

Nuclear Medicine Imaging

Student's Name

University Department

Date

To: Patients anticipating an NMI treatment, general public audience, and medical practitioners

CC: Dr. Sarah Read, Dr. Paul Collins, Professor Covey, and WR227 course members

From: [Insert your name][<-Fill in]

Date: Sunday 8/16 at 11:59 PM PST

Subject: Medicine Documentation- Nuclear Medicine Imaging

Abstract

The information provided in this research paper is about the history of Nuclear Medicine Imaging (NMI), the procedure used by medical practitioners and the importance of using NMI. It targets the general audience including medical practitioners and patients. The technology of NMI should replace traditional methods of diagnosing diseases because of its effectiveness. It has numerous benefits, including identification of diseases in their early development stages and provide molecular information which is useful in medication.

Keywords: Gastrointestinal, endocrine, tagging, Nuclear Medicine Imaging, and radiopharmaceuticals

Contents

Version history	5
List of Figures and Tables	5
Introduction	5
Methods	5
Results	6
How technology was developed.....	6
Benefits of Nuclear medicine imaging.....	6
Nuclear imaging procedures	7
Discussion.....	7
Procedure used to detect diseases.....	8
Clinical guidance in nuclear medicine imaging.....	8
Conclusion.....	9
References	10

Version history

Version	Description	Name	Date
v.0.3	Publication of v2.0 document: “Nuclear Medicine Imaging”		

List of Figures and Tables

- I. Figure 1: Gamma Camera used in Nuclear Medicine
- II. Figure 2: A doctor performing nuclear medicine imaging procedure to a patient
- III. Figure 3: Brain scan using Gamma cameras in nuclear medicine imaging equipment
- IV. Figure 4: Detected lung tumor using Nuclear Medicine Imaging procedure

Introduction

Instead of drawing blood from a patients for testing of pathogens and, an physicological complications, nuclear medicine imaging serves the diagnosis purpose without causing any pain to the particular patients. It is a technology that depends on radiopharmaceuticals to examine the health status of a patient.

There is a need for the contemporary society to embrace the technology of NMI. Usually, traditional methods of diagnosing diseases does not effectively identify diseases at their early stages. With NMI people are able to fight diseases even before their first symptoms. For that rason, this paper purpose to inform medical parctioners, patients and the general audience about the procedure used in NMI and the importance of using the technology in medicine.

Methods

The entire paper is a borrowing from secondary sources. The information, which is presented qualitatively, relies on a number of pre-existing scholarly articles. These sources provide

information about the history of NMI, the procedure and guideline used in NMI, and the importance of the technology (“Nuclear Medicine” n.d).

Results

How technology was developed

The proponent of nuclear medicine is Ernest Orlando who invented the first machine used in NMI in the year 1930. The machine was 4-inch in diameter with 2 D shaped-magnets that provided a magnetic fields for particles to be enlarged. At first the machine was used to increase the radius of particles. Later, it was developed to the modern cyclotron machine.

Figure 1: Gamma Camera used in Nuclear Medicine (shutterstock)



Benefits of Nuclear medicine imaging

The technology is effective in the treatment of endocrine, neurological and gastrointestinal disorders. Also, it is used to diagnose cancer, heart disease and other physiological conditions (Love & Palestro, 2016). During diagnosis, the patients do not experience any pain.

Nuclear imaging procedures

The procedure used in diagnosing patients for disease does not involve pain. Blood is drawn from the patient's veins and mixed with radionuclides. However, the patients can also inhale radionuclide, which enter the body and mix with blood (Cho et al. 2017). The radionuclide moves to specific body organs where there is probably a health issue. Then scanners are used to trace any radioactive energy emitted by the radiotracers in the blood stream (Bar-Sever et al. 2018).

Figure 2: A doctor performing nuclear medicine imaging procedure to a patient (“General Nuclear Medicine”)



Discussion

The technology of NMI is important in that it provides, besides the identified problems in human body, cellular information. Disease affecting any particular patient can be traced long before the patient experiences symptoms. Over the last 50 years NMI has been embraced in many developed and developing countries. The technology facilitates room for personal profile based treatment (Donohoe & Ahuja, 2019, March). Generally, the technology has facilitated improved healthcare services.

Procedure used to detect diseases

1. There is mixing radionuclide with the patients' blood. The process is known as tagging (KqA Reilly, 2019).
2. The patient is placed on the NMI machine for scanning of diseases. For better results, the patient is instructed to remain still.
3. The medical practitioner performing scanning should correctly interpret the image and any molecular information.

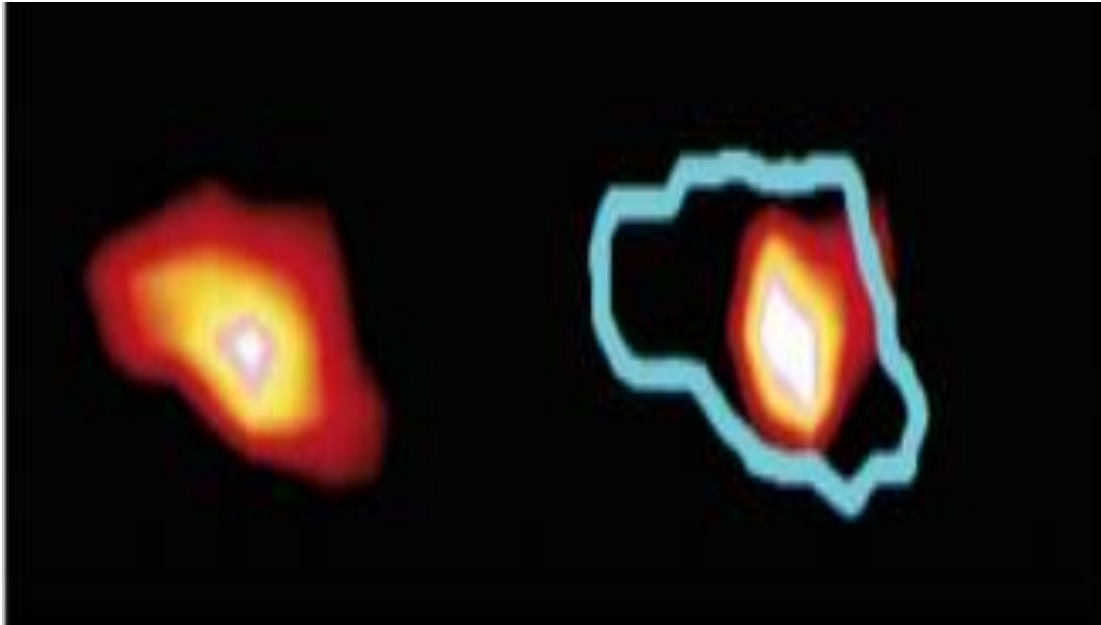
Figure 3: Brain scan using Gamma cameras in nuclear medicine imaging equipment (“94 Gamma Scan stock pictures and images”



Clinical guidance in nuclear medicine imaging

The doctor is required to follow the procedure used in NMI without any alteration (KqA Reilly, 2019). The image obtained during scanning should be correctly interpreted and the patients appropriately advised on what medical step to take.

Figure 4: Detected lung tumor using Nuclear Medicine Imaging procedure (Buvat et al. 2014)



Conclusion

In conclusion, the technology of NMI has rapidly improved over years. It is embraced worldwide, especially in developed countries. Stakeholder in medicine consider NMI the best method to diagnose all physiological diseases. For that reason, the technology should never be taken for granted for it identifies tumors, pathogens and give molecular information. It is therefore suitable in dealing with modern diseases.

References

“94 Gamma Scan stock pictures and images” retrieved from

<https://www.gettyimages.com/photos/gamma-scan?mediatype=photography&phrase=gamma%20scan&sort=mostpopular>

“General Nuclear Medicine” retrieved on 10/08/2020 from

<https://www.radiologyinfo.org/en/info.cfm?pg=gennuclear>

Bar-Sever, Z., Biassoni, L., Shulkin, B., Kong, G., Hofman, M. S., Lopci, E., ... & Lambert, B.

(2018). Guidelines on nuclear medicine imaging in neuroblastoma. *European journal of nuclear medicine and molecular imaging*, 45(11), 2009-2024.

Buvat, I., Frey, E., Green, A., & Ljungberg, M. (2014). Quantitative nuclear medicine imaging:

concepts, requirements and methods. *Human Health Reports*, 9.

Cho, S. G., Kim, J., & Song, H. C. (2017). Radiation safety in nuclear medicine procedures. *Nuclear*

medicine and molecular imaging, 51(1), 11-16.

Donohoe, K., & Ahuja, S. (2019, March). Society of Nuclear Medicine and Molecular Imaging

Efforts Toward Standardization: From Procedure Standards to Appropriate Use Criteria. *In Seminars in Nuclear Medicine* (Vol. 49, No. 2, pp. 153-160). WB Saunders.

KqA Reilly, R. M. (2019). Nuclear Medicine Imaging Technology. *Medical Imaging for Health*

Professionals: Technologies and Clinical Applications, 27-43.

Love, C., & Palestro, C. J. (2016). Nuclear medicine imaging of bone infections. *Clinical radiology*,

71(7), 632-646.

Nuclear Medicine” retrieved on 2/04/2020 from <https://www.youtube.com/watch?v=oWVsnFz->

Shutterstock. Nuclear Medicine Images. Retrieved from

<https://www.shutterstock.com/search/nuclear+medicine>