SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY

COURSE NAME :CONTRAST AND SPECIAL RADIOGRAPHY PROCEDURES

UNIT : PAEDIATRIC IMAGING

TOPIC : INTRODUCTION TO PAEDIATRIC IMAGING.

FACULTY NAME : MRS.G.HELANA JOY

INTRODUCTION (Define)

Paediatric imaging is essential in healthcare because children develop understanding at different ages, and successful radiographic studies depend largely on the technologist's approach and preparation in the room. This ability varies from child to child.

CHILD DEVELOPMENT

Childhood for diagnostic imaging is generally divided into six age groups, each with distinct physiological and psychological needs:

* Birth to six months.
* Infancy (six month to three years).
* Early childhood (three to six years).
* Middle childhood (six to 12 years).
* Early adolescence (12-15 years).
* Late adolescence (15-19 years).

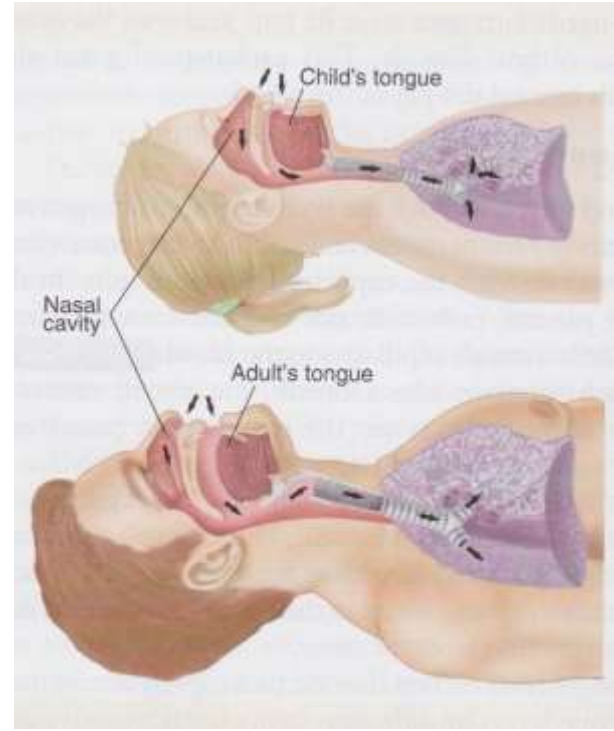
ANATOMICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS

- Young babies have thin skull vaults and vascular markings are not present before the age of one year.
- The nasal bones are not ossified before three years of age.
- Paranasal sinuses are not normally pneumatized until six years of age.
- The scaphoid bone is not ossified before six years of age.

ANATOMICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS

- Children have faster heart and respiratory rate than adults.
- More radiosensitive red bone marrow is more widespread in children and is present in almost all bones of a neonate.

These anatomical differences should be taken into account when optimizing techniques in paediatric radiography.

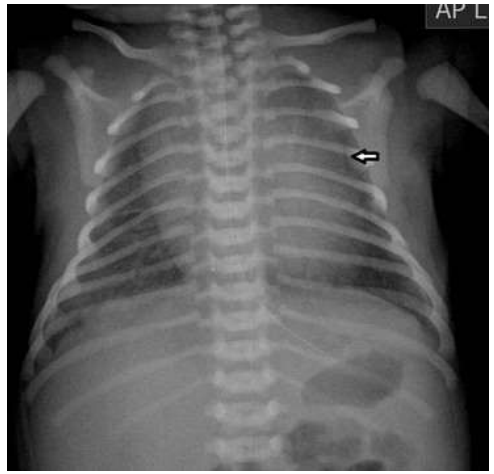


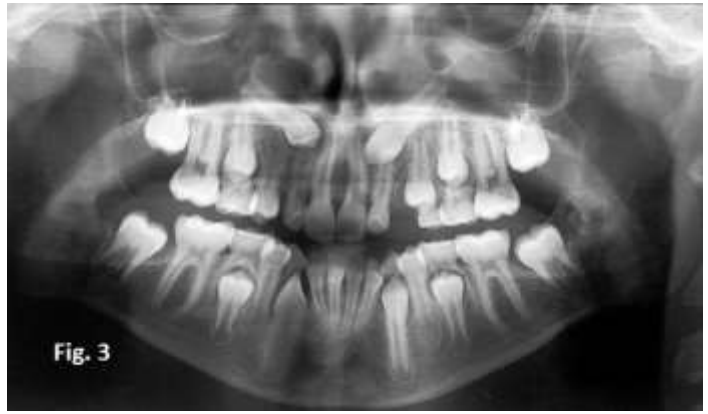
APPROACH TO A PAEDIATRIC PATIENT

- One should always introduce oneself to a child and parent in a friendly and capable manner.
- The child’s name,age and address should be verified.
- It is important to speak to the child at their level.
- A very encouraging,reassuring attitude has to be adopted,and an enormous amount of praise should be given for every single act of co-opeartion,e.g., ‘You are the best child at keeping still we have had all day!’ and ‘You are clever!’

COMMON PAEDIATRIC IMAGING

- Chest neonatal
- Chest post –neonatal
- Skull
- Sinuses
- Dental





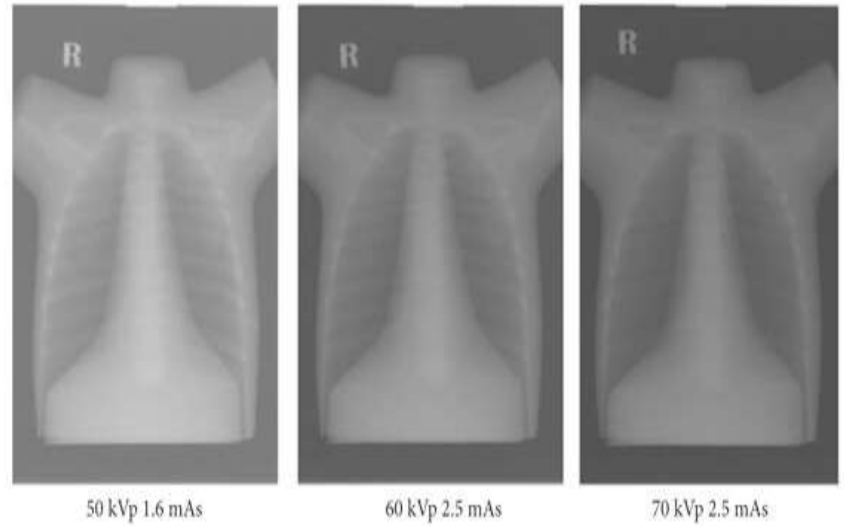
- Abdomen
- Pelvis and hips
- Spine for scoliosis
- Leg length assessment
- Elbow, bone age, hand and knees

IMAGING EQUIPMENT

- A new digital age is fast replacing conventional techniques in radiography.
- It has been shown that there are distinct advantages with dose savings of upto 60% when comparing a 1000 speed computed radiography system with commonly used 400 speed systems used in most departments.
- However, post processing can mask high-dose techniques, and careful optimization and regulation of digital equipment are essential.

DOSE MEASUREMENT

- All radiographic equipment, including mobile and fluoroscopy equipment, should have dose area product (DAP) meters in place.
- These have shown to provide a sensitive and simple method of monitoring and recording doses in pediatrics radiography.
- They need to be of high specification for children, otherwise the dose residing's will not be accurate.



DOSE MEASUREMENT CHART

Effective Diameter (cm)*	Lateral Thickness (cm)	Average Weight (kg)	Average Age (y)
		Brain	
0–14	0–12.5	0–8	0–0.5
>14–15.5	>12.5–14	>8–15	>0.5–3
>15.5–17	>14–15	>15–25	>3–7
>17–18	>15–16	>25–60	>7–17
>18	>16	>60	>17
		Abdomen-Pelvis	
0–14.5	0–16.5	0–12	<2
>14.5–18	>16.5–21.5	>12–23	>2–7
>18–22	>21.5–27	>23–45	>7–13
>22–25	>27–31	>45–60	>13–17
>25–28.5	>31–35	>60–70	>17–21
>28.5	>35	>70	>21
		Chest	
0–14.5	0–16.5	0–8	<0.5
>14.5–18	>16.5–21.5	>8–20	>0.5–6
>18–22	>21.5–27	>20–40	>6–12
>22–25	>27–31	>40–55	>12–16
>25–28.5	>31–35	>55–65	>16–20
>28.5	>35	>65	>20

RADIATION PROTECTION

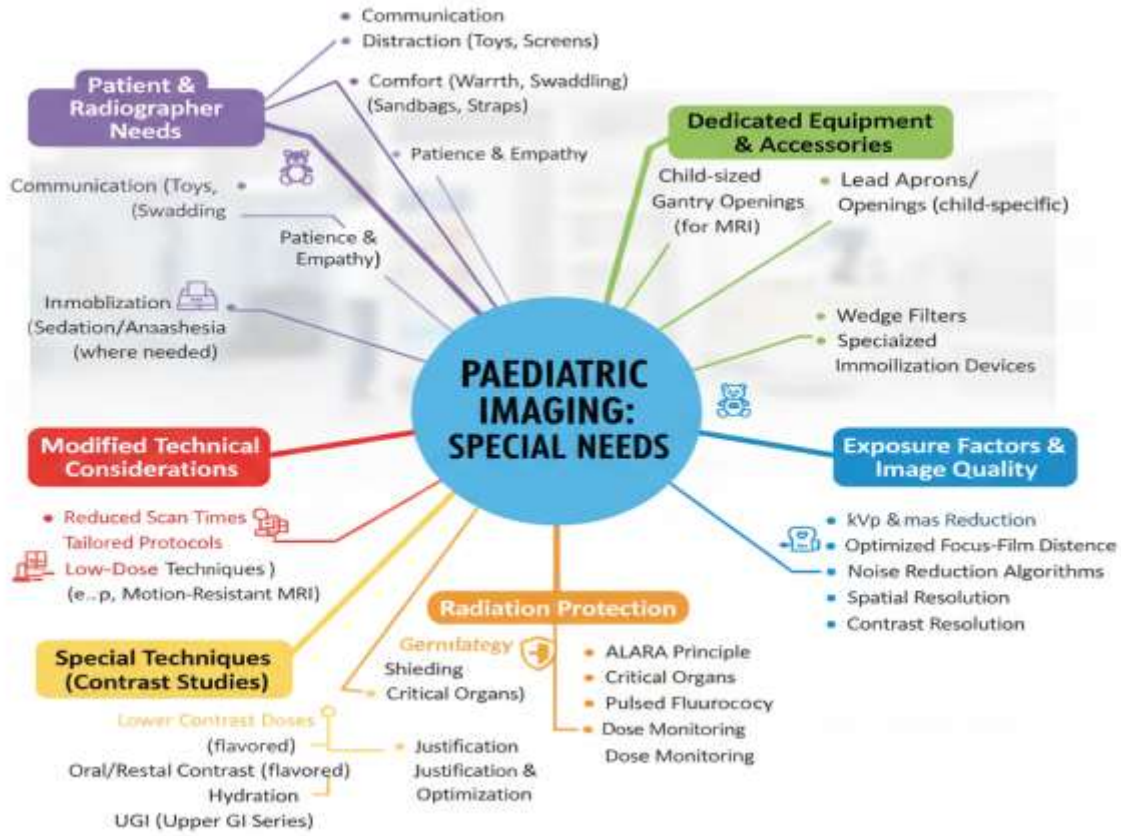
- The optimum dose for an X-ray examination should correspond to the

ALARA (as low as reasonably achievable) principle.

- Wearing of lead aprons or vests.
- Wearing of led thyroid collar.
- Wearing of lead gloves.
- Safety goggles.
- And by following the three basic protective measures in radiation safety:

Time, Distance and Shielding.

SUMMARY


PAEDIATRIC IMAGING: SPECIAL NEEDS
Patient & Radiographer Needs
Communication
Distraction (Toys, Screens)
Comfort (Warrth, Swaddling) (Sandbags, Straps)
Patience & Empathy
Communication (Toys, (Swadding
Patience & Empathy)
Immoblization (Sedation/Anaashesia (where needed)
Dedicated Equipment & Accessories
Child-sized Gantry Openings (for MRI)
Lead Aprons/ Openings (child-specific)
Wedge Filters
Specialized Immoilization Devices
Exposure Factors & Image Quality
kVp & mas Reduction
Optimized Focus-Film Distence
Noise Reduction Algorithms
Spatial Resolution
Contrast Resolution
Radiation Protection
Germfategy
Shieding
Critical Organs)
ALARA Principle
Critical Organs
Pulsed Fluurococy
Dose Monitoring
Dose Monitoring
Modified Technical Considerations
Reduced Scan Times
Tailored Protocols
Low-Dose Techniques)
(e..p, Motion-Resistant MRI)
Special Techniques (Contrast Studies)
Lower Contrast Doses
(flavored)
Oral/Restal Contrast (flavored)
Hydration
UGI (Upper GI Series)
Justification
Justification & Optimization

References

- https://en.wikipedia.org/wiki/Paediatric_radiology
- https://www.myesr.org/app/uploads/2025/05/ESR_Modern_eBook_22.pdf