

**NURSING CASE STUDY**

{Name of Writer}

{Name of Institute}

{Date}

## ***INTRODUCTION***

This is Nurse (your name) and I would like to present a report on one of my patient Mr Brian May, born on 10/Nov/1960 and 62 years of age. He was admitted to the emergency department earlier today following a motor vehicle accident and it is suspected that he experienced a medical event that caused him to lose control of his car. He informed the ambulance service and hospital staff that he was not taking his medicine as directed, which was causing his type 2 diabetes mellitus to become unstable. He was diagnosed previously as Hypercholesterolaemia, Depression and Hypertension. He smokes Current 25 cigarettes and 50 g ethanol daily and gained 15 kg weight in 3 months. His currently prescribed medications include: Atenolol (100mg bd), Atorvastatin (80mg daily) and Metformin (500 mg bd).

In the accident, Mr May sustained following injuries: Left pneumothorax and blunt chest injuries, Fracture left fibula and Left sided laceration of his forehead. Thus, Plaster on fractures, analgesia for pain reliefs, oxygen therapies, admission to PCR and COVID-19 testing were recommended. After nursing handover, the registered nurse reported that he had a restless night, slept for short periods only and at times was disorientated. This report includes the person's present clinical presentation, nursing management and inter-professional plan of care.

(Governance, New and Health, 2019)

## ***PRIMARY ADMISSION***

The person was admitted to the hospital following an accident in which he has injuries. The pathophysiology of the sustained injuries is described below:

### **PATHOPHYSIOLOGY OF BLUNT CHEST INJURY:**

Imbalances in the flow of blood, air, or both in combination are the main pathophysiology associated with blunt chest injuries. Chest-wall injuries are frequently caused by blunt trauma which is in this case. (Medscape.com, 2019)

### **PATHOPHYSIOLOGY OF LEFT PNEUMOTHORAX:**

A pneumothorax causes a shift in the pressure gradient within the thorax. When compared to air pressure, the pleural space normally has a lower pressure. Due to surface tension between the parietal and visceral pleurae, when the chest wall opens up, the lung likewise opens up. Due to elastic recoil, lungs frequently collapse. The gradient changes, lung collapse unit equilibrium is reached, or the rupture is sealed when there is connectivity between the pleural space and the alveoli. Due to this essential capacity, the lung shrinks, the pneumothorax grows, and the partial pressure of oxygen lowers. (McKnight and Burns, 2019)

### **PATHOPHYSIOLOGY OF FRACTURE:**

Patients with complex diabetes have been found to have a higher risk of surgical complications. (Gougoulis et al., 2020)

### **PATHOPHYSIOLOGY OF HEAD INJURY**

Despite significant fluctuations in systemic blood pressure, the non-damaged brain's cerebrovascular autoregulatory mechanisms maintain a consistent cerebral blood flow. The emergence of plateau waves in the presence of intact autoregulation serves as an illustration of the relationship between systemic blood pressure and ICP. (Steiner and Andrews, 2006)

### **CLINICAL MANIFESTATIONS OF PATHOLOGIES:**

The clinical manifestation of pathologies in patient patient are following:

- 1) B.P = 170/90 which is higher than the normal range which is 120/80 which means imbalances in blood pressure
- 2) Breath rate= 24 bpm which is higher than the normal range which is 20 bpm which means imbalances in air which is shortness of breath.
- 3) ABG results suggests that patient has acute respiratory acidosis occurs when the lungs can't remove enough of the carbon dioxide (CO<sub>2</sub>) that the body produces.

### ***NURSING PROBLEMS:***

From previous description of the pathophysiology and observed clinical manifestations, the two nursing problems that are to be prioritized for the person are:

- 1) **High blood pressure** which is due to previously diagnosed unstable hypertension along with chest injury that **can cause organ failure.**
- 2) **High breathing rate** which is due to COVID-19 along with lung pneumothorax that caused acute respiratory acidosis and may **lead to respiratory failure.**

### **JUSTIFICATION FOR FIRST PROBLEM:**

Uncontrolled blood pressure (BPs) can appear in a variety of clinical ways, and these situations are referred to as hypertensive emergencies. In these circumstances, the BP should be aggressively decreased over a period of minutes to hours otherwise it can lead to end organ dysfunction. (Medscape.com, 2019)

By making your arteries less elastic, high blood pressure can harm them, which reduces the flow of blood and oxygen to your heart and increases the risk of heart disease. Additionally, reduced blood supply to the heart can result in: angina, or chest pain. (CDC, 2021)

If left untreated, high blood pressure can cause heart failure, kidney failure, blood vessel damage, and stroke. (RNpedia, 2015)

### **JUSTIFICATION FOR SECOND PROBLEM**

Numerous neurological symptoms are caused by acute respiratory acidosis. The diagnosis of primary respiratory acidosis is made based on the presence of an acid pH and an increased PCO<sub>2</sub> (>45 mmHg). A headache, agitation, and anxiety are symptoms. These may intensify into delirium, somnolence, and tremors. (www.sciencedirect.com, n.d.)

The definition of acute respiratory acidosis is the abrupt entry of CO<sub>2</sub> into the lungs. The reasons of acute respiratory acidosis are more obvious and possibly alarming because it occurs suddenly. Acute respiratory acidosis has immediate repercussions, and the kidney responds to it within minutes. (Brennan, 2021)

Poor organ function, respiratory malfunction and shock are the potential complications of acidosis. (medlineplus.gov, n.d.)

### ***NURSING MANAGEMENT:***

#### **PROBLEM 1: HIGH BLOOD PRESSURE**

<b>NURSING ASSESSMENT</b>	<b>RATIONALE</b>
Make the distinction between a hypertensive emergency and a hypertensive urgency.	Blood pressure > 179/109 mmHg without symptoms of organ damage is considered hypertensive urgency. A hypertensive emergency is defined as a blood pressure over 179/109 with organ damage symptoms (i.e.

	elevated BUN and creatinine). Both of them are categorised as "hypertensive crises."
<b>NURSING INTERVENTION</b>	<b>RATIONALE</b>
To get to the desired range, titrate antihypertensives.	In the first hour or two, the blood pressure should be lowered by 20-25%, and in the next two to six hours, it should be at 160/100 mmHg. Unhealthy renal, cerebral, or coronary blood flow might result from abruptly lowering blood pressure.

(Goyal, Zeltser and Gunn, 2021)

- **Complete Nursing Plan For Problem 1**

<b>NURSING CARE</b>	<b>RATIONALE</b>
Create an atmosphere that is peaceful and quiet, and reduce environmental activity and noise. Limit the number of guests and the duration of their stay.	It assists in reducing sympathetic activity and encourages relaxation.

<p>Maintain activity limitations (bedrest or chair rest); plan continuous rest intervals; and, when necessary, help the patient with self-care tasks.</p>	<p>Reduces physical tension and stress, which have an impact on blood pressure and the development of hypertension.</p>
<p>Offer consolation options (back and neck massage, the elevation of head).</p>	<p>Lessens pain and conceivably lessens sympathetic stimulation.</p>
<p>Teach distraction strategies, guided imagery, and relaxation techniques.</p>	<p>Can lessen stressful stimuli, provide a soothing effect, and lower blood pressure.</p>
<p>Administer medications as indicated</p>	<ul style="list-style-type: none"> <li>•Nifedipine (Procardia), verapamil (Calan), diltiazem (Cardizem), amlodipine (Norvasc), isradipine (DynaCirc), and nicardipine are calcium channel antagonists (Cardene).</li> </ul> <p>When a diuretic and a sympathetic inhibitor are combined, it may be necessary to treat severe hypertension if the blood pressure cannot be controlled. Vasodilator therapy's further advantages include dilating the healthy heart vasculature and boosting coronary blood flow.</p>

• Guanadrel (Hylorel), guanethidine (Ismelin), and reserpine are adrenergic neurone blockers (Serpalan).

Reduce the sympathetic nerve endings' activity that causes venous and arterial constriction.

• Direct-acting oral vasodilators include minoxidil and hydralazine (Apresoline) (Loniten).

By relaxing the vascular smooth muscle, vascular resistance is decreased.

• Direct-acting parenteral vasodilators include labetalol, nitroprusside, and diazoxide (Hyperstat, Nitropress) (Normodyne).

They are administered intravenously to treat hypertensive crises.

• Angiotensin-converting enzyme (ACE) inhibitors include lisinopril (Zestril), fosinopril (Monopril), captopril (Capoten), enalapril (Vasotec), and ramipril (Altace).

Angiotensin II blockers include guanethidine and valsartan (Diovan) (Ismelin).



<p>Track how well blood pressure medicines are working.</p>	<p>When other methods have failed to control blood pressure, or when congestive heart failure (CHF) or diabetes are present, the administration of an extra sympathetic inhibitor may be necessary for its cumulative impact.</p> <p>The effectiveness of medication therapy, which typically entails a combination of beta and calcium channel blockers, diuretics, ACE inhibitors, vascular smooth muscle relaxants, and other pharmaceuticals, depends on the patient as well as the interactions between the drugs. The least amount and lowest dosage of drugs should be used due to side effects, drug interactions, and the patient's motivation for taking antihypertensive medication.</p>
<p>Adhere to the recommended dietary sodium, fat, and cholesterol limitations.</p>	<p>These limitations can lessen myocardial workload by managing fluid retention and the hypertensive response that goes along with it.</p>

(Vera, 2018), (Tollefson and Hillman, 2018), (Berman et.al, 2021), (Bullock et. al, 2020), (Bickley et. al,2020), (Berman et. al, 2021)

## PROBLEM 2: HIGH BREATH RATE

<b>NURSING ASSESSMENT</b>	<b>RATIONALE</b>
Keep an eye on your breathing depth, pace, and exertion.	Respiratory distress or failure can be brought on by alveolar hypoventilation and its corresponding hypoxemia and corona.
<b>NURSING INTERVENTION</b>	<b>RATIONALE</b>
Help the doctor start the patient's intubation and mechanical ventilation.	To provide appropriate ventilation and oxygenation while allowing the lungs to recover in order to retain an adequate supply of oxygen.

(Nurseslabs, 2019)

- **COMPLETE NURSING CARE PLAN FOR HIGH BREATH RATE:**

<b>NURSING CARE</b>	<b>RATIONALE</b>
Encourage and help with coughing, turning, and deep breathing exercises. Suction as required. As needed, give an adjunct to the airway. Put patient in a semi-Fowler pose.	These actions enhance lung airflow and lessen or eliminate airway blockage brought on by mucus buildup.
Limit the usage of tranquilizers or hypnotic sedatives.	The development of respiratory depression and CO <sub>2</sub> narcosis is possible when there is hypoventilation.
When the source of a chronic ailment is known, talk about the best self-care techniques and remedies.	Encourages treatment regimen participation and may lower disorder recurrence.
Aid in locating or treating the underlying cause.	The goal of treating the disease is to increase alveolar ventilation. Correction of the acid-base problem is facilitated by treating the underlying ailment (oversedation, lung and respiratory system injury, pulmonary edoema, aspiration).
Follow and graph serial measurements of ABG, pulse oximetry, Hb, and serum electrolyte values.	Evaluates the effectiveness and need for therapy. It should be noted that bedside pulse oximetry monitoring can detect early changes in oxygenation

	before additional symptoms or indicators become apparent.
Provide oxygen as needed. If a ventilator is being utilised, increase the tidal volume or breathing rate.	Prevents and treats respiratory collapse and hypoxia. Use with caution if you have emphysema because it could cause respiratory depression or failure.
IPPB and bronchodilators work together to assist with ventilatory assistance. observe the peak flow pressure.	Opens airways and expands the lung to promote ventilation and prevent respiratory failure.
Keep the patient hydrated (IV/PO) and give them humidification.  Provide the proper chest physical therapy, which should include breathing exercises and postural drainage.	Helps to reduce acidity and to thin and mobilise respiratory secretions.  Helps to remove excess CO <sub>2</sub> by eliminating secretions, which enhances ventilation.
Give IV treatments such lactated Ringer's solution or sodium lactate solution 0.6 M.	May be helpful to reduce acidosis in non-emergency circumstances, until the resolution of the underlying respiratory issue.
Give drugs as directed:	

Naloxone hydrochloride (Narcan)	In cases of drug overdose, sedation, or acidosis brought on by cardiac arrest, it may be helpful to awaken the patient and stimulate respiratory function.
Sodium bicarbonate (NaHCO <sub>3</sub> )	If the pH is below 7.25 and hyperkalemia is present, it is possible to administer modest IV dosages to swiftly reverse acidosis. Note: Tetany or rebound alkalosis could happen.
Potassium chloride (KCl)	Replaces the potassium that cells lose when they become acidic. As potassium moves back into the cells once the acidosis is corrected, a relative serum hypokalemia may result. A potassium imbalance can lead to heart dysrhythmias, widespread muscle weakness, or impaired neuromuscular or respiratory function.
Bronchodilators	Aids in releasing restricted airways to enhance gas exchange.
If necessary, give Pulmocare feedings, a low-carb, high-fat diet.	Enhances respiratory muscle function, metabolic equilibrium, and CO <sub>2</sub> reduction

(NurseStudy.Net, 2021), (Vera, 2014), (Tollefson and Hillman, 2018), (Berman et.al, 2021), (Bullock et. al, 2020), (Bickley et. al,2020), (Berman et. al, 2021)

### ***DISCHARGE PLANNING:***

Considering the situation of the person that tells he is a smoker, a drinker, recently put on weight and non-compliant to his medications the following discharge plan is recommended:

- Get familiar with taking your own blood pressure. Keep track of your outcomes. Find out from your healthcare professional whether numbers indicate you require medical attention.
- Follow the instructions on your blood pressure medication exactly. Never miss a dosage. Missing doses can result in dangerously high blood pressure.
- Find out what to do if you miss a dose from your healthcare practitioner.
- Avoid using medications with cardiac stimulants. Over-the-counter medications are included in this. Verify the label for any high blood pressure cautions. Before purchasing a medication you haven't used before, consult the pharmacist.
- Before using a decongestant, consult your doctor. This comprises medications whose labels list phenylephrine or pseudoephedrine. In case you are uncertain, ask the pharmacist. These could be a factor in high blood pressure.
- Reduce salt intake. Limit canned, dried, packaged, and quick foods to achieve this.
  - Avoid seasoning your food with salt at the table.
  - When seasoning meals, use herbs rather than salt.
  - Request no additional salt when dining out.

- Keep your daily sodium intake to 1,500 mg. By reducing your daily sodium intake to just 2,300 mg, you can change your life for the better. To find out how much salt is in each food, read the label.
- ✚ Adhere to the Dietary Approaches to Stop Hypertension. The diet suggested by this strategy promotes good blood pressure. Vegetables, fruits, whole grains, and other nutritious foods are part of the diet.
- ✚ Eat potassium-rich foods.
- ✚ Start an exercise regimen. Before you begin, have a conversation with your healthcare professional. To reduce blood pressure, work up to aerobic exercise 3 to 4 times per week for an average of 40 minutes at a time. Even easy exercises can lower blood pressure. These include gardening and walking.
- ✚ Work to stop smoking if you do. Join a programme to quit smoking. This will raise your likelihood of success. Inquire with your doctor about medications and services that can help you quit smoking.
- ✚ Keep your caffeine intake to two drinks per day. This covers beverages like cola, black or green tea, and coffee.
- ✚ Avoid using stimulants like cocaine or amphetamines. When used by someone with high blood pressure, these medications can be fatal.
- ✚ Make an effort to relax. You can pick up stress-reduction techniques.
- ✚ Drink alcohol in moderation. For women, this implies no more than one drink per day, and for men, no more than two.
- ✚ Schedule a follow-up visit as instructed.
- ✚ If you experience any of these, get in touch with your physician straight away:

- Light headache
- Extreme sleepiness
- Lightheadedness or dizziness
- Rushing or pulsating noises in your ears
- A home blood pressure reading of more than 180/110; an unexplained nosebleed;

✚ Immediately dial 911 if any of the following symptoms appear:

- Shortness of breath or chest pain; • Severe headache
- Numbness, tingling, or weakness in your arms, legs, or face (especially on 1 side of the body)
- Confusion, difficulty speaking or understanding words; a change in eyesight.

(demo.staywellhealthlibrary.com, n.d.)

## ***CONCLUSION:***

This report includes the person's present clinical presentation, nursing management and inter-professional plan of care who was brought to the hospital following an accident due to his unstable diabetes malitus 2. The sustained injuries which lead him to blood and air imbalances with chest tightness and restlessness. The imbalance of blood and air and lower levels of oxygen can become worse in a patient already diagnosed with type two hypertension because it may lead to organ failure or respiratory failures therefore, it was necessary to maintain the blood and air levels. To maintain blood level it is necessary to control the blood pressure through titrating anti-hypertensives. Complete nursing plan for maintaining blood pressure was described in the report. Similarly, to maintain air level it is necessary to initiate the intubation until the lungs get healed because the patient was also diagnosed with corona virus. Complete nursing plan for maintaining



air level is described in the report. After the successful management of the nursing problem in the patient, the report suggest the discharge plan visualizing the person's past and present medical history. The person is a smoker, drinks alcohol and is also non complaint to his medicines of diabetes therefore, the discharge plan is made considering these factors.

## ***REFERENCES:***

Alley, W.D. and Schick, M.A. (2022). Hypertensive Emergency. PubMed.

Anesthesiology, [online] 29(4), pp.382–387. doi:10.1097/ana.0000000000000370.

Berman, A, Snyder, SJ, Levett-Jones, T, Burston, A, Dwyer, T, Hales, M... & Stanley, D 2021, *Kozier and Erb's Fundamentals of Nursing: Concepts, Process and Practice*, 5th Australian edition, Pearson Australia, Melbourne, Victoria.

Bickley, L, Szilagyi, P, Hoffman, R & Soriano, R 2021, *Bates' guide to physical examination and history taking*, 13th edition, Wolters Kluwer, Philadelphia.

Brennan, D. (2021). What Is Respiratory Acidosis? [online] WebMD. Available at: <https://www.webmd.com/lung/what-is-respiratory-acidosis>.

Bullock, I, Clark, JM & Rycroft-Malone, J 2020, *Adult nursing practice: using evidence in care*, Oxford University Press, Oxford.

CDC (2021). About High Blood Pressure (Hypertension). [online] Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/bloodpressure/about.htm>.

demo.staywellhealthlibrary.com. (n.d.). Discharge Instructions for High Blood Pressure (Hypertension). [online] Available at: <https://demo.staywellhealthlibrary.com/Content/healthsheets-v1/discharge-instructions-for-high-blood-pressure-hypertension/> [Accessed 31 Aug. 2022].

Gougoulas, N., Oshba, H., Dimitroulias, A., Sakellariou, A. and Wee, A. (2020). Ankle fractures in diabetic patients. *EFORT open reviews*, [online] 5(8), pp.457–463. doi:10.1302/2058-5241.5.200025.

Governance, C., New, H. and Health, E. (2019). Section 1: Introduction to ISBAR Project toolkit. [online] Available at: <https://www.safetyandquality.gov.au/sites/default/files/migrated/ISBAR-toolkit.pdf>.

Krishnamoorthy, V., Chaikittisilpa, N., Kiatchai, T. and Vavilala, M. (2017). Hypertension After Severe Traumatic Brain Injury. *Journal of Neurosurgical*

McKnight, C.L. and Burns, B. (2019). Pneumothorax. [online] Nih.gov. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK441885/>.

medlineplus.gov. (n.d.). Respiratory acidosis: MedlinePlus Medical Encyclopedia. [online] Available at: <https://medlineplus.gov/ency/article/000092.htm#:~:text=Complications%20that%20may%20result%20>

Medscape.com. (2019). Blunt Chest Trauma: Background, Anatomy, Pathophysiology. [online] Available at: <https://emedicine.medscape.com/article/428723-overview>.

Medscape.com. (2019). Hypertensive Emergencies: Uncontrolled Blood Pressure, Management of Hypertensive Emergencies. [online] Available at: <https://emedicine.medscape.com/article/1952052-overview>.

Nurseslabs. (2019). 1,000+ Nursing Care Plans: The Ultimate Guide and Database for Free. [online] Available at: <https://nurseslabs.com/nursing-care-plans/#respiratory>.

NurseStudy.net. (2021). Impaired Gas Exchange Nursing Diagnosis and Nursing Care Plans. [online] Available at: <https://nursestudy.net/impaired-gas-exchange-nursing-diagnosis/>.

Steiner, L.A. and Andrews, P.J.D. (2006). Monitoring the injured brain: ICP and CBF. *British Journal of Anaesthesia*, 97(1), pp.26–38. doi:10.1093/bja/ael110.

Tollefson, J. and Hillman, E. (2018). *Clinical Psychomotor Skills: Assessment Tools for Nurses*. 7th ed. South Melbourne, Victoria, Australia: Cengage Learning Australia.

Vera, M. (2014). Respiratory Acidosis Nursing Care Plan. [online] Nurseslabs. Available at: <https://nurseslabs.com/respiratory-acidosis-nursing-care-plan/>.

Vera, M. (2018). 6 Hypertension Nursing Care Plans. [online] Nurseslabs. Available at: <https://nurseslabs.com/hypertension-nursing-care-plans/>.

www.sciencedirect.com. (n.d.). Respiratory Acidosis - an overview | ScienceDirect Topics. [online] Available at: <https://www.sciencedirect.com/topics/medicine-and-dentistry/respiratory-acidosis>.