

## Radiographers' practice to inform patients about radiation dose and risks in Northern Finland

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### Abstract

The purpose was to investigate whether radiographers inform patients about radiation dose and risks.

A semi-structured questionnaire was prepared and sent to radiographers in Northern Finland. Radiographers were asked whether they informed patients about the dose and risks of radiation and the preferred ways to describe them. Radiographers were asked to estimate their preparedness to provide information.

A total of 174/272 radiographers (64%) responded to the survey. Altogether 5% of the radiographers informed patients always and 36% sometimes about the dose, while 6% informed always and 41% sometimes about the risks of radiation. Dose was described by comparing it to the background radiation (48/71, 68%) or to the dose of a chest postero-anterior radiograph (31/71, 44%) and by using a verbal scale (36/71, 51%). Radiographers informed about increased risk of cancer (35/81, 43%), risk of genetic change (33/81, 41%) and risk of skin reaction (8/81, 10%). Most of the radiographers estimated their ability to inform patients about the dose and risks to be at least reasonable.

Radiographers inform patients insufficiently about the dose and risks of radiation, although they estimate their ability to provide information to be at least reasonable.

**Keywords:** communication; informed consent; patient safety; radiation

### Abbreviations and acronyms

CT Computed tomography  
EU European Union  
OUH Oulu University Hospital

## Introduction

Due to increased radiation doses from medical imaging to the public and reports of inappropriate examinations, there have been efforts to improve the implementation of justification (ICRP 2007, Oikarinen et al. 2009, Brenner 2010, Malone et al. 2012, Ulsh 2015). According to the principle of justification, radiation should do more good than harm when balanced against the possible detriment that radiation might cause (ICRP 2007, European Commission Council Directive 2013/59/Euratom). In the EU (European Union), both referrers and practitioners share the responsibility for justification. However, the patient's opinion should also be included in this process: the patient should be provided with due information before informed consent can be obtained (Malone et al. 2012, European Commission Council Directive 2013/59/Euratom). Informing patients is the responsibility of the referrer or the practitioner as specified by the Member States.

However, the practical aspects related to justification can be delegated to another accredited individual; in most cases, the radiographer (European Commission Council Directive 2013/59/Euratom). According to the previous EU directive, the practitioner was more likely to be responsible for informing patients, but the practical aspects could be delegated as appropriate (European Commission Council Directive 97/43/Euratom). The information should include the type of the suggested examination, its benefits and risks, alternative examinations, and the risks of not undergoing the examination (IAEA 2009, Malone et al. 2012). In addition to fulfilling the requirements and patient rights, appropriate information may reduce patient anxiety and decrease the demand for inappropriate examinations (Picano 2004, Malone et al. 2012, Nievelstein & Frush 2012, IAEA 2014).

Despite legislation and recommendations, little or no information on these issues is given to patients (Picano 2004, IAEA 2009, Malone et al. 2012, Semelka et al. 2012, Lam et al. 2015, Hadley & Watson 2016, Ukkola et al. 2016, Ukkola et al. 2017, Oikarinen et al. 2019, Ukkola et al. 2020). Lack of time, uncertainty and concerns about causing undue anxiety may prevent staff from giving information (Newman 2016, Schuster et al. 2017). Radiation terminology is also complicated and difficult to understand for both professionals and patients (Busey et al. 2013, Ricketts et al. 2013, Lam et al. 2015, Irving et al. 2016, Portelli et al. 2016).

Our previous survey carried out among patients revealed that patients do not feel adequately informed and expect diverse information (Ukkola et al. 2016). The present study was carried out to find out whether radiographers in Northern Finland inform patients about radiation dose and risks and to survey the preferred ways to describe the dose and risks. The results of the study are useful when developing patient information in our area.

## Materials and methods

This study was performed in 2014 in the Department of Diagnostic Radiology, Oulu University Hospital (OUH), Oulu, Finland, with the approval of the Institutional Review Board. The data was collected with a semi-structured questionnaire (Appendix 1) based on literature, conceptual analysis and experts' opinion and prepared by the authors in collaboration with a statistician (Burns & Grove 2012, Polit & Beck 2017). The validity of the inquiry was ensured with a pilot study using a sub-sample consisting of five radiographers. The target population comprised the radiographers in the public sector (n=272) in Northern Finland. The Webropol survey link (Webropol 2002) with information about the survey was sent to all the radiographers by e-mail, allowing four weeks response time, after which a reminder was sent. The radiographers worked in the university hospital, in central or district hospitals or in the radiology units of health centres (hereafter called "other departments"). The information letter outlined the purpose of the study, included contact information, and assured the voluntariness, confidentiality and anonymity of the participants.

The survey asked whether the participants informed (always - sometimes - no information) patients about the dose and the risks of radiation before examinations if the patients did not ask any questions about radiation. The radiographers were asked to describe their practice during the last 12 months. In the case of positive replies, the preferred ways to describe the dose and the risks were enquired. If the radiographers told the patients about the cancer risk, the preferred ways to describe it were also enquired. The radiographers were also asked if there was any connection between the information given and the dose level of the examination or the age of the patient. The dose levels of the examinations were classified as any level, at least medium (1–10 mSv), or high (>10 mSv) dose level of radiation (Malone et al. 2012, Peck & Samei 2017). The age of the patients was categorised into five groups.

The participants were also asked whether patients, in general, asked questions about radiation-related issues (very often - often - sometimes - rarely - very rarely - almost never). In addition, they were asked to evaluate the present situation of patient information in the university hospital/other departments in connection with radiological examinations using a Likert scale from 1 to 5 (bad – good). Radiographers' preparedness to provide information about the dose and risks was also enquired. Furthermore, the number of the radiographers' working years, categorised into five groups ( $\leq 3$  years, 4–10, 11–20, 21–30 and more than 30 years) as well as place of work (as listed above) were enquired.

The questions concerning the dose and risk information as well as the frequency of patients enquiring about radiation-related issues, the connection of information to the different dose levels and the preparedness to inform patients were single-answer type multiple-choice questions. Radiographers' preparedness was rated as very bad – bad – reasonable – good – very good. The questions regarding the age of the patients receiving information and the preferred ways to describe the dose and the risks were multiple-answer type multiple-choice questions. The respondents could also comment the way of giving information by answering an open question ("In another way/how?").

Frequency distributions of how often patients asked about radiation-related issues and of how often radiographers provided dose and risk information were calculated and compared between the university hospital and other departments and between the different work experience time categories by using a Chi-square test. Frequencies with proportions for the preferred ways to describe the dose and the risks were calculated. The relation of the dose level of examinations and of the different age groups of patients to the provided dose and risks information was also analysed. The opinion regarding the ability to provide information was presented as a number and proportion (%). The rating related to the present situation of information was presented by mean and standard deviation (SD). Linear-by-linear association was used to compare the categorised length of work experience between the university hospital and other departments. IBM SPSS Statistics 22 (IBM Corporation, Armonk, NY) was used to conduct the statistical analyses (IBM 2013). The open questions were analysed using content analysis by categorising the data into structured subject groups, and the number of expressions in each group was counted (i.e. quantification) (Polit & Beck 2017).

## Results

Altogether 174/272 radiographers (64%) responded to the inquiry; 87 (50%) were from the university hospital and 87 (50%) from other departments. The experience of working as a radiographer was longer in the other departments than in the university hospital ( $p=0.019$ )

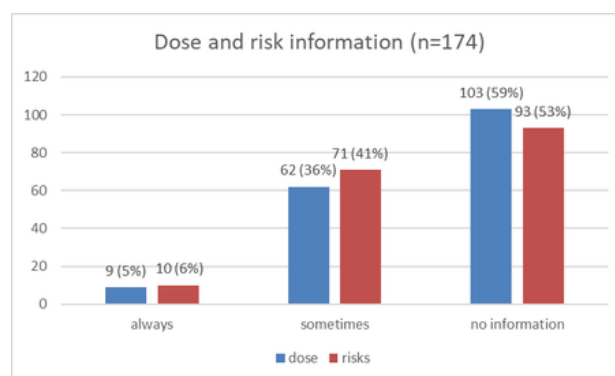
**Table 1.** The number of radiographers classified according to workplace and number of working years

	Frequency			p
	University hospital n (%)	Other departments n (%)	Total n (%)	
Years as a radiographer				0.019
Up to 3 years	16 (9)	8 (5)	24 (14)	
4–10 years	21 (12)	16 (9)	37 (21)	
11–20 years	24 (14)	24 (14)	48 (28)	
21–30 years	12 (7)	17 (10)	29 (17)	
Over 30 years	14 (8)	22 (13)	36 (21)	
Total	87 (50)	87 (50)	174 (100)	

The radiographers reported that the patients asked about radiation related issues very often or often (13/174, 7%), sometimes (58/174, 33%), and rarely or very rarely (96/174, 55%). There was no statistically significant difference between different work experience groups or between the university hospital and other departments.

## Dose information

In all, 9/174 respondents (5%) informed patients about the dose always and 62/174 (36%) sometimes, while 103/174 (59%) did not inform patients if they did not ask about the dose (Fig 1).



**Fig 1.** The number of radiographers providing information on the dose and the risks of radiation

There was no statistically significant difference between different work experience groups or between the university hospital and other departments (Table 2) when comparing giving information (always or sometimes) or not.

**Table 2.** The number of radiographers providing information on the dose and the risks (always or sometimes) in the university hospital and the other departments and compared by the work experience of radiographers

Institution							p <sup>3</sup>	
	Total n=174	OUH <sup>2</sup> n=87	Others n=87					
Inform <sup>1</sup> about								
dose	71 (40.8%)	32 (36.8%)	39 (44.8%)					0.355
risks	81 (46.6%)	35 (40.2%)	46 (52.9%)					0.128
Work experience in years								
	Total, n=174	Up to 3 years	4-10 years	11-20 years	21-30 years	Over 30 years	p <sup>3</sup>	p <sup>4</sup>
Inform <sup>1</sup> about								
dose	71 (40.8%)	10 (14.1%)	11 (15.5%)	22 (31%)	14 (19.7%)	14 (19.7%)	0.54	0.643
risks	81 (46.6%)	7 (8.6%)	16 (19.8%)	28 (34.6%)	9 (11.1%)	21 (25.9%)	7 0.03	0.122
<sup>1</sup> Always or sometimes <sup>2</sup> Oulu University Hospital <sup>3</sup> Significance from the Chi-square test <sup>4</sup> Significance from linear-by-linear association								

Dose was mostly described by comparing it to background radiation (48/71, 68%) or to the corresponding number of chest pa radiographs (31/71, 44%) and by using a verbal scale (36/71, 51%) (Table 3). The respondents who informed patients about the dose only after having been asked (103/174, 59%) described the dose similarly (77%, 41% and 53%, respectively). Radiographers gave four comments to the open question “in another way/how?” (Table 3).

**Table 3.** The preferences of the radiographers regarding the ways to convey the dose and the risks of radiation

	Dose	Risks
The preferences of the radiographers related to expression of the dose		
background radiation	48/71 (68%)	
number of chest pa radiographs	31/71 (44%)	
using verbal scale (minimal, low, medium, relatively high)	36/71 (51%)	
millisievert (mSv)	3/71 (4%)	
related to expression of the risks		
increased risk of cancer		35/81 (43%)
risk of genetic change		33/81 (41%)
risk of skin reaction (if theoretically possible)		8/81 (10%)
Comments to the open questions		
dose expression (n=4)		
no specific comment	4	
information about other risks (n=15)		
risks to pregnancy		5
risk of radiation		4
risks to radiation sensitive organ		2
no specific comment		4
expression of increased risk of cancer (n=11)		
benefit/risk comparison		2
changes in the cell level		2
no specific comment		7

Altogether 38/69 radiographers (55%) informed patients about the dose in connection with an examination causing any level of radiation, 18/69 (26%) with an examination causing at least medium dose of radiation, and 13/69 (19%) only with an examination causing high dose of radiation. In all, 42/71 respondents (59 %) provided information about the dose to patients of any age. All in all, 5/71 (7%) were not able to express their opinion.

**Risk information**

Altogether 10/174 radiographers (6%) informed patients always and 71/174 (41%) sometimes about the risks of radiation if the patients did not ask about the risks. In all, 93/174 (53%) did not inform patients about the risks (Fig 1). The yes/no results differed between work experience groups (p=0.031), but the outcome was not consistently ascending or descending (p=0.122). There was no statistically significant difference between the university hospital and the other departments (Table 2).

Radiographers informed patients about increased risk of cancer (35/81, 43%), risk of genetic change (33/81, 41%) and risk of skin reaction (8/81, 10%) (Table 3). The respondents who informed patients only after having been asked (93/174, 53%) informed them about similar risks (31%, 24% and 11%, respectively). The radiographers gave 15 comments to the open question “in another way/how?” (Table 3). The open question referring to increased risk of cancer yielded 11 comments.

Altogether 34/78 (44%) radiographers informed patients about the risks in connection with an examination causing any level of radiation, 23/78 (29%) with an examination causing at least medium dose of radiation, and 21/78 (27%) only with an examination causing high dose of radiation. Altogether 46/81 respondents (57%) provided information about the risks to patients of any age. All in all, 4/81 (5%) were not able to express their opinion.

**Abilities of radiographers to inform patients**

Altogether 69/174 radiographers (40%) estimated their ability to inform patients about the dose as excellent or good, 78/174 (45%) as reasonable, and 27/174 (16%) as poor, with nearly similar estimations of their ability to inform patients about the risks (40%, 47% and 13%, respectively) (Fig. 2). On a Likert scale from 1 to 5, radiographers rated the present situation in patient information at 2.8 (mean, SD 0.9).

**Discussion**

In this study, less than half of the radiographers informed patients about the dose and the risks in connection with radiological examinations at least sometimes. When comparing giving information or not, there was no statistically significant difference between the length of work experience or place of work. Radiographers did not rate the present situation in patient information as adequate. However, most of them evaluated their preparedness to inform patients about the dose and risks to be at least reasonable.



Patients did not ask about radiation-related issues very often. It has been stated that radiation communication is insufficient between radiographers and their patients unless the patient asks specifically about the risks (Hadley & Watson 2016). Our previous study among patients revealed that referring practitioner, information letter and radiographer were the preferred sources of overall information (Ukkola et al. 2016). However, the radiographer may be the first person to communicate about radiation-related issues if the patient has not been able to meet the referring doctor (Ukkola et al. 2020).

More than half of the radiographers did not inform patients about the dose and those who did, mostly did it sometimes. They mostly described doing so with patients of all ages and in connection with any examination. According to other studies, radiographers rarely discuss radiation dose and risks (Hadley & Watson 2016, Newman 2016, Portelli et al. 2016, Sin et al. 2013, Singh et al. 2017) and relatively few radiographers could give an accurate estimation of radiation doses in CT (Hadley & Watson 2016). Our previous study carried out among patients revealed that, in the university hospital, dose and risk information was only provided to a few patients and the sources were radiographer, letter and referrer (Ukkola et al. 2017). The results are contradictory: radiographers report informing more often about dose and risks than patients report it having happened. Patients may have forgotten the information they received or radiographers may overestimate their contribution.

Radiographers compared the dose to the background radiation or to the number of chest pa radiographs, or they used a verbal scale. According to patients, the preferred ways were the symbol of radiation, the scale and the corresponding number of chest pa radiographs (Ukkola et al. 2016). Furthermore, parents of children preferred symbols and the corresponding period of natural background radiation (Oikarinen et al. 2019). Dose can also be compared to the dose received from all radiation sources or to the dose received during a flight (Robey et al. 2014).

More than half of the radiographers did not inform patients about the risks of radiation. Those who did, mostly did it sometimes. They mostly informed patients of all ages and in connection with any examination. Our previous study revealed that patients wish to receive dose and risk information in connection with radiological examinations with different dose levels (Ukkola et al. 2016).

However, several studies have reported poor risk information provided by the professionals (Picano 2004, Baerlocher & Detsky 2010, Ricketts et al. 2013, Robey et al. 2014).

Radiographers mostly informed patients about increased risk of cancer and, surprisingly often, about the risk of genetic change. The way of conveying the cancer risk was not identified in this study. Our study among patients revealed that verbal and numerical scales are the preferred ways of describing cancer risks (Ukkola et al. 2016). Today, the risk of genetic change is uncertain (Peck & Samei 2017). It remains unclear whether the respondents in our study understood this concept correctly. The low proportion of positive replies related to information about skin reaction risks may indicate a passive approach due to lack of guidelines.

In a systematic review, the two most common ways of disclosing the risks of ionising radiation were identified: comparing risks to the risks of common life events and describing the risk as an additional risk to the baseline risk of cancer (Younger et al. 2019). Additional risk of death from radiation (Robey et al. 2014) has also been presented. Informing about risk may be carried out using numerical or verbal expressions (WHO 2016). In any case, expressions related to dose and risks should be consistent, clear and non-technical (Malone et al. 2012). The description of risks should be appropriate and the benefits should be linked to the risks (Younger et al. 2019).

Radiographers' estimation of the present situation in patient information was not very good (2.8 on a Likert scale). Patients in our area have rated the received information even lower (2.2) (Ukkola et al. 2016). Previous publications have also stated that the information does not work as it should (Freudenberg et al. 2011, Malone et al. 2012, ESR 2016, Cooper et al. 2019). Although the radiographers estimated their ability to inform patients as at least reasonable, the opportunity to provide information was not utilised. Our study has revealed some reasons for the passive approach: radiographers' assumption that information had already been given by the referrer or that information was not needed, or their concerns about causing unnecessary fear (Ukkola et al. 2017). According to some other studies, radiographers may have inadequate knowledge of radiation-related issues (Hadley & Watson 2016, Sin et al. 2013, Günalp et al. 2014, Newman 2016, Paolicchi et al. 2016).

Radiographers may have an uncertain conception of patient-centred health care and of their own role in the justification process. Working at a fast tempo requires knowledge and skills to achieve good interaction with the patient (Raaschou et al. 2019). Informing patients is not the task of radiographers' only, but the responsibility is shared between the referrer and the staff of the radiology department. However, there are no jointly accepted practical guidelines regarding informing in our country. Guidelines for responsibilities, and education are needed (Freudenberg et al. 2011, Malone et al. 2012, Cooper et al. 2014, ESR 2016). Notices and digital material could also be utilised. Utilizing the results of our studies, digital educational material for both public and professionals have already been published (Ukkola et al. 2016, Ukkola et al. 2017, Oikarinen et al. 2019, Ukkola et al. 2020, Health Village 2021).

There are some limitations in this study. The study is from one university hospital district only, and the results can therefore not be generalised. However, our aim was to assess the situation in Northern Finland in order to be able to proceed with the research and developmental project aimed at enhancing patient information in our area. The survey covered public sector radiology departments in Northern Finland as a whole, the respondents were evenly from the university hospital and from other departments, and represented different lengths of work experience fairly evenly. Furthermore, this survey was conducted some years ago. However, it is obvious that the situation in patient information has not changed essentially as no practical guidelines regarding information have been implemented in our area after this survey.

In conclusion, radiographers reported informing patients insufficiently about the dose and the risks of radiation although they estimated their preparedness to provide information to be at least reasonable. Practical guidelines specifying the contents and responsibilities of information, education and easy access to educational material are needed.

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**Kysely**

Kysymyksiin liittyviä selityksiä:

Kyselyssä oli yhteensä 43 kysymystä. Tässä on esitetty kysymykset, joiden tuloksia on käsitelty tässä artikkelissa.

Kysymys 21 on jatkokysymys kysymyksen 15 vaihtoehdolle "en kerro".

Kysymys 29 on jatkokysymys kysymyksen 23 vaihtoehdolle "en kerro".

1. Missä sairaanhoitopiirissä työskentelet?

Kainuun shp

Keski-Pohjanmaan shp

Pohjois-Pohjanmaan shp

Lapin shp

Länsi-Pohjan shp

2. Mikä on työpaikkasi?

Yliopistosairaala

Keskussairaala

Aluesairaala

Terveyskeskus

4. Mikä on ammattinimikkeesi?

Röntgenhoitaja

Laboratoriohoitaja

Muu ammattinimike. Mikä?

6. Montako vuotta olet työskennellyt säteilytyöntekijänä?

alle 1 vuotta

1-3 vuotta

4-10 vuotta

11-20 vuotta

21-30 vuotta

yli 30 vuotta

7. Kuinka usein potilaat kysyvät sinulta säteilyyn liittyvistä asioista?

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA

Hyvin usein (yli 80 % potilaista)

Usein (50-80 % potilaista)

Joskus (20-49 % potilaista)

Harvoin (5-19 % potilaista)

Erittäin harvoin (1-5 % potilaista)

Ei juuri koskaan

15. Kerrotko potilaalle tutkimuksen säteilyannoksesta ennen säteilytutkimusta? Oletetaan, että potilas ei kysy tutkimuksen säteilyannoksesta.

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA

Pyrin kertomaan aina

Kerron joskus

En kerro

17. Mitä ilmaisumuotoa käytät kertoessasi säteilyannoksesta ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
Ilmoitan annoksen millisieverteinä (mSv)

Vertaan thx pa-kuvien määrään

Vertaan taustasäteilyyn

Käytän skaalaa minimaalinen, matala, keskinkertainen, suht.suuri

Käytän muuta ilmaisua. Mitä?

18. Minkä annostason tutkimusten yhteydessä kerrot säteilytutkimuksen säteilyannoksesta?

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
Vain korkean annostason säteilytutkimusten

yhteydessä (yli 10 mSv, esim. vatsan TT, angiografiat)

Vähintään keskinkertaisen annostason

säteilytutkimusten yhteydessä (1-10 mSv, esim. rangat, kehkojen TT)

Kaikkien säteilytutkimusten yhteydessä

20. Minkä ikäisille potilaille kerrot säteilyannoksesta ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
Kaikenikäisille

Lapsille ja nuorille (alle 18 v.) ja/tai heidän vanhemmilleen

Nuorille aikuisille (18-35 v.)

Keski-ikäisille (36-60 v.)

Vanhuksille (yli 60 v.)

En osaa sanoa

21. Mikä on syy siihen, että et kerro potilaalle tutkimuksen säteilyannoksesta ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.

Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
En näe asiaa tarpeellisena

Koen, ettei minulla ole riittäviä valmiuksia kertomiseen  
Pelkään aiheuttavani turhaa pelkoa

Oletan, että lähettävä lääkäri on kertonut

Oletan, että lähettävän yksikön muu henkilökunta on kertonut

Oletan, että joku muu säteilytyöntekijä osastollani on kertonut/kertoo

Oletan, että potilas on saanut tiedon kirjeellä

Muusta syystä. Mistä?

22. Miten toimit, jos potilas kysyy säteilyannoksesta ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.  
 Kerron itse, ilmoitan annoksen millisieverteinä (mSv)  
 Kerron itse, vertaan thx pa-kuvien määrään  
 Kerron itse, vertaan taustasäteilyyn  
 Kerron itse, käytän skaalaa minimaalinen, matala, keskinkertainen, suht. suuri  
 Kerron itse, käytän muuta ilmaisua. Mitä?  
 Toimin muulla tavalla. Miten?  
 Ohjaan potilaan asiantuntijan luo. Kenen?

23. Kerrotko potilaalle säteilytutkimuksen riskeistä ennen säteilytutkimusta? Oletetaan, että potilas ei kysy säteilytutkimuksen riskeistä.  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Pysin kertomaan aina  
 Kerron joskus  
 En kerro

25. Mistä säteilyn aiheuttamista riskeistä kerrot potilaalle ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Ihoreaktion riskistä (mikäli se tutkimuksessa on teoreettisesti mahdollista)  
 Lisääntyneestä syöpäriskistä. Mitä ilmaisumuotoja käytät?  
 Geneettisen muutoksen riskistä  
 Muista. Mistä?

26. Minkä annostason tutkimusten yhteydessä kerrot säteilytutkimuksen riskeistä?  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Vain korkean annostason säteilytutkimusten yhteydessä (yli 10 mSv, esim. vatsan TT, angiografiat)  
 Vähintään keskinkertaisen annostason säteilytutkimusten yhteydessä (1-10 mSv, esim. rangat, kehkojen TT)  
 Kaikkien säteilytutkimusten yhteydessä

28. Minkä ikäisille potilaille kerrot säteilyriskeistä ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Kaikenikäisille  
 Lapsille ja nuorille (alle 18 v.) ja/tai heidän vanhemmilleen  
 Nuorille aikuisille (18-35 v.)  
 Keski-ikäisille (36-60 v.)  
 Vanhuksille (yli 60 v.)  
 En osaa sanoa

29. Mikä on syy siihen, että et kerro potilaalle säteilytutkimuksen riskeistä? Voit valita useita vaihtoehtoja.  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 En näe asiaa tarpeellisena  
 Koen, ettei minulla ole riittäviä valmiuksia kertomiseen  
 Pelkään aiheuttavani turhaa pelkoa  
 Oletan, että lähettävä lääkäri on kertonut  
 Oletan, että lähettävän yksikön muu henkilökunta on kertonut  
 Oletan, että joku muu säteilytyöntekijä osastollani on kertonut/kertoo  
 Oletan, että potilas on saanut tiedon kirjeellä  
 Muusta syystä. Mistä?

30. Miten toimit, jos potilas kysyy säteilyannoksesta ennen säteilytutkimusta? Voit valita useita vaihtoehtoja.  
 Kerron itse ihoreaktion riskistä (mikäli se tutkimuksessa on teoreettisesti mahdollista)  
 Kerron itse lisääntyneestä syöpäriskistä. Mitä ilmaisumuotoja käytät?  
 Kerron itse geneettisen muutoksen riskistä  
 Kerron itse. Käytän muuta ilmaisua. Mitä?  
 Pyydän osastoni toista hoitajaa/lääkärää kertomaan  
 Pyydän säteilyfysiikan asiantuntijaa kertomaan  
 Toimin muulla tavalla. Miten?

32. Millaiset valmiudet sinulla on kertoa potilaalle säteilytutkimusten (tarkoittaa kaikkien annostasojen tutkimuksia) säteilyannoksesta?  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Erittäin hyvät  
 Hyvät  
 Kohtalaiset  
 Huonot  
 Erittäin huonot

33. Millaiset valmiudet sinulla on kertoa potilaalle säteilytutkimusten (tarkoittaa kaikkien annostasojen tutkimuksia) riskeistä?  
 Kysymys koskee toimintaasi VIIMEISEN VUODEN AJALTA  
 Erittäin hyvät  
 Hyvät  
 Kohtalaiset  
 Huonot  
 Erittäin huonot

34. Arvioi asteikolla 1-5 nykytilannetta säteilytutkimusten potilasinformoinnissa.  
 Kysymys koskee yleistä käytäntöä  
 SAIRAALASSASI/TERVEYSKESKUKSESSASI

43. Muita aiheeseen tai kyselyyn liittyviä kommentteja

## Väitöskirja

# Potilaan informointi ionisoivalle säteilylle altistavien kuvantamistutkimusten yhteydessä

### Leila Ukkola

röntgenhoitaja (YAMK), TtT

Oulun yliopiston tutkijakoulu; Oulun yliopisto, Lääketieteellinen tiedekunta; Oulun yliopistollinen sairaala

### Tutkimuksen tarkoitus ja luonne:

Tutkimuksen tarkoituksena oli kuvailla aikuispotilaiden ja lasten huoltajien informointia ionisoivalle säteilylle altistavien kuvantamistutkimusten yhteydessä sekä heidän toiveitaan informoinnista. Lisäksi tarkoituksena oli kuvata ja selittää röntgenhoitajien toimintaa säteilyannosten ja -riskien informoinnissa sekä mahdollisia informointiin liittyviä esteitä.

### Menetelmät:

Tutkimus koostui kahdesta osatutkimuksesta. Ensimmäisessä osatutkimuksessa kuvailtiin aikuispotilaiden (osajulkaisu I) ja lasten huoltajien (osajulkaisu III) informointia ionisoivalle säteilylle altistavien tutkimusten yhteydessä sekä heidän toiveitaan asian suhteen (osajulkaisut II ja III). Toisessa osatutkimuksessa kuvailtiin ja selitettiin röntgenhoitajien toimintaa informoinnissa ja siihen liittyviä esteitä (osajulkaisut IV ja V). Aineisto kerättiin tätä tutkimusta varten kehitetyillä puolistrukturoiduilla mittareilla aikuispotilailta (n=147) ja lasten huoltajilta (n=41) sekä röntgenhoitajilta (n=174). Kahdessa tutkimuksessa käytettiin sopivuuteen perustuvaa otantaa ja Pohjois-Suomessa toimivat röntgenhoitajat pyydettiin mukaan tutkimukseen. Aineisto analysoitiin tilastomenetelmin. Avointen kysymysten vastaukset luokiteltiin sisällön analyysin periaatteella.

### Keskeiset tulokset:

Säteilytutkimukseen tulevat aikuispotilaat ja huoltajat, joiden lapset tulivat tavanomaiseen röntgentutkimukseen, eivät saaneet riittävästi informaatiota. Informointi oli vähäistä etenkin säteilyannoksista ja -riskeistä sekä vaihtoehtoisista tutkimuksista. Tutkittavat saivat informaatiota useammin säteilytutkimuksen tarkoituksesta. Aikuispotilaat ja lasten huoltajat toivoivat saavansa monipuolista informaatiota tutkimuksesta etenkin lähettävältä lääkäriltä ja röntgenhoitajalta. Lisäksi toivottiin tietoa kirjallisesti.

Informaatiota toivottiin erityisesti säteilytutkimuksen tarkoituksesta sekä säteilyannoksesta ja -riskeistä. Röntgenhoitajista vain harvat informoivat potilaita säteilyannoksista ja -riskeistä, koska he olettivat aiheuttavansa potilaille turhaa pelkoa tai eivät kokeneet sitä tarpeelliseksi. He olettivat myös lähettävän lääkärin jo kertoneen asiasta.

### Tulosten merkitys radiografian tieteenalalla:

Tutkimuksen tuottamaa tietoa voidaan hyödyntää säteilytutkimuksiin liittyvän informoinnin kehittämisessä osana potilaan korkeatasoista kokonaisuhoitoa. Tuotetun tiedon avulla voidaan myös selkeyttää röntgenhoitajan roolia osana oikeutusarvioinnin varmistamista. Tavoitteena on edelleen kehittää lain ja suositusten edellyttämä informoinnin toimintamalli Oulun yliopistolliseen sairaalaan. Jatkossa tuloksia voitaneen hyödyntää kansallisestikin.

### Yhteyshenkilön yhteystiedot:

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