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# Description of Recovery Time in ASA I and ASA II General Anesthesia Patients

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***Abstract*—Patients who use fast acting general anaesthetic agents generally must be able to recovery in 30 until 60 after general anaesthetic action and surgery. Delayed recovery from general anaesthesia caused by many factors. Delayed emergence from anaesthesia remains a major cause of concern both for anaesthesiologist and surgeon. Ideally, on completion of surgery and anaesthesia, the patient should be awake or easily arousable, protecting the airway, maintaining adequate ventilation and with their pain under control. The time taken to emerge to fully consciousness is affected by patient factors, anaesthetic factors, duration of surgery and pain stimulation. The principal factor for delayed awakening from anaesthesia assumed to be the medications and anaesthetic agents used in the perioperative period. Delayed emergence from anaesthesia caused by many factors and the use of anaesthesia agents not always be the main cause. Recovery time affected by patient condition, problem in surgery and anaesthesia, and the factor from anaesthesia agents. The purpose of this research is to find how the description of general anaesthesia patient with ASA I and ASA II recovery time in recovery room. This is a descriptive retrospective study that used data from medical records from January to December 2016 as many as 40 patients. The results obtained are of 40 patient, 34 patient (87,5%) recover from anaesthesia in 30 minutes and 6 patient (15 %) that recover from anaesthesia in more than 30 minutes. Patients with recovery time more than 30 minutes consist of 2 patients (5%) with ASA I, and 4 patients (10) with ASA II. The result illustrate that patient with ASA I can recover faster than patient with ASA II, and delayed recovery time didn't happens to patient with ASA I and ASA II in Dustira Hospital Cimahi.**

***Keywords—recovery time, general anaesthesia, risk factor***

## I. INTRODUCTION

### *A. Background of the Problem*

Evaluation before anaesthesia is the first step in a series of anaesthesia procedures performed on patients who are planning to undergo surgery. The pre-anaesthesia evaluation is carried out before the patient undergoes surgery. In the case of elective surgery, the evaluation before anaesthesia is carried out several days before the operation. Then re-evaluation is done the day before the operation, then re-evaluation is done again in the morning before the patient is sent to the operating room and the final evaluation is carried out in the preparation room of the central surgical installation to determine the physical status of ASA *(American Society of Anaesthesiology).* ASA assessment itself is divided into 5 categories assessed from the risk of comorbidities that become weighted during surgery or anaesthesia [1].

It is imperative that an assessment of physical status prior to anaesthesia be carried out by a doctor who works in the recovery room of a central surgical installation. The anaesthetic action itself is not differentiated based on the size or size of surgery on the patient. The consideration of anaesthetic techniques that will be given to patients undergoing surgical procedures is very complex and comprehensive considering that all types of anaesthesia that will be given have risk factors for complications that can be life-threatening to the patient, especially in general anaesthesia [2].

Recovery from general anaesthesia can be defined as a condition in the body when neuromuscular conduction, airway protective reflexes and consciousness have returned after stopping the anaesthetic drug administration and the surgical process has been completed. Recovery of ASA I and ASA II patients is said to be delayed if within 30 to 60 minutes after the anaesthetic drug administration is stopped the patient is still not fully conscious [3]. The main cause of delayed recovery is the lingering effect of the anaesthetics [4].

In a study conducted by Endah Permatasari, dr., SpAn. From the Department of Anaesthesiology and Intensive Therapy, Tangerang District General Hospital. In 2013, 26 ASA I and ASA II patients were able to recover on average in 53 to 55 minutes. According to theory, patients with ASA II will recover longer than patients with ASA I. Age, weight, type of operation, length of operation, and type of anaesthesia given play an important role if there is a prolonged or shortened recovery time in the patient.

Dustira Hospital is a health service unit that serves service patients who are active and retired members of the Indonesian national army and many members of the community in Cimahi City. Every year it carries out many surgeries. In this hospital

there has never been a study on various risk factors related to recovery time. Based on this, the researchers are interested in conducting research on the description of the recovery time of patients with ASA I and ASA II Dustira Cimahi Hospital.

## II. Literature Review

### A. Evaluation Before Anaesthesia Action

The pre-anaesthesia evaluation is the first monitoring measure documented as the initial assessment of the patient who is going to undergo surgery, this is done to avoid the occurrence of complication due to surgery. Time of surgery, patient name, surgery plan, name of surgeon, patient's family, anaesthetist, patient's residence, treatment room and bed number, weight, height and vital signs before surgery must be documented in the pre-anaesthetic evaluation. Physical status before anaesthesia is one of the factors that influence the return of vital functions of the patient, such as before undergoing surgery and anaesthesia after the termination of anaesthesia itself, in addition to other factors that play a role in influencing the patient's recovery time [1,2,5].

Collecting a medical history is the first and often the most important part of doctor-patient interactions. The medical staff collects a lot of data on which to base the diagnosis, learns about the patient as a human being and how the patient has experienced symptoms and illnesses, and begins to develop a trusting relationship. In brief, the classification of physical status before anaesthesia according to the *American Society of Anaesthesiologists* is, ASA I is a patient with surgical disease without systemic disease, ASA II is a surgical disease patient accompanied by mild to moderate systemic disease, ASA III is a surgical disease patient accompanied by severe systemic disease which is caused due to various causes but is not life-threatening, ASA IV is a patient with a surgical disease accompanied by severe systemic disease that is directly threatening his life, ASA V is a patient with a surgical disease accompanied by severe systemic disease that is no longer possible, operated on or not as long as 24 hours the patient will die. If the surgery is done on an emergency basis. It is marked with an "E" *(emergency)* behind the numbers, for example ASA 1 E [2,5,6].

### B. Visits Before Surgery

The preoperative visit should be done one day before the operation. If there is any doubt about the decision to proceed with surgery, the anaesthetist should be able to see the patient early, to avoid unnecessary delays and anxiety. During the preoperative visit, anaesthetic planning was carried out which included premedication, determination of the type of anaesthesia, maintenance during surgery, and postoperative arrangements [5,6].

### C. Types of Anaesthesia

*1) General anaesthesia:* General anaesthesia is an anaesthetic procedure that is reversible, in which the patient will lose consciousness due to blocked nerve impulses in the brain. As a result of administering anaesthetics to the central nervous system, the patient will experience loss of pain stimuli, inability to remember, loss of consciousness, and loss of muscle tone and reflexes [7,8].

General anaesthesia is indicated if the patient underwent surgery on the head, neck, large abdomen, and in patients who are not cooperative. General anaesthesia can be done by injection of drugs or by inhalation. Complications that can occur due to general anaesthesia include malignant hyperthermia, overdose, hypoventilation, and complications from anaesthesia and intubation [7].

There are 2 types of inhalation anaesthetics, namely gases and volatile liquids. For gas preparations, one of them is $N^2O$ gas, which is colourless, odourless, and non-irritating. Examples of volatile liquid preparations are halothane, enflurane, isoflurane, desflurane, sevoflurane. Types of injection anaesthetics include barbiturates (Sodium Penthothal), ketamine (Ketalar), propovol (Diprivan). As for several types of additional drugs such as hypnotics (Ativan, Valium, Benzodiazepine), opioid analgesics (Morphin, Meperidine, Fentanyl, Sefentanil), neuromuscular blocking agents (Pavulon, Norcuron, Atracurium) [8,9].

*2) Local or regional anaesthesia:* Is a technique of inserting anaesthetic drugs through topical and local infiltration. Topical anaesthesia is performed by applying anaesthetic directly to the surface to be operated on, while infiltration anaesthesia is by injecting an anaesthetic drug intracutaneously or subcutaneously around the tissue to be operated on [7,8,10].

Regional anaesthesia is a form of local anaesthesia. Regional anaesthesia is indicated if there are contraindications to general anaesthesia, there is a history of allergy to general anaesthetics, and according to the patient's preference if possible. Types of regional anaesthesia include block of the area to be operated on, nerve block, spinal anaesthesia, and epidural anaesthesia. Complications of local or regional anaesthesia are anaphylactic reactions, and an unsuitable administration technique. Absorption that occurs systemically can result in cardiovascular depression, blurred vision, decreased consciousness, incoherent speech, headaches, nausea, vomiting, tremors, seizures, increased pulse, increased respiration, overdose, hypnosis [8,10].

### D. Concomitant Diseases

Concomitant diseases or underlying diseases are diseases that often cause problems during surgery or anaesthesia. The role of a specialist who is called for consultation is not to provide a prognosis or other opinion regarding anaesthesia, but rather to ensure that the patient is in a state of capability for anaesthesia and surgery and that there is no indication for other therapy. Patients undergoing elective surgery and anaesthesia need attention for previous medical history. Some of the diseases that complicate the operation are ischemic heart disease, heart failure, hypertension, congenital heart disease,

respiratory system disorders, diabetes mellitus, liver disease, and anaemia [8,11].

Ischemic heart disease is a disease that can cause problems during surgical operations. Patients with ischemic heart disease are at great risk for complications during anaesthesia and surgery. Patients with ischemic heart disease the cardiac functional reserve is reduced to below normal levels for the age of the patient. If there are symptoms of heart disease, electrocardiography and chest X-ray should be taken. This examination is performed for all patients over 40 years of age, even if there are no symptoms of heart disease [8,10,11].

Patients with heart failure are unable to increase cardiac output in response to metabolic requirements, poor organ perfusion, including the heart muscle. Heart failure patients are more prone to venous thrombosis [8]. Inhalation gas and vapor uptake is inhibited due to heart failure. Surgeries other than those necessary to save lives, should not be performed in patients with untreated heart failure [8,11].

Respiratory system abnormalities can affect the patient's recovery after surgery. Airway and lung abnormalities affect oxygenation, elimination of carbon dioxide, uptake of inhaled gases and can increase the risk of respiratory tract infections after surgery [8]. Severe, life-threatening bronchospasm occasionally occurs in asthmatic patients or nicotine addicts, but in general, respiratory tract disorders do not significantly interfere with the administration of anaesthesia [8,10].

Chronic respiratory disease can affect anaesthesia when given. It includes a number of specific disease processes that have the same functional effect. Patients with chronic bronchitis, emphysema, pneumoconiosis or asthma are often found in surgical wards. A chest X-ray should be taken to establish the baseline for any patient showing symptoms and signs of respiratory distress, and possibly all other patients over 40 years of age to rule out lung disease [8].

Metabolic disorders such as diabetes mellitus can affect the patient's recovery process. This situation is handled appropriately by a team of physicians specializes in the management of diabetic patients. Operations on diabetic patients can be performed safely as long as some simple preparations are agreed upon. Anaesthesia in normal patients can cause an increase in blood sugar usually less than 5 mmol / litter, which is caused by reduced insulin levels and increased blood circulation catecholamines. Two important anaesthetics, ether and cycloprofan, can raise blood sugar, but halothane or narcotic anaesthetics supplemented with nitrogen oxides with muscle paralysis and regulated lung ventilation have no such effect [8,12,13].

Liver disease can affect recovery, especially in liver failure disease. It is said to have severe liver failure if there is already a disruption in drug metabolism, the amount of liver enzymes increases even though the mass of liver cells decreases so that metabolism is not affected at first [8]. Administration of analgesic and sedative drugs may have a long length of time working because metabolism by the brain is also affected when liver cells are damaged [8,11].

Anaesthesia in jaundiced patients has two real risks. The first is bleeding due to lack of prothrombin, as an initial action will be given vitamin K as prophylaxis. The second risk is renal failure, bilirubin which accumulates in the renal tubules and can cause renal failure if diuresis is not maintained. Mannitol is usually given during surgery to maintain urine flow, intravenous crystalloid infusion and furosemide are good alternatives [8,13].

### *E. Previous Anaesthesia History*

Many patients have had previous surgery and still remember the unpleasant effects of anaesthesia. Nausea and vomiting after surgery is usually not caused by anaesthetic drugs but is caused by a narcotic analgesic given together [14].

Headache is a common side effect which can be treated with mild analgesics. Headache symptoms often occur during anaesthesia by using halothane, because the effect of using halothane can increase cerebral blood flow [13,14].

A history of recovery from a previous procedure is an event that should be taken seriously. Special efforts to minimize the anxiety that will arise as a result of the patient's experience in previous surgery is very important. If the anaesthetic needs to be repeated for a short period of time, it is best to use a different anaesthetic at each occasion. There is an association between the onset of jaundice after surgery and repeated anaesthesia within 4 weeks with halothane. The cause of this complication is not fully known, but if severe liver failure occurs it can be fatal [15].

### *F. Factors that Influence Time Recovered*

*1) Aging process and function changes:* Circulatory system disorders are common in elderly patients. Circulatory system changes in elderly patients include decreased filling of the heart and blood vessels, and decreased autonomic response. The prolonged circulation time will inhibit the onset of the intravenous drug, but the induction of the drug with the inhalation agent will be faster. Circulatory system disorders in the form of heart failure, arrhythmias, and hypertension will affect patient recovery [15,16].

Decreased cognitive function and decreased consciousness after surgery are one of the sources that reduce morbidity. Although these two things have not been proven to be related to each other, they are different clinical syndromes. Postoperative complaints are impaired consciousness manifested by acute onset of symptoms, uncertainty in attention level and cognitive skills. There can be disorientation, impaired perception, regular thinking, and problems with memory due to decreased cognitive function. The appearance of delirium does not qualify as delirium after surgery. The risk of postoperative delirium after major surgery in older patients is about 10%, the risk varies according to the surgical procedure. The highest risk occ

urs is in surgery hips, with an estimated incidence of 35%. Some of the things that cause delirium are age, low basic cognitive function or dementia, depression, dehydration, and vision or hearing problems [16].

Old age is not a contra indication for anaesthesia. It is true that anaesthesia in old age often requires mechanical ventilation, tracheobronchial toilets, and more careful monitoring of vital sign function. Lack of ability of the organs of the circulatory system to compensate for vasodilation because anaesthesia causes hypotension and can affect the general postoperative state [16].

The general consideration for anaesthesia in elderly patients is the age factor, because there is usually a decrease in function and a decrease in body mass. In patients with old age there is often a decrease in the amount of body fluids, especially in intracellular spaces, and there is frequent disruption of body temperature regulation mechanisms [15-17].

Abnormalities in the muscles and skeleton also often make it difficult to perform surgery. Weakness in muscle and skeletal function, weak cheek cavity, mandibular atrophy and outdated teeth make it difficult to provide oxygen support through the facemask. The temporo-mandibular stiffness causes difficulty in performing the intubation. Osteoarthritis of the cervical spine can interfere with blood flow to the brain. Brittle skin requires caution when applying pressure to prevent damage to peripheral nerves [16].

Abnormalities in the circulatory system, especially blood cells, can enlarge the possibility of chronic dehydration and anaemia. Whereas in the central nervous system, cerebral atherosclerosis can worsen the degree of dementia. The dosage of both analgesic and anaesthetic drugs should be reduced for patients with central nervous system disorders [16].

The principle of anaesthesia in patients with old age is that only small doses of anaesthetic drugs are used because they can lead to impaired kidney function, impaired liver function, decreased total circulating blood volume, prolonged circulation time. Therefore, it is very important to provide distance after the injection of a small dose of drug is given to give the drug time to react. In addition, it is very important to have good access to the venous line for infusion. When administering anaesthesia for elderly patients it is important to provide anaesthetic supplements with oxygen, preventing hypotension, hypoxia and hypercarbia. Patient monitoring must be careful, especially should avoid hypothermia [16,18,19].

*2) Body weight and body mass index:* In obese patients there is an increase in oxygen consumption and an increase in carbon dioxide production, but the basal metabolic rate remains normal because it is related to body surface area. A decrease in the volume of expiratory reserve and a decrease in functional residual capacity occurs in the upright position of the patient so that the normal tidal volume is not fulfilled, this effect gets worse when the patient is in the supine position. In the end, there will be abnormalities in ventilation and perfusion, shunting from left to right, and hypoxemia. The elasticity of the thoracic wall is reduced in obesity, although the elasticity of the lungs is unchanged. Respiratory function, such as forced vital capacity, expiratory volume, and peak expiratory flow does not change in obesity. As body mass increases, the risk of hypoventilation syndrome increases. Hypoventilation syndrome is characterized by hypercapnia, sleep apnoea, hypersomnolence, and airway obstruction. Symptoms hypoventilation syndrome can progress to hypercarbia, hypoxia, hypersomnolence, hypertension, and biventricular failure [17,18].

Upper airway obstructive syndromes can be grouped into two categories, namely patients with *OSA* (*obstructive sleep apnoea*) and upper airway resistance. About 50% of obese patients have significant *OSA*. OSA was defined as 10 seconds or more of complete cessation of airflow within five or more hours of sleep despite persistent breathing attempts against closed glottis in combination with a decrease in arterial oxygenation of greater than 4%. The apnoea-hypo apnoea index shows the severity of OSA. An index of more than 30 means OSA, and an index of 16-30 means moderate OSA. Physiological abnormalities due to OSA include hypoxemia, hypercapnia, pulmonary and systemic vasoconstriction, and secondary polycythaemia. Result in an increased risk of heart disease and cerebral ischemic vascular disease. Hypoventilation syndrome in obesity is the result of a long-term syndrome and is seen in 5% to 10% of obese patients. It is a combination of hypoventilation and chronic obesity resulting in pulmonary hypertension and corpulmonar. The body mass index is divided into 5 categories, namely less than 18 kg / m2 thin category, 18.5 - 22.9 kg / m2 ideal category, 23.0 - 26.9 kg / m2 overweight category, 27.0 - 35 kg / m2 obesity category, more than 35 kg / m2. Obesity category has morbidity that can cause death [17,19].

*3) Types and hours of operation:* Different types of operations performed will have different effects on the patient's post-surgery condition. If bleeding occurs during surgery, which amounts to more than 15 to 20 percent of the total normal blood volume, it will affect organ perfusion, oxygen transport and the circulatory system. Patients with excessive bleeding requiring further action, giving a transfusion after surgery is more effective to replace lost blood fluids. Colloid intravenous fluids can help replace blood fluids if blood donor is not available [18,19].

Types of surgery are divided into 4 classifications, namely simple, mild, moderate and severe operations. In patients undergoing simple surgery, local or regional anaesthesia is usually sufficient. For patients with moderate to severe surgery, general or regional anaesthesia is usually given as needed. Major and moderate types of surgery usually take a long time, this causes the dose of anaesthesia to be increased. The type of surgery is directly proportional to the time of operation, the greater the type of surgery the patient will have, the longer it will take for the patient to recover [18].

Examples of surgery included in simple types of surgery include incision of an abscess, infiltration of varicose veins of 1 leg, and semi-quadrant debridement. Surgeries that are included in the type of minor surgery include extirpation, vein section, local circumcision, insertion of catheters, bougination, and excision of tumors with a size of more than 2cm and less than 5cm. Surgical procedures that include moderate surgery include expectoration of benign tumors, circumcision, appendectomy, hemorrhoidectomy, testicular torsion, moderate wound debridement, lymph node extraction with narcotics, excision biopsy with narcotics, and herniotomy. Surgical procedures that are included in the type of major surgery include laparotomy, large expansion, abdominoplasty, multiple tumor expansion, appendectomy with complications, multiple fibroadenoma mammae, and simple mastectomy [6,17].

*4) Physical status before anaesthesia action:* The first monitoring action that is documented as an initial identification of a patient who will undergo surgery, which is done to ensure that there are no complications during anaesthesia or surgery. Time of surgery, the patient's name, the action plan of the operation, the name of the expert surgeon, the family of the patient, the executor of anaesthesia, patient's place to stay, room care and the bed number, weight, height and vital signs before surgery which should be documented in this pre-anaesthesia evaluation where the pre-anaesthesia physical status is one of the factors that contribute to the return of vital functions of the patient such as before undergoing surgery and anaesthesia after termination. The anaesthetic action itself in addition to other factors that play a role in influencing the patient's recovery time [15,18,19].

*5) Recovery after anaesthesia:* Recovery from general anaesthesia is managed in the Recovery Room or Post Anaesthesia Care Unit (RR, Recovery Room or PACU, Post Anaesthesia Care Unit). Ideally recovery from anaesthesia will be gradual, no complaints and smooth. In fact, there are often unpleasant things due to stress after surgery or after anaesthesia, which are usually breathing problems, circulatory disorders, restlessness, pain, nausea, chills and sometimes bleeding [12,15,19].

The post-anaesthesia care unit must be located on one floor and near the operating room, so that when an emergency arises and requires immediate re-surgery, it will not experience many obstacles. In addition, because immediately after surgery is finished and anaesthesia is stopped, the patient is actually still under anaesthesia and needs to be closely monitored as in the operating room. Close supervision in the recovery room should be as if the patient is in the operating room until the patient is free from harm, therefore good monitoring equipment should be provided. Equipment such as tensimeter, oximeter, electrocardiography, cardiopulmonary resuscitation equipment and medication should be provided separately from the operating room. Personnel in the recovery room must be trained in the management of emergency patients, be adept at keeping the airway stable, responsive to early changes in vital signs that could endanger the patient [16,19].

Post-anaesthesia follow-up and patient discharge criteria from the recovery room used the Aldrette score after anaesthesia in the recovery room (See Table 1) [15,19].

TABLE I. ALDRETTE SCORE

| Object | Criteria | Score |
|---|---|---|
| ***Activity*** | Able to move four extremities | 2 |
| | Able to move two extremities | 1 |
| | Inability to move extremities | 0 |
| ***Respiration*** | Able to breath deeply and cough | 2 |
| | Shortness of breath or limited breathing | 1 |
| | Stop breathing or apnea | 0 |
| ***Blood pressure*** | Change up to 20% from pre surgery | 2 |
| | Change 20-30% from pre surgery | 1 |
| | Change> 50% from pre surgery | 0 |
| ***Awareness*** | Well aware and well oriented | 2 |
| | Can be awakened | 1 |
| | Unable to wake up | 0 |
| ***Skin color*** | Pink, without O2 saturation > 92% | 2 |
| | Pale without O2 saturation > 90% | 1 |
| | Cyanosis with O2 saturation <90% | 0 |
| **Total value** | | **15** |

Source: Latief et al. [2]..

The assessment is carried out when the patient enters the recovery room. Furthermore, a continuous assessment was carried out and recorded every 5 minutes until a value ≥ 9 was reached. The value for sending patients to the treatment room was ≥ 9.

Some things that need to be considered before sending a patient to the room are when the observation is carried out at least 30 minutes after administering narcotics or their antidote, when the observation is carried out at least 60 minutes after giving antibiotics, antiemetics or narcotics intramuscularly. Also pay attention when the observation is made at least 30 minutes after oxygen is stopped or 60 minutes after extubation. Other procedures will be determined later by anesthetists and surgeons [19].

## G. Framework

Recovery time starts when the patient enters the recovery room until the patient is transferred to the ward with an assessment using the Aldrette score. In the patient's recovery period, there are several factors that can affect the patient's recovery time after receiving general anesthesia in the operating room including age, body mass index, type of operation, time of surgery and anesthesia, and physical status according to ASA.

Before the patient gets surgery and anesthesia, the patient will be assessed on his physical status before general anesthesia using criteria according to ASA. This is necessary to assess the likelihood of complications during and after surgery.

## III. Research Materials and Methods

### A. Research Design

The research method used was retrospective descriptive. The data used in this study are secondary data, namely medical record data on patients undergoing the surgery process with general anaesthesia at Dustira Hospital.

### B. Research Subjects

The population is the entire source of data needed in a study, the research subjects in this study were all patients who underwent surgery with general anaesthesia techniques from January to December 2016. The sample is part of the number and characteristics of the population, the sampling in this study was done by *random sampling* by taking existing cases and in accordance with the criteria of this study randomly according to the number of samples required is met [12,13].

### C. Number of Samples

The sample size was determined to test the hypothesis of the proportion in the group [12].

$$n = \frac{N}{1 + N(d^2)} = \frac{45}{1 + 45(0{,}05^2)} = \frac{45}{1{,}1125} = 40{,}4$$

N = Population size n = Sample size

d = the level of confidence / accuracy desired

n = 40 (roundings, with calculation below)

Based on the calculations above, a sample of 40 patients was obtained. Sampling with a total sample by means of *random sampling,* until the researcher gets a sample size of 40 patients.

### D. Research Procedures

This research procedure begins with determining the research title and searching for material related to the research, followed by the preparation of research proposals and a trial of research proposals. Subsequently, a permit application was submitted to conduct this research at the Dustira Cimahi Hospital in patients who underwent surgery under general anaesthesia who had ASA I and ASA II status.

After obtaining permission from the Dustira Cimahi Hospital the data were collected and processed according to inclusion and exclusion criteria. Data were collected by nurses or doctors in the operating room, and written into a record medical or anaesthesia card. The researcher looked at the data in the medical record for analysis, then presented it in a form and descriptive explanation. The results of the research that have been carried out are then presented at the thesis trial.

### E. Data Analysis

From the data obtained, grouping is compiled in tables, namely a description of the recovery time of ASA I and ASA II patients, a table of patient characteristics based on physical status according to ASA, recovery time, length of operation, type of operation, and body mass index that meet the inclusion criteria. Then the research results are analysed and presented in narrative form.

### F. Place and Time of Research

The research site was carried out in the surgical installation of Dustira Hospital by taking patient medical record data at the Medical Records Division of the Cimahi Hospital.

### G. Aspects of Research Ethics

The ethical aspect in this research is justice. Because the researcher took secondary data from the results of the patient's medical record to find out the patient's physical status from the time the patient came to the operating room until he left the recovery room, so that the confidentiality of patient data was maintained by not including the patient's name.

## IV. Results and Discussion

This research was conducted at the Dustira Hospital for the period March to April 2018. The medical records were taken in the surgical room of the Dustira Hospital with a *random sampling* method. All data in this study were analysed using descriptive analysis [20,21]. The following are the results of the study regarding the recovery time description of general anaesthesia patients with ASA I and ASA II physical status in the recovery room of the Tk II Dustira Hospital.

### A. Overview of Patients with ASA I and ASA II

General description of patients based on physical status according to ASA, body mass index and age were taken from 40 patients. Patient characteristics based on age, duration of anaesthesia, type of operation and body mass index in the Surgical Installation are presented in the table below.

*1) Description of patients by age: I*n this study, there were 40 patients divided into 3 age groups. The data is presented in table 2.

TABLE II. Description of Patients by Age

| Patient characteristics | | ASA I | ASA II | n | % |
|---|---|---|---|---|---|
| ***Age (years)*** | 17 to 20 | 6 | 5 | 11 | 27.5 |
| | 21 to 35 | 11 | 13 | 24 | 60 |
| | 35 to 40 | 3 | 2 | 5 | 12.5 |
| Total | | | | 40 | 100 |

From table 2, it is found that 60% of patients aged 21-35 years, 17 to 20 years old 27.5%, and 12.5% more than 35 years old. There were 3 patients with ASA I (7.5%) who were in the age group of 35 up to 40 years, and in the patients with ASA II there were 2 patients (5%) who were included in that group. Patients with old age need a long time to recover from general anaesthesia because there is decreased function of the circulatory system and cognitive function, and there is sensitivity to several types of drugs due to decreased central

nervous system. Patients between 17 and 35 years of age with ASA I and ASA II physical status are able to recover within 30 to 60 minutes [4,22].

*2) Patient overview based on duration of anaesthesia:* Patient descriptions based on the duration of anaesthesia were taken from 40 patients. The data is presented in table 3.

TABLE III. PATIENT DESCRIPTIONS BASED ON DURATION OF ANAESTHESIA

| Patient characteristics | | ASA I | ASA II | n | % |
|---|---|---|---|---|---|
| ***Duration of anaesthesia*** | 30 minutes to 1 hour | 18 | 17 | 35 | 87.5 |
| | 60 to 90 minutes | 0 | 2 | 2 | 5 |
| | 90 minutes to 2 hours | 2 | 1 | 3 | 7.5 |
| Total | | | | 40 | 100 |

Based on table 3, it is found that the number of patients is dominated by anaesthetic duration of 30 to 60 minutes, namely 27 patients (87.5%). There were 3 patients (7.5%) who underwent anaesthesia with a time of 90 minutes to 2 hours, namely 2 patients (5%) with ASA I physical status and 1 patient with ASA II physical status. The longer it takes for the surgical operation, the more doses of anaesthetic drugs are used, so the time it takes to get rid of the effects of anaesthetic drugs will increase. This will affect the recovery time [3,4,23].

*3) Description of patients by type of operation:* Patient description based on the type of surgery is divided into 2 categories, namely major and moderate surgery. The data is presented in table 4.

TABLE IV. PATIENT DESCRIPTIONS BY TYPE OF OPERATION

| Patient characteristics | | ASA I | ASA II | n | % |
|---|---|---|---|---|---|
| ***Operation type:*** | Big | 8 | 12 | 20 | 50 |
| | Moderate | 12 | 8 | 20 | 50 |
| Total | | | | 40 | 100 |

From table 4, it is found that the number of patients who underwent major and moderate surgeries was the same. Even so, the type of surgery affects the patient's recovery time, because the longer the patient is under anaesthesia, the longer it will take for the patient to recover. In patients with moderate type of surgery, it requires a shorter time than patients with major operations, because major operations require a longer time and are more complicated. Along with a long operation time, more doses of anaesthetic drugs will be used. If the anaesthetic administration time is prolonged, the recovery time will depend on the anaesthetic drug uptake in the tissue, the drug concentration, and the length of exposure to the anaesthetic drug [3,23].

*4) Patient overview based on body mass index:* Patient figures according to body mass index were divided into 2 categories using the World Health Organization body mass index assessment.

TABLE V. DESCRIPTION OF PATIENTS BASED ON BODY MASS INDEX

| Patient characteristics | | ASA I | ASA II | n | % |
|---|---|---|---|---|---|
| ***Body mass index*** | Normal | 11 | 9 | 20 | 50 |
| | Excess BB | 9 | 11 | 20 | 50 |
| Total | | | | 40 | 100 |

From table 5, it is found that the number of patients with normal body mass index is 20 patients (50%) and 20 patients (50%) overweight. Obese patients are accompanied by a syndrome of airway obstruction, increased oxygen consumption, and hypoventilation, which is often difficult during anaesthesia. Patients with obesity, the work of anaesthetics will be disrupted because they are absorbed by fat in the body. During the recovery process, the drug will be released again by the fat so that the effect of the anaesthetic drug can still be felt by the patient even though the surgery has been completed and the administration of the anaesthetic has been stopped [7,22].

### *B. Overview of the Patient's Physical Status and Recovery Time*

Patient characteristics based on the physical status of pre-general anaesthesia according to the *American Association of Anaesthesiology* with the recovery time of patients in the conscious recovery room of the surgical installation are presented in Table 6.

TABLE VI. DESCRIPTION OF PATIENT RECOVERY TIME BASED ON PHYSICAL STATUS

| Patient characteristics | ASA I | ASA II | n | % |
|---|---|---|---|---|
| Recovery time: | | | | |
| In 30 minutes | 18 | 16 | 34 | 85 |
| After 30 minutes total | 2 | 4 | 6 | 15 |
| | | | 40 | 100 |

From table 6, it can be seen that the number of patients, namely 40 people, with the criteria for pre-general anaesthesia ASA I as many as 20 people (50%) and patients with pre-general anaesthesia ASA II physical status as many as 20 people (50%). The number of patients who recovered within 30 minutes after termination of anaesthesia was 34 people (85%) of a total of 40 patients, and patients who recovered after 30 minutes of termination of anaesthesia were 6 people (15%) of a total of 40 patients (100%).

From table 6, it can be seen that there are 6 patients (15%) were recovered in time more than 30 minutes, 2 patients (5%) with the status of physical ASA I and 4 patients (10%) with ASA II physical status. Patients with ASA I are nor accompanied by systemic disease, so the time needed to recover will be fast because there is little chance status. Patients with ASA I are not accompanied by systemic disease, so the time needed to recover will be fast because there is little chance of interruption of the recovery process. Patients with ASA II have mild systemic abnormalities that affect the

vital function of patients to recover, so that patients with ASA II will need a longer time to recover than patients with ASA I. In this study there was no delay in recovery time in patients with ASA. I and ASA II. From table 6, it is found that patients with ASA I are able to recover faster than patients with ASA II. This was shown from 6 patients (15%) who recovered over 30 minutes, there were only 2 patients (5%) with ASA I and 4 patients (10%) with ASA II [3,22].

In accordance with the theory that the patient's conscious recovery is influenced by several factors, namely patient factors, medication, surgery, and metabolic factors. Patient factors include age, genetic abnormalities, body shape and comorbidities. Drug factors include the type of drug, drug dosage, drug interactions and drug side effects on patients. Surgical factors include the duration of anaesthesia and surgery. Metabolic factors include impaired renal function, hyperglycaemia, hypoglycaemia, hypernatremia [4,23].

## V. Conclusion

Based on the results of the study and discussion of the relationship between physical status before general anaesthesia with the recovery time of patients in the conscious recovery room of the Dustira Hospital Surgery Installation, the following conclusions can be drawn

- In patients with ASA I, 18 patients (90%) were conscious within 30 minutes, and 2 patients (10%) were conscious in more than 30 minutes.
- In patients with ASA II, 16 patients (80%) were conscious within 30 minutes, and 4 patients (20%) were conscious in more than 30 minutes.
- Patients with ASA I physical status are able to recover faster than patients with ASA II in the recovery room of the surgical installation at Dustira Hospital.

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