



# A road-map for developing referral guidelines for diagnostic imaging in the Russian Federation

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# Justification in Russian radiation protection regulations

- One of the main principles of radiation protection in medicine
- Federal state law FZ-3 “On the radiation safety of the public”
- Norms of the radiation safety NRB-99/2009
- Basic sanitary rules of the provision of the radiation safety OSPORB 99/2010
- Medical exposure should be justified considering:
  - Clinical indications;
  - The use of the imaging modalities with the lowest doses
  - The use of alternative (non-radiation) diagnostic methods

Justification is the responsibility of the medical staff  
Considered to be inspected by RP authorities

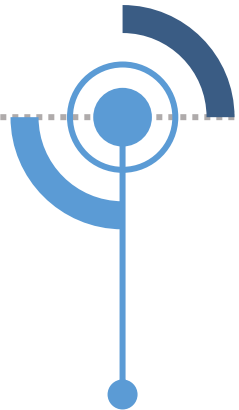


# Background

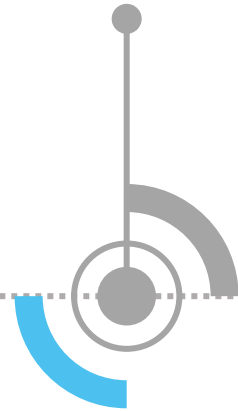
## Data collection in Russian hospitals

Identification of problems related to the justification in radiology

2009-2014



2012-2015



## Risk assessment

Development of the dedicated guidelines on the simplified assessment of radiation risks from different imaging modalities for the patients of different age groups

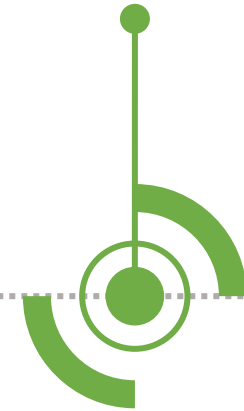
## Evaluation of the process

Developed guidelines on radiation risk assessment are seldom (never) used. Requirement to integrate with the existing documents from the Ministry of Healthcare

2015-2017



2017



## Joint project with IAEA

Practical arrangements with Rospotrebnadzor  
Task 2: Justification of medical imaging  
Jenia Vassileva; Håkan Holmberg

# Identified existing problems

- About 30% of examinations in surveyed hospitals in St-Petersburg were performed without proper referral (2009-2013)
- Significant number of self-referred PET/CT and CT examinations (2011-2017)
  - Cancer screening
- Fluoroscopic examinations of stomach and intestines (barium meal, enema) – performed by surgeons without any referral (2015-2019)
- Prevalent use of traditional imaging modalities (radiography, fluoroscopy) instead of CT (2011-2019)
  - Lack of equipment
  - Preferences of radiologists and referral physicians

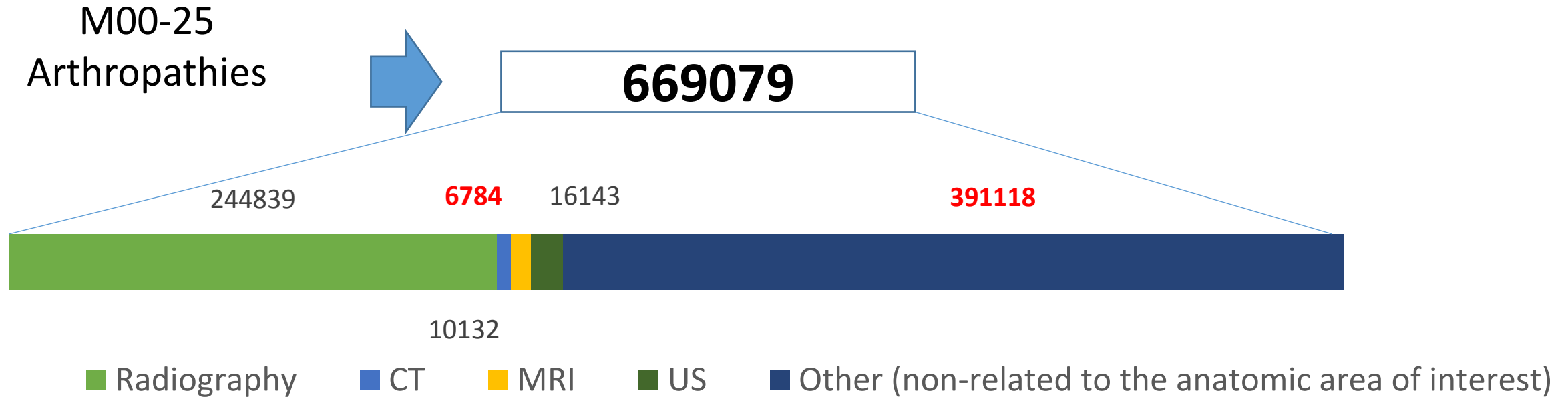
# Case report: St-Petersburg, 2016

Evaluation of the mandatory chest X-ray screening, St-Petersburg, 2016

8600 patients

Result	Number of patients	%
No pathology	7339	85,79
Other (age-related changes)	699	8,17
Infiltrate	256	2,99
Consolidation	65	0,76
Single pulmonary nodule	39	0,46
Posttuberculosis calcificate	102	1,19
Disseminated processes	17	0,20
Tuberculosis	16	0,19
Malignant lesion (lung cancer/metastases)	21	0,24

# Case report: Moscow, 2017



**60%** of incorrect admissions:

- Modalities with low diagnostic information (CT)
- Imaging non-related to the relevant anatomic area

# Methodical guidelines “Assessment of radiation risks for the patients undergoing diagnostic examinations with the use of ionizing radiation”

Category of radiation risk, rel. units.	Effective dose, mSv		
	Children (under 18 years)	Adults (18-64 years)	Older persons (65 years and over)
Negligible ( $<10^{-6}$ )	$<0.01$	$<0.02$	$<0.2$
Minimum ( $10^{-6} - 10^{-5}$ )	0.01 - 0.1	0.02 - 0.2	0.2 - 2
Very low ( $10^{-5} - 10^{-4}$ )	0.1 - 1	0.2 - 2	2 - 20
Low ( $10^{-4} - 10^{-3}$ )	1 - 10	2 - 20	20 - 200
Moderate ( $10^{-3} - 3 \cdot 10^{-3}$ )	10 - 30	20 - 60	200 - 500
Significant ( $3 \times 10^{-3} - 10^{-2}$ )	30 - 100	60 - 200	-

Category of radiation risk, rel. units.	CT examination		
	Children (Under 18 years)	Adults (18-64 years)	Older persons (65 years and over)
Very low ( $10^{-5} - 10^{-4}$ )	—	—	Skull; Thorax; Abdomen; Pelvis and hip
Low ( $10^{-4} - 10^{-3}$ )	Skull; Thorax; Abdomen	Skull; Thorax; Abdomen; Pelvis and hip	—

Category of radiation risk, rel. units.	Interventional procedures		
	Children (Under 18 years)	Adults (18-64 years)	Older persons (65 years and over)
Very low ( $10^{-5} - 10^{-4}$ )	All procedures (depending on the complexity)	—	—
Low ( $10^{-4} - 10^{-3}$ )		All procedures (Depending on the complexity)	All procedures (Depending on the complexity)
Moderate ( $10^{-3} - 3 \cdot 10^{-3}$ )	—		—



# Existing documents of the Ministry of Healthcare

Clinical recommendations

What the referring physician MAY use, considering the principles of evidence-based medicine

Not covered by the State Health Insurance

Medical-economical standards

What the referring physician SHOULD use, considering the availability and price

Covered by the State Health Insurance

Clinical standards of diagnostics and treatment

What the referring physician SHOULD use

Covered by the State Health Insurance

# Example for the kidney cancer (primary diagnostic)

Инструментальные методы исследования			
Type of examination	Наименование медицинской услуги	Усредненный показатель частоты предоставления	Усредненный показатель кратности применения
Mean frequency of admission (per 100 patients)	А04.12.002.001 Ультразвуковая доплерография сосудов (артерий и вен) нижних конечностей	0,01	1
	Регистрация электрокардиограммы	0,5	1
	<del>Магнитно-резонансная томография головного мозга</del>	<del>0,02</del>	<del>1</del>
	<del>Компьютерная томография органов грудной полости</del>	<del>0,3</del>	<del>0,5</del>
	<del>Рентгенография легких</del>	<del>0,7</del>	<del>1</del>
Mean multiplicity of admission (per 1 patient, for the whole stay in hospital)	А08.30.002.001 Компьютерная томография органов брюшной полости и забрюшинного пространства	0,3	0,5
	Компьютерная томография органов брюшной полости с внутривенным болюсным контрастированием	0,2	0,5
	Сцинтиграфия костей	0,2	0,25

Document	Developer	Objective	Actuality	Evidence-based medicine	Radiation protection data	Status
Clinical standards	Ministry of healthcare	Basic standards of diagnostics and treatment	Outdated			Mandatory
Medical-economical standards	Regional healthcare authorities	Regional standards of diagnostics and treatment				Mandatory
Recommendations of the professional bodies	Professional associations	Standards of diagnostics and treatment		+	-	Voluntary
Clinical recommendations of the Ministry of Healthcare	Ministry of Healthcare	Standards + decision-making support	Actual	+	-	Mandatory

Developed by the clinicians, without considering the radiologists/RP authorities

# Current activities

## Collaboration with Radiologists

- Russian Society of Radiologists
- Research and Practical Clinical Center of Diagnostics and Telemedicine Technologies, Department of Healthcare of Moscow

2018

2019

Joint meeting IAEA-  
IRH-Russian  
Radiological  
Society

Approval of the roadmap for the development of the referral guidelines

## Improvement of the existing clinical recommendations

From recommendations to the referral guidelines  
Supplement with data on radiation risks, typical patient doses, etc

2019-2020

2020+

From theory to practice

Implementation of the referral guidelines in Moscow and St-Petersburg

# A set of guidelines “Best practices of X-ray and instrumental diagnostics”

- Developed by the radiologists
- Designed for the referring physicians
- Adopted from iRefer referral guidelines
- Diagnostics of the pathologies and diseases of:
  - Urinary tract
  - Gastro-intestinal tract
  - Chest
  - Muscular-skeletal system
  - Central nervous system

For adult and pediatric patients  
In use in Moscow since 2018





# From recommendations to referral guidelines

Existing part

To add

Syndrome or pathology	ICD-10 code	Imaging modality	Priority	Description	Anatomic area	Category of radiation risk		Typical dose range, mSv
						Adults	Older persons	
Acute abdominal pain	R10 R19-3	Ultrasound	Primary method		Abdomen	-	-	-
		Computed tomography	Additional method		Abdomen	Low ☢☢☢☢	Very low ☢☢☢	2-20
		Radiography	Additional method		Abdomen	Very low ☢☢☢	Negligible ☢☢	0,2-2
		MRI	Additional method		Abdomen	-	-	-



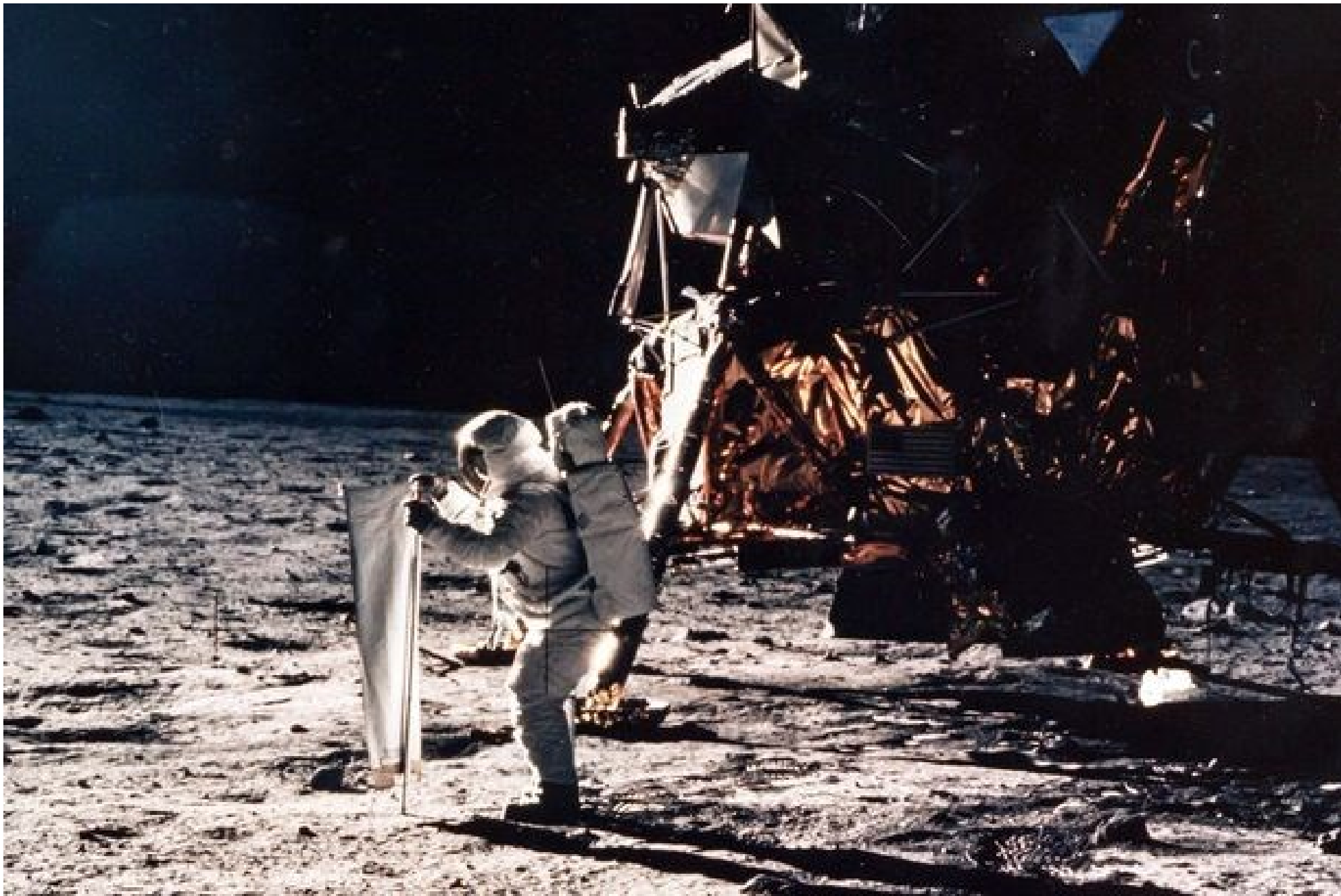
# Current activities

- Upgrade of the existing clinical recommendations for adult patients – in progress, deadline – **end of 2019**
- Review of the final referral guidelines on a regional level:
  - Moscow – Department of healthcare of Moscow; **2020**
  - St-Petersburg – St-Petersburg Society of radiologists + Department of Healthcare; **2020**
- Final approval by the Ministry of Healthcare - **2021**

# Main questions

- What regional specifics should be considered:
  - Differences in equipment
  - Differences in training
- Integration into hospital information systems
  - From textbook to decision support systems
- Feedback/benchmarking? Clinical audits?
  - Existing standards are built-in to the State Health Insurance systems
- Integration into intern/resident training





# Thank you for the attention!



РОССИЙСКОЕ ОБЩЕСТВО  
РЕНТГЕНОЛОГОВ И РАДИОЛОГОВ



Санкт-Петербургское  
Радиологическое  
общество

