

APPENDIX 1. Questionnaire used in the audit.

Clinical Audit: Are we effectively communicating to patients undergoing nuclear medicine examination about the radiation risk?

Patient Survey

Nuclear Medicine Unit, Queen Elizabeth Hospital.

1. Explain to patient and ask for permission: We are doing a clinical audit assessing our communication to patients about radiation risks of your nuclear medicine examination. It is completely anonymous. Are you happy to assist?
2. Age
 - 18-30
 - 31-40
 - 41-50
 - 51-60
 - 61-70
3. Gender
 - Male
 - Female
4. The examination the patient undergoes _____
5. Do you think it is important to know the potential radiation risks associated with the nuclear medicine examination you undergo?
 - Very important
 - Important
 - Unimportant
 - Very unimportant
6. Do you think you have received sufficient information about the potential radiation risks associated with the nuclear medicine examination you undergo?
 - Very sufficient
 - Sufficient
 - Insufficient
 - Very insufficient
7. Do you think you understand about the potential radiation risks associated with the nuclear medicine examination you undergo?
 - Very much understand
 - Understand
 - Not understand
 - Very much not understand
8. Thank the patient.

APPENDIX 2. New information pamphlet designed for radiographers in the re-audit.

Information on radiation risks

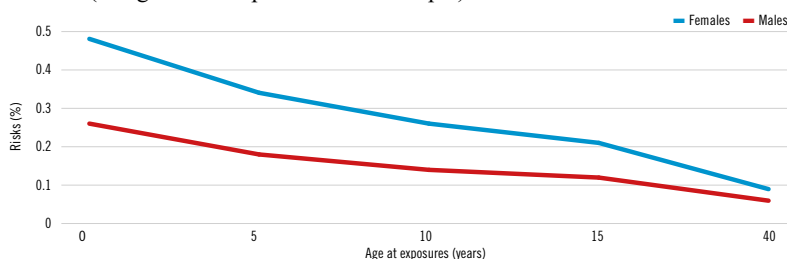
Risk Categorisation

Risk qualification	Approximate level of additional life time risk of fatal cancer	Life time probability of fatal cancer in the general population	Life time probability of fatal cancer in the general population with this extra level of risk
Negligible	< 1 in 1000000	20.00%	20.00%
Minimal	Between 1 in 1000000 and 1 in 100000	20.00%	20.00%
Very low	Between 1 in 100000 and 1 in 10000	20.00%	20.01%
Low	Between 1 in 10000 and 1 in 1000	20.00%	20.10%
Moderate	Between 1 in 1000 and 1 in 500	20.00%	20.20%

**Risk qualification for ADULTS in common nuclear medicine examinations
(1/2000 additional life time risk of fatal cancer for every 10mSv exposure in adults)**

Examination	Radiotracer	Effective dose(mSv)	Equivalent period of natural exposure(years)	Risk
Bone	Tc-MDP (20mCi)	6.3	2.6	Low
Renal	Tc-DTPA (10mCi)	1.8	0.8	very low
	Tc-MAG3 (4mCi)	1.0	0.4	very low
	Tc-DMSA (4mCi)	1.3	0.5	very low
Thyroid/testicular/salivary/meckel	Tc (2-20mCi)	1.0-10.0	0.4-4.0	very low/low
Gallium	Ga (3mCi)	11.0	4.6	low
Heart/parathyroid	Tc-MIBI/tetrofosmin(25mCi)	8.3	3.5	low
GI/haemangioma/MUGA/spleen	Tc-RBC(10-15mCi)	4.8-7.2	2.0-3.0	low
	Tc-denatured RBC (50MBq)	0.4	0.2	very low
Protein losing	Tc-HSA (20mCi)	4.9	2.0	low
Thallium	Tl (2mCi)	10.4	4.3	low
Hepatobiliary	Tc-HIDA (4mCi)	2.6	1.1	low
MIBG	I-131-MIBG (1mCi)	7.4	3.0	low
Octreotide	In-octreotide (5mCi)	10.0	4.2	low
	Tc-technegas (1mCi)	0.6	0.2	very low
Pulmonary	Tc-MAA (3mCi)	1.2	0.5	very low
	Tc-sulphur colloid (0.3-5mCi)	0.2-2.6	0.1-1.1	very low/low
Brain	Tc-ECD/HMPAO (25mCi)	7.1-8.6	3.0-3.6	low

The life-time cancer risks in children may be up to 5 times that of adults for the same radiation dose depending on age, as shown below (using 10mSv exposure as an example):

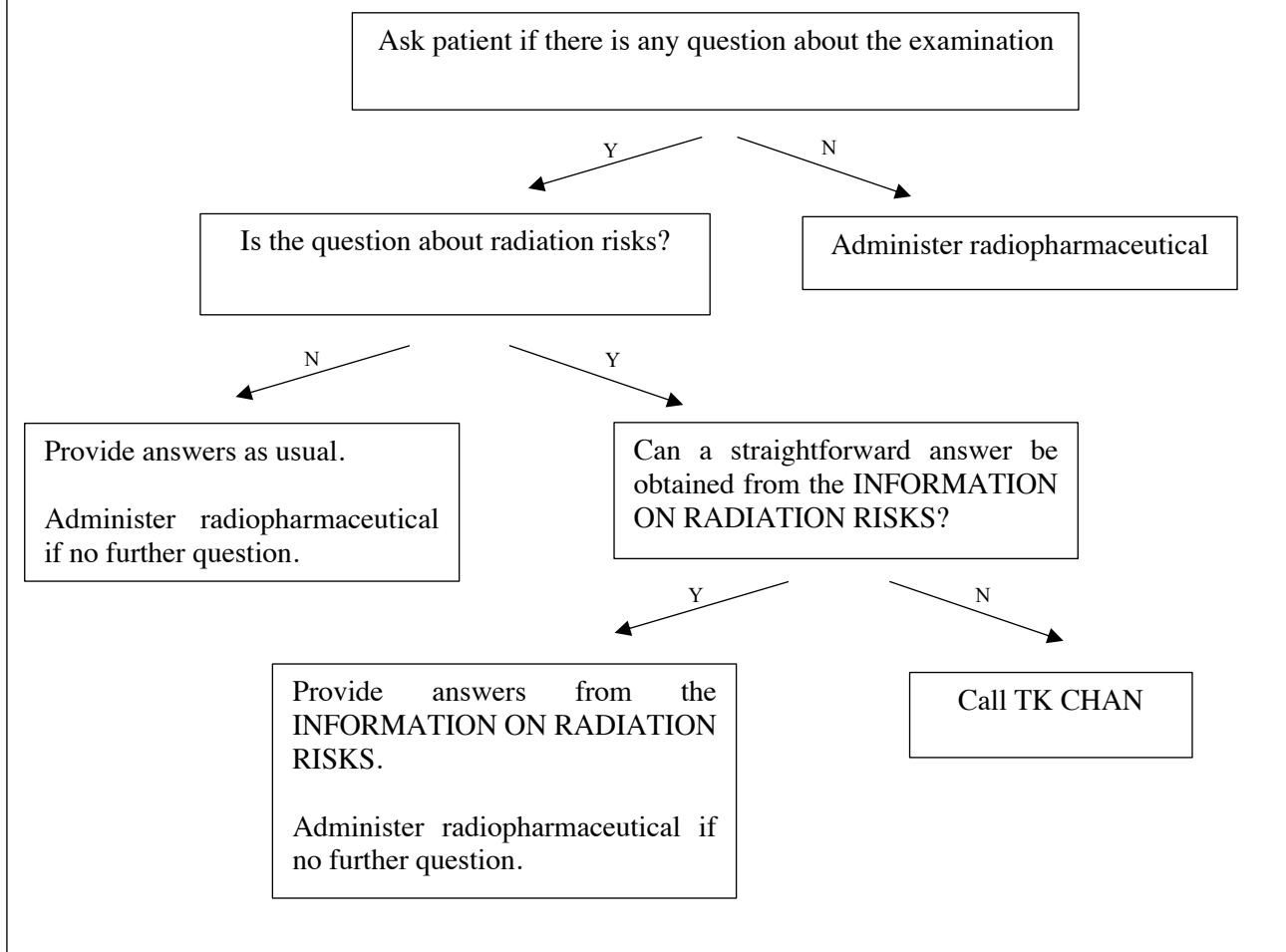


Nuclear Medicine Unit, Queen Elizabeth Hospital

Reference: BEIR 2006. Health risks from exposure to low levels of ionizing radiation: BEIR VII Phase 2. Washing DC. National Academies Press


APPENDIX 3. New workflow designed for radiographers in the re-audit.

Audit project: are we adequately communicating to patients undergoing nuclear medicine examination about the radiation risk?

WORKFLOW FOR RADIOGRAPHERS

APPENDIX 4. New information pamphlet designed for patients in the re-audit, adapted from the nuclear medicine patient poster designed by the Clinical Imaging Board of the United Kingdom, with permission granted.

Nuclear Medicine Examinations



Your health

Nuclear medicine examinations help with making diagnoses and monitoring treatment.


They involve the use of ionising radiation under the supervision of a specialist.


Radiation

Everyone receives some ionising radiation every day from radioactivity in the air, our food and even from space!

The amount of radiation in a nuclear medicine examination varies, but is less than 5 years' duration of your natural exposure. The radiation risks are negligible to low.*

The main benefit of the examination is to provide a correct diagnosis, so you can get the right treatment. This benefit far outweighs the small radiation risk, if any.





Your safety

Our staff are trained to take the best possible images of you or readings using the lowest possible amount of radiation.

Equipment is regularly checked to make sure the examination is safe and effective.


Your examination

Before your examination, you will be given a small amount of a radioactive substance. We normally inject it, but sometimes you can eat, drink or even breath it depending on the test.

If you are pregnant or think you may be pregnant, or are breastfeeding, please inform a member of staff immediately.

After your examination you may still have some radioactivity in your body which will leave over time. You will emit a small amount of radiation which will be insignificant for most people around you, but we may ask you to limit your contact with children and pregnant women for a time.

Your examination may include a computed tomography (CT) scan. This will incur extra radiation similar to or less than the nuclear medicine examination itself.



We are here to make sure the examination is right and safe for you. Please ask our staff if you need help.

Nuclear Medicine Unit, Queen Elizabeth Hospital Adapted from the Clinical Imaging Board, UK

* There is a 20% life time chance of developing a fatal cancer in the general population. A nuclear medicine examination may expose an adult patient to less than or much less than 0.1% extra chance.