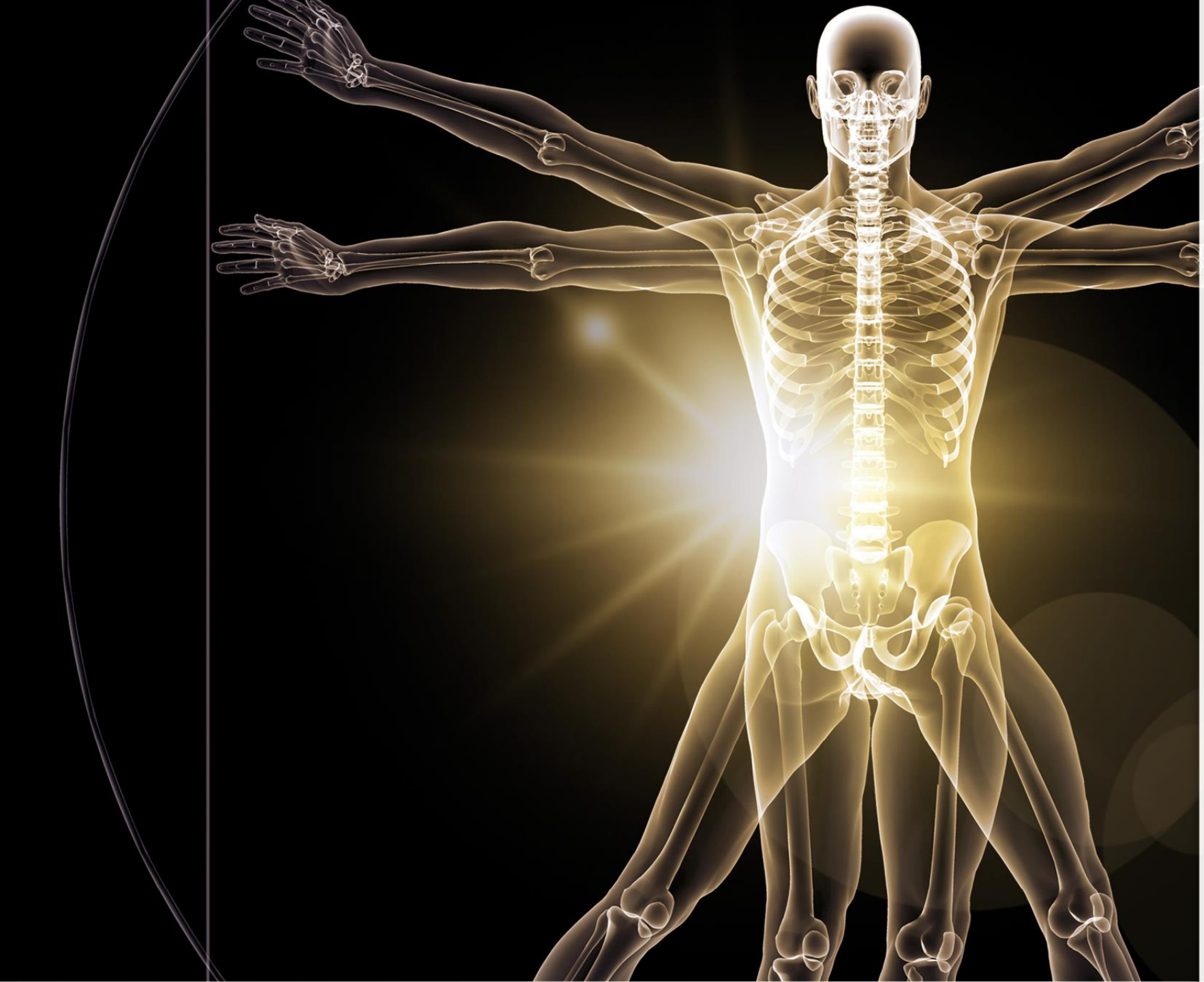

15th Biennial Symposium of the International Society for Strategic Studies in Radiology

IS3R 2023

Berlin/Germany
August 24–26, 2023

European Evaluation of CT Justification

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Background

- Imaging allows early diagnosis and accurate diagnosis of many pathologies, and provides valuable clinical information directing appropriate treatment and follow-up of patients
- Increase in numbers of imaging examinations over the last decades is attributed to advances in technology enabling fast and reliable imaging, to the aging population with chronic diseases and to practice of defensive medicine
- At least 20-30% of imaging procedures performed are not necessary and do not generate information that improves diagnosis or treatment, nor do they affect the patient's health

Hiscock H, Neely RJ, Warren H, Soon J, Georgiou A. Reducing unnecessary imaging and pathology tests: A systematic review. *Pediatrics*. 2018;141(2)

Figure 9.4. **MRI exams, 2007 and 2017 (or nearest year)**

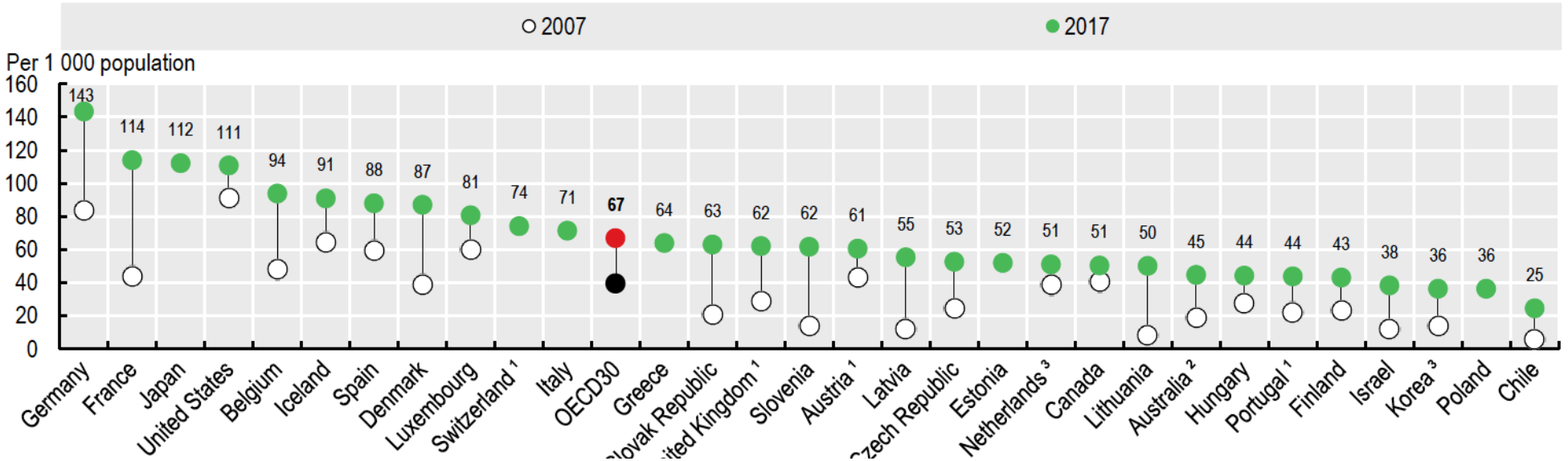
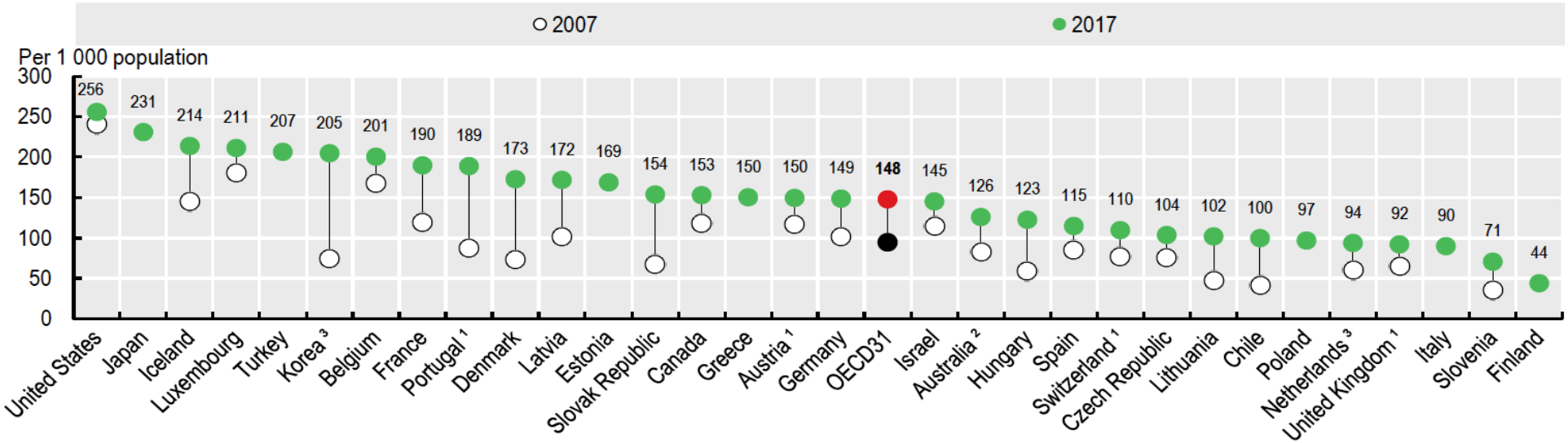
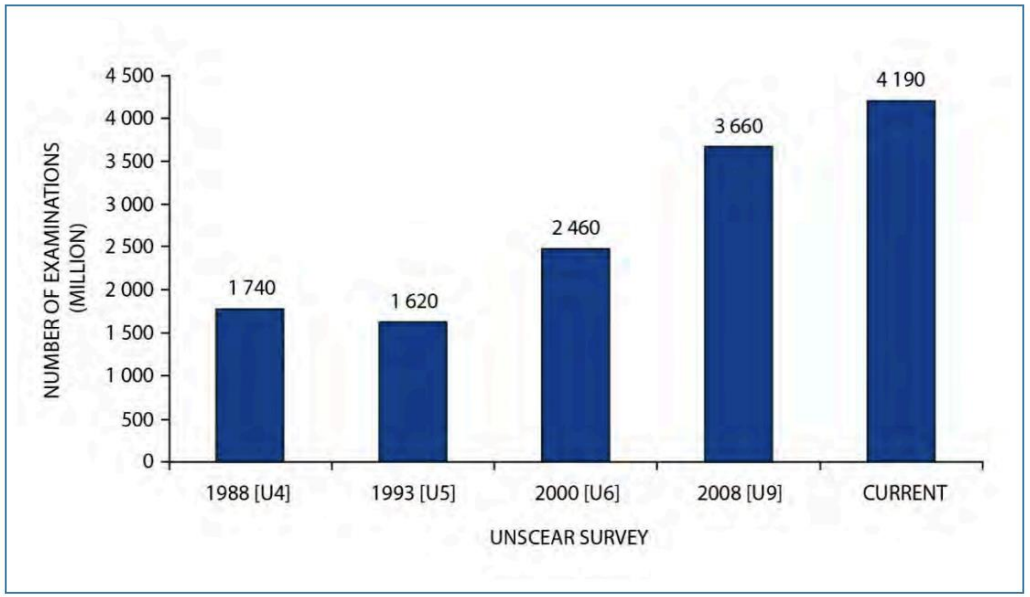


Figure 9.5. **CT exams, 2007 and 2017 (or nearest year)**



Medical radiation (UNSCEAR 2020/21)

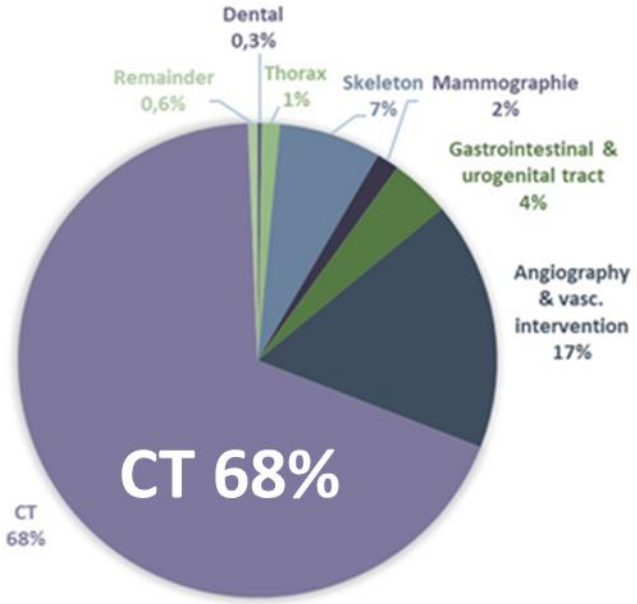
Figure V. Trend in global annual number of medical radiological examinations/procedures



	UNSCEAR 2008		UNSCEAR 2020/2021	
Modality	Number of examinations (2008)	Collective Dose (1000 man Sv) (2008)	Number of examinations (current)	Collective Dose (1000 man Sv) (current)
Conv. X-ray	2900	2350	2626	955
CT	220	1540	403	2556
IR	3,60	41,00	23,60	334

Computed Tomography

- In computed tomography, the number of procedures and the collective dose have risen markedly. The number of procedures has increased by about 80% and the collective dose has increased by around 70%.
- While there is evidence of some reduction in the average dose per procedure, use of computed tomography continues to grow
  - UNSCEAR 2020/21



2018 Data, Germany
Bundesamt für Strahlenschutz

Share of spending on low-value imaging services, by physician referral type

	Performed or ordered by PCP	Referred by PCP	Referred Previously by PCP	Referred by non-PCP
Back imaging for nonspecific low back pain	23%	6%	2%	69%
Head imaging for uncomplicated headache	29%	2%	1%	68%
Preoperative chest radiography	30%	2%	1%	68%
Head imaging in the evaluation of syncope	23%	2%	1%	75%
CT of the sinuses for uncomplicated acute rhinosinusitis	17%	8%	4%	71%
Imaging for the diagnosis of plantar fasciitis	2%	21%	4%	74%
Total spending on low-value services (including nonimaging)	15%	20%	6%	60%

STUDY IN ANNALS OF INTERNAL MEDICINE JOURNAL (2021) IDENTIFIES 31 MOST COMMON LOW-VALUE MEDICAL SERVICES

INCLUDING 6 IMAGING SERVICES

How can radiology be viewed as a value-creator?

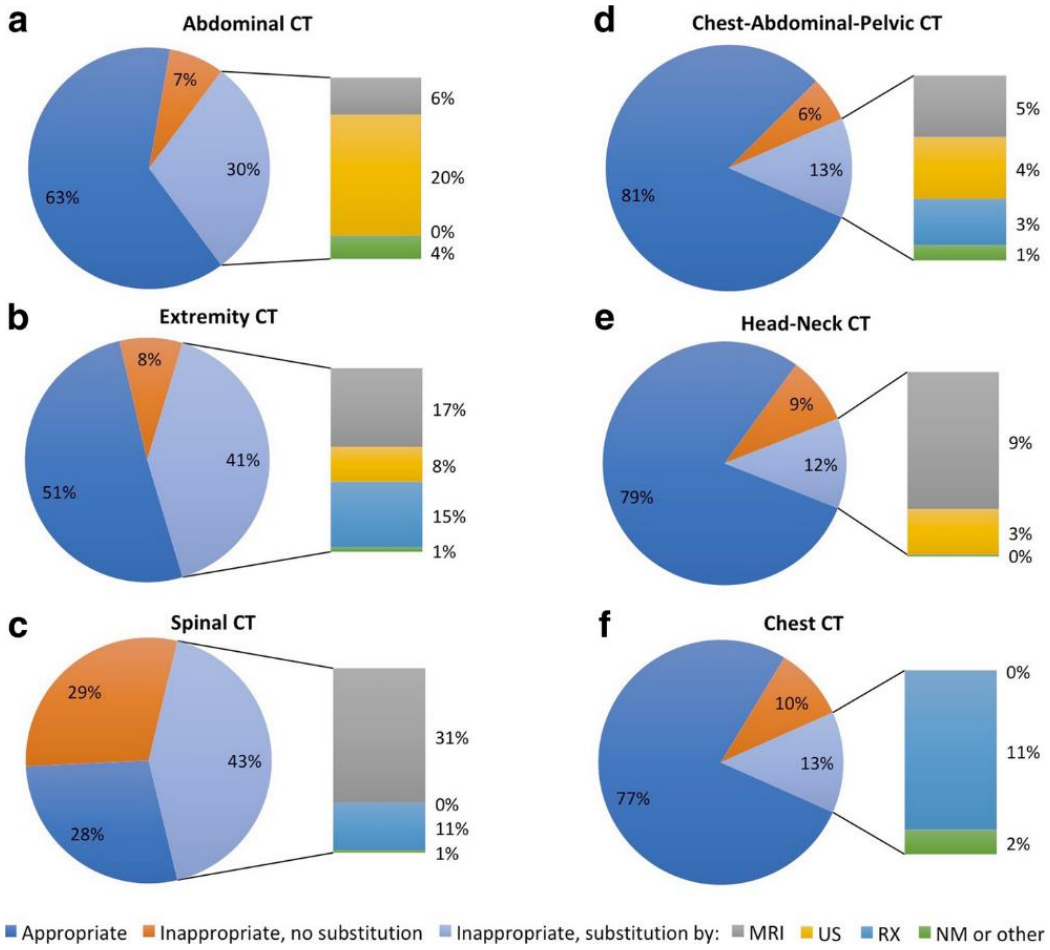
1. Breadth of contributions of radiology to patient care must be understood
2. Radiology specialty must work to quantify effects on patient outcomes and quality of life
3. Referrers should have accountability for their effect on cost of imaging and for ensuring optimised resource utilization
4. Managers must understand potential costs of undersupply of shared resources (bottlenecks)
5. **Radiologists must ensure justification and appropriate use of resources**

Brady A, Brink J, Slavotinek J (2020) Radiology and value-based healthcare. JAMA. https ://doi.org/10.1001/jama.2020.14930

Justification: What it does for us?

- Avoid Duplicate Exam
  - 100% dose reduction
- Appropriateness guidelines help us determine justification for the use of CT.
  - Radiation reduction: Avoid unnecessary dose
  - Cost reduction: Avoid unnecessary CT
  - Anxiety reduction: Reduce incidental findings of uncertain significance
  - Adverse effect reduction: Avoid contrast media and other tests

CT & MRI Audit, Luxembourg (2019)



A HIGH PROPORTION OF CT (39%) AND MRI (21%) REQUESTS ARE INAPPROPRIATE.

INAPPROPRIATE REFERRALS: ANOTHER EXAM WOULD HAVE BEEN APPROPRIATE IN 67% (CT) AND 58% (MRI) OF CASES

35% OF CT AND 55% OF MRI REFERRALS LACKED CLINICAL INFORMATION TO ASSESS APPROPRIATENESS

CT & MRI Audit, Sweden (2023)

Four regions in Sweden, 13.075 referrals assessed in semiautomatic fashion using ESR iGuide

Appropriateness score: 76% for MRI and 63% for CT
Inappropriate were 37% of CT examinations and 24% of MRI examinations

The appropriateness for CT was higher for referrals from hospitals compared to primary care centers and the opposite was the case for MRI

Stahlbrandt H, Bjornfot I, Cederlund T, Almen A. CT and MRI in Sweden- retrospective appropriateness analysis of large referral samples. Insights Into Imaging, August 2023

EU-JUST CT Project

EU-JUST CT (European co-ordinated action on improving justification of computed tomography)

- EU-funded audit project led by the ESR (36 months)
- Project lead: Boris Brkljačić /HR
- Project co-lead: Alexandra Karoussou-Schreiner/ LUX

- **ESR iGuide** web portal used by auditors to assess appropriateness CT referrals
- 7 participating countries, 145 participating centres

EU-JUST CT project

Objectives

The 36-month project aims to improve justification of computed tomography in Europe through co-ordinated action.

The project will meet the following specific objectives:

a) Collect up-to-date information about justification of CT examinations in Europe.

b) Develop a common methodology for auditing justification of CT examinations.

c) Carry out co-ordinated pilot audits of justification of CT examinations.

d) Discuss the status of justification of CT examinations with the Member States and identify opportunities for further action.

Project duration: 36 months

- Project start date: 7 April 2021
- Project end date: 31 March 2024

EU-JUST CT Methodology

- Random Sample of CT requests
- Two auditors per referral, Four per country
- Referrals assessed using ESR iGuide web portal
- Structured appropriateness assessment using Excel forms

- Key parameters
  - Completeness & clarity of reason for exam
  - Appropriateness of requested exam
  - Existence of more appropriate alternative exams

EU JUST CT Audit Form (sample)

	A	B	C	D	E	F	G
1	Referrer Specialty	Patient Age	Patient Sex	Patient Clinical Background	Reason for Exam/Clinical Indicatio	ESR iGuide Structured Reason(s) for Exam	Prior exams (if known)
2	Family Medicine/Gen	63	Female	Hypertonia, Arthrosis gen.l.u. Arthrosis subta	Please request a Cardio CT. Patient at	Dyspnea, cardiac origin suspected	Cardiac Ultrasound
3							
4							

	H	I	J	K	L
1	Exam requested original referral	Would you have requested the same exar	ESR iGuide exam name	Appropriateness origin	Highest recommended alternate exam in ESR iGuide
2	Cardiac CT angiography	Yes	CT, angiography, heart, coronary ar	7	CT, angiography, chest, pulmonary arteries, w iv contrast US, echo, heart, transthoracic rest
3					
4					

	M	N	O
1	Appropriateness alternate exam	Decision Support Number	Auditor comments/assessment
2	8	2888982	
3			
4			

Country	Number of collected referrals after removal of duplicates etc.	Inappropriate and not scored because of no or insufficient clinical data	Fully appropriate (i-guide score 7-9)	Moderately appropriate (score 4-6)	Inappropriate (1-3)
Belgium	982	15 **(1.5%)**	756 **(77%)**	156 **(15.9%)**	55 **(5.6%)**
Denmark	957	21 **(2.2%)**	808 **(84.4%)**	95 **(9.9%)**	33 **(3.5%)**
Estonia	1010	63 **(6.2%)**	650 **(64.4%)**	205 **(20.3%)**	92 **(9.1%)**
Finland	744	2 **(0.3%)**	569 **(78.7%)**	113 **(15.6%)**	39 **(5.4%)**
Greece	888	215 **(24.2%)**	390 **(43.9%)**	178 **(20.1%)**	105 **(11.8%)**
Hungary	1008	86 **(8.5%)**	705 **(69.9%)**	148 **(14.7%)**	69 **(6.8%)**
Slovenia	1014	266 **(26.2%)**	594 **(58.5%)**	96 **(9.5%)**	58 **(5.7%)**

EU JUST CT

Justification of CT exams in Europe
Discuss Results with Member States and Identify Opportunities for Further Action

European Commission

Workshop, September 28-29, 2023
Luxembourg

Guidance on the implementation of justification in healthcare settings

Contents

European Evaluation of CT Justification

Core team: Boris Brkljačić, Alexandra Karoussou-Schreiner, Jacob Sosna, Steve Ebdon-Jackson, Shane Foley, Adrian Brady, Monika Hierath, Clara Singer

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Finland, Denmark, Belgium, Estonia, Slovenia, Hungary, Greece

European Evaluation of CT Justification

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