Radiation Protection Information for patients and workers involved in Nuclear Medicine procedures

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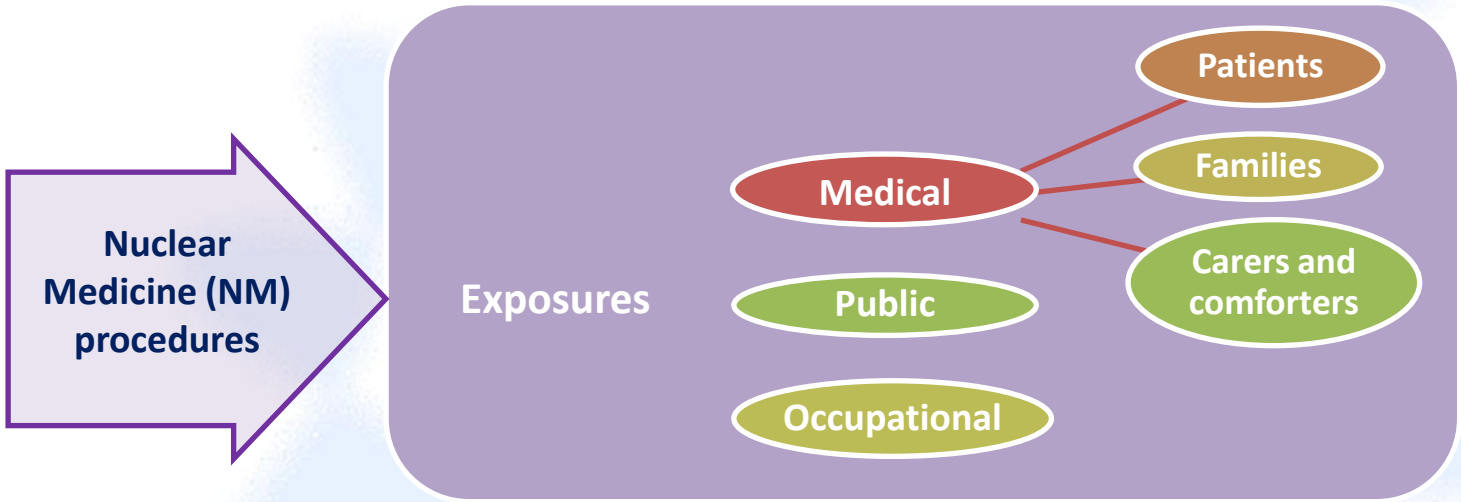
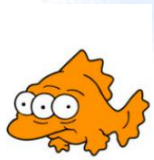


Lack of knowledge
Unreliable information on media

Inadequate perception of radiological risk



- **2013/59 EURATOM Directive**

  Education in RP in medical exposures

- **Bonn call for action (IAEA + WHO, 2013)**

- **IAEA Safety Standards**

  RP information adjusted to the level of risk associated

- **2013/59 EURATOM Directive**

  Education in RP in medical exposures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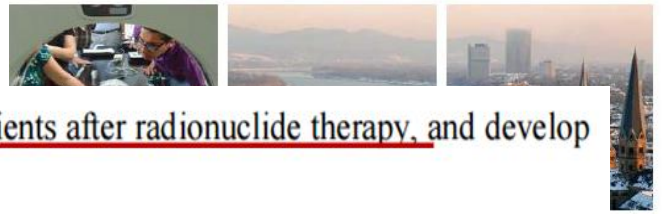
- **Bonn call for action (IAEA + WHO, 2013)**



Action 2: c) Implement harmonized criteria for release of patients after radionuclide therapy, and develop further detailed guidance as necessary;

Action 4: Strengthen radiation protection education and training of health professionals

in Medicine in the Next Decade

- **IAEA Safety Standards**

  RP information adjusted to the level of risk associated

- National legislation:

RD 783/2001	Education and training to professionals in the field of medical exposures is mandatory, both to exposed and non-exposed workers
Ministerial Order 2006/04/21	Medical Physics and Radiation Protection Department (MRPD) is responsible for this education
RD 1841/1997	Nuclear Medicine Department (NMD) and MRPD must provide the patient with information prior the procedure •Written instructions in therapy procedures → ALARA

OBJETIVE:

Analysis and update of the information and education in radiation protection provided to:

- ✓ patients undergoing nuclear medicine procedures
- ✓ and to the professionals who are somehow involved in the care of those patients

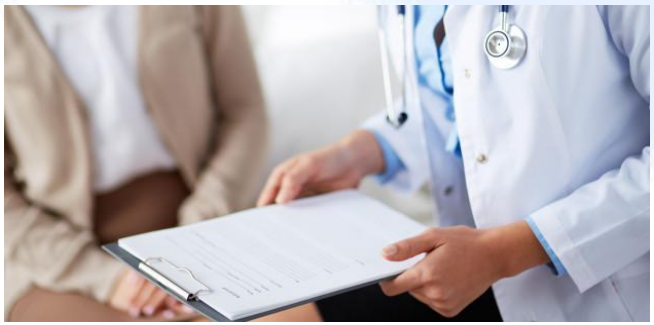
NMD of a University Hospital

- Diagnostic procedures
- Therapy procedures (3%)
  - Hyperthiroidism therapy (I-131)
  - Radioembolization therapy for liver cancer (Y-90)
  - Ra-223 treatment for metastatic prostate cancer

PATIENTS

Consultation:

oral
+ written
information



HEALTH PROFESSIONALS

Training RP sessions to exposed workers

- Periodical and programmed
- Performed by MRPD according to national regulation
- RP requirements:
  - in daily practice
  - new techniques

Information sessions to non-exposed workers

- On demand
- Given by MRPD
- Answer to concerns → improving clinical practice
- Radioembolization therapy

Written protocols

- Available to any professional
- Elaborated by MRPD
- Manipulation of radioactive sources outside NMD
- Hospitalisation outside NM facility

PATIENTS

- **Prior general information to patient**

  Colaboration: NMD + MRPD + prescribers

  90% out of total diagnostic procedures Tc-99m → No fruther RP restrictions

PATIENTS

- **Prior general informa**

  Colaboration: NMD + MRF

  90% out of total diagnosti

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INFORMATION TO PATIENTS ABOUT NUCLEAR MECINE EXPLORATIONS

What is Nuclear Medicine?
Nuclear Medicine is a medical modality in which diagnostic imaging and therapeutic procedures are performed using radioactive material.

What are the radiopharmaceuticals?
They are compounds which allow for studying the morphology and functionality of organs by its assimilation and emission of small amount of radiation. The equipment consists on a special camera (called gamma camera) which detects the radiation escaping from the patient's body and creates pictures offering information about the location and distribution of the radiopharmaceutical. Nowadays, Computer Tomography (TC) is integrated in the majority of the gamma cameras.

How is the procedure performed?
Nuclear Medicine explorations are noninvasive procedures in which the necessary dose of radiation is administrated by, generally, intravenous injection of a radiopharmaceutical. A determined interval of time, which depends on the type of procedure, is necessary between the administration and the performance of the exploration; ranging from few minutes (10min) until several hours (5h) or even days (1-5d). Some procedures require several explorations during the same day and others even different days, you will be informed if this is your case. Due to those different intervals of time, some patients may be attended before you although they had reached the faculty later. Once that waiting time is finished, you will be addressed to the room where the gamma camera is placed and the exploration will be performed. During the exploration is extremely important that you stay motionless in order to obtain a good diagnostic image quality.

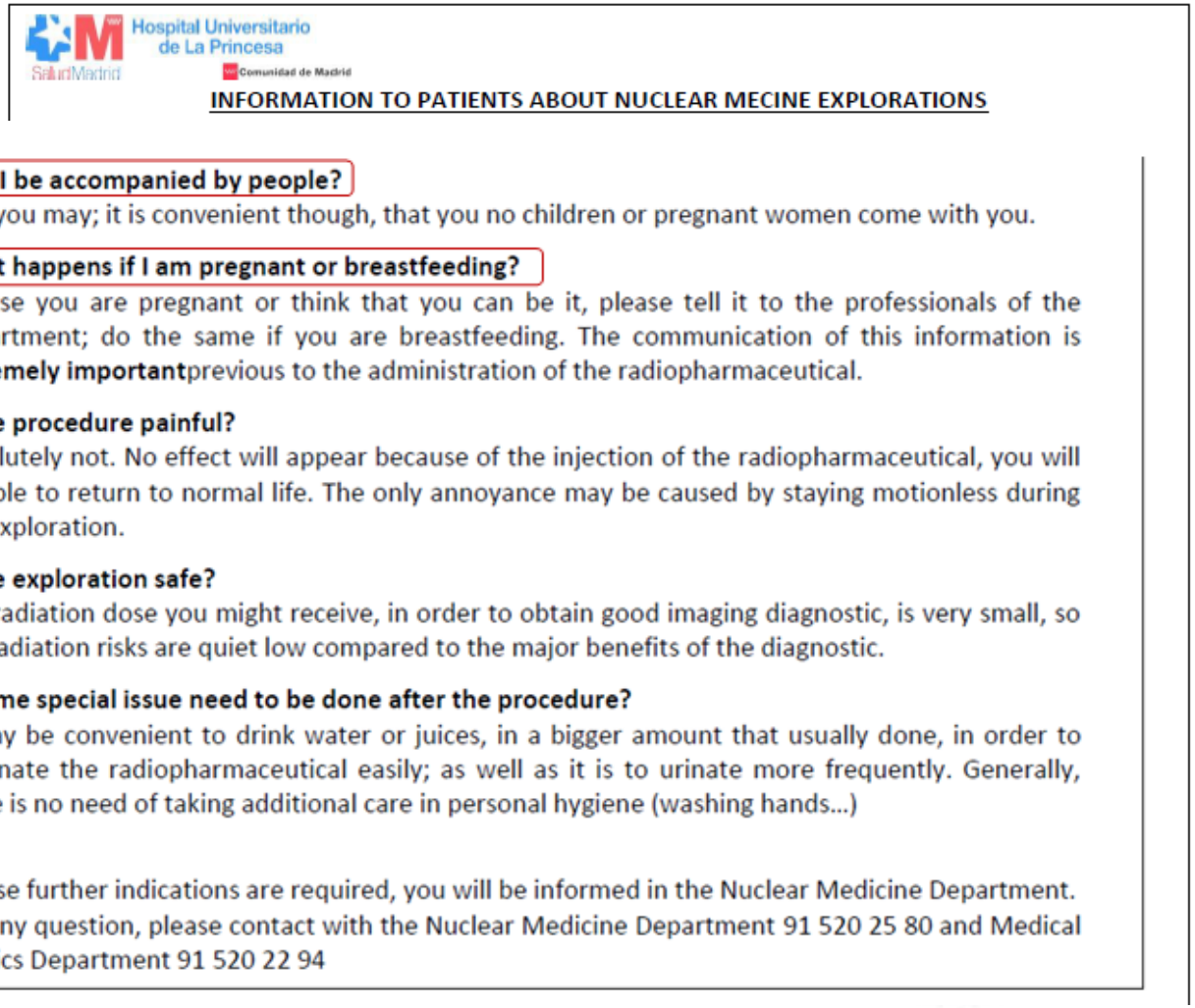
Do I need some preparation?
Generally not; in case you did need, you will be informed previously by the Nuclear Medicine Department. If necessary, you will also be asked for information about the medication you are taking.

PATIENTS

- **Prior general inf**

  Colaboration: NMD

  90% out of total di



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INFORMATION TO PATIENTS ABOUT NUCLEAR MECINE EXPLORATIONS

May I be accompanied by people?

Yes, you may; it is convenient though, that you no children or pregnant women come with you.

What happens if I am pregnant or breastfeeding?

In case you are pregnant or think that you can be it, please tell it to the professionals of the Department; do the same if you are breastfeeding. The communication of this information is **extremely important**previous to the administration of the radiopharmaceutical.

Is the procedure painful?

Absolutely not. No effect will appear because of the injection of the radiopharmaceutical, you will be able to return to normal life. The only annoyance may be caused by staying motionless during the exploration.

Is the exploration safe?

The radiation dose you might receive, in order to obtain good imaging diagnostic, is very small, so the radiation risks are quiet low compared to the major benefits of the diagnostic.

Is some special issue need to be done after the procedure?

It may be convenient to drink water or juices, in a bigger amount that usually done, in order to eliminate the radiopharmaceutical easily; as well as it is to urinate more frequently. Generally, there is no need of taking additional care in personal hygiene (washing hands...)

In case further indications are required, you will be informed in the Nuclear Medicine Department. For any question, please contact with the Nuclear Medicine Department 91 520 25 80 and Medical Physics Department 91 520 22 94

PATIENTS

- **Prior general information to patient**

  Colaboration: NMD + MRPD + prescribers

  90% out of total explorations Tc-99m → No fruther RP restrictions

- **Hyperthiroidism therapy patients:**

  prior information about the treatment

  + post treatment recommendations based on the dose rate + working and living conditions of patients

Introduction

PATIENTS

- **Prior general i**

  Colaboration: NM

  90% out of total

- **Hyperthiroidis**

  prior informati

  + post treatment
  conditions of pa

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PATIENT INFORMATION IN HYPERTHIROIDISM THERAPY IN NUCLEAR MEDICINE

What is Nuclear Medicine?
Nuclear Medicine is a medical modality in which diagnostic imaging and therapeutic procedures are performed using radioactive material. In hyperthyroidism therapy radioactive Iodine (I-131) is used

What is radioactive iodine?
Stable Iodine is part of our usual diet, and it is uptaken in the thyroid gland. I-131 is a radioisotope of Iodine, which emits radiation and is used for medical purposes.

What does the treatment consist of?
Dose of I-131 is going to be administrated to you, in a capsule form. The dose will be concentrated in your thyroid gland. As a consequence, it will receive some radiation dose which will allow to reduce its activity and enhancing your symptoms. Due to the relatively small dose administrated, this is an outpatient treatment.

Do I need some preparation?
In case you are taking antithyroid medication, you must discontinue that medication within 5 days before the treatment.

What happens if I am pregnant or think I may be?
YOU MUST INFORM ABOUT IT TO THE NUCLEAR MEDICINE SPECALIST BEFORE THE RADIOISOTOPE IS ADMINISTRATED.

What happens if I am breastfeeding?
YOU MUST INFORM ABOUT IT TO THE NUCLEAR MEDICINE SPECALIST and you will have to discontinue breastfeeding during some period of time you are told.

May I be accompanied by people?
Yes, you may, but in NO case by children or pregnant women.

Introduction

PATIENTS

- **Prior genera**

  Colaboration:

  90% out of tot

- **Hyperthiroi**

  prior inform

  + post treatme

  conditions o

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PATIENT INFORMATION IN HYPERTHIROIDISM THERAPY IN NUCLEAR MEDICINE

Which are the precautions after treatment?

I-131 is eliminated mainly by the urinary tract and also by faeces, saliva and other biological fluids, so once it has been administrated, YOU NEED TO ADOPT DURING A PERIOD OF TIME SOME RADIATION PROTECTION PRECAUTIONS.

- As far as possible, try not to stay at the same house with small children and pregnant women during the time you are told. If you have to keep contact with them, try to stay at more than 1 metre distance and for a short period of time.
- In the toilet sit down to avoid splashing, then double flush the tank and then wash hands carefully.
- Drink a normal amount of liquids.
- Don´t share glasses, plates, towels, sheets or clothes with other people, but it are not necessary to wash it separately.
- If possible, avoid sleeping at the same bed with anybody.
- Avoid getting pregnant at least within 6 months.
- Discontinue breastfeeding during some period of time you are told.
- You will be informed whether you need to stay out of work, and how much time it will be. Mainly if it involves contact with pregnant women, children or food handling.
- You must inform in case you planned a trip in the following days.

For any question, please contact with the Nuclear Medicine Department 91 520 25 80 and Medical Physics Department 91 520 22 94

PATIENTS

- **Prior general information to patient**

  Colaboration: NMD + MRPD + prescribers

  90% out of total explorations Tc-99m → No further RP restrictions

- **Hyperthiroidism therapy patients:**

  prior information about the treatment

  + post treatment recommendations based on the dose rate + working and living conditions of patients

Distribution of information to patients has been improved

✓ **clear and reproducible format**

HEALTH PROFESSIONALS

- **Radioembolization** therapy for liver cancer (Y-90)

  Training sessions for exposed workers: nuclear medicine + vascular radiology

- **Ra-223 treatment** for metastatic prostate cancer

  Training about RP and disposal waste for α-emitters

- Information sessions for **non-exposed workers** in:
  - Nephrology Department (dialysis patients from NM)
  - Cardiology Department (stress tests of NM)
  - Endoscopy Department
  - Operating theatre

HEALTH PROFESSIONALS

- **Protocols and procedures**

  available at the MRPD and constantly updated

Radiation Protection (RP) Protocols in Nuclear Medicine (NM)
RP for childbearing, pregnant or breastfeeding patients of NM
RP for patients undergoing a whole-body-scanning procedure
RP for professionals performing ergometry test
RP for professionals performing sentinel node technique
RP for assistance of hospitalised patients undergoing diagnostic procedures in NM
RP for hospitalised patients undergoing diagnostic procedures in NM with In-111
RP for hospitalised patients undergoing diagnostic procedures in NM with Ga-67
RP for outgoing patients undergoing hyperthyroidism treatment with I-131
RP for hospitalised hyperthyroidism patients
RP in radioembolization therapy for liver cancer procedures using Y-90
RP for professionalsassisting hospitalised patients undergoing radioembolization therapy with Y-90
RP in Ra-223 treatment procedures for prostate cancer

HEALTH PR

- **Protocol**

available a

RP for p

Medical Physics and Radiation Protection Department	Hospital Universitario de La Princesa SaludMadrid Comunidad de Madrid **RADIATION PROTECTION FOR PROFESSIONAL ASSINTING HOSPITALIZED PATIENTS UNDERGOING DIAGNOSTIC EXPLORATIONS IN NUCLEAR MEDICINE WITH GALLIUM-67** Protocol: PMN-14	Edited: 3/2017 Writted: 1/01/09 Revised: 01/03/2017 Page: 1/1 Archive: **Protocols/Nuclear medicine/PMN-14**

Object and scope: Optimising healthcare professionals radiation protection during the period from the radioisotope Ga-67 administration through the exploration performance.

H.U. La Princesa

Responsible: Nuclear Medicine Department and Medical Physics and Radiation Protection Department.

Method:
Excretion of this radionuclide is through urine and faeces.

HEALTH PR

- **Protocol**

available a

RP for p

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Edited: 3/2017

Radiation protection standards during the 24 hours after the administration

1. Handling patient's urine shall be performed using gloves and long-sleeved gown. Once it is finished, gloves must be disposed.
2. In case the patient has a Foley catheter, the urine bag shall be emptied through the toilet tube while maintaining the tap open in order to increase the dilution.
3. Self-sufficient patients shall be indicated to urinate sat down and double flush the tank after urinating, washing their hands carefully.
4. Picking the faeces is not necessary
5. Gloves will be the only protection material for workers, in case they need to manipulate the urine of the patient.

Every nursing role is able to be performed.
Special care needs to be taken during the 6 first hours, optimizing the time spent close to the patient.

During the 6 first hours, it is recommended that an average distance superior to half a metre is kept by visitors.

Presence of pregnant women, both relatives and workers, shall be avoided wherever possible.

Dose received by cause of contact with those patients is very low, 11,9 complete days would be necessary to stay closer than 1metre from the patient to overcome the 1mSv dose limit established for public.

In case of questions or suggestions, please call Medical Physics and Radiation Protection Department 13154/13131

CONCLUSIONS:

Information to patients **prior** to the procedure

- improve risk understanding (patients and also carers and comforters)

RP requirements for individual patients in therapy procedures after the treatment according to dose rate and social conditions

- reduce radiation exposures and implies better quality and life conditions for patients and family.

Education and training of health professionals

- care of nuclear medicine patients outside NMD improved

Thank you for your attention

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