EXPOSURE TECHNIQUES

For Pediatric and Adult Use with Valory

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Introduction

The NX Workstation can use patient categories based on patient age and patient weight to apply unique image processing and display settings. When used with Agfa DR systems the NX workstation can also be configured to provide default (average) exposure settings (kVp, mAs, etc.) by age. These default exposure settings appear when the system or operator selects a given exposure view and patient age, based on information provided automatically from the RIS or from patient records.

The default exposure settings should be determined by the user using good radiographic practice and the ALARA principle. They should be based on the target exposure index and image quality desired. This ensures that the appropriate image quality and patient dose is achieved, respecting the ALARA principle. The default exposure settings for age groups should be guidelines that work for the average size patient within a given age group at the specific facility. The user should always use appropriate techniques and set the final exposure settings as needed based on the proper measurement of the patient regardless of age.

The following table provides exposure techniques which can be used as a guide when developing site specific exposure parameters (protocols) for Agfa's Valory X-Ray system. It provides the guidance on exposure parameters for most common body parts for pediatric and adult use based on the use of a CsI Agfa DR detector with a with a 10:1 132 lines/inch grid (when specified) and no additional filtration.

Typical diagnostic reference levels can be found in following publications:

- IPEM/NRPB/RCR/CoR/BIR Diagnostic Reference Levels Working Party (United Kingdom
- ACR Practice Guideline for Diagnostic Reference Levels in Medical X-Ray Imaging (USA
- Code 35: Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities - Section A 3.5 Diagnostic Reference Levels (Canada)
- Bundesamt für Strahlenschutz: Bekanntmachung der aktualisierten diagnostischen Referenzwerte für diagnostische und interventionelle Röntgenuntersuchungen (Germany)
- Guidance National Diagnostic Reference Levels (NDRLs) from 19 August 2019 – Public Health England (United Kingdom)

Disclaimer

While this Technique Chart may be used as a reference guide for users to develop radiographic techniques, the exposure techniques required to achieve acceptable diagnostic quality at a given facility may vary significantly from this chart, depending on the examination type, the tube filtration, the grid used, and the image quality requirements of the Radiologists. Agfa makes no guarantees regarding the performance of radiographic techniques in this chart.

Each radiographic facility is ultimately responsible for developing their own radiographic techniques to produce diagnostically acceptable images for their facility. Any radiographic techniques used by a facility must be reviewed and approved by the appropriate personnel at the facility before making patient exposures.

Valory Pediatric Exposure Technique Guide: Infant-Toddler

			Infant (0-12 months)					Toddler (1-3 years)				
Body Part	**View**	**SID**	**Avg cm [1]**	**Grid**	**kVp**	**mAs**	**ESD (μGy)**	**Avg cm [1]**	**Grid**	**kVp**	**mAs**	**ESD (μGy)**
Abdomen	AP	100 cm	10	No	60	4	119	13	No	60	6	191
Chest	PA	100 cm	9	No	60	1.6	47	13	No	60	3.2	1028
	LAT	100 cm	13	No	60	2.5	80	17	No	60	5	175
	AP	180 cm	NA	NA	NA	NA	NA	13	No	70	2	88
	LAT	180 cm	NA	NA	NA	NA	NA	17	No	70	4	192
Skull	AP	100 cm	14	No	65	2.5	98	16	No	65	6.4	263
	LAT	100 cm	11	No	60	2.5	76	12	No	60	3.2	100
C-Spine	AP	100 cm	5	No	55	2.5	54	6	No	60	3.2	87
	LAT	180 cm	6	No	55	5	109	7	No	60	6.4	178
T-Spine	AP	100 cm	9	No	60	1.6	47	13	No	60	6.4	204
	LAT	100 cm	13	No	60	2	64	17	No	60	12.5	437
L-Spine	AP	100 cm	10	No	60	1.6	48	13	No	60	6.4	204
	LAT	100 cm	12	No	60	3.2	100	17	No	70	6.4	308
Pelvis	AP	100 cm	10	No	60	2.5	74	13	No	60	4	127
Humerus	AP	100 cm	3	No	55	0.8	16	4	No	55	2	42
Forearm	AP	100 cm	2	No	48	3.2	49	3	No	50	3.2	54
Elbow	AP	100 cm	2	No	48	3.2	49	4	No	50	4	69
Wrist	AP	100 cm	1.5	No	48	2.5	38	2	No	48	3.2	49
Hand	AP	100 cm	1.5	No	48	2	31	2	No	48	3.2	49
Femur	AP	100 cm	4	No	60	1.6	42	7	No	60	2	56
Knee	AP	100 cm	4	No	60	1.25	33	6	No	60	1.6	44
Tib/Fib	AP	100 cm	4	No	60	1.25	33	6	No	60	1.6	44
Ankle	AP	100 cm	2	No	50	2.5	41	4	No	55	2	42
Foot	AP	100 cm	2	No	50	2	33	4	No	55	1.6	34

[1] Average thickness of the body part

Valory Pediatric Exposure Technique Guide: Child-Adolescent

			Child (3-8 years)					Adolescent (8-10 years)				
Body Part	**View**	**SID**	**Avg cm [1]**	**Grid**	**kVp**	**mAs**	**ESD (μGy)**	**Avg cm [1]**	**Grid**	**kVp**	**mAs**	**ESD (μGy)**
Abdomen	AP	100 cm	14	No	65	5	196	16	Yes	75	6.4	349
Chest	PA	100 cm	14.5	No	65	3.2	127	17	No	70	2.5	120
	LAT	100 cm	22	No	70	5	272	24	No	75	4	266
	AP	180 cm	14.5	No	75	5	263	17	No	85	4	NA
	LAT	180 cm	22	No	75	12	759	24	No	85	5	NA
Skull	AP	100 cm	17	No	65	8	336	18	Yes	70	12.5	615
	LAT	100 cm	14	No	65	4	157	14	Yes	70	5	224
C-Spine	AP	100 cm	8	No	65	3.2	110	9	No	65	3.2	112
	LAT	180 cm	9	No	65	6.4	224	9	No	65	6	210
T-Spine	AP	100 cm	14	No	65	5	196	17	No	70	6.4	308
	LAT	100 cm	18	No	65	12.5	538	24	No	70	16	917
L-Spine	AP	100 cm	14	No	65	6.4	251	17.5	Yes	70	10	486
	LAT	100 cm	22	No	75	8	506	24	Yes	75	25	1665
Pelvis	AP	100 cm	14	No	65	5	196	20	Yes	75	12	721
Humerus	AP	100 cm	6	No	55	2.5	55	6	No	60	2	55
Forearm	AP	100 cm	4.5	No	52	4	78	5	No	52	3.2	63
Elbow	AP	100 cm	5	No	52	4	79	5	No	52	4	79
Wrist	AP	100 cm	3	No	48	4	63	3	No	48	4	63
Hand	AP	100 cm	3	No	48	4	63	3	No	48	4	63
Femur	AP	100 cm	9	No	60	4	116	10.5	No	70	6	248
Knee	AP	100 cm	8	No	60	4	114	9	No	70	3.2	128
Tib/Fib	AP	100 cm	7	No	60	2	56	7.5	Yes	60	2.5	70
Ankle	AP	100 cm	5	No	55	2	43	6	Yes	55	4	88
Foot	AP	100 cm	5	No	55	2	43	5	No	55	2.5	54

[1] Average thickness of the body part

Valory Pediatric Exposure Technique Guide: Teen

			Teen (10-18 years)				
Body Part	**View**	**SID**	**Avg cm [1]**	**Grid**	**kVp**	**mAs**	**ESD (μGy)**
Abdomen	AP	100 cm	18	Yes	80	10	662
Chest	PA	100 cm	23	Yes	125	1.25	200
	LAT	100 cm	31	Yes	125	2.5	499
	AP	180 cm	23	Yes	125	2.5	401
	LAT	180 cm	31	Yes	125	4	798
Skull	AP	100 cm	18	Yes	80	8	530
	LAT	100 cm	14	Yes	75	6.4	333
C-Spine	AP	100 cm	10	Yes	70	3.2	131
	LAT	180 cm	13	Yes	73	16	786
T-Spine	AP	100 cm	23	Yes	90	6.4	593
	LAT	100 cm	31	Yes	95	12.5	1653
L-Spine	AP	100 cm	23	Yes	90	6.3	583
	LAT	100 cm	31	Yes	95	32	4232
Pelvis	AP	100 cm	22	Yes	85	8	643
Humerus	AP	100 cm	8	Yes	70	2	78
Forearm	AP	100 cm	5	No	52	3.2	63
Elbow	AP	100 cm	5	No	52	4	79
Wrist	AP	100 cm	3	No	48	4	63
Hand	AP	100 cm	3	No	48	4	63
Femur	AP	100 cm	14	Yes	77	3.2	171
Knee	AP	100 cm	10	Yes	70	4	164
Tib/Fib	AP	100 cm	8	No	60	3.2	91
Ankle	AP	100 cm	6	No	55	5	109
Foot	AP	100 cm	5	No	55	2.5	53

[1] Average thickness of the body part

Valory Adult Exposure Technique Guide

			Adult				
Body Part	**View**	**SID**	**Avg cm(1)**	**Grid**	**Typical DAP ($dGycm^2$)**	**kVp**	**mAs(2)**
Abdomen	AP	115 cm	18	Yes	10.1	100	AEC
Chest	PA	180 cm	23	Yes	0.8	125	AEC
	LAT	180 cm	31	Yes	3.0	125	AEC
C-Spine	AP	115 cm	10	Yes	1.3	75	AEC
	LAT	180 cm	13	Yes	0.9	75	AEC
T-Spine	AP	115 cm	23	Yes	5.0	85	AEC
	LAT	115 cm	31	Yes	6.5	85	AEC
L-Spine	AP	115 cm	23	Yes	9.6	85	AEC
	LAT	115 cm	31	Yes	15.1	95	AEC
Pelvis	AP	115 cm	22	Yes	10.4	85	AEC
Hip	AP	115 cm		Yes	5.2	80	AEC
Shoulder	AP	115 cm		Yes	1.3	73	AEC
Upper arm	AP/LAT	115 cm	8	Yes	1,0	66	6.3
Lower arm	AP/LAT	115 cm	5	No	0.3	60	3.2
Elbow	AP/LAT	115 cm	5	No	0.3	60	3.2
Hand/Wrist	AP/LAT	115 cm	3	No	0.2	60	1.6
Femur	AP/LAT	115 cm	14	Yes	4,0	75	AEC
Knee	AP/LAT	115 cm	10	Yes	0.6	70	4
Lower leg	AP/LAT	115 cm	8	No	0.9	70	3.2
Ankle	LAT	115 cm	6	No	0.2	60	3.2
Foot	LAT	115 cm	5	No	0.2	60	3.2

(1) Average thickness of the body part

(2) AEC callibrated according to DIN EN 6868-150, 2.5μGy cut off dose