

**UNIVERSITI TEKNOLOGI MARA**

**NUCLEAR MEDICINE DEPARTMENT OF  
INSTITUT KANSER NEGARA (IKN) – 3  
YEARS IN SERVICE: OVERVIEW OF  
DIAGNOSTIC RADIOPHARMACEUTICAL  
PREPARATIONS**

**UMMU ‘AQILAH BINTI ABD GHAFAR**

Dissertation submitted in partial fulfilment of the  
requirements for the  
**Bachelor of Pharmacy (Hons.)**

**Faculty of Pharmacy**

**2017**

## **ACKNOWLEDGEMENT**

Firstly, I would like to express my sincere gratitude to my advisor Dr. Muhamad Faiz Bin Othman for the continuous support of my Bachelor degree study and related research, for his patience, motivation, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis. Thank you again Dr. Faiz for your insightful comments and encouragement, but also for the hard question which incited me to widen my research from various perspectives. I could not have imagined having a better supervisor for my research.

My sincere acknowledgement goes to Institut Kanser Negara (IKN) that was so kind to give me the necessary materials, data as well as cooperation to pursue this dissertation.

I thank my research partner, Fadtin Fatanah Binti Mustafa Kamal for the stimulating discussions, for the sleepless nights we were working together before deadlines, and for all the fun we have had in the last three years.

Last but not the least, I would like to thank my family and friends for supporting me spiritually throughout writing this thesis and my life in general.

## TABLE OF CONTENTS

|                                  |      |
|----------------------------------|------|
| TITLE PAGE                       |      |
| APPROVAL                         |      |
| ACKNOWLEDGEMENT                  | ii   |
| LIST OF TABLES                   | vi   |
| LIST OF FIGURES                  | viii |
| LIST OF ABBREVIATION             | x    |
| ABSTRACT                         | xii  |
| <br>                             |      |
| CHAPTER ONE : INTRODUCTION       | 1    |
| 1.1 Background                   | 1    |
| 1.2 Objectives                   | 4    |
| 1.3 Research questions           | 4    |
| 1.4 Problem statement            | 5    |
| 1.5 Significance of study        | 5    |
| <br>                             |      |
| CHAPTER TWO : LITERATURE REVIEW  | 6    |
| 2.1 History of Nuclear Medicine  | 6    |
| 2.2 Nuclear Medicine in Malaysia | 7    |
| 2.3 Division of Nuclear Medicine | 8    |

## ABSTRACT

**INTRODUCTION :** In Malaysia, the field of radiopharmacy has grown in importance parallel with expansion of nuclear medicine services that has expanded to more than 6 Malaysian Ministry of Health (MOH) hospitals as well as private hospitals including Institut Kanser Negara (IKN).

**OBJECTIVES :** (i) To identify commonly used radiopharmaceuticals for diagnostic in IKN between 2014 – 2016. (ii) To determine the usage of radiopharmaceuticals in diagnostic and number of patients benefited from the field between year 2014 - 2016

**METHODOLOGY :** Audit based study in collaboration with IKN. First, identify contact person (IKN). Then, acquire consent and ethical approval from UiTM and NMRR. IKN provide necessary data which will be compiled and analyzed using Microsoft Excel 2010.

**RESULTS :** The number of patient's appointment increasing from 2014 to 2015 (39.8%) and keep increasing up to 20.84% in 2016. The most commonly used radiopharmaceuticals is F-18 FDG followed by Tc-99m. Tc-99m Tetrofosmin has the highest demand and supply followed by Tc-99m MDP and Tc-99m Pertechnetate. Radioiodine preparations has upward trend over the year. However, Cr-51 EDTA does not have any significant changes over the year.

**CONCLUSION :** The radiopharmacy field in Malaysia will keep growing progressively as the demand for its service has increasing trend over the year.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background**

Nuclear medicine Unit has three major area and they are Clinical Nuclear Medicine, Nuclear Pharmacy and Nuclear Medicine Physics [1]. What is nuclear pharmacy? Nuclear Pharmacy or radiopharmacy is a clinical service that procures, prepares or compounds, dispenses radiopharmaceuticals and assures quality for diagnostic or therapeutic use in patient referred to nuclear service of hospital [2]. Hence, radiopharmacy practice can be defined as a set of procedures, processes, and operations that are carried out for the production of a specific radiopharmaceutical according to the Good Laboratory Practice (GLP) or Good Manufacturing Practice (GMP) [3]. In developed countries, the practice of radiopharmacy is already established. On the contrary in developing countries the implementation and progression of radiopharmacy varies up to certain extents [4].