

Role of Nurses in Daily Nuclear Medicine

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Abstract

The aim of this study is to demonstrate the role of nurses during daily nuclear medicine procedures and to discuss the influence of nurses in quality of patient care, patient preparation and radiation safety in nuclear medicine.

Methods: Data was collected from the day to day involvement of nurses during daily nuclear medicine procedures. There are several nuclear medicine procedures identified where the nurses are involved in various tasks. Those imaging studies include many procedures in Oncology, Renal, hepatobiliary, cardiac, thyroid and gastrointestinal Scintigraphy.

Results: Nurses spend a significant amount of time during cardiac imaging starting from taking history, review of patient preparation, medications, and laboratory data to ultimately performing clinical examination. For Renal Scintigraphy nurses have an important function, especially in children, starting from placing a Foley catheter, to hydrating after inserting an intravenous line, administering Ace inhibitor medication, if needed, and monitoring vital signs. For thyroid imaging, the role of nurses includes administering thyrogen injections. For gastrointestinal imaging, nurses play a key role in administering drugs like morphine sulfate, cholecystokinin and taking care of various tubes including Gastric, Jejunostomy, Nasogastric tubes and suctioning as needed. Nurses also have an important role taking care of patients during other unexpected emergencies like seizures and cardiac arrest. More important task of nurses includes assisting the technologists how to use and inject radiopharmaceuticals through the central lines, Porta catheter and Hickman catheters. During PET/CT imaging nurses monitor blood glucose and adverse reactions to iodine contrast. Nurses with special training in radiation safety discuss with the patients and other personnel the potential side effects of ionizing radiation.

Conclusion: Nurses have an important role in various tasks in assisting the technologists, physicians and patients to carry out daily nuclear medicine procedures. Nurses are essential in providing quality patient care and are crucial in saving patient's lives in emergencies during nuclear medicine imaging procedures.

INTRODUCTION

Quality of Care has come to the forefront of our attention in the recent years. After the Institute of Medicine's 'To Err is Human' monograph, highlighting the errors being made in the course of medical care and how most of the errors are avoidable, many attempts are being made to narrow the 'quality chasm' that exists in the day to day practice of medicine. One of the underutilized and less understood in the United States is the positive and preventive role nurses can play in a Nuclear Medicine Section.

Role of nurses in nuclear medicine is an evolving field and not known to many nurses. Nurses' role in Nuclear Medicine is better understood in Europe and underutilized in United States (1). The purpose of this communication is to highlight the important role nurses play in the nuclear medicine

sections and we strongly believe understanding and better integrating nurses role in Nuclear Medicine sections will further help to narrow the 'quality chasm'.

Nuclear medicine procedures require patient interactions relating to patient preparation, administering radioactive and non radioactive medications via oral or parental route, explaining the procedure, comforting and reassuring patients, and making the pediatric patients cheerful. These goals are achieved with the help of nurses. In addition, nurses perform several other tasks including inserting various lines, tubes as well as assessing the patients for tolerability of the procedures. Nurses are needed for several other diagnostic and therapeutic interventions.

Nurses who are experienced in oncology assist patients with making difficult decisions and educate them about the

advances in diagnostic and treatment options. During difficult neurodiagnostic studies for seizures, nurses keep patients from harming themselves and at the same time help the technologist to obtain good quality images without patient motion during imaging.

Nurses execute a major role during myocardial perfusion imaging (MPI). Prior to starting the study, they take history, review medications, patient preparation, check pertinent laboratory values, do related physical examination and convey any adverse findings to the physician. During MPI, the nurses monitor the vital signs, Electrocardiogram (EKG) and assist the physician and technologist to administer the required medications and radiopharmaceuticals.

METHODS

Data is collected from day to day involvement of nurses during daily nuclear medicine procedures. There are several nuclear medicine studies identified where the nurses are involved in various tasks. These studies include Renal, Hepatobiliary, Cardiac, Thyroid, Brain, Gastrointestinal and Oncology related Scintigraphy.

RESULTS

Nurses spend a significant amount of time during cardiac imaging starting from taking history, review of patient preparation, medications, and laboratory data to ultimately performing clinical examination. For Renal Scintigraphy nurses have an important function, especially in children, starting from placing a Foley catheter, to hydrating after inserting an intravenous line, administering Ace inhibitor medication if needed and monitoring vital signs. For thyroid imaging, the role of nurses includes administering thyrogen injections. For gastrointestinal imaging, nurses have a major role in administering drugs like morphine sulfate, cholecystokinin and taking care of various tubes including Gastric, Jejunostomy, Nasogastric tubes and suctioning as needed. Nurses also have an important role taking care of patients during other unexpected emergencies like seizures and cardiac arrest. More important task of nurses includes assisting the technologists how to use and inject radiopharmaceuticals through the central lines, Porta catheter, and Hickman catheters. Finally nurses help to monitor blood glucose and adverse effects to iodine contrast during Positron Emission Tomography/ Computed Tomography (PET/CT) studies.

There were several incidences where nurses played a critical role in daily nuclear medicine in saving patient's lives in our

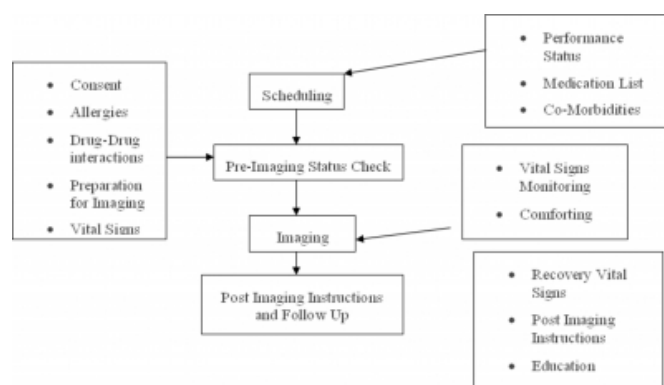
department in the past year: for example; one patient was on imaging table for a bone scan and had seizures and nurses helped to stabilize the patient. Several other patients during pharmacological stress testing had to be sent to intensive care unit or cardiac catheterization for acute changes in EKG where nurses performed a major role in monitoring the patients. Some diabetic patients who were fasting for the nuclear medicine procedures experienced hypoglycemia and needed immediate nursing help to check the blood sugar level and correct it.

DISCUSSION

There is a wide range of nursing involvement in patient care. The various tasks of nurses are summarized in Table 1. The word “Nuclear Medicine” often times cause lot of confusion and anxiety in many patients and other health care workers (1). Nurses can assist with an important role in educating and reassuring the patients and other health care professionals in the inpatient setting.

Figure 1

Table 1



Nurses are employed in only few nuclear medicine departments in United States. They are more widely employed in United Kingdom (UK) (1). However, even in UK, the number of nurses per unit varies depending on the location of the department or hospital. The responsibilities of the nurses in nuclear medicine are highly variable in UK, ranging from administering intravenous radioisotopes to non radioactive medications. There are a number of career advancing opportunities available for nurses to participate in various radioisotope meetings to learn about radionuclide imaging, radiation safety and how to take care of patients receiving radionuclide.

It is also the responsibility of the nurses to monitor the patients for any adverse reactions during or immediately after the administration of radioactive and non radioactive

materials to the patients. Nurses can answer the patient's questions regarding the medications. The nurses can also assist the technologists to assess the mental and physical status of the patients before the administration of the radiopharmaceutical.

Nurses with proper radiation safety training can also counsel patients, staff members and families with children regarding radiation effects on pregnancy and breast feeding (_{1,2,3}).

Nurses are essential during daily nuclear medicine procedures. Not only they help in multiple tasks, they are critical in taking care of especially oncology, pediatric, cardiac and neurology patients. Nurses with experience in oncological problems can better explain the new technological advancements in the diagnosis and treatment of patients including PET scanning and Radio immunotherapy and help patients to make the proper decisions (₄). Nurses who deal with children make them more comfortable to undergo difficult nuclear medicine procedures without the need for sedation in most cases (₅). During the complicated ictal Single photon emission computed tomography (SPECT) imaging of the Seizure patients, nurses contribute enormously to prevent the patient hurting and help at the same time to have a good quality images without motion occurring during imaging (_{6, 7}). Knowledge of various nuclear medicine procedures including Dual- energy x-ray absorptiometry (DEXA) scan can help the nurses to aid the patients with osteoporosis to undergo the procedure smoothly (₈).

During PET/CT imaging, the tasks of nurses include monitoring blood glucose and adverse reactions to iodine contrast (₉).

CONCLUSION

Nurses perform an important role in various tasks in assisting the technologists and physicians to carry out daily nuclear medicine procedures. Nurses are essential in providing quality patient care and saving patient's lives during an emergency in nuclear medicine. Nurses also are a

key role in alleviating the anxiety and fear of the patient, especially children, regarding the procedure. In taking care of oncology patients, nurses with knowledge of new technologies including PET, PET/CT scanning and Radio immunotherapy, better educate the patients about new advances in the diagnosis and treatment of cancer. Nurses with special training in radiation safety educate patients and other personnel the effects of radiation and exposure during pregnancy.

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References

1. Sherry I. Nuclear medicine: will I grow in the dark, nurse? *Nursing Standard* 2000;14:48-54.
2. Ghosh A, Brown LD. A simple screen for minimizing radiation doses to nursing staff involved in nuclear medicine procedures. *Phys Med Biol*.1979; 24: 643-6
3. Harding Lk, Harding NJ, Warren H et al. The radiation dose to accompanying nurses, relatives and other patients in a nuclear medicine department waiting room. *Nucl Med Commun*. 1990; 11:17-22.
4. Mautner BD, Schmidt KV, Brennan MB. New diagnostic techniques and treatments for early breast cancer. *Semin Oncol Nurs* 2000; 16:185-96
5. Awogbemi T, Watson AR, Hiley D et al. Preparing children for day case nuclear Medicine procedures. *Nucl Med Commun* 2005; 26:881-4.
6. Shpritz DW. Neurodiagnostic studies. *Nurs Clin North Am* 1999; 34:593-
7. Huntington NA. The nurse's role in delivery of radioisotope for ictal SPECT scans. *J Neurosci Nurs* 1999; 31:208-15
8. Kessenich CR. Diagnostic imaging and biochemical markers of bone turnover. *Nurs Clin North Am* 2001; 36:409-16
9. Lobrano MB, Singha P. Positron emission tomography in oncology. *Clin J Oncol Nurs*.2003; 7:379-85

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