



SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY

COURSE NAME : CONTRAST AND SPECIAL RADIOGRAPHY PROCEDURES

II YEAR

UNIT : 1 - TOPIC : PAEDIATRIC IMAGING



INTRODUCTION



- Paediatric imaging is important because children do not all reach a sense of understanding at the same paediatric age.
 - This ability varies from child to child.
 - A successful radiographic studies are dependent on two things :
 - * The technologists attitude and approach to a child.
 - * The technical preparation in the room.
1. Legislation
 2. Justification
 3. Optimization



CHILD DEVELOPMENT

- In the context of diagnostic imaging, childhood can be divided into six main age groups each of which has different needs and capabilities:

- * 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.
- 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 cooperation, 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 recording'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 lead thyroid collar.
- Wearing of lead gloves.
- Safety goggles.
- And by following the three basic protective measures in radiation safety:
Time, Distance and Shielding.



RADIATION PROTECTIVE DEVICE





THANK YOU