

Representing the Asian and Oceanic Society for Pediatric Radiology

Hyun Woo Goo, MD

Associate Professor, Department of Radiology

Asan Medical Center, University of Ulsan College of Medicine

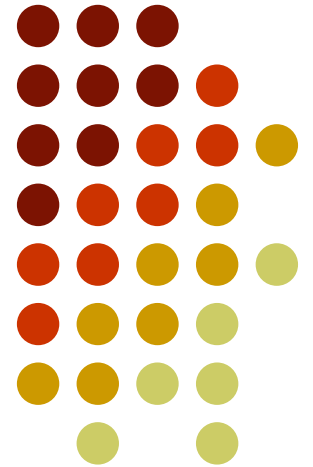


image
gentlySM

Overview: Health Care System and its Influences on Radiology Practice

- South Korea (Republic of Korea)
- Summary of Current National Health Care System in South Korea

Participation	Compulsory
Insurance Coverage	Universal
Insurance Benefits	Standardized
Primary Payer	Government
Physician Fees	Standardized



Private Insurance Coverage ⇒ “3.4% (2005)”

Overview: Health Care System and its Influences on Radiology Practice



- Health care expenditure → 6.8% of GDP (2007, the lowest among OECD countries); 5-year increase rate, 5.1% from 2003 (1.4%, average of OECD countries)
- Radiologists practice radiology in > 90%.
- Korean Society of Pediatric Radiology: approximately 40 members



Overview: Healthcare System and its Influences on Radiology Practice



- Attention on radiation protection among radiologist?
- The executive members of “The Korean Association for Radiation Protection” mainly consisting of radiation oncologist, nuclear medicine doctors, and physicists
- >> Radiologists >> Other physicians



**Pediatric CT: Understanding of Radiation Dose and
Optimization of Imaging Techniques¹**

Hyun Woo Goo, M.D.

¹Department of Radiology, University of Ulsan College of Medicine, Asan Medical Center

J Korean Radiol Soc 2008;58:169 - 175

**The Optimal Parameter for Radiation Dose in Pediatric Low
Dose Abdominal CT: Cross-sectional Dimensions versus Body Weight¹**

Yoon Young Jung, M.D., Hyun Woo Goo, M.D.

J Korean Radiol Soc 2008;59:333 - 347

**Pediatric 16-slice CT Protocols:
Radiation Dose and Image Quality¹**

Dong Hyun Yang, M.D., Hyun Woo Goo, M.D.

Table 1. Adapted Values of Tube Potential and Tube Current for Six Body Weight Groups and Six Anatomic Regions

Body Weight	Chest (n= 202)	Heart (n= 75) *	Abdomen-pelvis (n= 160)	Dynamic Abdomen (n= 41)	Neck (n= 26)	Brain (n= 36)
< 5 kg	80/40 (3)	80/50 (25)	80/65 (2)	80/80 (0)	100/40 (1)	100/120 (4)
5 - 9.9 kg	80/50 (2)	80/65 (30)	80/80 (6)	80/90 (15)	100/50 (1)	100/140 (8)
10 - 19.9 kg	80/65 (75)	80/90 (11)	80/105 (67)	80/120 (7)	100/60 (7)	100/190 (5)
20 - 39.9 kg	80/90 (65)	80/120 (9)	80/130 (48)	100/85 (16)	100/70 (7)	120/160 (13)
40 - 59.9 kg	100/65 (47)	100/85 (0)	100/95 (32)	100/100 (3)	100/80 (7)	120/170 (5)
60 - 69.9 kg	100/100 (10)	100/110 (0)	100/130 (5)	100/160 (0)	100/100 (3)	120/200 (1)

Note - Data are presented as tube potential (kV) / effective tube current-time product (mAs).

* Heart CT was performed without electrocardiography gating.

The numbers in parentheses indicate the number of examinations.

2009 KSPR Annual Meeting

Severance Hospital, May 9, 2009

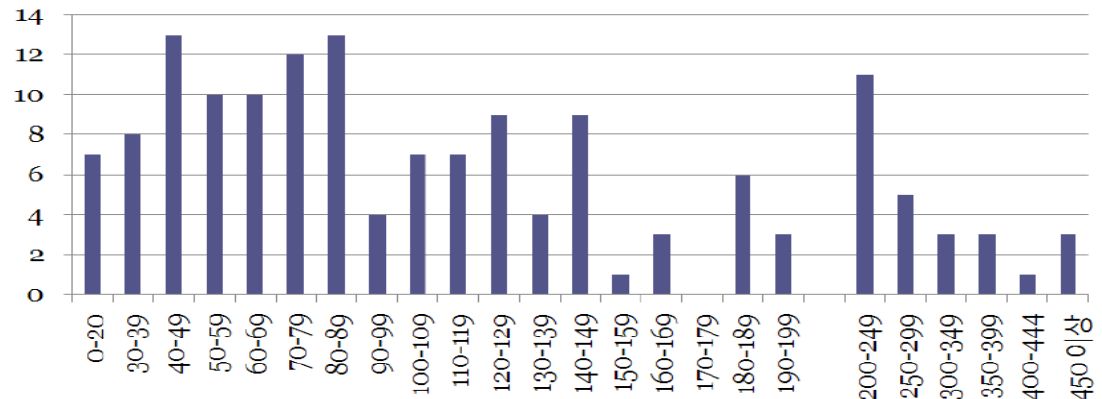
Program

12:30 - 13:00	Registration	
13:00 - 14:40	Scientific papers	
14:40 - 15:00	Coffee break	
15:00 - 16:30	Mini symposium (Dose Reduction & Image Quality)	
15:00 - 15:25	CR and DR	어 흥 (성균관대의대)
15:25 - 15:50	Fluoroscopy	장 윤 우 (순천향의대)
15:50 - 16:15	CT	구 현 우 (울산의대)
16:15 - 16:30	Discussion	
16:30 - 17:00	Break	
17:00 - 17:20	Image gently 소개 및 환자, 보호자 홍보물	김 명 준 (연세의대)

Title: Development of the diagnostic reference level of pediatric chest radiography

- 2009, supported by Korean FDA
- Principal Investigator: Hyun Woo Goo, M.D.

	Average	Median	3 rd Quartile
CR	164 μ Gy	109 μ Gy	178 μ Gy
DR	121 μ Gy	80 μ Gy	143 μ Gy
F/S	144 μ Gy	116 μ Gy	-
Total	140 μ Gy	93 μ Gy	161 μ Gy



Overview: Health Care System and its Influences on Radiology Practice



- Imaging (CT, MRI) is almost freely accessible for children. Insurance coverage for expensive MRI is expanding.
- Estimated 10 year growth of CT in adults and children
- 1998 ~ 2008, University hospitals > 300% increase

Annual Increment Rate of CT Exams
in Asan Medical Center ⇒ 14% (2008 ~ 2009),
215,602 Exams in 2009

image
gentlySM



Global Attitudes Regarding Radiation Protection and Key Influences on Their Evolution

- Annual course regarding 'Physics in Diagnostic Imaging & Quality Assurance' for Radiology Residents
- Annual refresh course for Radiation Safety Supervisors
- Training for radiographers (technologists): no regular nation-wide education program, a quarterly program in Asan Medical Center

Global Attitudes Regarding Radiation Protection and Key Influences on Their Evolution

- The biggest needs for education in radiation protection in your country/region? ⇒
Fluoroscopy (2008 AMC data)

	ESD (mGy)	mGy/min	Fluoro Time	# of Exposure	DAP (Gy·cm ²)
AMC	563	33	17 m 26 s	52	129
IAEA	26~100	-	-	-	-
NRPB	-	-	-	-	13

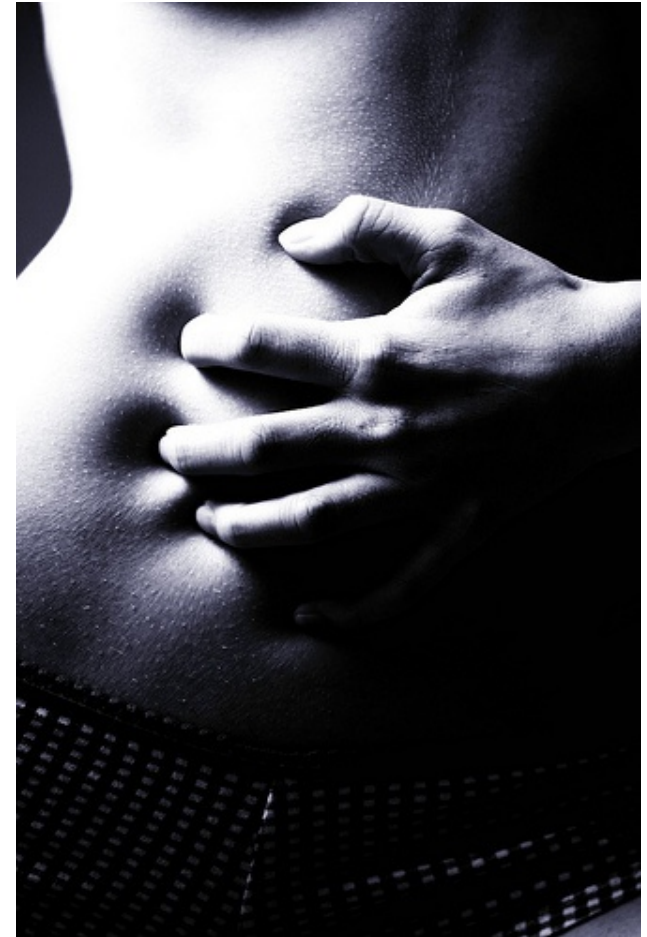
Global Attitudes Regarding Radiation Protection and Key Influences on Their Evolution

- Do children and their families have access to information about the risks and benefits of imaging in children? (especially regarding ionizing radiation) ⇒ usually “No”

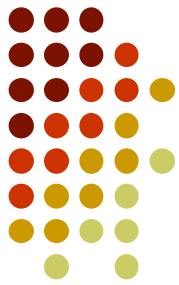
Save		Review							
Body Part :	Chest & Heart								
Machine :	Sensation 64								
Age :	11 - 15 yrs	Sex :	M						
DLP :	479								
Effective Dose :	8.03								
Exam Name : CT, Chest without Enhance (2008-07-22 11:08)									
Save				Review					
*	Exam Name	Exam Date	Dept	Physician	Writer	DLP	Effective Dose	Param1	Param2
0	CT, Dynamic Liver Transplan...	2008-09-02 12:04	PGN	김경모	이현주	158	5.65		
1	CT, Dynamic Liver Transplan...	2008-07-03 11:22	PGN	김경모	양동현	158	4.07		
2	CT, HR Chest	2008-06-19 14:13	PGN	김경모	양동현	40	0.87		
3	CT, Chest with Enhance	2008-06-04 10:06	PGN	김경모	양동현	34	0.74		
4	CT, Dynamic Liver Transplan...	2008-05-28 11:45	PGN	김경모	양동현	216	5.57		
5	CT, Dynamic Liver Transplan...	2008-05-22 20:02	PGN	김경모	양동현	152	3.92		
6	CT, Dynamic Liver Transplan...	2008-02-18 17:59	PED	김경모	양동현	156	5.58		
# Effective dose of current CT = 5.65 mSv.									
# Cumulative CT dose (2008-02-18 to 2008-09-02) = 26.40 mSv/ 6 months 2 weeks.									
								Send to report	Close

A Case Study of A Child with Acute Abdominal Pain

- A 10-year-old girl with acute onset of abdominal pain & no fever → ER, mild elevation of white blood cell count



A Case Study of A Child with Acute Abdominal Pain



Scenario 1

Plain Radiographs
CT



Tx Decision
Surgical Consult

Scenario 2

Plain Radiographs
Sonography

Tx Decision
Surgical Consult



CT



image
gentlySM





Radiation Protection in South Korea

- The biggest success: Growing attention on potential radiation risks from diagnostic imaging; Spreading of weight-based pediatric CT protocol to other hospitals
- The biggest challenge: Pediatric imaging by adult or general radiologists (> 100 mSv on a single day from adult protocol); No substantial supports from societies, organizations, or government

image
gentlySM

