NURBN 2016 case study

[Name of the Writer]

[Name of the Institution]

NURBN 2016 case study

**Part I**

1.1 **Anatomy**

Kidneys are bean-shaped retroperitoneal structures that are located in the transverse processes of vertebrae T12-L3, taking into account that the left kidney is more superior in terms of position as compared to the right kidney. The upper poles of the kidney are more medial and posterior as compared to the lower poles. Each kidney comprises of Renal Cortex and Renal medulla, where nephron lies between these sections. Nephron is the urine producing structures (Chandrasekhar, et, al.,2018).

**Physiology**

Kidneys are responsible for the extraction of urine, taking into account the mitigation of uremic toxins. It is responsible for the regulation of body systems such as extra and intracellular volumes, the units of acid-base and the metabolism of calcium and phosphate. These volumes maintain both qualitative and quantities composition of urine in order to keep urine function in balance. In kidneys, the plasma is filtered in accordance with renal and systematic homodynamic that is also termed as self-regulation (Chandrasekhar, et, al.,2018). Urine is modified in the segments of nephrons, where proximal nephron ensures massive reabsorption of water along with amino acids, bicarbonates and glucose. However, distal nephron includes distal convoluted tubule along with collecting duct and connector tube that maintains the composition of urine as per the need of the body (Chandrasekhar, et, al.,2018).

**1.2 Pathophysiology**

Taking into account the condition of Melanie it is asserted that she has renal insufficient function that caused renal failure. The decrease in renal function leads to the inability of the kidney to maintain the electrolyte and homeostasis. It refers to a decline in urine concentration that is followed by a decrease in the ability of kidney of excreting excess acid, phosphate and potassium (Barzilay, et al., 2018). As her GFR is 10ml/min it is asserted that urine has lost the ability to be effectively dilute and thus urine concentrated. moreover, her urinary volume doesn’t respond to the readily available variations in the intake of water. It is also followed by increased excretion of sodium in the urine if potassium plasma level would be maintained. However, calcium and phosphate abnormality may occur (Barzilay, et al., 2018). Moreover, there are chances of Vitamin D metabolism. As patient-reported of hypertension and found with chronic renal failure, pathophysiology includes vascular and glomerular changes, taking into account that increase in blood pressure causes a hypertrophic response that may lead to thickening of both large and small vasculature.

It is asserted that these mechanisms are compulsory in the beginning but with the passage of time, they may lead to glomerular damage as well which includes Global sclerosis and Focal segmental Sclerosis. Global sclerosis refers to ischemic injury to nephron that may cause its death while focal segmental sclerosis is the enlargement of glomerular that is meant for the compensation of loss of nephrons in different areas of the kidney. Interstitial nephritis is also associated with the condition of Melanie in which glomerular and vascular disease may cause tubular atrophy (Barzilay, et al., 2018). Chronologically, these changes are the way for other changes that may cause glomerular as well as the tubular loss that may cause nephron loss. With the death of some nephron, there are few left that could maintain the level of GFR. However, a gradual decline in GFR is noticed as the nephrons may continue to die (Barzilay, et al., 2018).

**Risk factors**

There are several risk factors of chronic renal failure in Melanie such as high blood pressure, sleep problem, changes in the amount of urination and fatigue and weakness (Barzilay, et al., 2018).

**Complications**

There are different complications of renal failure in case of Melanie, such as anemia, heart disease, high ratio of potassium, any kind of bone disease and buildup of fluid in the body. It is asserted that when kidneys wouldn’t be working properly, the body would not be having enough red blood cells. Melanie doesn't have healthy kidneys that means bones wouldn’t be healthy, causing risk of hyperphosphatemia. Heart disease can cause kidney disease and kidney disease can cause heart disease, when kidneys are not working the body is not in proper condition. As Melanie’s kidneys are filtering extra potassium so there would be complications of hyperkalemia. Moreover, Healthy kidney is capable of taking out extra fluid from the blood in the case of Melanie, they wound be able to excrete extra fluid (Barzilay, et al., 2018).

**Possible treatment**

All these complications can be treated by having low salt diet, use counted fluids, consult doctor off and on and try to suck ice cube when thirsty.

**1.3 Difference between acute and chronic renal failure**

1. Acute kidney failure occurs sufficiently and it is reversible in many cases while chronic renal failure develops and follows over a long period of time that is usually not reversible.
2. The causes of acute renal failure may include disease, wound, infection any accident or shock while chronic renal failure has no specified causes. It follows a long period as it is hard to trace an exact cause, however common causes are blood pressure or diabetes (Rocco, et, al., 2018).
3. The treatment of acute renal failure Is special diet or fluid restriction but chronic renal failure requires dialysis (Rocco, et, al., 2018)
4. The symptoms of acute renal failure are electrolyte imbalance or fluid buildup but the symptoms of chronic disease are anemic or increase phosphate in the blood (Rocco, et, al., 2018).
5. Acute renal disease is found in people or patient who is already admitted to the hospital while chronic renal failure is detected under normal routine (Rocco, et, al., 2018).
6. In acute renal failure, the size of the kidney stays normal while in chronic renal failure the size gets smaller (Rocco, et, al., 2018)

**1.4 Renal Replacement Therapy**

Renal replacement therapy is a therapy that is meant for replacement of non-endocrine kidney functions in the patients who are suffering from renal failure. There are different techniques that are used in this therapy. In the case of Melanie, Hemodialysis would be used. Hemodialysis is the incorporation of procedures that can filter as well as dialyze blood without any interruption. One of the major advantages of this technique is to remove the large ratio of fluids taking into account that the subject Melanie has a large ratio of fluids in her kidney (Yanda, et, al., 2019). Moreover, this procedure is able to avoid hypotensive episodes that are caused by intermittent hemodialysis taking into account intermittent removal of the large volumes of fluid. These procedures are meant for management of patients who are suffering from acute kidney injury similar to Melanie who was hemodynamically unstable (Yanda, et, al., 2019).

Taking into account the significance of this technique, it is asserted that the replacement therapy is capable of exchanging solute and remove unnecessary fluids from the body that were to be released by kidneys. It also facilitates filtration across permeable membranes. Moreover, this therapy is not a universal solution, its choice is highly dependent on factors such as patients need, availability, the expertise of the physician and the vascular access (Gupta, et, al., 2019).

**Part II**

2.1 Candesartan is suggested for Melanie because this medicine is used to treat high blood pressure. It lowers the pressure of blood and prevents kidney problems. This drug is directly linked with the condition of the patient because she is detected with a kidney disorder. This medication belongs to the category of drugs that are called angiotensin receptors blockers (Wong, et, al., 2019).

There are different side effects of the suggested medicine as well. It may cause dizziness to the patient. She may feel symptoms of cough or some other flu-like symptoms that may include cough, runny nose, fever and sneezing. The patient may fee; back pain and there are chances of nasal congestion as well (Wong, et, al., 2019).

**Major nursing considerations are as follows**

* The medicine should be used for 4-5 weeks
* Medicine should be taken orally
* Medicine should be taken with food
* It should be taken two times a day

Olmesartan is another drug that is prescribed to Melanie in order to treat hypertension kidney disease. This medicine plays a major role in lowering blood pressure as it is one of the best medicine that can be used for lowering blood pressure so that there are decreased chances of strokes, different kidney problems and heart attacks. This medicine is prescribed for Melanie because kidney failure is directly associated with hypertension that was left untreated for a very long time. Olmesartan belongs to the class of drugs that are also known as angiotensin receptor blockers (ARBs). These blockers aim and tend to relax blood vessel so that blood flow can be facilitated more easily (Rennke, et, la., 2019).

**Nursing considerations**

* This medicine should be used through oral means taking into account that the medicine would be given in high consultation with the doctor (Rennke, et, la., 2019).
* This medicine should be taken once a day with food if the patient is given this medicine in liquid form than the patient has to shake the bottle well before used. Moreover, special attention should be given to the measuring devices either that is the flask or the measuring spoon. One should not use the household spoon for giving the medicine as it may not give accurate measurements (Rennke, et, la., 2019).
* This medicine should be taken at the same time each day
* The patient should not stop using this medication although he feels well because there are a lot of patients who don’t feel sick with blood pressure (Rennke, et, la., 2019).

**Side Effects**

There are different side effects that are associated with this disease such as lightheadedness and dizziness. It usually occurs when the human body is trying to adjust to this medicine. A patient should consult his doctor if this situation gets worsened (Rennke, et, la., 2019).

* A patient may feel himself fainting there might some symptoms of the high potassium blood level
* There is a serious case of serious allergic reaction as a result of using this medicine
* It may cause dehydration or reregulation of bowl moments and the amount of urine that is produced.

If Melanie feels that these symptoms are getting worse or they are causing serious issues she has to consult to the doctor because some people find it hard to adjust to a medicine (Rennke, et, la., 2019).

2.2 Glomerular Filtration test is a test that is used to define or trace the renal functions. It defines how much blood is filtered by the kidney every minute. It can be calculated by the result of blood creatinine tests, gender, age and the size of the body. In normal patients GFR is between 90 or high (Kooman, et, al., 2019). In Melanie, the GFR is low which means that she has some impairment of kidneys or it is the symptom of occurrence of some superimposed insult to the kidneys. Hemoglobin test is used for measuring the levels of hemoglobin in the body, it is a protein that carries oxygen from lungs to the other body parts. Moreover, normal Hb level for females is 12 to 15 grams per deciliter but in case of Melanie, it is 95gm/l, which may cause some serious disease, However, in the subject case study, it is a clear symptom of kidney disease (Kooman, et, al., 2019).

**Part III**

**3.1** Teach back method is also called **show me method** that is used by healthcare providers in order to confirm that the patients are understanding what is explained to him or not. If the patient has well understood whatever is being taught, he would be able to teach back the same information in the same way. This method is used by health care providers in order to improve health literacy. The subject of the information is about the treatment plan, diagnose, benefits and risks of the treatment that is given to the patient. After teach-back, the healthcare provider modifies or simplifies the information for better understanding or he is clear that the patient has understood (Arnold-Chamney, et, al., 2019).

**3.2** Taking into account the teach-back method, Melanie would be taught about managing fluid intake. She would be taught that the average water quantity would be dangerous for her. So, she should try to control the water intake or fluid intake. Although hemodialysis removes excessive water, still what matters is the ease and for your health, it is necessary to maintain fluid intake. If you are thirsty try to use ice cube because fluid allowance and excess water may cause swelling that would increase your blood pressure. Even too much water can make it hard for you to breath (Arnold-Chamney, et, al., 2019). You should try to limit the amount of salt and the spicy foods in your diet. Always be aware of the hidden fluids in diet such as gravy, soup and treats such as ice-cream. Always try to stay cool so that you can feel less thirty. When you are taking beverages try taking it in sip it will savour the liquid for a longer time, you can also use small cups and small glasses. Always take your medicine with diet and try to swallow pills with applesauce rather than taking a liquid (Tal, et, al., 2019). Try to maintain a healthy diet that can help you to maintain good blood glucose level if you are on diabetes, if you don’t have diabetes, high glucose level can increase thirst and you will think of drinking water that may harm you. Try to act on simple diet and try to live a simple life so that you are aware of your energy consumption (Gupta, et, al., 2019).

References

Arnold-Chamney, M., Podham, M., & Anderson, J. (2019). Chronic kidney disease. *Chronic Care Nursing*, 275.

Barzilay, J. I., Davis, B. R., Pressel, S. L., Ghosh, A., Rahman, M., Einhorn, P. T., ... & Wright Jr, J. T. (2018). The effects of eGFR change on CVD, renal, and mortality outcomes in a hypertensive cohort treated with 3 different antihypertensive medications. *American journal of hypertension*, *31*(5), 609-614.

Chandrasekhar, D., Ganesan, V. M., Sreekumar, S., Pradeep, A., Geoji, A. S., & George, A. E. (2018). Impact of intensified pharmaceutical interventions in medication adherence in chronic kidney disease patients. *Journal of Young Pharmacists*, *10*(2), 208.

Gupta, A., Hong, Z., Li, S., & Bai, H. J. (2019). Role of Chronic Kidney Disease: A Literature Review. *Social Science and Humanities Journal*, 876-882.

Kooman, J. P., & van der Sande, F. M. (2019). Body Fluids in End-Stage Renal Disease: Statics and Dynamics. *Blood purification*, *47*(1-3), 223-229.

Rennke, H. G., & Denker, B. M. (2019). *Renal pathophysiology: the essentials*. Lippincott Williams & Wilkins.

Rocco, M. V., Sink, K. M., Lovato, L. C., Wolfgram, D. F., Wiegmann, T. B., Wall, B. M., ... & Lewis, C. E. (2018). Effects of intensive blood pressure treatment on acute kidney injury events in the Systolic Blood Pressure Intervention Trial (SPRINT). *American Journal of Kidney Diseases*, *71*(3), 352-361.

Tal, L., Virk, M. K., & Arikan, A. A. (2019). Fluid Overload and Management. In *Critical Care Pediatric Nephrology and Dialysis: A Practical Handbook* (pp. 35-46). Springer, Singapore.

Wong, C. K., Chen, J., Fung, S. K., Mok, M. M., Cheng, Y. L., Kong, I., ... & Lam, C. L. (2019). Direct and indirect costs of end-stage renal disease patients in the first and second years after initiation of nocturnal home haemodialysis, hospital haemodialysis and peritoneal dialysis. *Nephrology Dialysis Transplantation*.

Yanda, M. K., Liu, Q., Cebotaru, V., Guggino, W. B., & Cebotaru, L. (2019). Role of calcium in adult onset polycystic kidney disease. *Cellular signalling*, *53*, 140-150.