Quality Assurance of Technitium$^{99m}$-Labelled Radiopharmaceuticals in the Radiation and Isotopes Centre of Khartoum [RICK]

تأكيد الجودة للمستحضرات الإشعاعية الصيدلانية المرموقة بالتكنيشيوم-$^{99m}$ بالمركز القومي للعلاج بالأشعة والطب النووي بالخرطوم

A complementary research submitted in fulfillment of the requirements of MSc degree in Nuclear Medicine Technology.

Prepared By:
Awad Abdalla Adlan

Supervisor:
Dr. Othman Mustafa Mukhtar
Ph.D., Physics

2007

List of Contents
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedication</td>
<td>i</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>ii</td>
</tr>
<tr>
<td>Abstract [English]</td>
<td>iii</td>
</tr>
<tr>
<td>Abstract [Arabic]</td>
<td>iv</td>
</tr>
<tr>
<td>List of Abbreviations</td>
<td>v</td>
</tr>
<tr>
<td>List of contents</td>
<td>vi</td>
</tr>
</tbody>
</table>

## Chapter One

### Introduction

1

## Chapter Two

### Literature Review

2.1 Radiopharmaceuticals and their production 5  
2.2 Preparation of Radiopharmaceuticals 6  
2.3 Production of Radionuclides 7  
2.4 Radionuclide generator system 9  
2.5 Chemistry of technetium 14  
2.6 Technitium radiopharmaceuticals 15  
2.7 Laboratory techniques 18  
2.8 Quality control of radiopharmaceuticals 20  
2.9 The roles and functions of the nuclear of the nuclear medicine technologist 22  
2.10 Quality management systems 24

## Chapter Three

### Materials and methods

3.1 Materials 34  
3.2 Methods 37

## Chapter Four

### Results and Discussion

4.1 Results 39  
4.2 Discussion 49

## Chapter Five

### Conclusion and Recommendations

5.1 Conclusion 53  
5.2 Recommendations 55

## References

## Appendices

(vi)