DIABETIC NEPHROPATHY
A Case Study

Presented to the Faculty of
Paramedical Department of
Our Lady of Mercy College

In partial fulfillment of the requirements
for the Degree Bachelor of Science in Nursing

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INTRODUCTION

History

Diabetic nephropathy (nephropatia diabetica), also known as Kimmelstiel-Wilson syndrome and intercapillary glomerulonephritis, is a progressive kidney disease caused by angiopathy of capillaries in the kidney glomeruli. It is characterized by nephrotic syndrome and nodular glomerulosclerosis. It is due to longstanding diabetes mellitus, and is a prime cause for dialysis in many Western countries.

Discovered by British physician Clifford Wilson (1906-1997) and German-born American physician Paul Kimmelstiel (1900-1970) and was published for the first time in 1936.

Causes

The exact cause of diabetic nephropathy is unknown, but it is believed that uncontrolled high blood sugar leads to the development of kidney damage. In some cases, your genes or family history may also play a role. Not all persons with diabetes develop this condition.

Each kidney is made of hundreds of thousands of filtering units called nephrons. Each nephron has a cluster of tiny blood vessels called a glomerulus. Together these structures help remove waste from the body. Too much blood sugar can damage these structures, causing them to thicken and become scarred. Slowly, over time, more and more blood vessels are destroyed. The kidney structures begin to leak and protein (albumin) begins to pass into the urine.

Persons with diabetes who have the following risk factors are more likely to develop this condition:

- African American, Hispanic, or American Indian origin
- Family history of kidney disease or high blood pressure
- Poor control of blood pressure
- Poor control of blood sugars
- Type 1 diabetes before age 20
- Smoking

Diabetic nephropathy generally goes along with other diabetes complications including high blood pressure, retinopathy, and blood vessel changes.
Prevalence and Incidence Rate

Diabetes has become the primary cause of end-stage renal disease (ESRD), and the incidence of type 2 diabetes mellitus continues to grow in the United States and worldwide. Approximately 44% of new patients entering dialysis in the United States are diabetics. Early diagnosis of diabetes and early intervention are critical in preventing the normal progression to renal failure seen in many type 1 and a significant percentage of type 2 diabetics.

In the United States, approximately 20.8 million people, or 7.0% of the population, are estimated to have diabetes, with a growing incidence. Roughly one third of this population, 6.2 million, is estimated to be undiagnosed with type 2 diabetes. The prevalence of diabetes is higher in certain racial and ethnic groups, affecting approximately 13% of African Americans, 9.5% of Hispanics, and 15% of Native Americans, primarily with type 2 diabetes. Approximately 20% to 30% of all diabetics will develop evidence of nephropathy, although a higher percentage of type 1 patients progress to ESRD.

Epidemiology

The syndrome can be seen in patients with chronic diabetes (15 years or more after onset), so patients are usually of older age (between 50 and 70 years old). The disease is progressive and may cause death two or three years after the initial lesions, and is more frequent in men. Diabetic nephropathy is the most common cause of chronic kidney failure and end-stage kidney disease in the United States. People with both type 1 and type 2 diabetes are at risk. The risk is higher if blood-glucose levels are poorly controlled. Further, once nephropathy develops, the greatest rate of progression is seen in patients with poor control of their blood pressure. Also people with high cholesterol level in their blood have much more risk than others.

Signs & Symptoms

Early signs and symptoms of kidney disease in patients with diabetes are typically unusual. However, a vast array of signs and symptoms listed below may manifest when kidney disease has progressed:

- Swelling, usually around the eyes in the mornings; later, general body swelling may result, such as swelling of the legs
- Foamy appearance or excessive frothing of the urine
- Unintentional weight gain (from fluid accumulation)
- Fatigue
Frequent hiccups
General ill feeling
Generalized itching
Headache
Nausea and vomiting
Poor appetite
Weakness, paleness, and anemia
Ankle and leg swelling, leg cramps
Going to the bathroom more often at night
High blood pressure

**Tests and diagnosis**

Laboratory tests that may be done include:
- BUN (Blood Urea Nitrogen)
- Serum creatinine
- The levels of these tests will increase as kidney damage gets worse. Other laboratory tests that may be done include:
- 24-hour urine protein
- Blood levels of phosphorus, calcium, bicarbonate, and potassium
- Hemoglobin
- Hematocrit
- Protein electrophoresis - urine
- Red blood cell (RBC) count

**Complications**

Possible complications include:
- hypoglycemia (from decreased excretion of insulin)
- rapidly progressing chronic kidney failure
- end-stage kidney disease
- hyperkalemia
- severe hypertension
- complications of hemodialysis
- complications of kidney transplant
- coexistence of other diabetes complications
- peritonitis (if peritoneal dialysis used)
- increased infections
Treatments and drugs

The goals of treatment are to keep the kidney disease from getting worse and prevent complications. This involves keeping the blood pressure under control (under 130/80). Controlling high blood pressure is the most effective way of slowing kidney damage from diabetic nephropathy.

The doctor may prescribe the following medicines to lower the blood pressure:

- Angiotensin-converting enzyme (ACE) inhibitors
- Angiotensin receptor blockers (ARBs)

These drugs help reduce the amount of protein in the urine. Many studies have suggested that a combination of these two types of drugs may be best.

- It is also very important to control lipid levels, maintain a healthy weight, and engage in regular physical activity.

- Closely monitor the blood sugar levels. Doing so may help slow down kidney damage, especially in the very early stages of the disease. Change diet to help control blood sugar.

- The doctor may also prescribe medications to help control the blood sugar. Dosage of medicine may need to be adjusted from time to time. As kidney failure gets worse, our body removes less insulin, so smaller doses may be needed to control glucose levels.

- Urinary tract and other infections are common and can be treated with appropriate antibiotics.

- Dialysis may be necessary once end-stage renal disease develops. At this stage, a kidney transplant must be considered. Another option for patients with type 1 diabetes is a combined kidney-pancreas transplant.
PATIENT’S PROFILE

I. VITAL INFORMATION

<table>
<thead>
<tr>
<th>Information</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
<td>Mrs. A.</td>
</tr>
<tr>
<td>ADDRESS</td>
<td>Guiuan, Eastern Samar</td>
</tr>
<tr>
<td>AGE</td>
<td>69 years old</td>
</tr>
<tr>
<td>SEX</td>
<td>Female</td>
</tr>
<tr>
<td>HEIGHT</td>
<td>5 Ft.</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>58 Kg</td>
</tr>
<tr>
<td>NATIONALITY</td>
<td>Filipino</td>
</tr>
<tr>
<td>RELIGION</td>
<td>Roman Catholic</td>
</tr>
<tr>
<td>BIRTHDAY</td>
<td>June 22, 1939</td>
</tr>
<tr>
<td>STATUS</td>
<td>Married</td>
</tr>
<tr>
<td>OCCUPATION</td>
<td>Housewife</td>
</tr>
<tr>
<td>ADMISSION DATE</td>
<td>March 02, 2009</td>
</tr>
<tr>
<td>ROOM NO</td>
<td>Female Medical Ward</td>
</tr>
<tr>
<td>BED NO</td>
<td>5</td>
</tr>
<tr>
<td>ATTENDING PHYSICIAN</td>
<td>Dra. Myrna Diaz</td>
</tr>
<tr>
<td>CHIEF COMPLAINT</td>
<td>Easy fatigability, Chest and back pain</td>
</tr>
<tr>
<td>INFORMANT</td>
<td>Patient itself</td>
</tr>
</tbody>
</table>

II. CLINICAL ASSESSMENT

History of Present Illness

On the 2\(^{nd}\) day of March 2009 at around 3 in the afternoon, the patient was confined at Eastern Samar Provincial Hospital with a chief complaint of easy fatigability, back pain and swelling of both legs and face and an admitting diagnosis of diabetic nephropathy with severe anemia.

A week PTC the patient suffered chest pain, dizziness and cough while she was doing household chores (Sweeping, washing clothes, etc.). Thereafter, she took a pain reliever medication to ease the pain and a “banyos” applying it unto her chest. Her sleeping pattern was also affected as she could not sleep well.

However, easy fatigability, back pain and swelling of her both legs & face worsen her condition. Thus, prompted her family to confine
she at Felipe Abrigo Memorial Hospital, Guiuan, Eastern Samar on the 28th day of February 2009.

Several test (blood chemistry & urinalysis) had been made and she was diagnosed with Diabetic Nephropathy with severe anemia. Captropil 25 mg SL 1tab bid & furosemide was given as her initial treatment. However, her condition persisted and she did not respond to medication and treatment given to her while she was confined on the said hospital. Thus, she was referred by her doctor to Eastern Samar Provincial Hospital for further examination and treatment.

Past Medical History

Sometime in 1994, as recalled by the patient, she was diagnosed with Diabetes Mellitus Type 2 by a private Medical Doctor. Diamicron was given as her medication for her everyday maintenance but she failed to follow the Doctor’s order. Last year on the month of October she was confined at EVRMC due to swelling of her both legs and was diagnosed with Diabetic Nephropathy. Her condition was temporarily relieve. Thus, her physician permitted her to go home. No any surgery has been done during her younger years.

Psychosocial History

Mrs. A is an elementary graduate from Guiuan National High School, unfortunately, she haven’t finished her secondary level. Her father died with no known cause at her age of 34, while her mother succumbed to DM at her age of 42. She married at the age of 22, and blessed with 6 children, 3 of whom are boys and 3 were girls. But 3 of which are dead, 1 boy and 2 girls. Upon recall of Mrs. A, at 1 y.o his son died because of measles, also her daughter at the same age died because of the same disease. Her other daughter died due to leukemia at the age of 24, but have married at the age of 20 and blessed with 2 children. Her 4th and only unmarried son remains in their house at the proper of Guiuan, and the other 2 already have their own family.

Mrs. A has a small sari-sari store where she spends most of her time. This store is their primary source of income. She’s fond of eating sweet foods.

She is a smoker, she begin smoking in her younger years. She can consume 3 sticks in a day just after eating her meals. She also
drinks tuba and beer occasionally. However she quitted smoking due to diabetes mellitus.

Environmental History

Mrs. A and her husband lives in Brgy. Barbo, Guiuan Eastern Samar. They prefer to stay there, where in fact they have their house in the proper of Guiuan. A sari-sari store is in their front yard, this keeps her busy every day.

Fruit trees are visible in their vicinity. Water supplies for drinking, cooking, washing are taken from a communal faucet near the river, 20 meters away from the comfort room.

Food preparation is usually done by her. They usually store their food in the refrigerator. They have a pail flush type toilet located at the back of their house. They throw their garbage in their compost pit located at their backyard.
FAMILY HEALTH HISTORY

LEGEND:
DM - Diabetes Mellitus
Hpn - Hypertension
Ass - Asthma
Msl - Measles
L - Leukemia
M/F - Male/Female

Mother
(+) DM
Deceased

Father
Unknown Disease
Deceased

1st Child
(F)

2nd Child
(M)

3rd Child
(F)
DM
Hpn

4th Child
(M)

5th Child
(F)

1st Child
(F)

2nd Child
(M)

3rd Child
(F)
Deceased

L

4th Child
(M)

5th Child
(M)
Deceased

Msl

6th Child
(F)
Deceased

Msl
## Patterns of Functioning

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Before Illness</th>
<th>During Illness</th>
<th>During Hospitalization</th>
<th>Analysis</th>
</tr>
</thead>
</table>
| Eating Pattern | - Prefers vegetables, fish and sometimes meat.  
- Typical food intake consists of rice and viand.  
- Restriction was made as ordered by the doctor way back 1994 when she was diagnosed w/ DM 2 | - 3/4 cup of rice and viand consumed  
- Restriction was made but failed to follow | - Restriction on high in sodium, high in both saturated fat and total fat, high in carbohydrates.  
- Diet high in calcium, potassium and magnesium was ordered.  
- | - Eating pattern has been modified due to illness. |
| Drinking Pattern | - Her typical water/fluid intake is usually 5 – 6 glasses per day. | - She drinks 4 to 6 glasses of water per day.  
- Frequent urination | - She drinks 1 glass of water a day.  
- Defecates once a day  
- Urinates 5 times a day | - Drinking of water has been decreased due to her condition |
| Elimination Pattern | - Eliminates once a day, usually in the morning | - Defecates twice a week.  
- Frequent urination | - Defecates once a day.  
- Urinates 5 times a day | - Elimination pattern has been altered due to her condition |
| Sleeping Pattern | - Usually sleeps around 9 or 10 in the evening and wakes up around 5 am on a typical day. | - Sleep at around 5 – 7 pm and wakes up around 4 – 6 am | - Usually awake | - Sleeping pattern has been interrupted due to the recent condition |
| Social Pattern | - She is a friendly person.  
- Drinks “tuba” and is a smoker | - Usually stays at home  
- Refrain from drinking “tuba” and Smoking. | - Communication to his relative and other people has been limited. | - Social pattern has been altered due to her condition. |
General Survey: upon assessment, the patient was seen on bed conscious. V/S: T = 37.7°C; P = 98 bpm; RR = 24 cpm; BP = 180/90 mmHg.

Physical Assessment

<table>
<thead>
<tr>
<th>System</th>
<th>Structures</th>
<th>Normal</th>
<th>Findings</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integumentary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head</td>
<td>Size, shape &amp; symmetry</td>
<td>Rounded, smooth skull contour Smooth, uniform consistency, absence of nodules or masses</td>
<td>Normal in size, rounded, Absence of nodule or masses, smooth skull.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of nodules &amp; masses</td>
<td>Evenly distributed hair Thick hair Silky, resilient hair Variable</td>
<td>Evenly distributed hair Thick hair Silky, resilient hair Variable</td>
<td></td>
</tr>
<tr>
<td>Hair</td>
<td>Scalp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thickness/thinness</td>
<td>Hair evenly distributed</td>
<td>Symmetrically aligned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Texture</td>
<td></td>
<td>Skin intact</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amount</td>
<td></td>
<td>Equally distributed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transparent &amp; shiny</td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eyebrows</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eyelids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eyelashes</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Conjunctiva</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nose</td>
<td>External Nose</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>Color</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nails</td>
<td>Curvature &amp; angle</td>
<td>Uniform in areas exposed to the sun</td>
<td>Uniformed in areas exposed to the sun</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color</td>
<td>Highly vascular &amp; pink Smooth texture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td>Neck</td>
<td>Prompt return of pink or usual color (3 sec.)</td>
<td>Equal in size, head centered</td>
<td>No edema</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Lower Extremities</td>
<td>Skin</td>
<td>15-20 cpm</td>
<td>Quit, rhythmic &amp; effortless respiration</td>
<td>None</td>
</tr>
<tr>
<td><strong>Cardiovascular</strong></td>
<td>Chest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RR</td>
<td>Palpations</td>
<td>Peripheral Pulse</td>
<td>Palpations</td>
</tr>
<tr>
<td></td>
<td>Breathing Pattern</td>
<td>Skin</td>
<td>Skin color pink</td>
<td>Full palpations</td>
</tr>
<tr>
<td></td>
<td>Secretions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gastrointestinal</strong></td>
<td>Mouth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lips</td>
<td>Palpation</td>
<td>Peripheral Perfusion</td>
<td>Skin</td>
</tr>
<tr>
<td></td>
<td>Gums</td>
<td>Palpations</td>
<td>Palpation</td>
<td>Light palpation</td>
</tr>
<tr>
<td></td>
<td>Teeth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tongue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdomen Palpation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>Dry lips, slightly pale</td>
<td>Slightly dark in color</td>
<td>Incomplete dentures</td>
</tr>
<tr>
<td></td>
<td>Palpation</td>
<td>Unblemished skin &amp; uniform in color</td>
<td>Smooth &amp; shiny</td>
<td>32 adult teeth</td>
</tr>
<tr>
<td></td>
<td>Light palpation</td>
<td>No tenderness; relaxed abdomen with smooth, consistent tension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deep Palpation</td>
<td>No tenderness</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GUT</strong></td>
<td>Bladder</td>
<td>Not Palpable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Palpation</td>
<td>Dullness with full bladder</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percussion</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Due to dryness of mucosal lining because she was dyspnic Due to smoking

Due to kidney impairment

Due to kidney impairment

Due to urinary retention
ANATOMY AND PHYSIOLOGY

THE ENDOCRINE SYSTEM

The nervous system sends electrical messages to control and coordinate the body. The endocrine system has a similar job, but uses chemicals to “communicate”. These chemicals are known as hormones. A hormone is a specific messenger molecule synthesized and secreted by a group of specialized cells called an endocrine gland. These glands are ductless, which means that their secretions (hormones) are released directly into the bloodstream and travel to elsewhere in the body to target organs, upon which they act.

Function

The Endocrine system is an information signal system much like the nervous system. However, the nervous system uses nerves to conduct information, whereas the endocrine system mainly uses blood vessels as information channels. Glands located in many regions of the body release into the bloodstream specific chemical messengers called hormones. Hormones regulate the many and varied functions of an organism, e.g., mood, growth and development, tissue function, and metabolism, as well as sending messages and acting on them.

Role in disease

Diseases of the endocrine system are common, including diseases such as diabetes mellitus, thyroid disease, and obesity. Endocrine disease is characterised by dysregulated hormone release (a productive Pituitary adenoma), inappropriate response to signalling (Hypothyroidism), lack or destruction of a gland (Diabetes mellitus type 1, diminished erythropoiesis in Chronic renal failure), or structural enlargement in a critical site such as the neck (Toxic multinodular goitre). Hypofunction of endocrine glands can occur as result of loss of reserve, hyposecretion, agenesis, atrophy, or active destruction. Hyperfunction can occur as result of hypersecretion, loss of suppression, hyperplastic, or neoplastic change, or hyperstimulation.

Endocrinopathies are classified as primary, secondary, or tertiary. Primary endocrine disease inhibits the action of downstream glands. Tertiary endocrine disease is associated with dysfunction of the hypothalamus and its releasing hormones.
Cancer can occur in endocrine glands, such as the thyroid, and hormones have been implicated in signalling distant tissues to proliferate, for example the Estrogen receptor has been shown to be involved in certain breast cancers. Endocrine, Paracrine, and autocrine signalling have all been implicated in proliferation, one of the required steps of oncogenesis.

### Glands of the Human Endocrine System

<table>
<thead>
<tr>
<th>Gland</th>
<th>Hormone(s) Secreted</th>
<th>Function(s) of Hormones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pituitary</td>
<td></td>
<td>The pituitary gland is a small oval endocrine gland that lies at the base of the brain. It is sometimes called the master gland of the body. This part of the brain consists of three lobes called &quot;anterior&quot;, &quot;interior&quot; and &quot;posterior&quot;.</td>
</tr>
<tr>
<td>Posterior</td>
<td>• Oxytocin</td>
<td>• Stimulates uterine contraction and breast contraction for milk release.</td>
</tr>
<tr>
<td></td>
<td>• Anti-Diuretic</td>
<td>• Stimulates re-absorption of</td>
</tr>
</tbody>
</table>

Hormones secreted by the main Endocrine Glands
Hormone (ADH), also known as ‘vasopressin’

- Production of breast milk (works in men too).
- Hypo- causes Diabetes Insipidus (large amounts of urine produced).

Anterior

- Prolactin (PRL)
- Human Growth Hormone (HGH)
- Adrenocorticotropic Hormone (ACTH)

- Thyroid Stimulating Hormone (TSH)
- Stimulates the thyroid to release thyroxin.

- Follicle Stimulating Hormone (FSH)
- Stimulates growth/development of Graafian follicles (= a mature follicle in the ovary prior to ovulation, containing a large fluid-filled cavity that distends the surface of the ovary) on approx. 28 day cycle.

- Melanin Stimulating Hormone (MSH)
- Brings about ovulation and maintains the corpus luteum.
- **Gonadotrophins** - Secondary sexual characteristics.

- **Interstitial Cell Stimulating Hormone (ICSH)** - Works on the seminiferous tubules in the testes – to produce sperm – which take 21 days to mature. (If not ejaculated within 21 days, the sperm are re-absorbed back into the body.)

**Pineal**

A pea-sized mass of nerve tissue attached by a stalk to the posterior wall of the third ventricle of the brain, deep between the cerebral hemispheres at the back of the skull.

- **Melatonin**
  - A hormone produced by the pineal gland in darkness but not in bright light.
  - Melatonin receptors in the brain react to this hormone and synchronize the body to the 24 hour day/night rhythm, thus informing the brain when it is day and when it is night.
  - Melatonin is derived from serotonin, with which it works to regulate the sleep cycle.

**Thyroid Gland**

Located in the anterior part of the neck in the midline. It consists of two lateral lobes lying on each side of the thyroid cartilage (Adam’s apple) and connected by a band of tissue called the isthmus.

- **Thyroxin**
  - Concerned with the Basal Metabolic Rate (BMR), which is the amount of energy the body uses, just to ‘tick over’.

  **Hyper-Thyroidism** = ‘over-active thyroid’ = Thyrotoxicosis
  - Symptoms: increase in BMR; increase in heart-rate; loss of weight; hyper-activity; insomniac; develops bulging eyes due to accumulation of fluid behind the eye; may develop Goitre; possible link with Attention Deficit Disorder.

  **Hypo-Thyroidism**
Symptoms: decrease in BMR; weight gain; lethargy; skin becomes dry and puffy; hair becomes thin and brittle.

Causes: Derbyshire Neck (originally due to insufficient iodine in the soil in Derbyshire), Graves Disease, and Cretinism (= mental and sexual development impaired, if occurs in children).

- **Calcitonin**
  - Uptake of calcium to bone.

- **Parathyroid Gland**
  - Small glands of the endocrine system which are located behind the thyroid. There are four parathyroid glands which are normally about the size of a pea.
  - **Parathormone**
    - Associated with the growth of muscle and bone.
    - Distribution of calcium and phosphate in the body.
  - Hyper- Causes transfer of calcium from the bones to the blood; bones become fragile & easily broken; osteoporosis.
    - (Parathormone activity is inhibited by oestrogen.)
  - Hypo- Lowers blood calcium levels, causing tetany (which may be treated by injections of the hormone); low calcium levels in skeletal muscle (which may cause cramps).

- **Thymus**
  - The thymus gland is located straddled across the trachea & bronchi in the upper thorax (a bi-lobed organ in the root of the neck, above and in front of the heart). The thymus (a gland associated with the immune system), is enclosed in a capsule and divided internally by cross-walls into many lobules (full of T-lymphocytes).
  - **Thymosin**
    - Activates the immune system by activating the T-Cells (T-Killer Cells; T-Helper Cells; T-Memory Cells).
  - **T-Lymphocytes**
    - The thymus consists of lobules full of T-lymphocytes (white blood cells associated with
antibody production).

- T-lymphocytes migrate from the bone marrow to the thymus, where they mature and differentiate until activated by antigens.

### Pancreas

The human pancreas weighs approximately 80 grams, has roughly a configuration of an inverted smoker’s pipe, and is situated in the upper abdomen. The head of the pancreas (equivalent to the bowl of the pipe) is immediately adjacent to the duodenum, while its body and tail extend across the midline nearly to the spleen.

### Islets of Langerhan

Located within the pancreas. Contains groups of both Alpha- and Beta- cells.

- **Beta Cells**
  - **Insulin**
    - Conversion of glucose to glycogen.
    - Cellular up-take of Glucose.
    - Conversion of excess glucose to fat.

  **Hypo-** causes Diabetes Mellitus:

  Symptoms: Blood glucose levels rise (hyperglycaemia). Glucose is excreted into the urine (glycosuria) - which increases levels of urination, causing dehydration. As glucose levels in the blood increase, fat and protein are broken-down for energy. Coma and death may follow if the symptoms are not treated.

- **Alpha Cells**
  - **Glucagon**
    - Conversion of glycogen to glucose.

### Adrenal Glands

The adrenal glands are orange-colored endocrine w/c are located on the top of both kidneys.

- **Adrenalin (Epinephrine)**
  - Prepares the body for "fright, fight or flight" and has many effects:
    - Action of heart increased.
    - Rate and depth of breathing
• Metabolic rate increased.
• Force of muscular contraction improves.
• Onset of muscular fatigue delayed.
• Blood supply to the bladder and intestines reduced, their muscular walls relax, the sphincters contract.

Noradrenalin (Norepinephrine)

Similar effects to adrenalin:
• Constriction of small blood vessels leading to increase in blood pressure.
• Increased blood flow through the coronary arteries and slowing of heart rate.
• Increase in rate and depth of breathing.
• Relaxation of the smooth muscle in the intestinal walls.

Ovaries
The ovaries are pair of female reproductive organs. They are located in the pelvis, one on each side of the uterus.

• Estrogen
  • Break-down of the uterine wall.

• Progesterone
  • Builds up and maintains the uterus wall for embedding of fertilized egg.
  • Associated with secondary sexual characteristics, e.g. body hair, breast enlargement, changes in physical body.

Testes
Two glands suspended within a sac of skin called scrotum. They are composed of a large number of seminiferous tubules.

• Testosterone
  • Development and function of male sex organs.
  • Secondary sexual characteristics, e.g. body hair,
The Endocrine Pancreas

The pancreas houses two distinctly different tissues. The bulk of its mass is exocrine tissue and associated ducts, which produce an alkaline fluid loaded with digestive enzymes which is delivered to the small intestine to facilitate digestion of foodstuffs. Scattered throughout the exocrine tissue are several hundred thousand clusters of endocrine cells which produce the hormones insulin and glucagon, plus a few other hormones.

Insulin and glucagon are critical participants in glucose homeostasis and serve as acute regulators of blood glucose concentration. From a medical perspective, insulin in particular is enormously important - a deficiency in insulin or deficits in insulin responsiveness lead to the disease diabetes mellitus.

The pancreas is an elongated organ nestled next to the first part of the small intestine. The endocrine pancreas refers to those cells within the pancreas that synthesize and secrete hormones.

The endocrine portion of the pancreas takes the form of many small clusters of cells called islets of Langerhans or, more simply, islets. Humans have roughly one million islets. In standard histological sections of the pancreas, islets are seen as relatively pale-staining groups of cells embedded in a sea of darker-staining exocrine tissue.

Pancreatic islets house three major cell types, each of which produces a different endocrine product:

- Alpha cells (A cells) secrete the hormone glucagon.
- Beta cells (B cells) produce insulin and are the most abundant of the islet cells.
- Delta cells (D cells) secrete the hormone somatostatin, which is also produced by a number of other endocrine cells in the body.

Interestingly, the different cell types within an islet are not randomly distributed - beta cells occupy the central portion of the islet and are surrounded by a "rind" of alpha and delta cells. Aside from the insulin, glucagon and somatostatin, a number of other "minor" hormones have been identified as products of pancreatic islets cells.
Islets are richly vascularized, allowing their secreted hormones ready access to the circulation. Although islets comprise only 1-2% of the mass of the pancreas, they receive about 10 to 15% of the pancreatic blood flow. Additionally, they are innervated by parasympathetic and sympathetic neurons, and nervous signals clearly modulate secretion of insulin and glucagon.

THE URINARY SYSTEM

The urinary system consists of two kidneys, two ureters, the urinary bladder, and the urethra. The formation of urine is the function of the kidneys, and the rest of the system is responsible for eliminating the urine. Body cells produce waste products such as urea, creatinine, and ammonia, which must be removed from the blood before they accumulate to toxic levels. As the kidneys form urine to excrete these waste products, they also accomplish several other important functions:

1. Regulation of the volume of blood by excretion or conservation of water
2. Regulation of the electrolyte content of the blood by the excretion or conservation of minerals
3. Regulation of the acid–base balance of the blood by excretion or conservation of ions such as H_ ions or HCO3_ ions
4. Regulation of all of the above in tissue fluid
Kidneys - 2 (paired). The left is higher than the right due to the presence of the liver.

- renal artery
- renal vein
- ureter
- nerves

is located retroperitoneal. It is embedded in fat. This fatty pouch consists of 3 layers:

1. Renal capsule - innermost layer. Is strong and fibrous. It is attached to the kidney. It functions to prevent infection.
2. Adipose capsule - second layer. Is a protective layer.
3. Renal fascia - third layer. Is a supportive layer. It anchors the kidney to the peritoneum and the abdominal wall.

Kidney structure Has two layers

1. Outer cortex - many capillaries
2. inner medulla - many blood vessels and tubules
   a. renal pyramids - tubules (tips = renal papilla)
   b. renal columns - separate pyramids. Transmit blood vessels

Nephron - the functional unit of the kidney. It functions to produce urine. It is made up of many tubules and their associated blood vessels. There are over 1 million nephrons

Glomerulus - A tuft of capillaries with fenestrations

Glomerular (Bowman's) capsule - surrounds the glomerulus. Together they form the renal corpuscle. The epithelium of the glomerular capillaries contains pores called fenestrae. These allow filtrate but NOT proteins to pass from the blood into the glomerular capsule. The glomerular capsule has a parietal and a visceral layer. The parietal layer is for structure only and does not play a role in filtration. The visceral layer is made up of highly specialized cells called podocytes. These cells have foot processes (pedicels) which line the basement membrane of the glomerulus. Between the foot processes we see filtration slits which allow the filtrate to pass into the capsular space.
Proximal convoluted tubule - Here we see cuboidal cells with a brush border (microvilli) These cells resorb substances from the filtrate as well as secrete substances into the filtrate. The microvilli greatly increase the ability to resorb water.

Loop of Henle - has both ascending and descending limbs

Descending limb - (thin segment) is simple squamous epithelium and is highly permeable to water.

Ascending limb - (thick segment) the epithelium is cuboidal or even low columnar.

Distal convoluted tubule - here the cells are cuboidal and thinner than those seen in the proximal convoluted tubule. This shows that these cells play a role in secreting substances into the filtrate rather than removing substances from it. Here we also see two cell types:

1. intercalated cells (cuboidal with microvilli) - these function in acid/base balance of the blood.
2. principal cells (no microvilli) - these function in body Na⁺ and water balance.

Collecting duct - Not a part of the Nephron. The distal convoluted tubules connect to collecting ducts. Passes through the renal pyramids and ends at the renal papillae where it empties into a minor calyx.

Two types of Nephrons:

1. Cortical nephrons: these make up 85% of our nephrons. With the exception of the tip of the loop of Henle these nephrons are located in the renal cortex.
2. Juxtamedullary nephrons: here the renal corpuscles are located in the cortex, yet very near the cortex-medulla junction.

Blood supply - renal arteries feed into segmental arteries, which turn into interlobar arteries (in renal columns) which feed into arcuate arteries (branched out at the level between the cortex and medulla). Interlobular arteries branch off of the arcuate arteries and run out into the cortex. From these branch the afferent arterioles which bring blood to the glomeruli (blood filtrate enters the urinary
tubules). Blood leaving the glomerulus enters an efferent arteriole which takes the blood to peritubular capillaries around the convoluted tubules OR vasa recta surrounding the ascending and descending limbs of Henle. At this point the blood enters veins that parallel the arteries. That is, interlobular veins to arcuate veins to interlobar veins to renal veins to the IVC.

**Ureters** - are retroperitoneal and paired. - enter the urinary bladder

The wall of the ureter has 3 layers (tunics)

1. **inner mucosa** - continuous with the lining of the urinary bladder. It has transitional epithelium that secretes a protective mucous (lubrication)
2. **middle layer** - Muscularis. It has an inner longitudinal and outer circular layer of smooth muscle.
3. **Outer layer** - fibrous coat made of loose CT. This coat covers the ureter and anchors it in place.

**Urinary bladder** - storage bag for urine. It is located behind the pubic symphysis yet in front of the rectum in males and in front of the uterus in females.

The wall has 4 layers:

1. **Muscosa** - innermost layer. Has transitional epithelium. Will find many folds (rugae) except in the area known as the trigone. This is a triangular area demarcated by three points, the two openings of the ureters and the exit point for the urethra.
2. **Submucosa** - supports the mucosa
3. **Muscularis** - has three layers called **detrusor** muscle. This muscle helps to form the internal urethral sphincter.
4. **Serosa** - outermost layer. It is found only on the superior surface of the bladder. It is actually a continuation of the peritoneum.

**Urethra** - female - short. Approx. 4 cm long

- male - longer. Consists of three regions
  1. **prostatic urethra** - passes through the prostate gland
  2. **membranous urethra** - passes through the UG diaphragm
  3. **Penile (spongy) urethra** - passes the length of the penis.

**Urethral wall** -The inside of the wall is lined by mucous membrane surrounded by a thick layer of smooth muscle. We also see urethral glands which secrete
mucous into the urethral canal. There is an external urethral sphincter which is composed of voluntary skeletal muscle.

Micturition - urination, which is a reflex action. Stretch receptors activate the detrusor muscle and relax the internal urethral sphincter. The external urethral sphincter is under voluntary control after approx. 2 years of age. This has to do with growth of the spinal cord and appropriate nerves.
DM TYPE 2

**Predisposing Factor**
- Hereditary
- Lifestyle
- Old age

- Less sensitivity of tissue to insulin
  - Impaired utilization of insulin & glucose
  - Inability of glucose to penetrate the cell

- Increased basal hepatic glucose production
  - Chronic elevation of blood glucose

- Stimulate brain (Hypothalamus) to eat
  - Excessive hunger (Polyphagia)

- Breakdown of fats (Lypolysis)
  - Hyperlipidemia
  - Free fatty acids
  - Atherosclerosis
  - Hypertension

- Decreased blood perfusion of supply to vital organs
  - Impaired immune function
  - Infection

- Diabetic Retinopathy

- Diabetic Neuropathy
  - Numbness & tingling in the lower extremities

**Precipitating Factor**
- Genes
- Obesity
- 69 yrs old

- Hyperglycemia
  - Increased plasma osmolality of glucose
    - Glucose spills to renal tubules (Glucosuria)
    - Glucose attracts water
    - Excessive Urination (Polyuria)
    - The cell will shrink/dehydrated
    - Excessive thirst (Polydipsia)
    - Weight loss

- Diabetic Nephropathy

- Diabetic Retinopathy

- Impaired immune function
  - Infection

- Sudden vision changes

- Numbness & tingling in the lower extremities

- Diabetic Neuropathy
**Nephropathy**

**Predisposing Factor**
- Long Standing DM
- Old Age

**Precipitating Factor**
- 15 yrs
- 69 yrs old
- Hypertension
- Hyperglycemia

**Early glomerular hemodynamic changes**
- Hyperfiltration & Hyperperfusion
- Dysfunction of autoregulatory response

**Increased arterial dilation**
- Increased messangial cell matrix production
- Increased intraglomerular pressure

**Increased extracellular matrix deposition & messangial hypertrophy**

**Expansion of messangial area**
- Decreased glomerular filtration rate
- Reduction of the surface area for filtration

**Decreased glomerular filtration**
- Marks the beginning of renal failure

**Increased BUN**
- Hypertrophy of remaining nephrons

**Increased sodium creatinine**
- Inability to concentrate urine

**Decreased glomerular filtration**

**Reduction of the surface area for filtration**

**Hypertrophy of remaining nephrons**

**Inability to concentrate urine**
Further loss of nephron function

- Loss of nonexcretory renal function
  - Failure to produce erythropoietin
    - Anemia, pallor, weakness, fatigue
  - Immune disturbances
    - Infection
- Loss of excretory renal function
  - Decreased sodium reabsorption in tubule
    - Water retention
    - Edema
LABORATORY TESTS & RESULTS

Complete Blood Count

A complete blood count (CBC), also known as full blood count (FBC) or full blood exam (FBE) or blood panel, is a test requested by a doctor or other medical professional that gives information about the cells in a patient's blood. A lab technician (diploma holder) or technologist (bachelor holder) performs the requested testing and provides the requesting Medical Professional with the results of the CBC. A CBC is also known as a "hemogram".

A complete blood count will normally include:

**Red cells**

- **Total red blood cells** - The number of red cells is given as an absolute number per litre.
- **Hemoglobin** - The amount of hemoglobin in the blood, expressed in grams per decilitre. (Low hemoglobin is called anemia.)
- **Hematocrit or packed cell volume (PCV)** - This is the fraction of whole blood volume that consists of red blood cells.
- **Red blood cell indices**
  - **Mean corpuscular volume (MCV)** - the average volume of the red cells, measured in femtolitres. Anemia is classified as microcytic or macrocytic based on whether this value is above or below the expected normal range. Other conditions that can affect MCV include thalassemia and reticulocytosis.
  - **Mean corpuscular hemoglobin (MCH)** - the average amount of hemoglobin per red blood cell, in picograms.
  - **Mean corpuscular hemoglobin concentration (MCHC)** - the average concentration of hemoglobin in the cells.
- **Red blood cell distribution width (RDW)** - a measure of the variation of the RBC population

**White cells**

- **Total white blood cells** - All the white cell types are given as a percentage and as an absolute number per litre.

A complete blood count with differential will also include:
Neutrophil granulocytes - May indicate bacterial infection. May also be raised in acute viral infections. Because of the segmented appearance of the nucleus, neutrophils are sometimes referred to as "segs." The nucleus of less mature neutrophils is not segmented, but has a band or rod-like shape. Less mature neutrophils - those that have recently been released from the bone marrow into the bloodstream - are known as "bands" or "stabs". Stab is a German term for rod.

Lymphocytes - Higher with some viral infections such as glandular fever and. Also raised in lymphocytic leukaemia CLL. Can be decreased by HIV infection. In adults, lymphocytes are the second most common WBC type after neutrophils. In young children under age 8, lymphocytes are more common than neutrophils.

Monocytes - May be raised in bacterial infection, tuberculosis, malaria, Rocky Mountain spotted fever, monocytic leukemia, chronic ulcerative colitis and regional enteritis

Eosinophil granulocytes - Increased in parasitic infections, asthma, or allergic reaction.

Basophil granulocytes - May be increased in bone marrow related conditions such as leukemia of lymphoma.

Platelets

Platelet numbers are given, as well as information about their size and the range of sizes in the blood.
<table>
<thead>
<tr>
<th>Day</th>
<th>Normal Values</th>
<th>Result</th>
<th>Remarks</th>
<th>indications</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 28,</td>
<td>Leucocytes No. Cone Adult: 5-10 x10^9/L</td>
<td>7.1 x 10^9/L</td>
<td>Normal</td>
<td>To identify normal blood cells to diagnosed blood disease</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diff. Cell Count</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Segmenters: 0.65-0.85</td>
<td>0.90</td>
<td>Increased</td>
<td>Vital in diagnosing and treatment of hemorrhagic disease</td>
<td>-presence of infection</td>
</tr>
<tr>
<td></td>
<td>Lymphocytes: 0.15-0.35</td>
<td>0.10</td>
<td>Decreased</td>
<td></td>
<td>-anemia</td>
</tr>
<tr>
<td></td>
<td>Hemoglobin Mass Cone: 12.0-14.0 g/L</td>
<td>6.0 g/L</td>
<td>Decreased</td>
<td>Measures the amount of hemoglobin in the blood</td>
<td>-anemia and heart disease</td>
</tr>
<tr>
<td></td>
<td>Hematocrit 0.37-0.47</td>
<td>0.18</td>
<td>Decreased</td>
<td>Measure of RBC found in the blood, stated as a percentage of the total blood</td>
<td>-anemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>volume</td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>Normal Values</td>
<td>Result</td>
<td>Remarks</td>
<td>Clinical Significance</td>
<td></td>
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<td>---------</td>
<td>------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>March.2, 2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hgt 80-120 mg/dL</td>
<td></td>
<td>200 mg/dL</td>
<td>Increased</td>
<td>To determine the level of blood sugar in the blood</td>
<td></td>
</tr>
<tr>
<td>Blood Uric Acid 2.6-6.0 mg/dL</td>
<td></td>
<td>9.0 mg/dL</td>
<td>Increased</td>
<td>Product of metabolism of protein present in the blood &amp; excreted in the urine</td>
<td></td>
</tr>
<tr>
<td>Blood Urea Nitrogen 1.7-8.3 mmol/L</td>
<td></td>
<td>16.3 mmol/L</td>
<td>Increased</td>
<td>The amount of nitrogen in the blood in the form of urea</td>
<td></td>
</tr>
<tr>
<td>Serum Creatinine 0.5-1.2 mg/dl</td>
<td></td>
<td>9.8 mg/dL</td>
<td>Increased</td>
<td>Measures the amount of creatinine in the blood</td>
<td></td>
</tr>
</tbody>
</table>

(+): DM, Gout, Diabetic nephropathy
Urinalysis

A urinalysis is a group of manual and/or automated qualitative and semi-quantitative tests performed on a urine sample. A routine urinalysis usually includes the following tests: color, transparency, specific gravity, pH, protein, glucose, ketones, blood, bilirubin, nitrite, urobilinogen, and leukocyte esterase. Some laboratories include a microscopic examination of urinary sediment with all routine urinalysis tests. If not, it is customary to perform the microscopic exam, if transparency, glucose, protein, blood, nitrite, or leukocyte esterase is abnormal.

Purpose

Routine urinalyses are performed for several reasons:

- general health screening to detect renal and metabolic diseases
- diagnosis of diseases or disorders of the kidneys or urinary tract
- monitoring of patients with diabetes

In addition, quantitative urinalysis tests may be performed to help diagnose many specific disorders, such as endocrine diseases, bladder cancer, osteoporosis, and porphyrias (a group of disorders caused by chemical imbalance). Quantitative analysis often requires the use of a timed urine sample. The urinary microalbumin test measures the rate of albumin excretion in the urine using laboratory tests. This test is used to monitor the kidney function of persons with diabetes mellitus. In diabetics, the excretion of greater than 200 μg/mL albumin is predictive of impending kidney disease.
<table>
<thead>
<tr>
<th>Day</th>
<th>Normal Values</th>
<th>Result</th>
<th>Remarks</th>
<th>indications</th>
<th>Clinical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 28, 2009</td>
<td>Color Amber yellow</td>
<td>yellow</td>
<td>Normal</td>
<td>Presence of blood cells</td>
<td>Debris, bacteria sediment</td>
</tr>
<tr>
<td></td>
<td>Transparency Clear</td>
<td>turbid</td>
<td></td>
<td>Indication of urine concentration or amount of solutes present in the urine.</td>
<td>Increase acidity with renal tubular acidosis tract infection</td>
</tr>
<tr>
<td></td>
<td>Gravity 1.005-1.030</td>
<td>1.015</td>
<td>Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>pH 7.35-7.45 Ave: 6.0</td>
<td>5.0</td>
<td>Decreased</td>
<td>To determine the relative acidity and alkalinity of urine and assess the</td>
<td>Acidity, UTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>clients acid-based status.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Albumin</td>
<td>(+)</td>
<td>Present</td>
<td>To determine the amount of protein being lost in the urine</td>
<td>Albuminuria, UTI</td>
</tr>
<tr>
<td></td>
<td>Glucose 0 or not present</td>
<td>trace</td>
<td>Present</td>
<td>Important test of diabetic and other disorder</td>
<td>High blood glucose level</td>
</tr>
<tr>
<td></td>
<td>Blood not present</td>
<td>(+)</td>
<td>Present</td>
<td>To determine the presence of blood in the urine</td>
<td>UTI and Diabetic nephropathy</td>
</tr>
<tr>
<td>Day</td>
<td>Normal Values</td>
<td>Result</td>
<td>Remarks</td>
<td>indications</td>
<td>Clinical Significance</td>
</tr>
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<td>----------------------------------------</td>
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<td>---------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mar. 3, 2009</td>
<td>Color Amber yellow</td>
<td>yellow</td>
<td>Normal</td>
<td>Presence of blood cells</td>
<td>Debris, bacteria sediment</td>
</tr>
<tr>
<td></td>
<td>Transparency Clear</td>
<td>turbid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gravity 1.005-1.030</td>
<td>1.020</td>
<td>Normal</td>
<td>Indication of urine concentration or amount of solutes present in the urine.</td>
<td>Increase acidity with renal tubular acidosis tract infection</td>
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<tr>
<td></td>
<td>pH 7.35-7.45 Ave: 6.0</td>
<td>5.0</td>
<td>Decreased</td>
<td>To determine the relative acidity and alkalinity of urine and assess the clients acid-based status.</td>
<td>Acidity, UTI</td>
</tr>
<tr>
<td></td>
<td>Albumin (+4)</td>
<td>Present</td>
<td></td>
<td>To determine the amount of protein being lost in the urine</td>
<td>Albuminuria</td>
</tr>
<tr>
<td></td>
<td>Glucose 0 or not present (+1)</td>
<td>Present</td>
<td></td>
<td>Important test of diabetic and other disorder</td>
<td>High blood glucose level</td>
</tr>
<tr>
<td></td>
<td>Puss cell 10-15</td>
<td>Increased</td>
<td></td>
<td>Indicate the cause of infection</td>
<td>Presence of infection</td>
</tr>
<tr>
<td></td>
<td>RBC 4.2-5.4 x 10^6/mL^3</td>
<td>5-10</td>
<td>Increased</td>
<td>To determine proteinuria &amp; high protein</td>
<td>Protenuria</td>
</tr>
<tr>
<td><strong>Generic Name (Brand Name)</strong></td>
<td><strong>Category</strong></td>
<td><strong>Action</strong></td>
<td><strong>Nursing Consideration</strong></td>
<td><strong>Patient Teaching</strong></td>
<td><strong>Contraindication</strong></td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
</tbody>
</table>
| Gliclazide (Diamicron)      | Pregnancy Category C | Helps to lower blood glucose by stimulating the release of insulin from the pancreas. | • Administer with food to decrease GIT irritation and prevent hypoglycemia.  
• Instruct the patient not to take alcoholic beverages because it can lead to severe hypoglycemic reaction.  
• Assess patient for signs of depression throughout the therapy. | Should be informed that prolonged use may lead to dependence. | Should not be used in DM complicated by acidosis, ketoacidosis or coma, or in patient with a history of repeated episodes of ketoacidosis or coma. |
| Glipizide (Glucotrol)       | Pregnancy Category C | Blood glucose lowering drug of sulfonylurea class. | • Abnormal blood glucose levels during pregnancy are associated with a higher incidence of congenital abnormalities.  
• Avoid other medications especially aspirin and alcohol. | Should be inform of potential risk and advantages of Glucotrol and of alternative mode of therapy. They should also be informed about the dietary instructions of a regular exercise program and of regular testing of urine and or blood sugar.  
• If hypoglycemia occurs take a glass of orange juice, 2-3 tsp of sugar, honey or | Should not be given to patient with known hypersensitivity to the drug.  
Should not be given to patient with DM type 1, diabetic ketoacidosis with or without coma. |
| **Lactulose**  
*Portalac* | Pregnancy Category B | - Increase H2O content and softens the stool.  
- Lowers the pH of the colon.  
- Assess patient for abdominal distention, presence of bowel sounds, and normal pattern of bowel function.  
- Effects are seen in 24-48 hours  
- Do not self medicate with another laxative because of slow onset.  
- Notify Doctor if diarrhea persists for more than 24 hrs., could be a sign of overdose and made for med adjustment.  
- Effects are seen in 24-48 hours.  
- Do not self medicate with another laxative because of slow onset.  
- Notify Doctor if diarrhea persists for more than 24 hrs., could be a sign of overdose and made for med adjustment. | Educate patient that this drug is used cautiously in DM, pregnancy, lactation, or children.  
- Excessive or prolonged use may lead to dependence.  
- Should not be given to patient on low – galactose patient. |
| **Omeprazole**  
*Lasec* | Pregnancy Category B | - Binds to an enzyme on gastric parietal cells in the presence of acidic pH, preventing the final transport of hydrogen ions into the gastric lumen.  
- Administer before meals. Caution patient to swallow capsules whole-not to open, chew, or crush them.  
- Arrange for further evaluation of patient after 8 wk of therapy for gastroreflux disorders; not intended for maintenance therapy.  
- Administer antacids | Instruct patient to take medication as directed for the full course of therapy, even if feeling better.  
- May cause occasional drowsiness of dizziness.  
- Advise patient to avoid alcohol products containing aspirin, this may cause GI irritation.  
- Should not be given to patient with known hypersensitivity. |
<table>
<thead>
<tr>
<th>Drug</th>
<th>Pregnancy Category</th>
<th>Action</th>
<th>Assessment</th>
<th>Instructions</th>
<th>Contraindications</th>
</tr>
</thead>
</table>
| **Metoclopramide** | B                  | ➢ Block dopamine receptors in chemoreceptor trigger zone in CNS  
➢ Stimulates motility of the upper GI tract, and accelerates gastric empty. | ➢ Assess patient for nausea and vomiting, abdominal distention, and bowel sounds prior to and following administration.  
➢ Assess patient for signs of depression throughout the therapy. | ➢ Advise patient to take metoclopramide exactly as directed.  
➢ Advise patient to avoid concurrent use of alcohol and other CNS depressants, while taking this medication.  
➢ This medication may cause drowsiness, caution patient to avoid driving or other activities requiring alertness until response to medication is known. | ➢ Hypersensitivity, hemorrhage, history of seizures disorders, parkinson's disease. |
| **Ranitidine**     | B                  | ➢ Inhibits the action of histamine at the H2 receptor site located primarily in gastric parietal cells. | ➢ Assess patient routinely for epigastric or abdominal pain and rank or occult blood in the stool, emesis or gastric aspirate. | ➢ Encourage patient to quit smoking, or at least not to smoke after last dose of the day.  
➢ Inform patient that increase fluid and fiber intake and exercise may minimize constipation. | ➢ Hypersensitivity, some oral liquids contain alcohol and should be avoided in patients with known tolerance. |
| **Spironolactone**  
**Aldactone** | **Diuretics (potassium – Sparing)** | - Cause loss of sodium bicarbonate and calcium while saving potassium and hydrogen ions.  
- Antagonizes aldosterone in the distal tubules, increasing sodium and water excretion.  
| **Monitor I&O ratios and daily weight during therapy.**  
- If medications is given as an adjunct to antihypertensive therapy, monitor BP before administering.  
- Monitor response of S/Sx of hypokalemia (weakness, fatigue, arrhythmias, polyuria, and polydipsia).  
- To enhance absorption, give drug with meals.  
- Protect drug from light.  
- Monitor elderly patients closely, who are susceptible to excessive diuresis.  
| **Instruct patient to take drug in the morning to prevent need to urinate at night.**  
- To prevent serious hyperkalemia, warn patient to avoid excessive ingestion of potassium-rich foods, salts substitutes and potassium supplements.  
- Caution patient not to perform hazardous activities if adverse reactions occurs.  
| **Contraindicated in patient hypersensitive to drug and in those with anuria, acute or progressive renal insufficiency, or hyperkalemia.** |
| **Cefuroxime**  
**Zinacef** | **Second-generation cephalosporins Anti-infectives** | - Inhibits cell-wall synthesis, promoting osmotic instability, usually bactericidal.  
| **Before giving drug, ask patient if he or she is allergic to penicillins or cephalosporins.**  
- For IM use, inject into a large muscle, such as the gluteus maximus or the side of the thigh.  
- Absorption or oral drug is enhanced by  
| **Tell patient to take drug as prescribed, even after he/she feels better.**  
- Instruct patient to take oral form with food.  
- If patient has difficulty swallowing tablets. Show her/him how to dissolve or crush tablets. But warm him/her the bitter taste.  
| **Contraindication in patients hypersensitive to drug or other cephalosporins.** |
| **Furosemide** *(Lasix)* | Loop diuretic | Inhibits sodium and chloride reabsorption at the proximal and distal tubules and the ascending loop of Henle. | To prevent nocturia, give P.O. and IM preparations in the morning. Give second dose in early afternoon.  
- Monitor weight, BP, and pulse rate routinely with long-term use and during rapid diuresis.  
- Monitor fluid intake and output and electrolyte, BUN and carbon dioxide levels frequently.  
- Watch for signs of hypokalemia, such as muscle weakness and cramps. | Advise patient to take drug with food to prevent GI upset, and to take drug in morning to prevent need to urinate at night.  
- Inform patient of possible need for potassium or magnesium supplements.  
- Instruct patient to consult health care professional regarding a diet high in potassium. | Contraindicated in patients hypersensitive to drug and in those with anuria. |
**Metoprolol**  
*Lopresor*

Beta blockers  
Antianginals, antihypertensives

- A selective beta blocker that selectively blocks beta receptors; decreases cardiac output, peripheral resistance, and cardiac oxygen consumption; and depresses rennin secretion.

- Always check patient’s apical pulse rate before giving drug.
- Monitor glucose level closely because drug masks common S/Sx of hypoglycemia.
- Monitor BP frequently; drug masks common S/Sx of shock.
- Monitor I&O output ratios and daily weight.
- Instruct patient to take drug as exactly as prescribed and with meals.
- Tell patient to alert prescriber if shortness of breath occurs.
- Instruct patient not to stop drug suddenly but notify prescriber about unpleasant adverse reactions.

- Contraindicated in patients hypersensitive to drug or other beta blockers.
**NURSING CARE PLAN**

<table>
<thead>
<tr>
<th>ASSESSMENT</th>
<th>NSG. DIAGNOSES</th>
<th>RATIONALE</th>
<th>EXPECTED OUTCOME</th>
<th>NSG. INTERVENTION</th>
<th>RATIONALE</th>
<th>EVALUATION</th>
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</thead>
<tbody>
<tr>
<td>Subjective:</td>
<td>“ano dawla kahinugad hen nga ak lawas” as verbalized by the patient</td>
<td>Knowledge deficit regarding condition, prognosis, treatment, self care and discharge needs related to unfamiliarity with information resources as manifested by frequent asking of questions regarding Diabetes Nephropathy.</td>
<td>-Absence or deficiency of cognitive information related to specific topic. (Gulanick, et. Al) -Information must be taught to pt. with DN in order to allay anxiety, prevent complications and it may serve as an opportunity for learning self management skills. (Doenges, et.al)</td>
<td>After an hour of health teaching on essential elements regarding condition, prognosis, treatment, self care and discharge needs, the patient will be able to verbalize understanding of condition / disease process, prognosis &amp; treatment; identify relationship of sign / symptoms to the disease process and correlate symptoms with causative factors; and initiate necessary lifestyle changes and participate in treatment regimen.</td>
<td>1).Create an environment of trust by listening to concerns, being available</td>
<td>1).Rapport of respect need to be established before the patient will be willing to take part in the learning process. (Doenges, et.al)</td>
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<td>2).Discuss disease process, prognosis, and precipitating factors.</td>
<td>2).Provide knowledge based on which the pt. can make informed choices. (Doenges, et.al)</td>
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<td>3).Discuss dietary plan limiting intake of sugar, fat, salt, alcohol and eating complex carbohydrates specially those high in fiber and ways to deal with meals outside the home.</td>
<td>3).Adequate nutrition is necessary to promote healing/tissue regeneration while adherence to restrictions may prevent complications</td>
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<td>4).Encourage patient to observe characteristics of urine and amount/frequency of output.</td>
<td>4).Changes may reflect alterations in renal function/need for dialysis. (Doenges, et.al)</td>
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<td>5).Discuss activity restriction and gradual resumption of desired activity. Encourage use of energy-saving, relaxation, and diversional techniques.</td>
<td>5).Patient with ARF may need to restrict activity and/or may feel weak for an extended period during lengthy recovery phase, requiring measures to conserve energy and reduce boredom / depression. (Doenges, et.al)</td>
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<td>6).Recommend scheduling activities with adequate rest periods.</td>
<td>6).Prevents excessive fatigue and conserves energy for healing, tissue regeneration. (Doenges)</td>
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Objective:

- T : 37.7˚C
- PR : 98 BPM
- RR : 24 CPM
- BP : 180/90 mmHg

Weight: 52 kg (pre-illness)
58 kg (during hospitalization)

Inaccurate follow through of instruction
Frequent asking about her condition
Verbalizing inaccurate information

After an hour of health teaching on essential elements regarding condition, prognosis, treatment, self care and discharge needs, the patient will be able to verbalize understanding of condition / disease process, prognosis & treatment; identify relationship of sign / symptoms to the disease process and correlate symptoms with causative factors; and initiate necessary lifestyle changes and participate in treatment regimen.
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<tr>
<td>Subjective:</td>
<td>Fluid volume excess related to compromise regulatory mechanism (renal failure) as evidenced by venous distension, generalized edema, fatigue, weakness, body malaise, restlessness and pitting edema (25.4 mm).</td>
<td>-Kidney failure decreases kidney's ability to excrete salt in the urine. Thus, the amount of salt in the body increases, which causes the body to retain water and decrease urine output.</td>
<td>After 8 hours of fluid restrictions, administering medications (diuretics &amp; antihypertensive) as indicated, the patient will experience normal fluid balance, display appropriate urinary output with specific gravity laboratory studies near normal, stable weight and absence of edema.</td>
<td>Independent 1). Record accurate intake and output (I/O). 2). Administer/restrict fluid as indicated. 3). Administer medication as indicated (Diuretics).</td>
<td>1). Accurate I/O is necessary for determining renal function and fluid replacement needs and reducing risk of fluid overload. 2). Fluid management is usually calculated to replace output from all sources and estimated insensible losses. 3). Given early in oliguric phase of renal failure in an effort to convert nonoliguric phase, flush the tubular lumen of debris and promote urine volume. Maybe given to treat hypertension by counteracting effects of renal blood flow and/or circulating volume overload. 4). Daily body weight is best monitor of fluid status.</td>
<td>The goal was met; patient has displayed/experienced normal fluid balance, appropriate urinary output with specific gravity/laboratory studies near normal, stable weight and absence of edema after 8 hours of fluid restrictions, administering medication (diuretics &amp; antihypertensive) as indicated.</td>
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<td>Objective:</td>
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<td>- T : 37.7°C</td>
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<td>- PR : 98 BPM</td>
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<td>- BP : 180/90 mmHg</td>
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<td>Weight:</td>
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<td>Venous distension</td>
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<td>Generalized edema</td>
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<td>Report of fatigue, weakness and body malaise</td>
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<tr>
<td>Pitting Edema (25.4 mm)</td>
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<tr>
<td>Restlessness</td>
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</table>
6). Plan oral fluid replacement with patient, within multiple restrictions.

kgs) of fluid before pitting edema is detected.

6). Helps minimize boredom of limited choices and reduces sense of deprivation and thirst.
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<thead>
<tr>
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<tr>
<td>Subjective:</td>
<td>High risk for impaired skin integrity related to altered sensation secondary to disease process as evidenced by high glucose levels of HGT: 200 mg/dl; and lesions noted on both legs</td>
<td>- The risk of infection elevates the higher the Glucose level of a person with diabetes. This is largely because; High blood sugar causes the loss of sensation (neuropathy) and impedes circulation throughout the body (specially the feet). Diminished sensation can interfere with the body's injury warning system, pain. Thus, Small cuts, abrasions and other skin alterations may go unnoticed and become infected. (Wolfe, L.)</td>
<td>After following a 3 day series of health teachings on the preventive measures, the pt. will maintain intact skin, identify risk factors and demonstrate behaviors/techniques that prevents skin breakdown.</td>
<td>Independent: 1).Anticipate and use preventive measures in pt's who are at risk for skin breakdown, such as anyone who is thin, obese, aging, or debilitated. 2).Maintain strict skin hygiene, using mild, nondetergent soap (if any), drying gently and thoroughly, and lubricating with lotion or emollient. 3).Massage bony prominence gently with lotion or cream.</td>
<td>1).Decubitus ulcers are difficult to heal, and prevention is the best treatment. (Doenges, et.al) 2).A daily bath Is usually not necessary in elderly patients because there is atrophy of sebaceous and sweat glands, and bathing may create dry-skin problems. However, as epidermis thins with age, cleansing and use of lubricants is needed to keep skin soft/pliable and protect susceptible skin from breakdown. (Doenges, et.al) 3).Enhances circulation to tissues, increases vascular tone, and reduces tissue edema. (contraindicated if area pink/red, as cellular damage may occur.) Gentle massage around area may stimulate circulation to impaired tissues. (Doenges, et.al)</td>
<td>Patient's skin remains intact, as evidenced by no redness over bony prominences and capillary refill less than 6 seconds over areas of redness after following a 3 day series of health teachings on the preventive measures.</td>
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<td>Objective:</td>
<td>Weight: 52 kg (pre-illness) 58 kg (during illness)</td>
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<td>4).Inspect skin surface/folds and bony prominences</td>
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<td>VIS:</td>
<td>High Glucose level RBS by hgt: 03/02/09 : 200 mg/dl Lesions noted on both legs</td>
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<td>Normal Value: HGT : 80 – 110 mg/dl</td>
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<td></td>
<td>- T : 37.7˚C - PR : 98 BPM - RR : 24 CPM - BP : 180/90 mmHg</td>
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<tr>
<td>Routine Precautions</td>
<td>Tips for Skin Care</td>
<td>Foot Complications</td>
<td>Foot Hygiene Tips</td>
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<td>Increase preventive measures when reddened areas are noticed.</td>
<td>Do not use alcohol-based lotions on your skin. Do not use too much softening lotion; use just enough to prevent dry skin. Maintain a good prosthetic fit at all times.</td>
<td>The most frequent reason for hospitalization in persons with diabetes is due to problems with their feet. These could be prevented through simple preventive foot care.</td>
<td>Wash residual limb with mild soap and water, then rinse and pat dry. Do this at least once a day, or more often if you sweat a lot or are treating a rash or infection.</td>
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<td>5). Conduct health teaching on preventive care for diabetes-foot related complications such as;</td>
<td>- Do not use too much softening lotion; use just enough to prevent dry skin.</td>
<td>for infection &amp; necrosis, possibly involving muscle and bone. There is increased risk of redness/irritation around legs due to elastic bands in adult diapers/incontinence pads. (Doenges, et.al)</td>
<td>-to keep skin soft/pliable and protect susceptible skin from breakdown. (Doenges, et.al)</td>
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<td>-it may cause the skin to dry and crack, increasing the chance of infection. (Wolfe, L.)</td>
<td>-using too much softening lotion may cause skin irritation. (Wolfe, L.)</td>
<td>-to maintain correct alignment and socket fit.</td>
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<td></td>
<td>- Maintain a good prosthetic fit at all times.</td>
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</table>
Check feet daily and immediately care for small cuts or blisters.

Eat a balanced diet, drink adequate water each day and exercise regularly.

Dependent
- Limit drinking beverages which contain caffeine.
- Keep blood pressure under control.

6). Monitor and maintain glucose levels at normal range (80-100 mg/dl).

7). Administer nutritional supplements and vitamins as indicated.

Having the right fit will help relieve pressure spots and soreness. (Wolfe, L.)

- Most problems for diabetics begins with small sores on the skin like crapes and blisters. (Wolfe, L.)

- Drinking caffeine beverages can constrict blood vessels and may contribute to circulation problems. (Wolfe, L.)

- High BP can cause circulatory problems in the feet. (Wolfe, L.)

6). Keeping in range as often as possible will dramatically reduce risk of serious complications from diabetes. (Wolfe, L.)

7). Aids in healing / cellular regeneration. (Doenges, et.al)
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<tr>
<td>Subjective:</td>
<td>- “maluya pirme it ak pagabat” as verbalized by the patient</td>
<td>Severe Anemia &amp; high glucose level RBS of hgt: 200 mg/dl.</td>
<td>Fatigue is a feeling of tiredness, exhaustion, or lack of energy. It feels mildly fatigued because of overwork, poor sleep, worry, boredom, or lack of exercise. Any illness, such as a cold or the flu, may cause fatigue, which usually goes away as the illness clears up. A stressful emotional situation may also cause fatigue. This type of fatigue usually clears up when the stress is relieved. Many prescription and nonprescription medicines can also cause fatigue. It may be caused by a more serious health problem, such as: Metabolic disorders, such as diabetes, in which sugar (glucose) remains in the blood rather than entering the body’s cells to be used for energy.</td>
<td>After a day of providing alternate activities with periods of rest and uninterrupted sleeps, the client will improve sufficient energy to complete desired light activities.</td>
<td>Independent</td>
<td>1). Discuss with pt. the need for activity. Plan schedule with pt. and identify activities that lead to fatigue. 2). Assess patient’s ability to perform normal tasks/noting reports of weakness, fatigue, and difficulty accomplishing task 3). Alternate activity w/ periods of rest / uninterrupted sleep. 4). Monitor pulse, respiratory rate and BP before/after activity. 5). Discuss ways of conserving energy while bathing, transferring, and so on. 6). Increase pt. participation in ADLs as tolerated.</td>
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<td>Objective:</td>
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<td>- T : 37.7˚C</td>
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<td>Weight:</td>
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<td>58 kg (during illness)</td>
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<tr>
<td>Severe Anemia</td>
<td>Weakness</td>
<td>Pallor</td>
<td>Restlessness</td>
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<td>High Glucose level RBS by hgt: 03/02/09 : 200 mg/dl</td>
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<tr>
<td>Normal Value:</td>
<td>HGT : 70 – 100 mg/dl</td>
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### NURSING CARE PLAN

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<td><strong>Subjective:</strong></td>
<td>Decreased tissue perfusion related to peripheral vaso-occlusion of blood vessels secondary to disease process as evidenced by chest pain, restlessness, pallor, fatigue, generalized edema, elevation in BUN (16.3 mmol/l), capillary refill &gt; 3 secs and BP of 180/90 mmHg</td>
<td>After 4 hours of implementing measures to reduce vascular resistance and improve tissue perfusion:</td>
<td>Independent 1). Give antihypertensive drugs, diuretics as prescribed.</td>
<td>1). A wide range of medications is available for treatment: vasodilators, beta-blockers, and angiotensinogen-converting enzyme (ACE) inhibitor.</td>
<td>1). To know the base line of BP.</td>
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<tr>
<td><strong>Objective:</strong></td>
<td><strong>T</strong>: 37.7°C</td>
<td><strong>PR</strong>: 98 BPM</td>
<td><strong>RR</strong>: 24 CPM</td>
<td><strong>BP</strong>: 180/90 mmHg</td>
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<tr>
<td><strong>Weight</strong>: 52 kg (pre-illness) 58 kg (during illness)</td>
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<td>2). Monitor blood pressure every 4 hours.</td>
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<tr>
<td>Pallor</td>
<td>Chest pain</td>
<td>Restlessness</td>
<td>Fatigue</td>
<td>Generalized edema noted</td>
<td>Elevation in BUN (16.3 mmol/l)</td>
<td>Capillary refill &gt; 3 secs</td>
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<td>Subjective</td>
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<td>- “maluya pirme it ak pagabat” as verbalized by the patient</td>
<td>Activity intolerance related to imbalance between oxygen supply and demand as evidenced by weakness, restlessness, fatigue, pallor, severe anemia &amp; high glucose level RBS of hgt: 200 mg/dl.</td>
<td>-because of diminished oxygen-carrying capacity of the red blood cells, thus resulted to insufficient physiological energy to endure or complete required or desired daily activities. (<a href="http://knol.google.com/k/charles-pollack/shortness-of-breath/zqxdFRm/sj1LaA#">http://knol.google.com/k/charles-pollack/shortness-of-breath/zqxdFRm/sj1LaA#</a>)</td>
<td>Short term: After 8 hours of complete bed rest with elevated HOB and implementing energy saving technique, the patient will report an increase in activity tolerance including activities of daily living, demonstrate a decrease in physiological signs of intolerance and display laboratory values within acceptable range. Long term: After months of nursing interventions the patient is free from weakness and risk of complications has been prevented.</td>
<td>Independent 1). Assess patients to perform normal task or activities of daily living. 2). Elevate head of bed as tolerated. 3). Identify or implement energy saving technique like sitting while doing a task. 4). Recommend quite atmosphere, bed rest if indicated. 5). Note changes in balance/gait disturbances and muscle weakness. 6). Provide or recommend assistance with activities or ambulation as necessary, allowing patient to do as much as possible. 7). Plan activity progression with patient, including activities that the patient views essential.</td>
<td>1). Influences choice of interventions or needed assistance. 2). Enhances lung expansion to maximize oxygenation for cellular uptake. 3). Encourage patient to do as much as possible, while conserving limited energy &amp; preventing fatigue. 4). Recommend quite atmosphere, bed rest if indicated. 5). May indicates neurological changes affecting patient safety or risk of injury. 6). Enhances rest to lower body’s oxygen requirements and reduce strain on the heart and lungs. 7). Although help maybe necessary, self esteem is enhanced when patient does some things for self. Promotes gradual return to normal activity level and improved muscle tone or stamina without undue fatigue.</td>
<td>The patient revealed an increase in activity tolerance, demonstrating a reduction in physiological signs of intolerance and laboratory values within normal range after 8 hours of complete bed rest with elevated HOB and implementing energy saving technique.</td>
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<td>Objective:</td>
<td>V/S</td>
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<td>- T : 37.7°C</td>
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<td>- PR : 98 BPM</td>
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<td>- RR : 24 CPM</td>
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<td>- BP : 180/90 mmHg</td>
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<td>Weight : 52 kg (pre-illness) 58 kg (during illness)</td>
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<td>Fatigue Severe Anemia Weakness Restlessness Exertional discomfort/dyspnea</td>
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<td>High Glucose level RBS by hgt: 03/02/09 : 200 mg/dl</td>
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<td>Normal Value: HGT : 70 – 100 mg/dl</td>
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8). Monitor lab studies Hb, Hct, & RBC count.

8). Identifies deficiencies in RBC components affecting oxygen transport & treatment needs or response to therapy.
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<tr>
<th>ASSESSMENT</th>
<th>NSG. DIAGNOSES</th>
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<th>EVALUATION</th>
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<tr>
<td>Objective:</td>
<td>V/S: T : 37.7°C - PR : 98 BPM - RR : 24 CPM - BP : 180/90 mmHg</td>
<td>Altered fluid &amp; electrolytes balance related to urinary retention as evidenced by dyspnea, decrease of urine output 250 cc, generalized edema, pitting edema on lower extremities, restlessness, dribbling of urine</td>
<td>The production of an abnormally small volume of urine is a result of kidney failure.</td>
<td>Short term: After 8 hours of treatment: encouraging client to void every 2-4 hours and when urge is noted, the patient will be able to increase urine output to at least 1500 cc.</td>
<td>Independent 1). Assess the cause of decrease urinary output. 2). Encourage client to void every 2-4 hours and when urge is noted. 3). Determine the initial fluids and electrolytes level 4). Monitor I/O hourly.</td>
<td>Goal partially met; patient passed out urine at least 300 cc</td>
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<td>Weight: 52 kg (pre-illness) 58 kg (during illness)</td>
<td>Dyspnea Decrease of urine output 250 cc</td>
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<td>5). Percuss/palpate suprapubic area</td>
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<td>Generalized edema</td>
<td>Pitting edema on lower extremities</td>
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<td>6). Observe signs and symptoms of fluid and electrolytes imbalance such as dyspnea and changes in ECG.</td>
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<td>Restlessness</td>
<td>Dribbling of urine</td>
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<tr>
<td>High Glucose level RBS by hgt: 03/02/09 : 200 mg/dl</td>
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<tr>
<td>Normal Value: HGT : 70 – 100 mg/dl Urine Output(adult) : 1200-1500 cc/day</td>
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NURSING CARE PLAN
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<tr>
<td>Subjective:</td>
<td>Anxiety related to change in health status (progressive/debilitating disease) as manifested by frequent asking of questions regarding her condition, weakness, confusion, distressed, increased blood pressure, fearful; restlessness, feelings of helplessness &amp; discomfort, sleep problems; and forgetfulness</td>
<td>- Anxiety is a normal experience. Moderate or high level of anxiety can increase alertness and performance in particular situation. However, people who experience continues or recurring fears or episodes of intense fear can feel powerless to manage their symptoms and their lives become severely restricted. (<a href="http://www.panicanxietydisorder.org.au/index.htm">http://www.panicanxietydisorder.org.au/index.htm</a>)</td>
<td>After maintaining a calm and tolerant manner while interacting with pt., and assisting in developing anxiety-reducing skills (relaxation, deep breathing, positive visualization, reassuring self-statements, etc.) the client will appear relaxed and report anxiety to a manageable level, verbalize awareness of feelings of anxiety and identify healthy ways to deal with and express anxiety.</td>
<td>Independent 1). Assess patient's level of anxiety. 2). Acknowledge awareness of patient's anxiety. 3). Maintain a calm and tolerant manner while interacting with patient. 4). Reduce sensory stimuli by maintaining a quite environment. 5). Assist in developing anxiety-reducing skills (relaxation, deep breathing, positive visualization, reassuring self-statements, etc.) 6). Encourage patient to notify staff when anxious feelings occur.</td>
<td>1). Helps determine the kind of interventions required. (Gulanick, et al) 2). Acknowledgement of patient's feelings validates the feelings and communicates acceptance of those feelings. (Gulanick, et al) 3). Staff's anxiety may be easily perceived by patient. The patient's feeling of stability increases in calm and nonthreatening atmosphere. (Gulanick, et al) 4). Anxiety may escalate with excessive conversation and noise. (Gulanick, et al) 5). Utilizing anxiety-reduction strategies enhance patient's sense of personal mastery and confidence. (Gulanick, et al) 6). Staff availability reinforces a feeling of security for patient. (Gulanick, et al) 7). To medications maybe used if patient's anxiety continues to escalate and the anxiety becomes disabling. (Gulanick, et al)</td>
<td>The client appeared relaxed and report anxiety to a manageable level, verbalized awareness of feelings of anxiety and identified healthy ways to deal with and express anxiety after maintaining a calm and tolerant manner while interacting with pt., and assisting in developing anxiety-reducing skills (relaxation, deep breathing, positive visualization, reassuring self-statements, etc.)</td>
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<td>Subjective:</td>
<td>- “kinakapos ak hit paghinga” as verbalized by the patient</td>
<td>Impaired gas exchange related to decreased O2-carrying capacity of blood secondary to anemia as evidenced by dyspnea, weakness, restlessness, irritability, easy fatigue, pallor, confusion, dizziness and RR of 24 cpm</td>
<td>After 30 minutes of elevating HOB to 45°, providing bed rest and supplemental oxygen the client will demonstrate improved ventilation and adequate oxygenation of tissues by ABG’s within normal limits and absence of symptoms.</td>
<td>Independent 1). Position with proper body alignment for optimal respiratory excursion (if tolerated, head of bed at &gt; 45 degrees)</td>
<td>1). This promotes lung expansion and improves air exchange. (Doenges, et al.)</td>
<td>The client demonstrated improved ventilation and adequate oxygenation of tissues by ABG’s within normal limits and absence of symptoms after 30 minutes of elevating HOB to 45°, providing bed rest and supplemental oxygen.</td>
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<td>Objective:</td>
<td>V/S:</td>
<td>- T : 37.7°C</td>
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<td>Dependent 2). Provide supplemental oxygen as indicated.</td>
<td>2). To provide adequate oxygenation (Gulanick, et al)</td>
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<td>- PR : 98 BPM</td>
<td>- RR : 24 CPM</td>
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<td>3). Assist with procedures as individually indicated (e.g. transfusions)</td>
<td>3). To improve respiratory function/oxygen-carrying capacity (Doenges, et al)</td>
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<td>- BP : 180/90 mmHg</td>
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<td>Independent 4). Encourage frequent position changes and teach the patient appropriate deep breathing technique. 5). Routinely check the patient’s position so he/she does not slide down in bed.</td>
<td>4). Promotes optimal chest expansion and to facilitate adequate air. (Gulanick, et al)</td>
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<td>Weight : 52 kg (pre-illness) 58 kg (during hospitalization)</td>
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<td>6). Pace activities and schedule rest periods</td>
<td>5). Causing the abdomen to compress the diaphragm, which would cause respiratory embarrassment (Gulanick, et al)</td>
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<td></td>
<td>Dyspnea</td>
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<td>7). Anticipate need for</td>
<td>6). To prevent fatigue. Even simple activities (such as bathing) during bed rest can cause fatigue and increase oxygen consumption (Gulanick, et al)</td>
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<td>Weakness</td>
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<td>Restlessness</td>
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<td>Easy fatigue</td>
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<td>Pallor</td>
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<td>Dizziness</td>
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<td>Confusion</td>
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<td>Irritability</td>
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intubation and mechanical ventilation if patient is unable to maintain adequate gas exchange.
8). Explain the need to restrict and pace activities. Promote calm/restful environment.
9). Provide psychological support, active listen questions/concerns.

oxygen. (Gulanick, et al)
8). To decrease oxygen consumption during acute episodes. (Gulanick, et al)
9). To reduce anxiety. (Doenges, et al.)
### NURSING CARE PLAN

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<td>Subjective:</td>
<td>Sleep pattern disturbance related to urinary frequency as evidenced by complaints of not feeling rested, early morning awakening, restlessness, fatigue, irritability, weakness, sleep problems and distressed.</td>
<td>The client is unable to sleep she frequently urge to empty urinary bladder. Thus, her sleeping pattern is disrupted (Klopp).</td>
<td>After 8 hours of health teaching regarding on proper management of sleeping problems the patient will be able to increase the sleeping hours from 4hours to at least 8 hours a day.</td>
<td>Independent 1). Create an environment of trust by listening to concerns, being available</td>
<td>1). Rapport of respect need to be established before the patient will be willing to take part in the learning process. (Doenges, et.al) 2). Helps determine the kind of interventions required. (Gulanick, et.al)</td>
<td>Goals partially met. Patient's sleeping pattern increased from 4 hours to 6 hours a day after 8 hours of health teaching regarding on proper management of sleeping problems.</td>
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7). Discourage pattern of daytime naps unless deemed necessary or part of usual pattern.

8). Provide nursing aids (e.g. backrub, bedtime care, comfortable position, relaxation techniques)

7). Napping can disrupt normal sleep pattern. (Gulanick, et.al)

8). To promote rest, relaxation. (Gulanick, et.al)
PROGNOSIS

Our patient has a bad prognosis, she did not respond to medication and treatment. Our patient died because of many complications that had occurred and failed to response such given medication.
HEALTH TEACHING

1). Keep blood glucose levels as close to normal as possible. The American Diabetes Association recommends that you keep your blood sugar levels at:
- 90 mg/dL to 130 mg/dL before meals
- 110 mg/dL to 150 mg/dL at bedtime.
- Less than 180 mg/dL 1 to 2 hours after meals.

Three keys to success in monitoring your blood sugar anywhere are:
- Keeping your meter and supplies with you at all times so that you always have them when you need them.
- Making it a habit to check your blood sugar level by building it into your routine.
- Checking your blood sugar meter's accuracy when you visit your doctor by comparing your results with your doctor's results.

2). Have yearly testing for protein in urine.

3). Maintain blood pressure at less than 130/80 mm Hg with medicine, diet, and exercise. Learn to check blood pressure at home.

How to take your blood pressure at home:
- You should not eat, use tobacco products, use medicines known to raise blood pressure (such as certain nasal decongestant sprays), or exercise (for at least 30 minutes) before taking your blood pressure.
- Avoid taking your blood pressure if you are nervous or upset. Rest at least 15 minutes before taking a reading.
- When you first obtain a blood pressure device, check its accuracy by comparing readings from it with readings obtained by a doctor or nurse taken in the doctor's office. Ask your doctor or nurse to observe your technique to make sure that you are using the device correctly and that it works right. It is a good idea to have your device checked every year.
- The size and position of the blood pressure cuff can greatly affect the accuracy of blood pressure readings. If the cuff is too small or too large, the blood pressure results will be inaccurate. As a general rule, the inflatable part of the cuff needs to be at least as long as the widest measurement around your upper arm.
Take your blood pressure while you are seated in a comfortable, relaxed position. Try not to move or talk while you are measuring your blood pressure. Be aware that the blood pressure readings may be 10 to 20 mm Hg different between your right arm and your left arm. For this reason, you may want to use the same arm for every reading.

Record your blood pressure reading.

4). **Maintain a healthy weight.** This can help prevent other diseases, such as high blood pressure and heart disease.

5). **Follow the nutrition guidelines for hypertension** (including the Dietary Approaches to Stop Hypertension, or DASH, diet).

**Key points:**

- Eating fewer processed foods, such as snack items, luncheon meats, and canned soups, will reduce the amount of sodium in your diet and help you lower your blood pressure.
- A diet high in calcium, potassium, and magnesium may lower your blood pressure.
- A diet high in sodium may cause high blood pressure.
- To increase the potassium in your diet, fruits and vegetables are excellent sources of this nutrient. Dairy products are high in calcium and magnesium. DASH recommends that you eat 8 to 10 servings of fruits and vegetables and 3 servings of low-fat dairy products each day.
- Eating a diet low in both saturated fat and total fat will also help lower your blood pressure. Only 30% of your total calories should be from fat, with only 7% to 10% of your fat calories from saturated fat. Saturated fat is found in meats, cheeses, butter, poultry, snack foods, and other processed foods.

In general, vegetarian diets reduce blood pressure. The DASH diet could easily be a vegetarian diet if legumes were substituted for meat. Vegetarian diets tend to be higher in potassium, magnesium, and calcium, as is the DASH diet. Vegetarian diets also are higher in fiber and unsaturated fat than other diets.

6). Do not smoke or use other tobacco products.
7). Avoid dehydration by promptly treating other conditions—such as diarrhea, vomiting, or fever—that can cause it. Be especially careful during hot weather or when exercising.

8). Treat other conditions that may block the normal flow of urine out of the kidneys, such as kidney stones, an enlarged prostate, or bladder problems.

9). Avoid the use of medicines that may be harmful to our kidneys, especially nonsteroidal anti-inflammatory drugs (NSAIDs). Be sure that your health professional knows about all prescription, nonprescription, and herbal medicines you are taking.

10). Avoid X-ray tests that require IV contrast material, such as angiograms, intravenous pyelography (IVP), and some CT scans. IV contrast can cause further kidney damage. If you do need to have these types of tests, make sure your health professional knows that you have diabetic nephropathy.

11). Avoid situations where you risk losing large amounts of blood, such as unnecessary surgeries. Do not donate blood or plasma.