Nurses' knowledge regarding Nursing Care of Patients with Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for Renal Diseases and Surgery, Gezira State, Sudan, 2015

Myada Malik Mohammed Ahmed Abass

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Nurses' knowledge regarding Nursing Care of Patients with Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for Renal Diseases and Surgery, Gezira State, Sudan, 2015

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Supervision Committee:

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<th>Position</th>
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<td>Main Supervisor</td>
<td></td>
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<tr>
<td>Dr. Amna Eltom Ibrahim</td>
<td>Co- Supervisor</td>
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Date: .................., 2016
Nurses' knowledge regarding Nursing Care of Patients with Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for Renal Diseases and Surgery, Gezira State, Sudan, 2015

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Examination Committee:

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<td>Chair Person</td>
<td>....................</td>
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<tr>
<td>Dr. Faiza Ali Nasour Taha</td>
<td>External Examiner</td>
<td>....................</td>
</tr>
<tr>
<td>Dr. Ekhlas Mohamed Ali Ahmed</td>
<td>Internal Examiner</td>
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Date of Examination: .................... 2016
Dedication

To my Father

To Mother....

My Sisters ....

My Brother....

And My Friends ....
Acknowledgement

First I wish to thank Allah for Affording me the time and the ability needed face.

I am deeply indebted to grateful for my main supervisor Dr. Bothyna Bassyonyie Elssayed Etewa and my Co-supervisor Dr. Amna Eltom Ibrahim for their helpful advices and valuable suggestions to me at the various stages of the research and their ultimate consultation.

I also appreciate their patience and the effort that they expended supplying me with opinion and suggestions, that I was to incorporate into my dissertation. Extended thanks are due to all staff members department of nursing in faculty of applied medical sciences, university of Gezira and a lot of thanks goes to all staff of nurses in Gezira Hospital for Renal Diseases and Surgery.
Nurses' knowledge regarding Nursing Care of Patients Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for Renal Diseases and Surgery, Gezira State, Sudan, 2015

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Abstract

Pulmonary edema is characterized by sudden onset of respiratory distress related to accumulation of fluid in the lung interstitium over matter of minutes or hours. Nurses play critical roles in preventing and control of pulmonary edema with chronic renal failure with resulting in decrease mortality and morbidity. A descriptive hospital-based study was conducted aimed at assessing Nurses' knowledge regarding nursing care of hemodialysis patients with Pulmonary Odema. The study sample consisted of (114) hemodialysis nurses during the period from (September to October 2015). Data was collected by using a questionnaire designed for the purposes of the study. Data was analyzed by using statistical package for social sciences (SPSS). The results showed {19.3% and 17.5%} of the study sample responded with correct answers regarding Definition of chronic renal failure and pulmonary odema respectively. (21.0% and 22.8%) of the study sample responded with correct answers regarding signs and symptoms and types of pulmonary odema respectively. 25.4% and 21.1% of the study sample responded with correct answers regarding complications and prevention of pulmonary odema with chronic renal failure respectively. 14.0% and 19.3% of the study sample responded with correct answer regarding assessment and nursing intervention of fluid volume excesses respectively. The study concluded that nurses' knowledge regarding nursing care of hemodialysis patients with Pulmonary Odema were inadequate. It recommended that periodic training program for nurses about Pulmonary Odema with chronic renal failure must conducted and logbook must be designed and available for the nurses in the hospital.
مساء:M. مهدي مسلم محمد أحمد عباس

ملخص الدراسة

من أخطر مضاعفات الوضعية البوية المصاحبة لمرضى الغسيل الدموي ضيق التنفس والذي ينتج من تجمع السوائل في الرئة، وتلعب الرعاية التمريضية دور مهم في تقليل نسبة حدوث الإعياء، مضاعفات ووفاة. أجريت هذه الدراسة الوصفية بمستشفى الجزيرة لأمراض وجراحة الكلى، مدينة دمدني، ولاية الجزيرة، السودان. هدفت الدراسة إلى تقديم معرفة الممرضات بشأن الرعاية التمريضية لمرضى الوضعية البوية المصاحبة للغسيل الدموي في مجتمع الدراسة من 114 من الممرضات في وحدة الغسيل الدموي بالمستشفى أثناء الفترة من سبتمبر إلى أكتوبر 2015. تم جمع البيانات باستخدام استمارة استبيان تم تصميمها في الدراسة. تم تحليل البيانات بواسطة برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS). أظهرت النتائج أن 19.3% و17.5% من عينة الدراسة كانت إجاباتها صحيحة عن تعريف الفشل الكلوي المزمن والوضعية البوية على التوالي. (21.0% و22.8%) من عينة الدراسة كانت إجاباتها صحيحة عن علامات وأعراض وأنواع الوضعية البوية على التوالي. 25.4% و21.1% من عينة الدراسة كانت إجاباتها صحيحة عن مضاعفات والوقاية من الوضعية البوية المصاحبة بالفشل الكلوي المزمن في التوالي. 14.0% و19.3% من عينة الدراسة كانت إجاباتها صحيحة عن التقييم والمعالجة التمريضية لزيادة كمية السوائل في الجسم. خلصت الدراسة إلى أن معرفة الممرضات عن الرعاية التمريضية لمريضة الوضعية البوية المصاحبة للغسيل الدموي ضيق التنفس كافية. أوصت الدراسة بعمل دورات تدريبية مستمرة للممرضين والممرضات على الوضعية البوية المصاحبة لمرضى الفشل الكلوي وتصميم كتبية لممرضات عن رعاية مرضى الوضعية البوية المصاحبة للفشل الكلوي المزمن وتكوين مئات بالممثلي.
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<td>CKD</td>
<td>Chronic Kidney Disease</td>
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<td>GFR</td>
<td>Glomerular Filtration Rate</td>
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<td>ESRD</td>
<td>End-Stage Renal Disease</td>
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<td>EPO</td>
<td>Erythropoietin</td>
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<td>CRF</td>
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<td>HAPE</td>
<td>High Altitude Pulmonary Edema</td>
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<td>ARDS</td>
<td>Adult Respiratory Distress Syndrome</td>
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<td>ABCs</td>
<td>Airway, Breathing, And Circulation</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<td>WHO</td>
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<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
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<td>CBC</td>
<td>Complete Blood Count</td>
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<td>MICU</td>
<td>Medical Intensive Care Unit</td>
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<td>BCPAP</td>
<td>Boussignac Continuous Positive Airway Pressure</td>
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<td>ACPE</td>
<td>Acute Cardiogenic Pulmonary Edema</td>
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<td>NIV</td>
<td>Non-Invasive Ventilation</td>
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<td>SOB, DOB</td>
<td>Shortness of Birthing and Difficult of Birthing</td>
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<td>APO</td>
<td>Acute pulmonary Edema</td>
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<td>PEEP</td>
<td>Positive End-Expiratory Pressure</td>
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1. Introduction

1.1 Background:

Chronic kidney failure refers to progressive loss of kidney function. Kidney is an organ with multiple functions and one of major function is to expel excessive fluid out of the body. This is the reason why we urinate a lot when we drink a lot of water. For chronic kidney failure patient when kidney tissues are injured seriously, kidney function decreases. As a result excessive fluid in the body can not be discharged successively. These fluid buildup in the body, leading to edema. Pulmonary edema.

Pulmonary edema is often classified as cardiogenic or non-cardiogenic [due to a heart (cardiac) problem or due to a non-heart related issue respectively]. Cardiogenic Pulmonary Edema: Cardiogenic pulmonary edema is the most common type and is sometimes referred to as heart failure or congestive heart failure. It may be helpful to understand how blood flows in the body to appreciate why fluid would "back up" into the lungs. The function of the right side of the heart is to receive blood from the body and pump it to the lungs where carbon dioxide is removed, and oxygen is deposited. This freshly oxygenated blood then returns to the left side of the heart which pumps it to the tissues in the body, and the cycle starts again. Pulmonary edema is a common complication of atherosclerotic (coronary artery) disease. As the blood vessels that supply nutrients to the heart tissue progressively narrow, the heart muscle may not receive enough oxygen and nutrients to pump efficiently and adequately. This can limit the heart's ability to pump the blood it receives from the lungs to the rest of the body. If a heart attack occurs, portions of the heart muscle die and is replaced by scar tissue, further limiting the heart's pumping capability leaving it unable to meet its work requirements. (Haynes RB, 2009).

1.2 Problems Statement:

Worldwide: The respective role of higher pressure and high tidal volume to promote high airway pressure pulmonary edema are unclear positive end-expiratory
pressure (PEEP) was shown to reduce long water content in this type of edema, but its possible effect of cellular lesion were not documented. We compared the consequence of normal tidal volume ventilation in mechanically ventilated rates at high airway pressure, with those of high tidal volume ventilation and high/low airway pressure and effects of PEEP (10cm H2O)on both edema and lung ultra structure. Polumanry edema was assessed by extravascular lung water content and microvascular permeability by the dry lung Wight and the description space labeled albumin. (Didier D, et al. 2008).

**Developed countries:** Evaluation of nursing staff knowledge and practices throughout chronic renal failure treatment for patients with pulmonary edema in hemodialysis units and to determine the relationship between nurses’ knowledge and their demographical characteristics in carried out at hemodialysis units of Baghdad teaching hospitals started from December 25th, 2011 through May, 9th, 2012. Non-probability (purposive sample) of (30) nurses, who were working in hemodialysis units, were selected from Baghdad teaching hospitals. The data were collected through the use of constructed questionnaire, which consist of two parts (1) Demographic data form that consist 10-items and (2) Nurses’ practices form that consist of 25 items, by means of direct interview technique and visualization of the nurses. Reliability of the questionnaire was determined through a pilot study and the validity through a panel of (9) experts. Descriptive statistical analysis procedures (frequency, percentage, mean of score) and inferential statistical analysis procedures (person correlation coefficient, contingency coefficient) were used for the data analysis. Results: The findings of the study indicated that there was a deficit in the nurses’ practice that should be applied to the patient throughout hemodialysis treatment. No significant relationship was found between nurses’ practice and their gender, level of education, years of experience in hemodialysis units, while significant relationship was found between nurses’ practice and their marital status. (Serwan J et al, 2012).
Developing countries: in Taiwan Nurses' knowledge about palliative care was high (accurate-answer rate, 96.75%); knowledge about providing of hemodialysis Patients with Pulmonary Odema patients was lower (accurate-answer rate, 53.67%). Although nurses' attitudes about providing of hemodialysis Patients with Pulmonary Odema patients as having more burdens than benefits (6.35 [2.19]), nurses' behavioral intentions still favored providing ANH (3.21 [0.95]). In subjective norms, "attending physicians and/or superiors" (45.3%) and, secondarily, "patients" (38.4%) were important influencing persons on nurses' support for of hemodialysis Patients with Pulmonary Odema patients. Other influencing factors were communication difficulties with patients and/or family members (3.40 [0.83]), staff disagreements (3.01 [0.78]), and fear of medical dispute (3.42 [0.95]). Study results suggest that reinforcing in-service education to enhance nurses' knowledge of providing of hemodialysis Patients with Pulmonary Odema patients and building up positive attitudes and behavioral intentions may strengthen nurses' efforts to actively communicate and cooperate with physicians in assisting patients and families to make the most appropriate medical decision. (Kshirsagar AV, Hogan SL, 2010).

In Sudan: Study done by Mahmoud Loghman-Adham, 2003, For many chronic conditions, poor patient compliance with prescribed medications and other aspects of medical treatment can adversely affect the treatment outcome. Compliance with long-term treatment for chronic asymptomatic conditions such as hypertension is on the order of 50%. Although drugs with a longer therapeutic half-life may ease the burden of repeated daily dosing, the efficacy of any self-administered medication depends to a large extent on patient compliance. A focused discussion of compliance in dialysis and renal transplant patients is followed by a general review of the literature on patient compliance. Many factors associated with poor compliance in this patient population are identified via a review of the recent literature. The difficulties in monitoring medication compliance and the methods used are discussed. Many strategies have been suggested to improve medication compliance, most without scientific validation. Strategies to improve compliance in dialysis and transplant patients are similar to those described for other chronic conditions and include simplifying the treatment regimen, establishing a partnership with the patient, and increasing awareness through education and feedback. (Mahmoud Loghman-Adham, 2003)
1.3 Justification:

The nurses should:

The study focused on nurses’ knowledge because they should have the correct knowledge and care of chronic renal failure patients with pulmonary edema such as definition, causes or indications or complications reactions etc. The nurses should be aware of the right knowledge and care and they should be engaged in educational and training programs about chronic renal failure patients with pulmonary edema pre and post dialysis, if they have to provide safety and more proper administration of caring for patients. Since, preventable nurses have a curial role to prevent and control of the diseases, so current investigation their knowledge and nursing care are urgent to upgrade their known results in enhancing their role.
1.4 Objectives

1.4.1 General Objective

- To study Nurses' knowledge regarding nursing care of Pulmonary Odema patients with Chronic Renal Failure in Gezira Hospitals for renal diseases and surgery, Gezira state, Sudan during the period of the study from (September to October 2015)

1.4.2 Specific Objectives:

- To assess Nurses' knowledge regarding Pulmonary Odema patients in Chronic Renal Failure in Gezira Hospital for renal diseases and surgery in Gezira state, Sudan during the period of the study from (September to October 2015).
- To identify Nurses' nursing care regarding of hemodialysis patients with Pulmonary Odema in Chronic Renal Failure such as definition, sings and sympptoms, types of pulmonary odema, treatment etc. in Gezira Hospital for renal diseases and surgery in Gezira state, Sudan during the period of the study from (September to October 2015).
2. Literature Review

2.1 Introduction:

2.1.1 Definition of Chronic renal failure

Chronic renal failure (CRF), also known as chronic kidney disease (CKD), is a progressive reduction of functioning renal tissue such that the remaining kidney mass can no longer maintain the body’s internal environment. CRF can develop insidiously over many years, or it may result from an episode of a cure renal failure from which the client has not recovered. Few symptoms may develop until after more than 75% of glomerular filtration is lost; then the remaining normal parenchyma deteriorates progressively, and symptoms worsen as renal function decreases. If the condition goes unchecked, uremic toxins will accumulate and produce potentially fatal physiologic changes in all major organ systems. If the patient cannot tolerate it, maintenance dialysis or kidney transplantation can sustain life. (Cochrane MG, 2008). Diabetes mellitus and hypertension are the main causes of chronic renal failure, accounting for two-thirds of cases. Glomerulonephritis, chronic infections, congenital anomalies like polycystic kidneys, vascular diseases, systemic lupus erythematosus and long-term aminoglycoside therapy gradually destroy the nephros and eventually cause irreversible renal failure. Similarly, acute renal failure that fails to respond to treatment becomes chronic renal failure. (Haynes RB, McKibbon KA 2007).

2.1.2 Definition of Pulmonary Edema:

Pulmonary edema is a collection of excess fluid in the lungs. Pulmonary edema is classified as either cardiogenic (caused by heart problems) and non-cardiogenic. The primary symptom of pulmonary edema is shortness of breath. Pulmonary edema can be a life-threatening medical situation. The treatment for pulmonary edema can be ICU care in some cases, and medication in other cases. (Horowitz RI, 2013)

2.2 Pulmonary Edema Overview

Pulmonary edema literally means an excess collection of watery fluid in the lungs. (pulmonary=lung +edema=excess fluid). However, the lung is a complex organ, and there are many causes of this excess fluid accumulation. Regardless of the
cause, fluid makes it difficult for the lungs to function (to exchange oxygen and carbon dioxide with cells in the bloodstream). Air enters the lungs through the mouth and nose, traveling through the trachea (windpipe) into the bronchial tubes. These tubes branch into progressively smaller segments until they reach blind sacs called alveoli. Here, air is separated from red blood cells in the capillary blood vessels by the microscopically thin walls of the alveolus and the equally thin wall of the blood vessels. The walls are so thin that oxygen molecules can leave air and transfer onto the hemoglobin molecule in the red blood cell, in exchange for a carbon dioxide molecule. This allows oxygen to be carried to the body to be used for aerobic metabolism and also allows the waste product, carbon dioxide, to be removed from the body.

If excess fluid enters the alveolus or if fluid builds up in the space between the alveolar wall and the capillary wall, the oxygen and carbon dioxide molecules have a greater distance to travel and may not be able to be transferred between the lung and bloodstream. This lack of oxygen in the bloodstream causes the primary symptom of pulmonary edema, which is shortness of breath. (Kshirsagar AV, 2011).

### 2.3 Pulmonary Edema Causes

Pulmonary edema is often classified as cardiogenic or non-cardiogenic [due to a heart (cardiac) problem or due to a non-heart related issue respectively]. (Curtin RB, 2009).

Non-cardiogenic Pulmonary Edema: Non-cardiogenic pulmonary edema is less common and occurs because of damage to the lung tissue and subsequent inflammation of lung tissue. This can cause the tissue that lines the structures of the lung to swell and leak fluid into the alveoli and the surrounding lung tissue. Again, this increases the distance necessary for oxygen to travel to reach the bloodstream. (Blackburn S. 2007).

The following are some examples of causes of non-cardiogenic pulmonary edema.

- **Kidney failure**: In this situation the kidneys do not remove excess fluid and waste products from the body, and the excess fluid accumulates in the lungs.
• Inhaled toxins: Inhaled toxins (for example, ammonia or chlorine gas, and smoke inhalation) can cause direct damage to lung tissue.

• High altitude pulmonary edema (HAPE): HAPE is a condition that occurs in people who exercise at altitudes above 8,000ft without having first acclimated to the high altitude. It commonly affects recreational hikers and skiers, but it can also be observed in well-conditioned athletes.

• Medication side effects: These may occur as a complication of aspirin overdose or with the use of some chemotherapy drug treatments.

• Illicit drug use: Non-cardiogenic pulmonary edema is seen in patients who abuse illicit drugs, especially cocaine and heroin.

• Adult respiratory distress syndrome (ARDS): ARDS is a major complication observed in trauma victims, in patients with sepsis, and shock. As part of the body's attempt to respond to a crisis, the antiinflammatory response attacks the lungs with white blood cells and other chemicals of the inflammatory response causing fluid to fill the air spaces of the lungs. (Blackburn S. 2007).

• Pneumonia: Bacterial or viral pneumonia infections are quite common; however, occasionally become complicated as a collection of fluid develops in the section of the lung that is infected.

**Pulmonary Edema with renal failure**

**Introduction:**

Pulmonary edema happens when increased pressure in the blood vessels in the lungs causes them to fill up with fluid, making it hard to breathe. It is often caused by heart disease. Pulmonary edema is a serious condition that needs immediate medical attention. Chronic renal failure refers to the progressive loss of kidney function. Kidney is an organ with multiple functions and one of the major function is to excessive fluid out of the body. This is the reason why the urinate a lot when the patients drink lots of water. For chronic renal failure patients when kidney tissues are
injured seriously, kidney functions decreased. As a result, excessive fluid in the body can not be discharged successfully. These fluid build up in the body leading to edema. Pulmonary edema is fluid accumulation in the air and parenchyma of the lungs and it occurs easily when illness condition deteriorates to advanced stage.

2.4 Pulmonary Edema Symptoms:

Shortness of breath is the most common symptom of pulmonary edema and is due to the failure of the lungs to provide adequate oxygen to the body. In most cases the shortness of breath or dyspnea (dys=abnormal +pnea=breathing) has a gradual onset. However, depending on the cause, it may occur acutely. For example, flash pulmonary edema, which has an abrupt onset, is often associated with a heart attack. The shortness of breath may initially be manifested by difficulty doing activities that once were routine. There may be a gradual decrease in exercise tolerance, where it takes less activity to bring on symptoms. In addition to shortness of breath, some patients with pulmonary edema will also wheeze. Orthopnea and paroxysmal nocturnal dyspnea are two variants of shortness of breath seen in association with pulmonary edema. (Mai FM, Busby K, 2009).

• Orthopnea describes shortness of breath while lying flat. Some patients with orthopnea may use two or three pillows to prop themselves up at night or resort to sleeping in a recliner. • Symptoms of paroxysmal nocturnal dyspnea are generally described by the patient as wakening in the middle of the night, short of breath, with a need to walk around and perhaps stand by a window.

The lack of oxygen in the body can cause significant distress, leading to a respiratory crisis, gasping for air, and feeling unable to breathe. In effect, if there is enough fluid in the lungs, it can feel like a drowning. The patient may begin coughing up frothy sputum, become markedly sweaty and cool and clammy. The lack of oxygen can also affect other organs. Confusion and lethargy from lack of oxygen delivery to the brain; andangina (chest pain) from the heart, can both be associated with massive pulmonary edema and respiratory failure. Pulmonary edema is due to left heart failure, in which pressure backs up into the blood vessels of the lungs, but some patients also have associated right heart failure. In right heart failure, the pressure backs up in the veins
of the body, and fluid accumulation can occur in the feet, ankles, and legs as well as any other dependent areas like the sacrum, if the patient sits for prolonged periods of time. Patients with high altitude pulmonary edema may also develop high altitude cerebral edema (inflammation and swelling of the brain). This may be associated with headache, vomiting, and poor decision making. (Mai FM, Busby K, 2009).

2.5 Medical Care:

Unexplained shortness of breath is not normal, and medical care should be accessed to find the reason. Pulmonary edema can be a life-threatening situation. For persons in respiratory distress, emergency care should be sought immediately. In addition to struggling with breathing, these individuals may be weak, lethargic, ashen or blue in color, pale, and sweaty. They may be coughing up frothy sputum. (Anonymous, 2009).

2.5.1 Exams and Tests

Should the patient present in respiratory distress, initial stabilization of the ABCs (airway, breathing, and circulation) may occur at the same time as, or take priority over, any diagnostic testing or examination. However, if there is time, history and physical examination are important first steps in making the diagnosis and establishing the cause of pulmonary edema. (Bame SI, Petersen N, 2013).

2.5.2 Patient History

With the history taken from the patient or family, the health care practitioner will try to determine the cause of the shortness of breath that brings the patient in for care. Symptoms of shortness of breath on exertion, chest pain, orthopnea, and paroxysmal nocturnal dyspnea (waking from sleep due to respiratory distress) may be the clue to make the diagnosis of pulmonary edema. Past medical history may provide direction as to the cause. Patients at risk for cardiogenic pulmonary edema may have risk factors for heart disease, including high blood pressure, high cholesterol, diabetes, family history of heart disease, and smoking. Questions about signs of infection, medications and other complaints may be asked to access for reasons other than
pulmonary edema that may be causing the shortness of breath. Non-cardiogenic causes of pulmonary edema are also considered, especially in patients with no previous history of heart disease. (Bame SI, Petersen N, 2013).

2.5.3 Physical Examination

Physical examination often concentrates on the heart and lungs. Listening to the lungs may reveal abnormal lung sounds consistent with fluid accumulation. Wheezing may be heard, and while may people equate wheezing with asthma or chronic obstructive pulmonary disease (COPD), this is not always the case and may be due to pulmonary edema. Listening to the heart may reveal abnormal heart sounds or murmurs associated with valvular heart disease. If right heart failure exists, there may be swelling of the feet, ankles, and legs as well as jugular venous distention (a prominence of the veins in the neck associated with fluid overload). (Beck DE, Fennell RS, 2008).

2.5.4 Imaging and Other Tests

Often a chest X-ray is taken to assess the status of the lungs. It may reveal obvious fluid, or there may be subtle changes that give direction to the diagnosis. An electrocardiogram (EKG) may be helpful in diagnosing heart rhythm disturbances, previous heart attack, and ventricular hypertrophy (thickening of the heart ventricle muscle) associated with hypertension. If there is concern about the structure and pumping capabilities of the heart, an echocardiogram may be considered. This uses ultrasound images which can help identify valve abnormalities, pumping efficiency of the heart, motion of the heart wall, and heart muscle thickness. The pericardium, the lining of the heart, can also be evaluated. (Beck DE, Fennell RS, 2008).

2.5.5 Blood Tests

Screening blood tests may be considered to look for any underlying medical issues. A complete blood count (CBC) may find an elevated white blood cell count associated with infection or stress. Blood chemistries can screen for diabetes and kidney disease. An arterial blood gas can assess lung function by assessing the oxygen and carbon
dioxide levels in the blood; measuring pH and helping determine the acid-base balance of the body. (Beck DE, Fennell RS, 2008).

2.5.6 Self-Care at Home

Persons who have new, unexplained shortness of breath should seek medical care immediately. If the individual appears to be in distress, the emergency medical system should be activated (call 911 if available). First responders, EMTs, and paramedics can provide life-saving initial treatment on the scene and en-route to a hospital. For high altitude pulmonary edema, the first treatment goal is to descend and bring the affected person to lower altitude if possible.

2.6 Medical Treatment

Medications may include diuretics (water pills) to get rid of excess fluid in the lungs, blood pressure medication and drugs to dilate blood vessels. In rare cases, surgery may be needed. Noninvasive, positive pressure ventilation (NPPV) and continuous airway pressure may help treat acute cardiogenic pulmonary edema. When a patient is in respiratory distress, the initial treatment will occur at the same time or even before the diagnosis is made. The health care practitioner will assess whether the airway is open and whether breathing is adequate; otherwise there may be a need to breathe for the patient until treatment becomes effective. The blood pressure may need to be supported with medications until the breathing status improves.

In situations in which there is the luxury of time to evaluate the patient, such as in an office or outpatient clinic, the treatment of pulmonary edema may involve minimizing risk factors that may have caused it. In cardiogenic pulmonary edema, efforts to maximize heart function and decrease the amount of work the heart has to do are attempted to try to decrease the amount of fluid that the heart has to pump. This should decrease the amount of fluid build-up in the lungs and relieve symptoms. (Beck DE, Fennell RS, 2008).

2.6.1 Medications
In the acute situation, oxygen is the first drug that may help reduce dyspnea, or shortness of breath. Intravenous diuretics [furosemide (Lasix), bumetanide (Bumex)] are first-line medications to help the kidneys remove excess fluid from the body. Even in kidney failure, these drugs may help shift fluid out of the lung for a short period of time. Reducing the work effort of the heart may be helpful in the acute situation. Nitroglycerin (Nitrolingual, Nitrolingual Duo Pack, Nitroquick, Nitrostat) can be used to reduce the workload of the heart by dilating blood vessels and reducing the amount of blood returning to the heart. Enalapril (Vasotec) and captopril (Capoten) are examples of medications that dilate peripheral arteries and decrease the resistance against which the heart muscle must pump. (Beck DE, Fennell RS, 2008).

Morphine may be considered to ease anxiety and help with the feeling of shortness of breath. If the patient is in respiratory failure, positive airway pressure breathing machines (CPAP, BiPAP) may be used to force air into the lungs. This is a short-term solution (used for up to a few hours) until the medications work. In patients who become somnolent (sleepy) or who are no longer able to breathe adequately on their own, intubation (putting a tube into the airway) and using a ventilator may be required.

In non-cardiogenic pulmonary edema, the focus will be on decreasing lung inflammation. While the above medications may be considered, the short-term use of mechanical ventilation with CPAP, BiPAP, or a ventilator may be indicated. The underlying cause of pulmonary edema needs to be diagnosed, and this will direct further therapy. (Cramer JA. 2013).

2.6.2 Follow-up

Cardiogenic pulmonary edema is a chronic condition to be controlled and not necessarily cured. Controlling heart disease risk factors (high blood pressure, high cholesterol, diabetes, and smoking) decreasing salt intake, and taking prescribed medications will help minimize symptoms and future episodes of pulmonary edema. Follow-up appointments may be recommended to monitor fluid, weight gain, and
blood pressure measurements. A consultant for diet management may be helpful. (Beck DE, Fennell RS, 2008).

2.7 Prevention:

Cardiogenic pulmonary edema is due to heart-related illnesses. Many of these are preventable by maintaining a healthy lifestyle and controlling illnesses like hypertension and diabetes. Routine visits with a primary health care practitioner for screening and maintenance examinations may be helpful.

Outlook

Cardiogenic pulmonary edema affects up to 2% of the US population and accounts for hundreds of thousands of hospital admissions. Research continues on a variety of medications to help treat patients with acute respiratory distress. New medications such as nesiritide (Natrecor) are being introduced and evaluated to help in the treatment of this disease. Meanwhile, population education remains the mainstay in trying to decrease the risk of heart disease and the subsequent development of pulmonary edema and heart failure. (Cramer JA. 2013).

2.8 Nursing Care Plans

This post has five chronic renal failure nursing care plans.

Nursing Goal

The nursing goal for client’s with CRF is to prevent further complications and supportive care. Client education is also critical as this is a chronic disease and thus requires long-term treatment. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).

2.8.1. Fluid Volume Excess

Renal disorder impairs glomerular filtration that resulted to fluid overload. With fluid volume excess, hydrostatic pressure is higher than the usual pushing excess fluids into
the interstitial spaces. Since fluids are not reabsorbed at the venous end, fluid volume overloads the lymph system and stays in the interstitial spaces leading the patient to have edema, weight gain, pulmonary congestion and HPN at the same time due to decrease GFR, nephron hypertrophied leading to decrease ability of the kidney to concentrate urine and impaired excretion of fluid thus leading to oliguria/anuria.

**Assessment**

*Patient may manifest:*

- Edema
- Hypertension
- Weight gain
- Pulmonary congestion (SOB, DOB)
- Oliguria
- Distended jugular vein
- Changes in mental status

**Diagnosis**

- Fluid Volume Excess R/T decrease glomerular filtration rate and sodium retention.

**Planning**

- Patient will demonstrate behaviors to monitor fluid status and reduce recurrence of fluid excess
- Patient will manifest stabilize fluid volume AEB balance I & O, normal VS, stable weight, and free from signs of edema. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).

**Nursing Interventions**

- Establish rapport
- Monitor and record vital signs
- Assess possible risk factors
Monitor and record vital signs.
Assess patient’s appetite
Note amount/rate of fluid intake from all sources
Compare current weight gain with admission or previous stated weight
Auscultate breath sounds
Record occurrence of dyspnea
Note presence of edema.
Measure abdominal girth for changes.
Evaluate mentation for confusion and personality changes.
Observe skin mucous membrane.
Change position of client timely.
Review lab data like BUN, Creatinine, Serum electrolyte.
Restrict sodium and fluid intake if indicated
Record I&O accurately and calculate fluid volume balance
Weigh client

**Rationale**

To gain patient’s trust and cooperation.
To assess precipitating and causative factors.
To obtain baseline data
To obtain baseline data
To note for presence of nausea and vomiting
To prevent fluid overload and monitor intake and output
To monitor fluid retention and evaluate degree of excess
For presence of crackles or congestion
To evaluate degree of excess
To determine fluid retention
May indicate increase in fluid retention
May indicate cerebral edema.
To evaluate degree of fluid excess.
To prevent pressure ulcers.
To monitor fluid and electrolyte imbalances
• To lessen fluid retention and overload.
• To monitor kidney function and fluid retention.
• Weight gain indicates fluid retention or edema.
• To conserve energy and lower tissue oxygen demand.
• To promote wellness. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).

2.8.2. Acute Pain

Pain is a discomfort that is caused by the stimulation of the nerve endings. Any trauma that the kidney experience (by any causes or factors) perceive by the body as a threat, the body releases cytokine and prostaglandin causing pain which is felt by the patient at his flank area.

Assessment

*Patient may manifest:*

• Facial Grimaces
• Guarding behaviors
• Costovertebral pain/ Flank pain
• Limited ROM
• Body weakness
• Facial Mask
• Narrowed Focus
• Sleep Disturbance
• Diaphoresis
• RR & BP changes

Diagnosis

• Acute Pain

Planning

• Patient will demonstrate use of relaxation skills to relieve pain.
- Patient will report relief/control of pain.

**Nursing Interventions**

- Establish rapport.
- Monitor and record vital signs.
- Assess pt’s general condition
- Accept patient’s description of pain.
- Perform a comprehensive assessment of pain (location, onset, characteristics, frequency)
- Determine possible pathophysiology and causes of pain
- Assess patient’s perception along with behavioral and physiological responses.
- Perform pain assessment each time pain occurs, note and investigate changes from previous report.
- Assess patient’s description of pain.
- Observe nonverbal cues including how client walks, holds body, sits, facial expressions, cool fingertips/toes, which can mean constricted vessels
- Assess for referral pain as appropriate
- Review patient’s previous experiences with pain and methods found either helpful or unhelpful for pain control in the past.
- Explore method for alleviation/control of pain.
- Encourage verbalization of feelings about the pain.
- Provide quite environment, calm activities and adequate rest reinforce
- Provide comfort measures such as back rub, change position, use of heat/cold.
- Instruct/encourage use of relaxation exercise such as focused breathing.
- Encourage diversional activities such as TV and socialization with others.
- Assist with self-care activities.
- Assist in treatment of underlying disease process causing pain.
- Provide for individualized physical therapy/exercise program that can be continued by the client discharge refer to physical therapist.

**Rationale**

- To get the cooperation of the patient and SO.
• To obtain baseline data.
• To obtain baseline data.
• Pain is a subjective experience and cannot be felt by other.
• To be able to compare changes from previous reports to rule out worsening of underlying condition/developing complications.
• To know underlying condition that leads to pain and possible management that would not further aggravate pain.
• To know clients attitude towards pain and use of specific pain and medication.
• To rule out worsening of underlying condition / development of complication.
• To acknowledge the pain experience convey acceptance of client’s response to pain.
• Observation may/ may not be congruent with verbal reports indicating need for further evaluation.
• To help determine possibility of underlying condition or organ dysfunction requiring treatment.
• To rule out worsening of pain due to methods used.
• Timely intervention is more likely to be successful in alleviating pain.
• To allow out let for emotions and enhance coping mechanism.
• To prevent fatigue and lessen stimuli.
• To provide non-pharmacologic pain management.
• This is a form of relaxation technique that helps decrease level of pain.
• Provides diversionary activities that help block the perception of pain by the brain.
• To able to perform ADL’s and maintain good hygiene.

2.8.3. Altered Renal Tissue Perfusion

For optimal cell functioning the kidney excrete potentially harmful nitrogenous product-Urea, Creatinine, Uric Acid but because of the loss of kidney excretory functions there is impaired excretion of nitrogenous waste product causing in increase in Laboratory result of BUN, Creatinine, Uric Acid Level. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).
Assessment

- Increase in Lab results (BUN, Creatinine, Uric Acid Level)
- Oliguria
- Anuria
- Edema
- Pulmonary Congestion
- Hypertension
- Hematuria

Diagnosis

- Altered Renal Perfusion RT Glomerular Malfunction

Planning

- Patient will demonstrate participation in his/her recommended treatment program.
- Patient will demonstrate behavior/lifestyle changes to prevent complications

Nursing Interventions

Establish rapport

Monitor and record vital signs.

Assess patient’s general condition.

Determine factors related to individual situation and note situation that can affect all body system.

Note characteristic of urine: measure urine specific gravity.

Ascertain usual voiding pattern

Note presence, location intensity duration of pain.

Note mentation status and review lab result such as BUN and creatinine levels.

Monitor BP, ascertain patient’s usual range.
Observe for dependent generalized edema.

Measure urine output on a regular schedule and weigh daily.

Provide diet restriction as indicated, while providing adequate calories.

Encourage discussion of feelings regarding prognosis or long term effects of discussion.

Identify necessary changes in lifestyle and assist client to incorporate disease management to ADLs.

Assess patient emotional/psychological factors affecting the current situation.

Establish realistic activity goal with patient.

Give information about positive signs of improvement such as improve vital signs/circulation.

Provide physiologic support. Maintain calm attitude but admit concerns if questioned by the client/SO.

Review expectations of the patient/SO.

Give patient information that provides evidence of daily/weekly progress.

Encourage patient to maintain positive attitude; suggest use of relaxation technique such as guided imagery as appropriate.

Administer medication as ordered.

Promote overall health measure.

**Rationale**

To get the cooperation of the patient and SO.

To obtain baseline data

To obtain baseline data.

To assess causative and contributing factors
To assess for hematuria and proteinuria and renal impairment.

To compare with current situation.

May indicate pain on affected organ

increase BUN and creatinine levels may alter mentation

GFR may increase rennin and raise BP.

To note degree of impairment of renal function.

To assess renal perfusion and function.

Calories to meet body’s need while restriction of protein helps limit BUN.

To decrease anxiety about condition and correct his wrong ideas about condition.

To promote wellness and prevent further progression of complication.

Stress or depression may be increasing the effect of an illness or depression might be the result of being forced into inactivity. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).

Enhance commitments to promoting optical outcomes.

To provide encouragement.

Honestly can be reassuring when so much activity or worries are apparent to the client or SO.

To establish individual goals.

To sustain motivation.

To enhance sense of well being.

For faster recovery. It is used to treat the client’s disease condition.

To promote wellness.

**2.8.4. Impaired Urinary Elimination**
Renal Failure is a problem which results to loss of kidney functions and as GFR decrease, the kidney cannot excrete nitrogenous product and fluid causing impaired in Urinary elimination and together with prolonged use of medications such as NSAIDs this will lead to further kidney destruction which may thus decreasing the glomerular filtration and destroying of the remaining nephrons. This will result into inability of the kidney to concentrate urine which makes the patient to have a nursing diagnosis of impaired urinary elimination. (Kimmel PL, Peterson RA, Weihs KL, et al. 2005).

**Assessment**

*Patient may manifest:*

- Increase in Lab results (BUN, Creatinine, Uric Acid Level)
- Oliguria
- Anuria
- Hesitancy
- Urinary Retention

**Diagnosis**

- Impaired Urinary Elimination R/T failing glomerular filtration AEB Impaired excretion of nitrogenous products secondary to Renal Failure

**Planning**

- Patient will verbalize understanding of condition
- Patient will participate in measures to correct/compensate for defects

**Nursing Interventions**

Establish rapport.

Monitor and record vital signs.

Assess pt’s general condition

Review for laboratory test for changes in renal function.
Establish realistic activity goal with client.

Determine clients pattern of elimination

Palpate bladder

Investigate pain, noting location

Determine client’s usual daily fluid intake

Note condition of skin and mucous membranes, color of urine.

Observe for signs of infection

Encourage to verbalize fear/concerns

Emphasize the need to adhere with prescribe diet

Emphasize importance of having good hygiene.


**Rationale**

To get the cooperation of the patient and SO.

To obtain baseline data.

To know what problem and interventions should be prioritize.

To assess for contributing or causative factors.

Enhance commitments to promoting optimal outcomes.

To assess degree of interference.

To assess retention

To investigate extent of interference

To help determine level of hydration.

To assess level of hydration.
To help in treating urinary alterations

Open expression allows client to deal with feelings and begin problem solving.

To prevent aggravation of disease condition.

To promote wellness.

To promote wellness.

2.8.5. Altered Nutrition: Less than Body Requirements

Due restricted foods and prescribed dietary regimen, an individual experiencing renal problem cannot maintain ideal body weight and sufficient nutrition. At the same time patients may experience anemia due to decrease erythropoietic factor that cause decrease in production of RBC causing anemia and fatigue

Assessment

- Anorexia
- Anemia
- Fatigue
- Reported inadequate food intake less than recommended daily allowance

Diagnosis

- Altered Nutrition: Less than body Requirement R/T Catabolic state, Anorexia and Malnutrition 2O to Renal Failure

Planning

- Patient will display normalization of laboratory values and be free of signs of malnutrition.
- Patient will demonstrate behaviors, lifestyle change to regain and maintain an appropriate weight.
Nursing Interventions

Establish rapport

Assess general appearance and monitor vital signs.

Identify patient at risk for malnutrition.

Ascertain understanding of individual nutritional needs.

Assess weight, age, body build, strength, rest level.

Assist in developing individualized regimen.

Provide diet modification as indicated.

Determine whether patient prefers more calories in a meal.

Avoid high in sodium-rich food.

Promote relaxing environment.

Provide oral care.

Provide safety.

Maintain bed rest.

Change position every 2 hours.

Position the bed into semi-fowler’s position.

Limit fluid intake as ordered.

Encourage to do Passive range of motion exercise.

Encourage early ambulation.

Regulate Intravenous line as Ordered.

Administer Medications as ordered.

Rationale

To gain patient’s trust.
To establish baseline data.
To assess contributing factors.
To determine what information to provide the patient.
To provide comparative baseline.
To control underlying factors.
To establish a nutritional plan.
To establish a nutritional plan.
To prevent further increase in sodium level.
To enhance intake.
To prevent further spread of dental caries.
To prevent injury.
To decrease metabolic demand.
To prevent ulcerations.
To enhance lung expansion.
To prevent water retention.
To have proper circulation of blood.
To prevent muscle atrophy.
To maintain hydration status.
To prompt treatment.

Other Possible Nursing Care Plans

- Hyperthermia due to possible infection or activation of inflammatory process.
- Impaired skin integrity due to edema.
- Deficient Knowledge
2.9 Previous studies:

Acute pulmonary oedema (APO) in patients undergoing chronic dialysis (CD), a common cause of hospital admission in this population, is poorly documented. The objective of this study was to determine the causes, profile, clinical course and outcomes of APO in CD patients admitted in an intensive care unit (ICU). Methods. Medical charts of all CD patients consecutively admitted for APO in the renal ICU of the Tenon Hospital (Paris, France) between January 2000 and December 2007 were considered. Data collection included patient characteristics, etiologic factors for chronic renal failure and co-morbidities, past history of APO, precipitating factors, clinical evolution and outcomes. Results. Of the 112 files considered, 102 (65% men) were included in the final analysis. Patients were aged 20–88 years and had been dialysed for a median duration of 2 years. Hypertension (36.3%), chronic glomerulonephritis (25.5%) and diabetes mellitus (17.6%) were the main etiologic factors of chronic renal failure; 38.2% had a past history of APO. Acute pulmonary infection (26%), excessive interdialytic weight gain (25%) and inappropriate dry weight prescription (23%) were the leading causes of APO. The duration of hospitalization was <4 days in 60% of participants. Nine deaths (four being of cardiac origin) were recorded. Being referred from another hospital service was the main predictor of death. Conclusions. APO fuelled in part by chest infection, excessive interdialytic weight gain and inappropriate dry weight are important causes of hospitalization in CD patients. Mortality is high among those referred from other services usually in critical conditions.

The respective role of higher pressure and high tidal volume to promote high airway pressure pulmonary edema are unclear positive end-expiratory pressure (PEEP) was shown to reduce long water content in this type of edema, but its possible effect of cellular lesion were not documented. We compared the consequence of normal tidal volume ventilation in mechanically ventilated rates at high airway pressure, with those of high tidal volume ventilation and high/low airway pressure and effects of PEEP (10cm H2O)on both edema and lung ultra structure. Pulmonary edema was assessed by extravascular lung water content and microvascular permeability by the dry lung Wight and the description space $^{125}$I-labled albumin. (Didier D, et al. 2008).
Developed countries: Of the 112 files considered, 102 (65% men) were included in the final analysis. Patients were aged 20–88 years and had been dialysed for a median duration of 2 years. Hypertension (36.3%), chronic glomerulonephritis (25.5%) and diabetes mellitus (17.6%) were the main etiologic factors of chronic renal failure; 38.2% had a past history of APO. Acute pulmonary infection (26%), excessive interdialytic weight gain (25%) and inappropriate dry weight prescription (23%) were the leading causes of APO. The duration of hospitalization was <4 days in 60% of participants. Nine deaths (four being of cardiac origin) were recorded. Being referred from another hospital service was the main predictor of death. Conclusions. APO fuelled in part by chest infection, excessive interdialytic weight gain and inappropriate dry weight are important causes of hospitalization in CD patients. Mortality is high among those referred from other services usually in critical conditions. (Missouris, Belli, & MacGregor, 2000).

Flash pulmonary edema and acute pulmonary edema are terms used to define the sudden development of respiratory distress related to the rapid accumulation of fluid within the lung interstitium secondary to elevated cardiac filling pressures (Little, & Braunwald, 1997). For the purposes of this review, flash pulmonary edema will be the term used. One of the first studies to describe its occurrence linked its development to individuals with preexisting coronary artery disease and hypertension (Lee, Cabin, & Francis, 1988). The connection between flash pulmonary edema and kidney disease was initially described in individuals with bilateral renal artery stenosis (Pickering et al., 1988). This association has been so well characterized that the recommendation has been made that anyone presenting with flash pulmonary edema be considered for evaluation for renal artery stenosis (Missouris, Belli, & MacGregor, 2000).

Flash pulmonary edema, also termed acute onset pulmonary edema, is characterized by the sudden onset of respiratory distress related to accumulation of fluid in the lung interstitium over a matter of minutes or hours. Chronic kidney disease is often associated with predisposing cardiac risk factors that make patients susceptible to development of flash pulmonary edema. This article highlights the connection between cardiac pathologies found in chronic kidney disease and development of flash pulmonary edema. Nephrology nurses may be instrumental in reducing the risk of flash pulmonary edema by recognizing symptoms of heart failure and need for treatment of acute elevations in blood pressure.
In five men with a history of susceptibility to high-altitude pulmonary edema (HAPE), hemodynamics and pulmonary gas exchange were measured at sea level, and again 24 hours following ascent to an altitude of 3,100 m. At sea level, all findings were essentially normal including a mean pulmonary arterial pressure of 13.8 ± 1.9 mm Hg. None of the subjects developed clinically detectable pulmonary edema at altitude. Wedge pressures and cardiac output remained normal. Increased remarkably, being 38.8 ± 10.3 mm Hg at rest and 53.2 ± 11.6 mm Hg during moderate exercise. Acute relief of hypoxia only partially relieved this pulmonary hypertension. Arterial blood gases were normal at sea level. In spite of hyperventilation at altitude, arterial O₂ pressure was only 50.8 ± 6.1 torr at rest and fell to 41.4 ± 3.3 torr during exercise due to a widening of the alveolar-arterial O₂ pressure difference to 28.0 ± 6.8 torr. Hence, these men susceptible to HAPE developed excessive pulmonary hypertension and impaired pulmonary O₂ exchange without detectable pulmonary edema following ascent to high altitude. The increase in pulmonary vascular resistance is only partially explained by hypoxic pulmonary vasoconstriction.
3. Materials and Methods

3.1 Study Design:

A descriptive hospital-based study was conducted in Gezira Hospital for Renal diseases and surgery, Wad Medani town, Gezira State, Sudan during the period of the study aimed to assess Nurses' knowledge regarding nursing care of Pulmonary Odema patients with Chronic Renal Failure in Gezira Hospitals for renal diseases and surgery in Gezira state, Sudan during the period of the study from September 2015.

3.2 Study Area:

The study was carried out in Gezira hospital for renal diseases and surgery at Wad Medani the capital of Gezira State, which is a large agricultural area located in the central region of Sudan. The locality is about 186 km south to Khartoum state. It receives the patients from the whole state and neighboring states e.g. Algardarif, Sinnar, there are acute renal failure unit and hemodialysis ward and out patients unit. The hospitals units consisted of hemodialysis unit entailed 21 machines and 21 chairs, peritoneal dialysis unit 4 beds, intensive care unit (ICU) 4 beds, cystoscopy unit, female ward 18 beds and male ward 21 beds, Ultra Sound (US) Extracarobnal Shock Waves Lisotop (ESWL) and X-ray unit. Gezira Hospital for Renal Diseases and Surgery (Sudan) is the one of the well-established hemodialysis centres in Sudan with large catchment's area, where 258 patients are in regular hemodialysis. The capacity of renal diseases and surgery about 79 beds and 27 machines.
Table (3.1): Distribution of manpower in the Gezira Hospital for Renal Diseases and Surgery

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>4</td>
</tr>
<tr>
<td>Registrars</td>
<td>9</td>
</tr>
<tr>
<td>Medical officers</td>
<td>15</td>
</tr>
<tr>
<td>House officers</td>
<td>10</td>
</tr>
<tr>
<td>Sisters</td>
<td>130</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>4</td>
</tr>
<tr>
<td>Assistant pharmacist</td>
<td>3</td>
</tr>
<tr>
<td>Nutritionists</td>
<td>2</td>
</tr>
<tr>
<td>Assistant Nutritionists</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>199</strong></td>
</tr>
</tbody>
</table>

*Source:* Statistical Department of Gezira Hospital for Renal Diseases and Surgery, 2015
Table (3.2): Distribution of wards and beds in Gezira Hospital for Renal Diseases and Surgery during the period of the study

<table>
<thead>
<tr>
<th>Wards</th>
<th>No of wards</th>
<th>No of beds</th>
<th>Average No of beds</th>
<th>Average No of patient staying</th>
</tr>
</thead>
<tbody>
<tr>
<td>General ward</td>
<td>17</td>
<td>60</td>
<td>44</td>
<td>3-9</td>
</tr>
<tr>
<td>ICU</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3-7</td>
</tr>
<tr>
<td>Hemodialysis</td>
<td>1</td>
<td>23</td>
<td>23</td>
<td>Less than 1 day</td>
</tr>
<tr>
<td>Outpatient room</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>Less than 1 day</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>93</strong></td>
<td><strong>73</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Statistical Department of Gezira Hospital for Renal Diseases and Surgery, 2015
3.3 Study Population:

The population of the present study was included registered hemodialysis nurses who working at Gezira hospital for renal diseases and surgery in hemodialysis unit from all shifts during the period of the study from September 2015 to October 2015.

3.3.1 Inclusion Criteria:

- All hemodialysis nurses who have direct contact with hemodialysis patients in previous setting in Gezira hospital for renal diseases and surgery.
- All nurses with one year experience and more in hemodialysis unit.

3.3.2 Exclusion Criteria:

- Nurses with diploma degree.
- Hemodialysis nurses have experience less than 1 year in hemodialysis unit.
- Under Training Nurses in hemodialysis unit.

3.4 Sampling size:

The sample was constituted of all available nurses during the period of the study.

3.5 Ethical Consideration:

- Official letters for the head manager and matron of Gezira hospital for renal diseases and surgery at Wad Medani for approval to collect the data.
- All qualified nurses with one year experience and more were collected from the available staff included (114) nurses who are responsible for caring of hemodialysis patients at time of this research execution.
- Explanation for the hemodialysis nurses about the study questionnaire.
• Questionnaire was distributed for each available nurse to fill it within 20-25 minutes under the researcher guidance.

3.6 Data collection tools:

Structured questionnaire was designed by the researcher and utilize for two purposes as follows:

First socio-demographic data: Data about characteristics of nurses such as age groups, gender, years of experiences and level of education.

Second nurses' knowledge: The nurses' knowledge regarding nursing care of hemodialysis patients with Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for renal diseases and surgery in Gezira state, such as (definition, causes, sign and symptoms and complications …etc).

3.7 Data analysis:

Data was analyzed by using statistical package for social sciences (SPSS).
4. Results and Discussion

4.1 Results:

4.1.1 Socio-Demographic data:

Table {4.1}: Distribution of the study sample according to their gender and age groups:

<table>
<thead>
<tr>
<th>Gender</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>114</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age groups</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 – 29 years</td>
<td>39</td>
<td>34.2%</td>
</tr>
<tr>
<td>30 – 34 years</td>
<td>42</td>
<td>36.8%</td>
</tr>
<tr>
<td>35 – 40 years</td>
<td>33</td>
<td>29.0%</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table {4.1} shows that all of the study samples (100%) were females and 36.8% of them at age range between 30 - 34 years.
Table {4.2}: Distribution of the study sample according to their level of education:

<table>
<thead>
<tr>
<th>Educational level</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor</td>
<td>75</td>
<td>65.8%</td>
</tr>
<tr>
<td>Post graduate</td>
<td>39</td>
<td>34.2%</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table {4.2} revealed that (65.8%) of the study sample their level of education were bachelor, while (34.2%) were post graduate.
Figure {4.1} Distribution of the study sample according to their years of experience:

Figure (4.1) illustrated that 63% of the study sample their years of experience ranged between 5 to 9 years.
Figure 4.2 Distribution of the study sample according to their source of knowledge regarding nursing care of patients with pulmonary oedema:

Figure (4.2) illustrated that 48.3% of the study sample their source of knowledge regarding nursing care of patients with pulmonary oedema from university.
Figure 4.3 Distribution of the study sample according to receiving training programs regarding nursing care of patients with pulmonary odema:

Figure 4.3 illustrated that only 26% of the study sample had receiving training programs regarding nursing care of patients with pulmonary odema.
4.1.2 Nurses' knowledge regarding nursing care of patients with pulmonary odema

Table 4.3: Distribution of the study sample according to their knowledge regarding Definition of chronic renal failure and pulmonary odema

Table 4.3 shows that {19.3% and 17.5%} of the study sample responded with correct complete answers regarding Definition of chronic renal failure and pulmonary odema respectively. While {80.7% and 82.5%} of them responded with wrong answers.

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Wrong answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Definition of chronic renal failure</td>
<td>22</td>
<td>19.3</td>
<td>92</td>
</tr>
<tr>
<td>Definition of pulmonary odema</td>
<td>20</td>
<td>17.5</td>
<td>94</td>
</tr>
</tbody>
</table>
Table (4.4): Distribution of the study sample according to their knowledge regarding signs and symptoms and types of pulmonary edema:

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>signs and symptoms of pulmonary edema</td>
<td>24</td>
<td>21.0</td>
<td>90</td>
</tr>
<tr>
<td>types of pulmonary edema</td>
<td>26</td>
<td>22.8</td>
<td>88</td>
</tr>
</tbody>
</table>

Table (4.4) showed that (21.0% and 22.8%) of the study sample responded with correct answers regarding signs and symptoms and types of pulmonary edema respectively while (79.0% and 77.2%) of them responded with Incorrect answers.
Table 4.5: Distribution of the study sample according to their knowledge regarding cardiogenic and non-cardiogenic causes of pulmonary odema:

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>cardiogenic causes of pulmonary odema</td>
<td>24</td>
<td>21.0</td>
<td>90</td>
</tr>
<tr>
<td>non-cardiogenic causes of pulmonary odema</td>
<td>29</td>
<td>25.4</td>
<td>85</td>
</tr>
</tbody>
</table>

Table 4.5 showed that 21.0% and 25.4% of the study sample responded with correct answers regarding cardiogenic and non-cardiogenic causes of pulmonary odema respectively while 79.0% and 74.6% of them responded with incorrect answers.
Table {4.6}: Distribution of the study sample according to their knowledge regarding diagnosis of pulmonary edema and physical examinations of patients having pulmonary edema:

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>diagnosis of pulmonary edema</td>
<td>23</td>
<td>20.2</td>
<td>91</td>
</tr>
<tr>
<td>physical examinations</td>
<td>24</td>
<td>21.0</td>
<td>90</td>
</tr>
</tbody>
</table>

Table {4.6} showed that 20.2% and 21.0% of the study sample responded with correct answers regarding diagnosis and physical examinations for pulmonary edema respectively while 79.8% and 79.0% of them responded with incorrect answers.
Table (4.7): Distribution of the study sample according to their knowledge regarding treatment of pulmonary edema and follow-up:

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>treatment of pulmonary edema</td>
<td>25</td>
<td>22.9</td>
<td>89</td>
</tr>
<tr>
<td>follow-up</td>
<td>26</td>
<td>22.8</td>
<td>88</td>
</tr>
</tbody>
</table>

Table (4.7) showed that (22.9% and 22.8%) of the study sample responded with correct answers regarding treatment of pulmonary edema and follow-up respectively while 78.1% and 77.2% of them responded with incorrect answers.
Table 4.8: Distribution of the study sample according to their knowledge regarding complications and prevention of pulmonary oedema:

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>complications</td>
<td>29</td>
<td>25.4</td>
<td>85</td>
</tr>
<tr>
<td>prevention</td>
<td>24</td>
<td>21.1</td>
<td>90</td>
</tr>
</tbody>
</table>

Table 4.8 showed that 25.4% and 21.1% of the study sample responded with correct answers regarding complications and prevention respectively while 74.6% and 78.9% of them responded with incorrect answers.
Table 4.9: Distribution of the study sample according to their knowledge regarding assessment and nursing interventions of fluid volume excess

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>assessment fluid volume excess</td>
<td>16</td>
<td>14.0</td>
<td>98</td>
</tr>
<tr>
<td>nursing interventions of fluid volume excess</td>
<td>22</td>
<td>19.3</td>
<td>92</td>
</tr>
</tbody>
</table>

Table 4.9 showed that 14.0% and 19.3% of the study sample responded with correct answers regarding assessment and nursing interventions of fluid volume excess respectively while 86.0% and 80.7% of them responded with incorrect answers.
Table {4.10}: Distribution of the study sample according to their knowledge regarding assessment and nursing interventions of acute pain

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>assessment of acute pain</td>
<td>21</td>
<td>19.4</td>
<td>93</td>
</tr>
<tr>
<td>nursing interventions of acute pain</td>
<td>24</td>
<td>21.0</td>
<td>90</td>
</tr>
</tbody>
</table>

Table {4.10} revealed that 19.4% and 21.0% of the study sample responded with correct answers regarding assessment and nursing interventions of acute pain respectively while 81.6% and 79.0% of them responded with incorrect answers.
Table 4.11: Distribution of the study sample according to their knowledge regarding assessment and nursing interventions of altered renal tissue perfusion

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>assessment of altered renal tissue perfusion</td>
<td>27</td>
<td>23.7</td>
<td>87</td>
</tr>
<tr>
<td>nursing interventions of altered renal tissue perfusion</td>
<td>29</td>
<td>25.4</td>
<td>85</td>
</tr>
</tbody>
</table>

Table 4.11 Illustrated that 23.7% and 25.4% of the study sample responded with correct answers regarding assessment and nursing interventions of altered renal tissue perfusion respectively while 76.3% and 74.6% of them responded with incorrect answers.
Table {4.12}: Distribution of the study sample according to their knowledge regarding assessment and nursing interventions of impaired urinary elimination

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>assessment of impaired urinary elimination</td>
<td>29</td>
<td>25.4</td>
<td>85</td>
</tr>
<tr>
<td>nursing interventions of impaired urinary elimination</td>
<td>33</td>
<td>28.9</td>
<td>81</td>
</tr>
</tbody>
</table>

Table {4.12} showed that 25.4% and 28.9% of the study sample responded with correct answers regarding assessment and nursing interventions of impaired urinary elimination respectively while 74.6% and 71.1% of them responded with incorrect answers.
Table (4.13): Distribution of the study sample according to their knowledge regarding assessment and nursing interventions of altered nutrition

<table>
<thead>
<tr>
<th>Nurses’ knowledge</th>
<th>Correct answers</th>
<th>Incorrect answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>assessment of altered nutrition</td>
<td>31</td>
<td>27.2</td>
<td>83</td>
</tr>
<tr>
<td>nursing interventions of altered nutrition</td>
<td>34</td>
<td>29.8</td>
<td>80</td>
</tr>
</tbody>
</table>

Table (4.13) revealed that 27.2% and 29.8% of the study sample responded with correct answers regarding assessment and nursing interventions of altered nutrition respectively while 72.8% and 70.2% of them responded with incorrect answers.
4.2 Discussion

Pulmonary edema is often classified as cardiogenic or non-cardiogenic [due to a heart (cardiac) problem or due to a non-heart related issue respectively]. Cardiogenic Pulmonary Edema: Cardiogenic pulmonary edema is the most common type and is sometimes referred to as heart failure or congestive heart failure. It may be helpful to understand how blood flows in the body to appreciate why fluid would "back up” into the lungs.

A descriptive hospital-based study was conducted in Gezira Hospital for Renal diseases and surgery during the period of the study, aimed at assessing Nurses' knowledge regarding nursing care of hemodialysis patients with Pulmonary Odema in Chronic Renal Failure in area of the study, Gezira state, Sudan during the period of the study from (September to October 2015).

Scio-demographic data:

The results shows that all of the study samples were females and 34.2% of them their age ranged between 24 – 29 years and 36.8% at age range between 30 – 34 years and 29.0% of the study sample their aged range from 35 – 40 years. (65.8%) of the study sample their level of education were bachelor, while (34.2%) were post graduate.

Also it illustrated that 63% of the study sample their years of experience ranged between 5 to 9 years and 30.0% from 10 years and more. 48.3% of the study sample their source of knowledge regarding nursing care of patients with pulmonary odema from university and 26.3% their knowledge from training programs and 10.5% from colleagues. 26% of the study sample had receiving training programs regarding nursing care of patients with pulmonary odema while 74% didn’t

Nurses' knowledge regarding to nursing care of patients with pulmonary odema in chronic renal failure the results showed that {19.3% and 17.5%} of the study sample responded with correct answers regarding Definition of chronic renal failure and pulmonary odema respectively. While {80.7% and 82.5%} of them responded with wrong answers.
21.0% and 22.8% of the study sample responded with correct answers regarding signs and symptoms of pulmonary odema and types of pulmonary odema respectively while {79.0% and 77.2%} of them responded with incorrect answers.

21.0% and 25.4% of the study sample responded with correct answers regarding cardiogenic and non-cardiogenic causes of pulmonary odema respectively while 79.0% and 74.6% of them responded with incorrect answers. This results is similar to study to done by Missouris, Belli, & MacGregor, 2000. out of the 112 files considered, 102 (65% men) were included in the final analysis. Patients were aged 20–88 years and had been dialysed for a median duration of 2 years. Hypertension (36.3%), chronic glomerulonephritis (25.5%) and diabetes mellitus (17.6%) were the main etiologic factors of chronic renal failure; 38.2% had a past history of APO. Acute pulmonary infection (26%), excessive interdialytic weight gain (25%) and inappropriate dry weight prescription (23%) were the leading causes of APO. The duration of hospitalization was <4 days in 60% of participants. Nine deaths (four being of cardiac origin) were recorded. Being referred from another hospital service was the main predictor of death. Conclusions. APO fuelled in part by chest infection, excessive interdialytic weight gain and inappropriate dry weight are important causes of hospitalization in CD patients. Mortality is high among those referred from other services usually in critical conditions.

On the other hand this results revealed that 20.2% and 21.0% of the study sample responded with correct answers regarding diagnosis and physical examinations for pulmonary odema respectively while 79.8% and 79.0% of them responded with incorrect answers. {22.9% and 22.8%} of the study sample responded with correct answers regarding treatment of pulmonary odema and follow-up respectively while 78.1% and 77.2% of them responded with incorrect answers.

25.4% and 21.1% of the study sample responded with correct answers regarding complications and prevention respectively while 74.6% and 78.9% of them responded with incorrect answers.

Regarding nursing care plans this study shows that 14.0% and 19.3% of the study sample responded with correct answers regarding to assessment fluid volume
excess and nursing interventions of fluid volume excess respectively while 86.0% and 80.7% of them responded with incorrect answers. 19.4% and 21.0% of the study sample responded with correct answers regarding to assessment of acute pain and nursing interventions of acute pain respectively while 81.6% and 79.0% of them responded with incorrect answers.

23.7% and 25.4% of the study sample responded with correct complete answers regarding to assessment of altered renal tissue perfusion and nursing interventions of altered renal tissue perfusion respectively while 76.3% and 74.6% of them responded with incorrect answers.

25.4% and 28.9% of the study sample responded with correct answers regarding to assessment of impaired urinary elimination and nursing interventions of impaired urinary elimination respectively while 74.6% and 71.1% of them responded with incorrect answers.

27.2% and 29.8% of the study sample responded with correct complete answers regarding to assessment of altered nutrition and nursing interventions of altered nutrition respectively while 72.8% and 70.2% of them responded with correct incomplete answers.
5. Conclusion and Recommendations

5.1 Conclusion:

Based on the results of this study, the researcher concluded that:

- Nurses who were working with hemodialysis patients with Pulmonary Odema were inadequate regarding nursing care of patients in Chronic Renal Failure at Gezira Hospitals for renal diseases and surgery.
5.2 Recommendations:

The study recommended that:

- Continuous training program for the actual staff as well as for the newly working nurses staff is recommended as well.

- Logbook in the hemodialysis unit should be available for all nurses’ staff including up-data nursing care for Pulmonary Odema in Chronic Renal Failure

- Periodic training program for nurses about Pulmonary Odema with chronic renal failure.
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Omey, Monica I.; Micheli, Lyle J. (2009). Department of emergency medicine, University of california; 31 (7) S470-S486

Questionnaire for Nurses' knowledge regarding Nursing Care of Patients with Pulmonary Odema in Chronic Renal Failure at Gezira Hospitals for Renal Diseases and Surgery, Gezira State, Sudan, 2015

A. General Characteristic

1. Gender:
   a. Male ( )  b. Female ( )

2. Age group:
   a. From 24 – 29 years ( )  b. From 30 – 34 years ( )
   c. From 35 – 39 years ( )  d. 40 years and more ( )

3. Education level:
   a. Secondary ( )  b. Diploma ( )
   c. Bachelor ( )  d. Post graduate ( )

4. Years of experience:
   a. From 1 – 4 years ( )  b. 5 to 9 years ( )
   c. 10 and years and more ( )

5. Source of knowledge regarding Pulmonary Odema:
6. Did you receive training programs regarding care of patients with Pulmonary Odema?

a. Yes ( )
  b. No ( )

7. If yes how many?
   …………………………………………………………………………………..

B. Nurses' Knowledge regarding care of patients with Pulmonary Odema:

1. Definition of Chronic renal failure:

a. A gradual loss of kidney function ( )

b. A kidneys filter wastes and excess fluids from the blood ( )

c. Chronic kidney disease, is a slow progressive loss of kidney function over a period of several years ( )

d. All the above ( )
2. Definition of Pulmonary Odema:

a. Pulmonary edema is a collection of excess fluid in the lungs.
   ( )

b. Pulmonary edema is classified as either cardiogenic (caused by heart problems) and non-cardiogenic.
   ( )

c. Pulmonary edema is a condition in which fluid accumulates in the lungs ( )

d. All the above
   ( )

e. None of the above
   ( )

3. Signs and symptoms of Pulmonary Odema:

a. Difficulty breathing and Coughing up blood
   ( )

b. Excessive sweating and Anxiety
   ( )

c. Pale skin and Pink frothy sputum or if left untreated can lead to coma and then death - usually due to hypoxia
   ( )

d. All the above
   ( )
e. None of the above
(  )

4. Types of Pulmonary Odema:

a. Cardiogenic pulmonary edema
(  )

b. Non-cardiogenic pulmonary edema
(  )

c. All the above
(  )

d. None of the above
(  )

5. Cardiogenic (originating in the heart) causes of pulmonary edema:

a. Congestive heart failure
(  )

b. Fluid overload, such as from kidney failure or intravenous therapy
(  )

c. Hypertensive crisis
(  )

d. Pericardial effusion with tamponade
(  )

e. Severe arrhythmias (tachycardia/fast heartbeat or bradycardia/slow heartbeat)
(  )
f. Severe heart attack with left ventricular failure
   (  )

g. All the above
   (  )

h. None of the above
   (  )

6. Non-cardiogenic (not originating in the heart) causes of pulmonary edema:

   a. Acute respiratory distress syndrome
      (  )

   b. Aspirin overdose and high altitude
      (  )

   c. Intracranial hemorrhage and kidney failure
      (  )

   d. Methadone/heroin overdose
      (  )

   e. Pleural effusion - too much liquid around the lung is removed, causing it to expand too quickly
      (  )

   f. All the above
      (  )

   g. None of the above
      (  )

7. Diagnosis of pulmonary edema:
a. Blood test - to determine blood oxygen levels.  
  
  (  )

b. Chest x-ray - to see whether there is any fluid in or around the lungs. This imaging test may also be used to check the size of the heart.  
  
  (  )

c. ECG (electrocardiogram) - to check heart rhythm and any evidence of a heart attack.  
  
  (  )

d. Echocardiogram - this is an ultrasound scan of the heart.  
  
  (  )

e. All the above  
  
  (  )

f. None of the above  
  
  (  )

8. **Physical Examination**

a. Physical examination often concentrates on the heart and lungs.  
  
  (  )

b. Listening to the lungs may reveal abnormal lung sounds consistent with fluid accumulation.  
  
  (  )

c. Wheezing may be heard  
  
  (  )

d. All the above  
  
  (  )
9. **Treatment**

   (   )

b. Placing the patient in a sitting position, oxygen,
   (   )

c. Assisted or mechanical ventilation (in some cases), and drug therapy.
   (   )

d. The goal of treatment is to reduce the amount of fluid in the lungs, improve gas exchange and heart function, and, where possible, to correct the underlying disease.
   (   )

e. All the above
   (   )

f. None of the above
   (   )

10. **Follow-up**

a. Follow-up appointments may be recommended to monitor fluid
    (   )

b. Weight gain
    (   )
c. Blood pressure measurements. (  )

d. All the above (  )

e. None of the above (  )

11. Complications

a. Lower extremity and abdominal swelling (  )

b. Buildup of fluid in the membranes that surround the lungs (pleural effusion) (  )

c. Congestion and swelling of the liver (  )

d. All the above (  )

e. None of the above (  )

12. **Prevention:**

a. Maintaining a healthy lifestyle (  )

b. Maintaining controlling illnesses like hypertension and diabetes. (  )
c. Routine visits with a primary health care practitioner for screening and maintenance examinations may be helpful.

(   )

d. All the above

(   )

e. None of the above

(   )

Nursing Care Plans

13. To assessment fluid volume excess

a. Edema and hypertension

(   )

b. Weight gain and pulmonary congestion (SOB, DOB) and Oliguria

(   )

c. Distended jugular vein and changes in mental status

(   )

d. All the above

(   )

e. None of the above

(   )

14. Nursing Interventions of fluid volume excess
a. Establish rapport, Monitor and record vital signs and Assess possible risk factors
   
   
   b. Monitor and record vital signs, assess patient’s appetite and Note amount/rate of fluid intake from all sources
   
   
   c. Compare current weight gain with admission or previous stated weight, auscultate breath sounds and Record occurrence of dyspnea
   
   
   d. Note presence of edema, measure abdominal girth for changes, Evaluate mentation for confusion and personality changes and observe skin mucous membrane.
   
   
   e. Change position of client timely, review lab data like BUN, Creatinine, Serum electrolyte, restrict sodium and fluid intake if indicated and record I&O accurately and calculate fluid volume balance
   
   
   f. Weigh client and encourage quiet, restful atmosphere.
   
   
   g. All the above
   
   
   h. None of the above
   
   
15. To Assessment of Acute Pain:

   a. Facial Grimaces, guarding behaviors and costovertebral pain/ Flank pain
b. Limited ROM, body weakness and facial Mask
   (   )

c. Narrowed Focus, sleep Disturbance and diaphoresis and RR & BP changes
   (   )
d. All the above
   (   )
e. None of the above
   (   )

16. Nursing Interventions of Acute Pain:

a. Monitor and record vital signs, assess pt’s general condition and accept patient’s description of pain.
   (   )

b. Perform a comprehensive assessment of pain, determine possible pathophysiology and causes of pain and assess patient’s perception along with behavioral and physiological responses.
   (   )

c. Perform pain assessment each time pain occurs, note and investigate changes from previous report, assess patient’s description of pain and Observe nonverbal cues Assess for referral pain as appropriate
   (   )

d. Encourage verbalization of feelings about the pain and provide quite environment, calm activities and adequate rest reinforce
   (   )
e. Provide comfort measures such as back rub, change position, use of heat/cold and assist in treatment of underlying disease process causing pain.

   (     )

d. All the above

   (     )

e. None of the above

   (     )

17. To Assessment Altered Renal Tissue Perfusion

a. Increase in Lab results and oliguria

   (     )

b. Anuria, edema and pulmonary Congestion

   (     )

c. Hypertension and hematuria

   (     )

d. All the above

   (     )

e. None of the above

   (     )

18. Nursing Interventions of Altered Renal Tissue Perfusion

a. Establish rapport and monitor and record vital signs.

   (     )
b. Assess patient’s general condition and Determine factors related to individual situation and note situation that can affect all body system.

(c)

c. Monitor BP, ascertain patient’s usual range and observe for dependent generalized edema.

(d)

d. Measure urine output on a regular schedule and weigh daily and assess patient emotional/psychological factors affecting the current situation.

(e)

e. Provide physiologic support. Maintain calm attitude but admit concerns if questioned by the client/SO and encourage patient to maintain positive attitude; suggest use of relaxation technique such as guided imagery as appropriate.

(f)

f. All the above

(g)

g. None of the above

( )

19. **To Assessment Impaired Urinary Elimination**

a. Increase in Lab results (BUN, Creatinine, Uric Acid Level)

(b)

b. Oliguria, Anuria

(c)

c. Hesitancy and Urinary Retention

( )
d. All the above
   (   )

e. None of the above
   (   )

20. Nursing Interventions of Impaired Urinary Elimination

a. Monitor and record vital signs and assess pt’s general condition
   (   )

b. Determine clients pattern of elimination, palpate bladder and
   Investigate pain, noting location
   (   )

c. Observe for signs of infection, encourage to verbalize fear/concerns
   and Emphasize the need to adhere with prescribe diet
   (   )

d. Emphasize importance of having good hygiene and emphasize
   importance of adhering to treatment regimen.
   (   )

e. All the above
   (   )

f. None of the above
   (   )

21. To  Assessment Altered Nutrition: Less than Body Requirements

a. Anorexia and Anemia
   (   )
b. Fatigue

(   )

c. Reported inadequate food intake less than recommended daily allowance (   )

d. All the above

(   )

e. None of the above

(   )

22. Nursing Interventions Altered Nutrition:

a. Assess general appearance and monitor vital signs and Identify patient at risk for malnutrition.

(   )

b. Ascertain understanding of individual nutritional needs and assess weight, age, body build, strength, rest level.

(   )

c. Assist in developing individualized regimen, provide diet modification as indicated and determine whether patient prefers more calories in a meal.

(   )

d. Avoid high in sodium-rich food, promote relaxing environment and Provide oral care.

(   )

e. Provide safety, maintain bed rest, change position every 2 hours and position the bed into semi-fowler’s position.

(   )
f. Encourage to do Passive range of motion exercise, encourage early ambulation, regulate Intravenous line as Ordered and administer Medications as ordered. (    )

g. All the above

(    )

h. None of the above

(    )