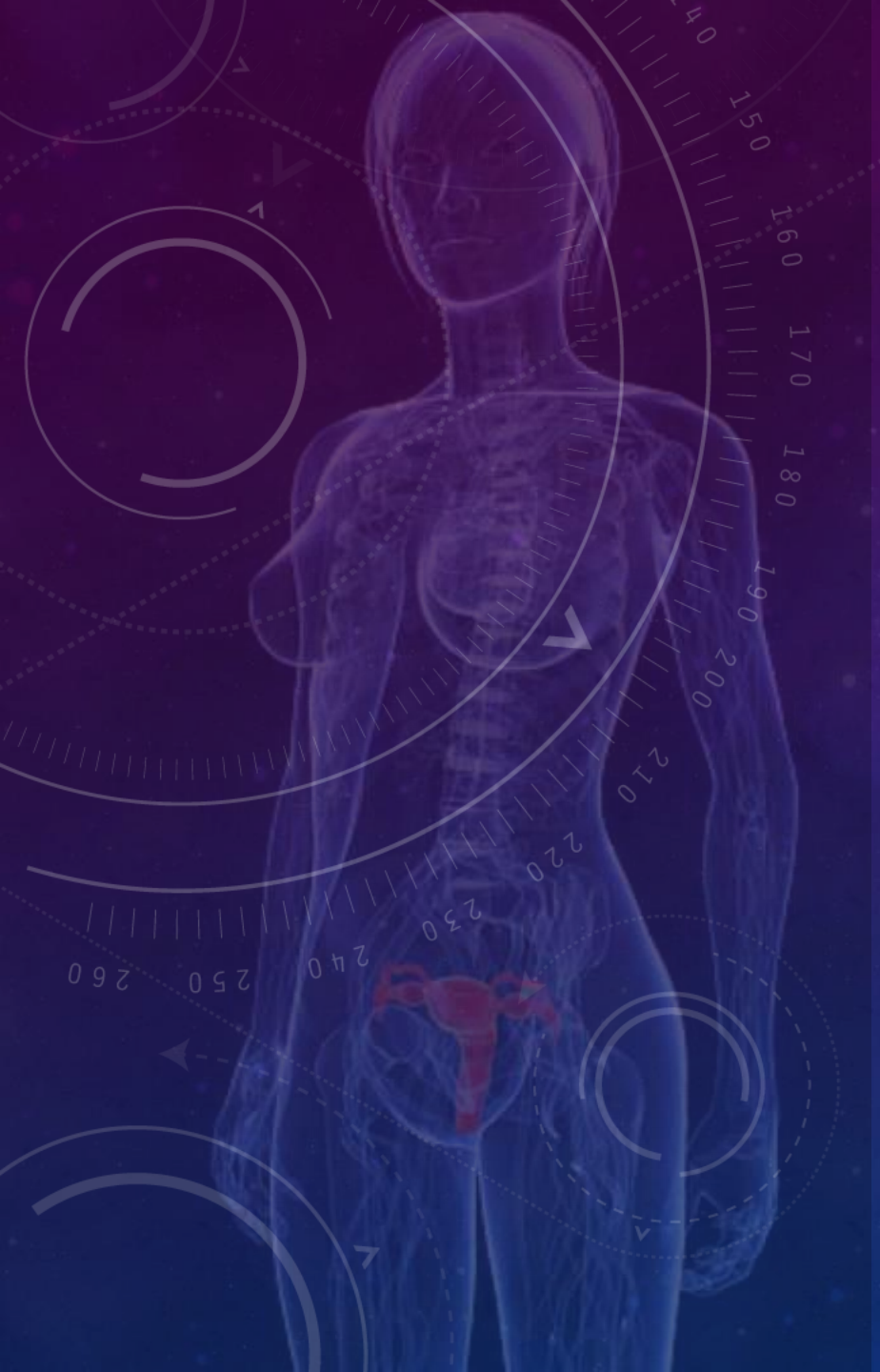


OŽIARENIE PACIENTOV PRI OPAKOVANÝCH CT VYŠETRENIACH

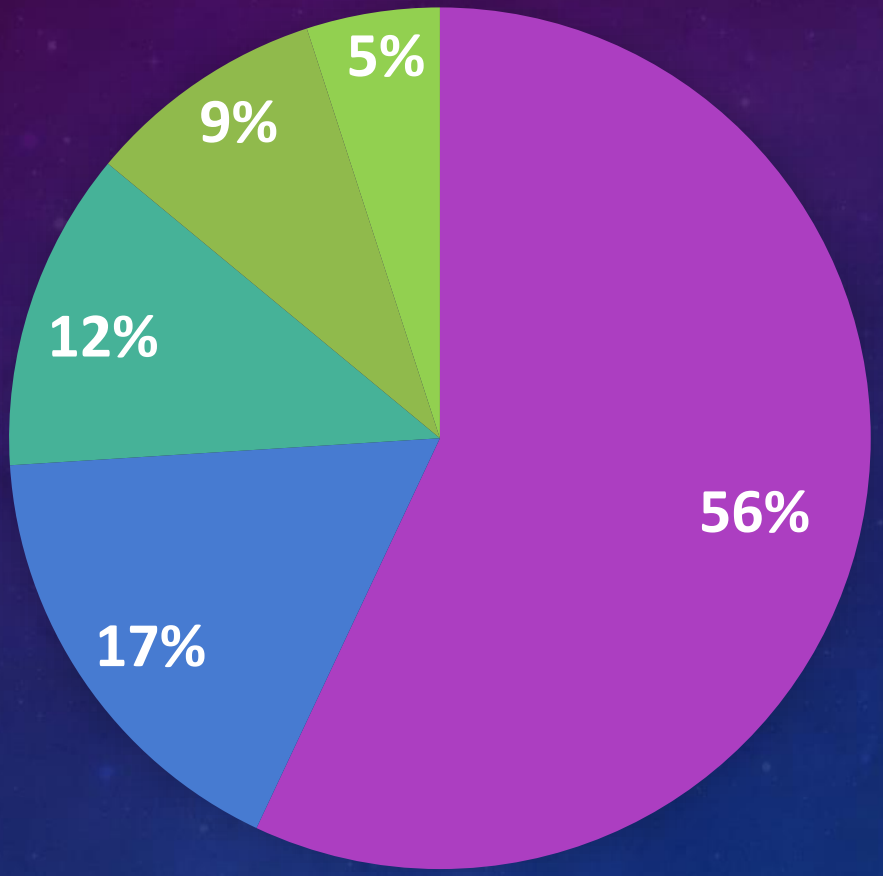
ŠALÁT, KLEPANEC, NIKODEMOVÁ, GUĽAŠOVÁ

(a) Categories of exposures to people

United Nations Scientific Committee on the Effects of Atomic Radiation

According to UNSCEAR (2008), five main categories of people were exposed to radiation from Chernobyl. These numbers have changed considerably from earlier reports, especially the large increase in the numbers of clean-up workers.

1. About 530,000 **clean-up workers** (formerly called 'liquidators') sent into the Chernobyl exclusion zone for decontamination work, sarcophagus construction, and other clean-up operations between 1986 and 1989. Their average dose was ~100 mSv.
2. About 115,000 **evacuees** who were evacuated within two weeks of the accident and 16,000 more before the autumn of 1986. Their average dose was ~33 mSv.
3. About 6.4 million **residents of contaminated areas** in Belarus, Ukraine and Russia. Their average dose was ~10 mSv.
4. About 100 million people who lived in in Belarus, Ukraine and Russia whose average dose was about 1.3 mSv.
5. Approximately 500 million **living in the rest of Europe** whose average dose was about 0.3 mSv.

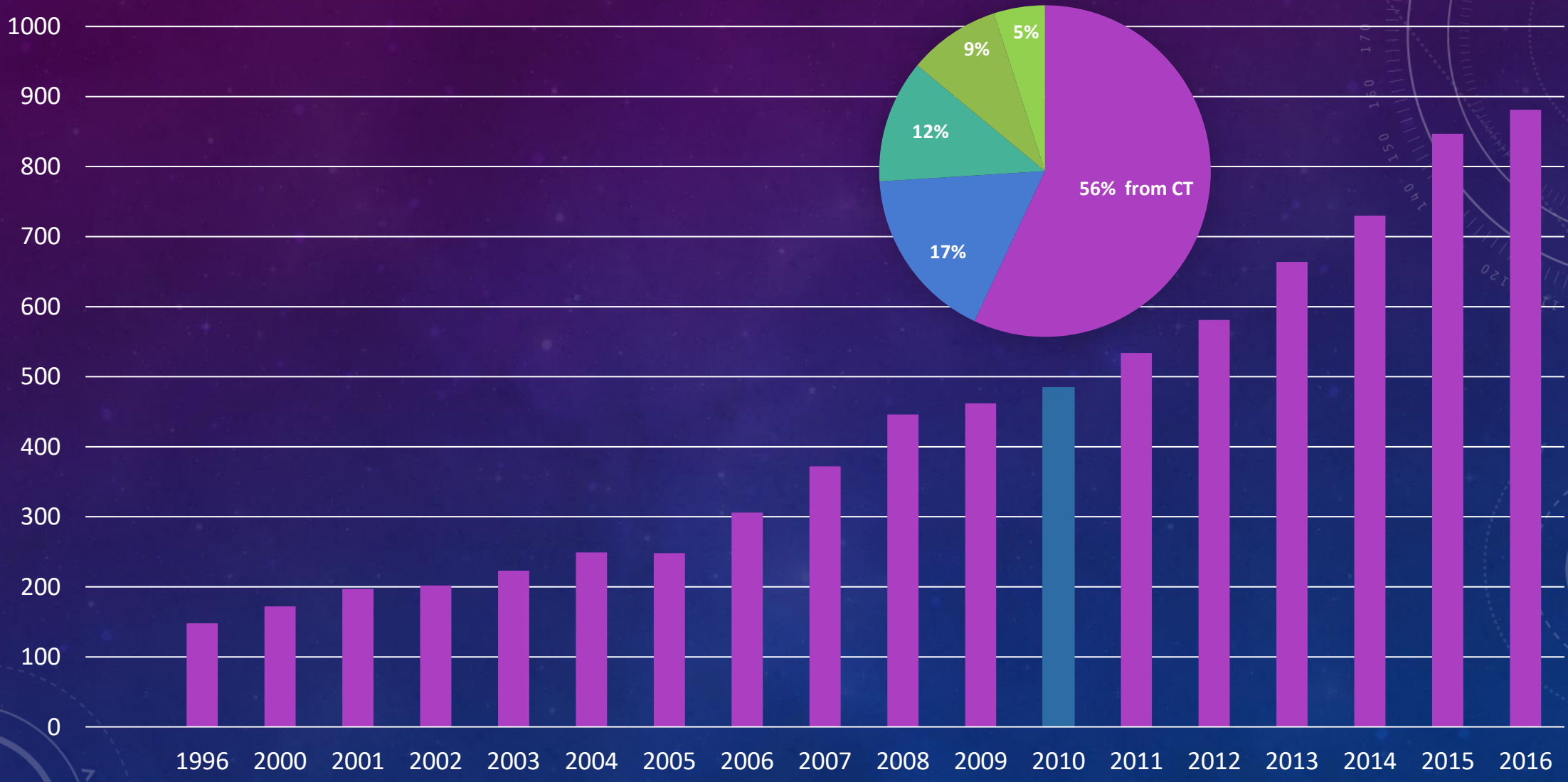


DISTRIBUTION OF COLLECTIVE EFFECTIVE DOSES (DDM2 in 2010)

NATIONAL HEALTH INFORMATION CENTER

Number of CT examinations in Slovakia (in thousands)

1 Mil.



Patients undergoing recurrent CT scans: assessing the magnitude

Madan M. Rehani, Kai Yang, Emily R. Melick, John Heil, Dušan Šalát, William F. Sensakovic & Bob Liu

European Radiology

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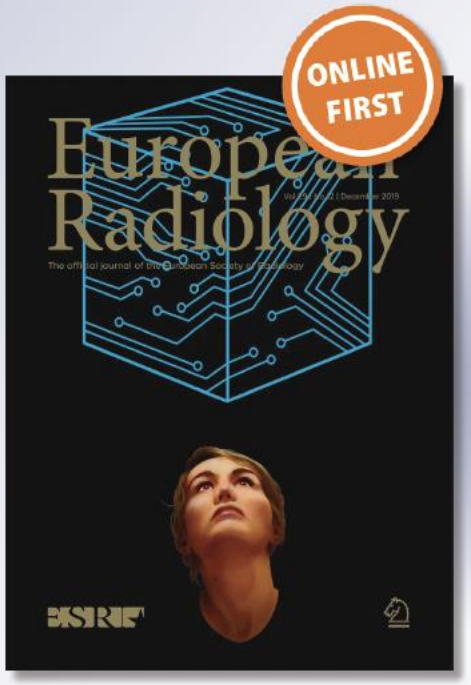

Springer

Abstract

Objectives To assess percent of patients undergoing multiple CT exams that leads to cumulative effective dose (CED) of ≥ 100 mSv and determine their age distribution.

Methods Data was retrieved retrospectively from established radiation dose monitoring systems by setting the threshold value of 100 mSv at four institutions covering 324 hospitals. The number of patients with CED ≥ 100 mSv only from recurrent CT exams during a feasible time period between 1 and 5 years was identified. Age and gender distribution of these patients were assessed to identify the magnitude of patients in the relatively lower age group of ≤ 50 years.

Results Of the 2.5 million (2,504,585) patients who underwent 4.8 million (4,819,661) CT exams during the period of between 1 and 5 years, a total of 33,407 (1.33%) patients received a CED of ≥ 100 mSv with an overall median CED of 130.3 mSv and maximum of 1185 mSv. Although the vast majority (72–86%) of patients are > 50 years of age, nearly 20% (13.4 to 28%) are ≤ 50 years. The minimum time to accrue 100 mSv was a single day at all four institutions, an unreported finding to date.

Conclusions We are in an unprecedented era, where patients undergoing multiple CT exams and receiving CED ≥ 100 mSv are not uncommon. While underscoring the need for imaging appropriateness, the consideration of the number and percent of patients with high exposures and related clinical necessities creates an urgent need for the industry to develop CT scanners and protocols with sub-mSv radiation dose, a goal that has been lingering.

Table 1 Data on number and frequency of CT exams in different institutions

Institute	Duration (years and months)	Number of hospitals	Number of CT scanners	Total number of patients undergoing CT
A	1/2013–12/2017 (5 years)	1 (5 sites)	19	267,013
B	5/2016–12/2018 (2 years 7 m)	1 (16 sites)	35	430,049
C	7/2013–6/2018 (5 years)	70	108	807,526
D	1/2018–2/2019 (1 year 1 m)	252	326	999,997
Total		324	488	2,504,585

32 %

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Old enemy, new threat: you can't solve today's problems with yesterday's solution

Madan M Rehani[1]

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Starý nepriateľ, nová hrozba: dnešné problémy nevyriešite včerajším riešením

Cumulative radiation dose from multiple CT examinations: stronger justification, fewer repeats, or dose reduction technology needed?

Denis Remedios

European Radiology **30**, 1837–1838 (2020) | Cite this article

Potrebujeme prísnejšie odôvodnenie, menej opakovaní alebo technológie na zníženie dávky?

Radiačný preukaz pacienta (DQC)

P.č.	Vek	Pohl.	E (mSv)	DG
1	43	M	323	pankreatitída
2	40	M	302	pankreatitída
3	47	M	274	pankreatitída
4	41	M	248	pankreatitída
5	36	M	246	pankreatitída
6	36	M	213	pankreatitída
7	29	M	154	pankreatitída
8	24	M	151	pankreatitída
9	38	M	114	pankreatitída
10	35	M	109	pankreatitída
11	40	M	108	pankreatitída

Vek	Pohlavie	Počet snímkov	Počet CT snímkov	Efektívna dávka [mSv]
(65–73) 8	F	132	115 (16)	1686.43
(65–73) 8	M	177	159 (14)	1412.791
(57–64) 7	M	141	126 (14)	1309.164
(55–61) 6	F	86	73 (11)	1098.28
(60–66) 6	F	80	71 (12)	1030.219
(54–61) 7	M	48	25 (12)	1028.089
(68–74) 6	M	123	109 (16)	1025.844
(65–73) 8	M	119	99 (15)	1017.581
(40–47) 7	M	371	118 (61)	950.164
(49–55) 6	M	114	86 (12)	950.144
(65–72) 7	F	107	68 (13)	944.817
(68–76) 8	M	119	88 (14)	929.886
(50–55) 5	M	81	64 (10)	892.92
(63–67) 4	M	54	38 (7)	878.45
(67–73) 6	M	115	56 (5)	854.933
(51–58) 7	M	59	58 (6)	839.553
(47–51) 4	M	120	111 (5)	831.333
(65–72) 7	F	103	99 (13)	830.409
(59–66) 7	M	39	24 (4)	809.141
(26–32) 6	M	108	67 (1)	808.598
(73–79) 6	M	120	102 (9)	806.023
(66–70) 4	F	83	77 (2)	802.175
(55–61) 6	F	96	86 (9)	798.607
(59–66) 7	M	110	102 (28)	798.222
(61–68) 7	M	46	46 (10)	788.383
(54–61) 7	F	64	57 (8)	781.084
(42–48) 6	M	124	71 (14)	775.945

World Journal of Gastroenterology

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ORIGINAL ARTICLE

Retrospective Study

Computed tomography scan imaging in diagnosing acute uncomplicated pancreatitis: Usefulness *vs* cost

Shana Kothari, Michael Kalinowski, Matthew Kobeszko, Tarek Almouradi

CONCLUSION

CT imaging is unnecessary when AUP is diagnosed clinically and biochemically. Reducing overuse of diagnostic CT scans will decrease healthcare expenditure and radiation exposure to patients.

CT zobrazenie je **zbytočné**, keď je akútna nekomplikovaná pankreatitída diagnostikovaná klinicky a biochemicky. (lipáza,amyláza)

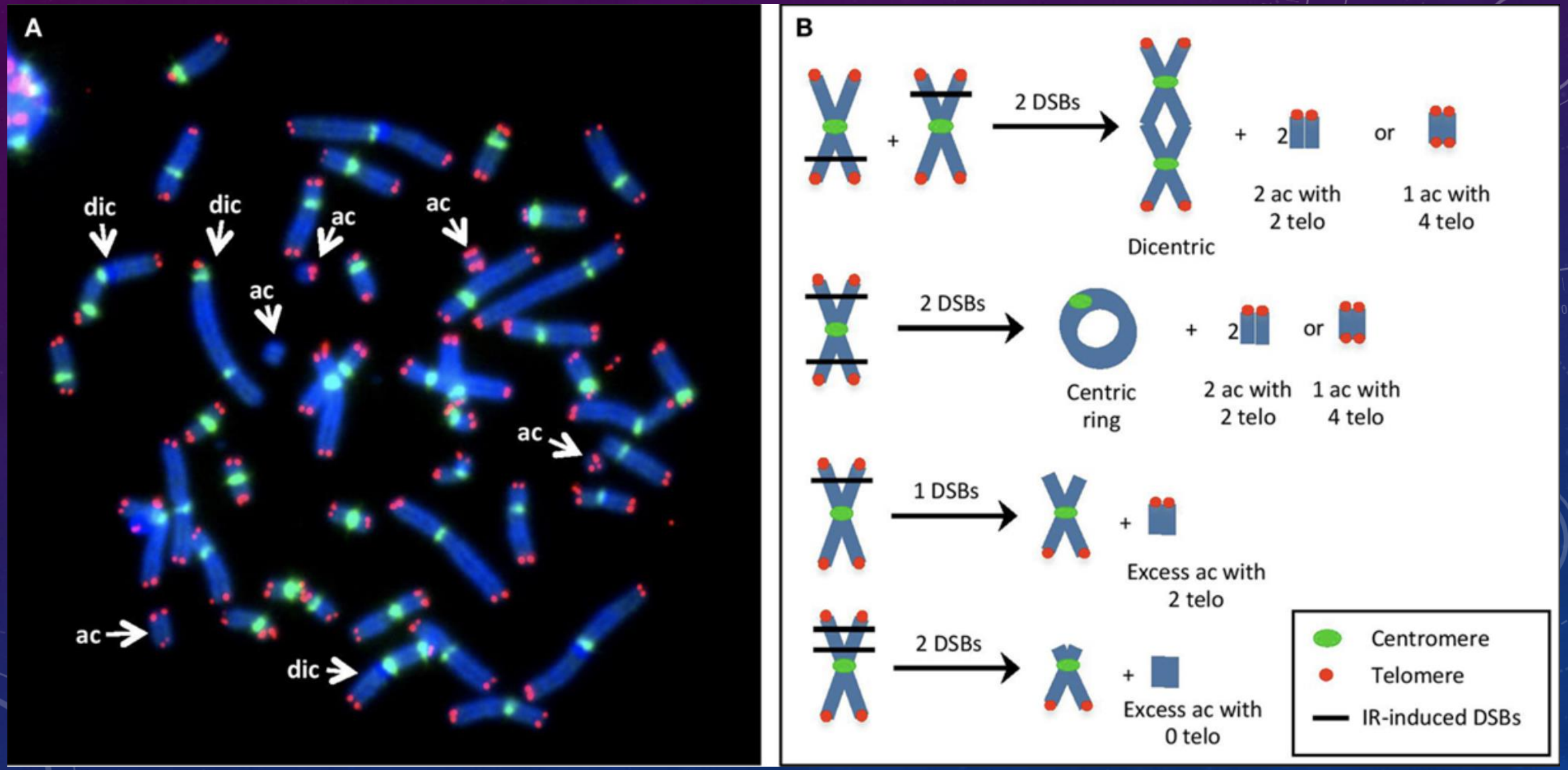
„Zníženie nadmerného používania diagnostických CT vyšetrení zníži výdavky na zdravotnú starostlivosť „

a **radiačnú záťaž pacientov.**

Table 1 Ranson's criteria at admission estimates severity and mortality of patients with acute pancreatitis based on initial lab values

Ranson criteria at admission	
White blood cell count > 16000	1 point
Age > 55 years of age	1 point
Blood glucose > 200 mg/dL	1 point
Aspartate transaminase > 250	1 point
Lactate dehydrogease > 350	1 point

RÁDIOBIOLOGICKÉ POŠKODENIA ANALYZOVANÉ V RBL



Záver

- neschopnosť poskytnúť indikujúcemu lekárovi vhodné informácie, aby dokázal hodnotiť prínos a riziko pri opakovaných CT vyšetreniach

- nevieme uplatniť odhad rizika pre **individuálneho pacienta**,

- nepoznáme **koncepciu kumulatívneho rizika** pri nízkych dávkach, ktorá zohľadňuje časový odstup medzi CT vyšetreniami,

- neuplatňujeme hodnotenie rizika podľa veku, pohlavia a diagnózy,

- zvyčajne **iba konštatujeme prínos** CT vyšetrenia a **riziko zanedbávame**,

ZÁKLADNÉ PRINCÍPY RADIAČNEJ OCHRANY

- ODÔVODNENIE

nové indikačné kritéria (biochémia…)

- OPTIMALIZÁCIA

DRÚ podľa diagnózy, nie iba podľa vyšetrovanej časti tela

ďalšie DRÚ napr. pre PRT, staging a pod.

- LIMITOVANIE

pri CED +100 mSv odôvodní vyšetrenie napr.konzílium

ĎAKUJEM ZA POZORNOSŤ