Radiation Protection of patients in Computed Tomography

Session Chairs: P.L. Khong (Hong Kong, China)  
   P. Shrimpton (UK)

Presentations:
1) New Developments in CT technology and their impact on patient protection; W. Kalender (Germany)
2) Radiation Protection in Paediatric CT; W. Lee (Korea)
3) Reporting of Dose in CT; W. Hendee (USA)
Figure XVI. Trend in the annual collective effective dose from diagnostic medical radiological examinations.
Annual per caput effective dose (mSv) for the USA population in 1980 and 2006

UNSCEAR 2008
Figure B-X. Mean effective doses for various CT examinations in health-care level I countries

1: head; 2: thorax; 3: abdomen; 4: spine; 5: pelvis; 6: other
Justification

• Developing and adopting clinical referral guidelines
• Issues with inappropriate or unnecessary examinations
  – Estimated to be at least 25%
  – Patient self-presentation
  – Financially motivated self-referral
  – Defensive medicine
  – Reimbursement patterns
Optimisation

• **Dose**
  - Developing appropriate protocols
    • Specially tailored for various clinical indications
  - Hybrid modalities and new applications
    • PET-CT, SPECT-CT
    • Cone beam CT
    • CT fluoroscopy
    • Use of CT in Emergency Departments
  - New technologies in equipment to reduce dose
    • Submillisievert imaging
Optimisation

– Reporting of dose and CT dose measurement
  • CTDI$_{vol}$, DLP, effective diameter, SSDE (size-specific dose estimate)
– CT dose; in developing countries
– DRLs, updating of, especially for Paediatric CT
Audit, Education and Communication

• Reporting of errors and events
• Communication of benefits/risks
  – Estimation of cancer risk
• Consent
  – Which examinations, what to say and how to say it
  – Informed decision making VS informed consent
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