK$8000 per month. It was lower than the median of HK$17500 for the general population of Hong Kong. In fact, patients with higher family income were found to have higher QOL scores. Patients receiving social/disability allowance had the lowest QOL score across all subscales. It could be attributed to the poor health, feeling of dependence, low self-esteem and inadequacy of social allowance. Most of the stressors were due to uncertainty about future in dialysis patients. Dialysis patients only focused on the living for today. Some of the patients mentioned that they dared not think about the future. They expressed a negative feeling for the future. Only one-third of the respondents looked forwards to receiving renal transplantation and considered it the most important aspect of their lives. However, 26% of respondents expressed hopelessness that people tend to adjust their aspiration level to fit with the new circumstances, which in turn restored subjective well-being. The pessimistic thought may be the result of multiple “ maladjustments” in their aspiration (Ching, Pun, Wong and Chan, 2000). Mr. Wong also complained of fatigue which might due to anemia but also the low QOL. His social isolation, inactivity, deconditioning, and fatigue continued to feed off each other, creating a serious disability (Straub, Murphy, Rosenblum, 2008).

Knowledge deficit: Knowledge deficit of Mr. Wong was observed. ADPKD was passed from parent to child by dominant inheritance. Symptoms usually began between the ages of 30 and 40, but they could begin earlier, even in childhood. ADPKD was the most common form of polycystic kidney disease (PKD) that causing about 90% PKD. High blood pressure was the most common sign of PKD, this insidious sign always delayed client seek for help. Ultrasound was the most reliable, inexpensive and non-invasive way to diagnose PKD (NKF, 2010). However, general practitioner might only treat hypertension rather than finding out root cause. A low-salt diet was recommended when hypertension or renal failure was present. Mr. Wong felt anxiety related to his current disease process and gradual worsening of his disease. He also felt guilty about potential of passing ADPKD to his daughter and for not having his daughter genetically tested early.

## Conclusion

Chronic renal failure required long-term and multidiscipline to tailor each client’s need concerning their physical, psychosocial and environmental need. No matter which type of dialysis they used, they were waiting for renal transplantation hopelessly due to shortage of organ. Self-care at home was encouraged in Hong Kong. However, in the unit policy of Tuen Mun Hospital, there was no case manager to collaborate process of on-going assessment, planning, facilitation and advocacy for options and services to meet an individual’s health needs through communication and available resources to provide continuity of care and thus lower hospitalization. Also, lack of follow up to detect problems was another policy problem. Health care professionals could detect the physical and psychosocial problems and referred other discipline promptly when necessary in follow up. Case management seemed to be a new strategies dealing with chronic disease.

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## Appendix 1

## Current medication

CAPD Baxter ultra bag (low calcium)

2. 5% dextrose 2. 5 litres 4 bags per day

Alutab (aluminium hydroxide) tablet

Oral: 1200 mg tds

Renitec (enalapril maleate) tablet

Oral: 5 mg daily

Adalat retarded (nifedipine) sustained release tablet

Oral: 20 mg bd

Recormon (erythropoietin beta) prefilled syringe

Parenteral: 4000 units once (every Friday) weekly

Slow K (potassium chloride) sustained release tablet

Oral: 600 mg daily

Synalar (fluocinolone acetonide) cream 0. 005% 100g

Tropical: bd