13th International Congress of the IRPA
13th – 18th May, Glasgow

Symposium 4.2

Teaching Radiation Protection in Schools:

A Regional Experience

Lawrence Lau, Melbourne / AU
FACR, FRANZCR, FRCR, FAMS
Chairman, International Radiology Quality Network

Learning Objectives

- To be informed of the "***X-rays: The Inside Story***" project
- To consider an opportunity of collaboration in a global project to teach radiation protection to school students
- To consider the elements affecting its successful implementation

Limited Resources

- Sun safety & effects of UV rays are taught in schools[1]
- AM built a portable battery-powered X-ray machine[2]
- Most students: low awareness of medical radiation issues
- Med students & practitioners poorly informed about RP[3,4,5]
- On-line resources for public & professionals
- Limited resources for school students

[1] *WHO (2003) Sun Protection: A Primary Teaching Resource. WHO, Geneva*

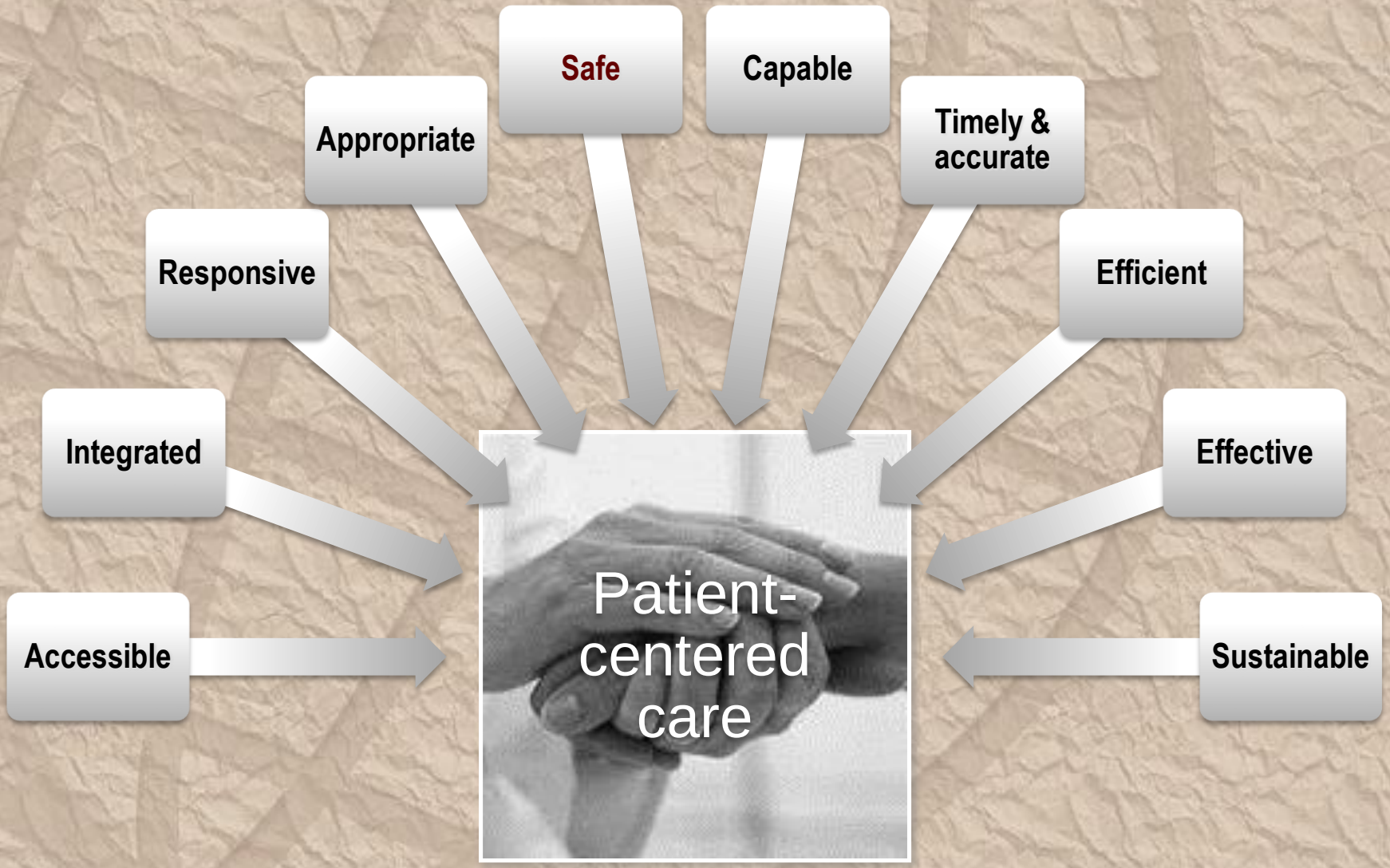
[2] *Popular Science April 2012*

[3] *Georgen S (2010) J Med Imaging Radiat Oncol 54(1):1-2*

[4] *Smith-Bindman R (2010) N Engl J Med 363(1):1-4*

[5] *Zhou GZ et al (2010) J Med Imaging Radiat Oncol 54(1):17-23*

Quality Elements



National Health Performance Framework Report. 2001

Improvement Actions

- Radiation protection measures
  - Procedure justification[1]
  - Optimization of image quality, imaging data & RP[1]
  - Error minimization
- Implementation Strategies[2]
  - Promote awareness
  - Conduct research
  - Provide education & training
  - Strengthen infrastructure
  - Apply policy
  - Evaluate impact
  - On-going improvement

[1] *Radiological Protection in Medicine (2007). Ann ICRP 37 (6). Elsevier, Oxford*

[2] *Lau LSW et al (2011) J Am Coll Radiol 8(5):330-334*

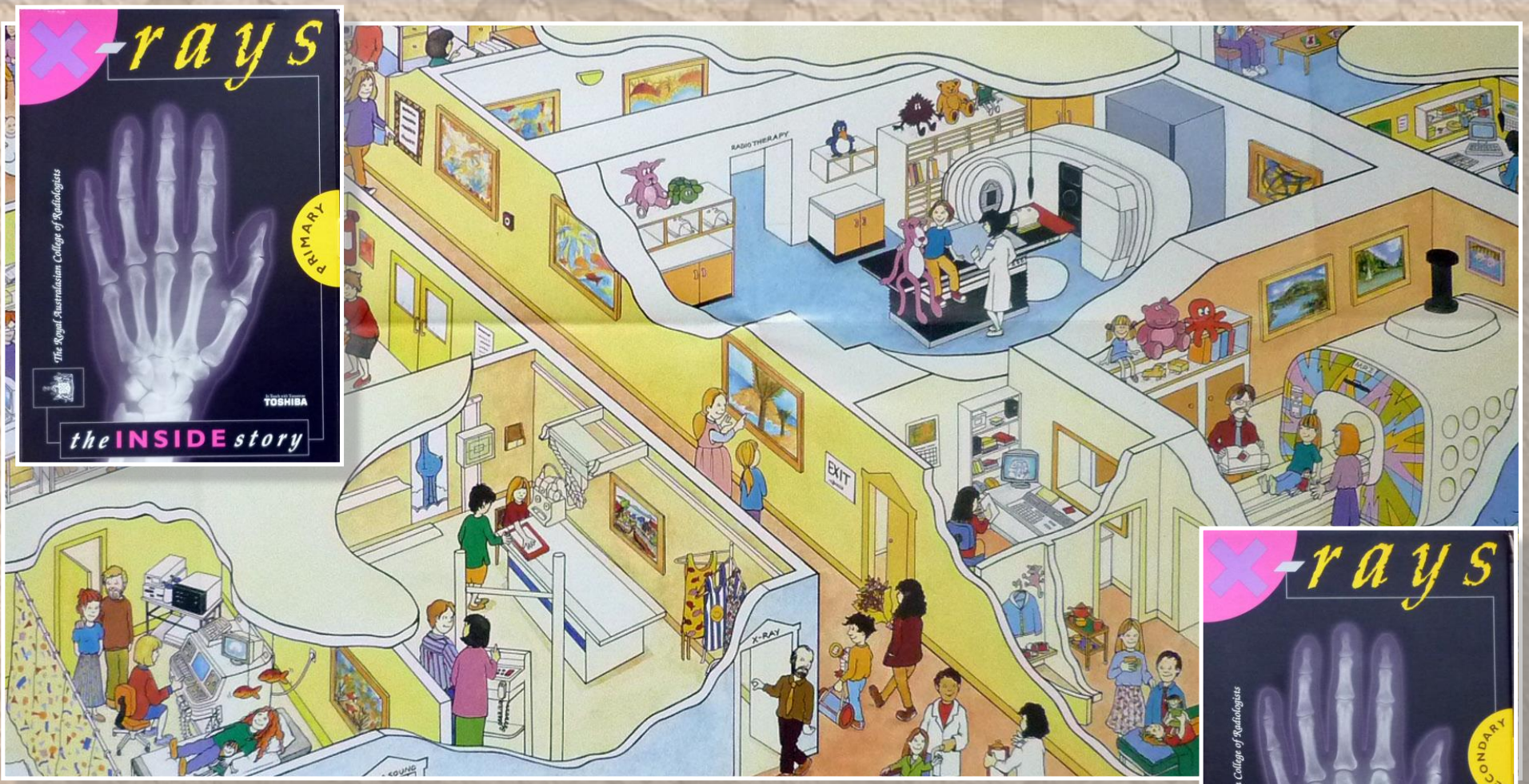
Education & Training

- Medical students, referrers & providers
  - Improve knowledge & competency
  - Strengthen curricula & programs
  - Revise & improve content, format & delivery appropriate for end-users .
- School students
  - More vulnerable to the effects of radiation
  - Improve awareness, potential extended coverage
  - Empower consumers to improve use & enhance radiation safety
  - Promote interest in physical sciences & career choice

A Regional Experience

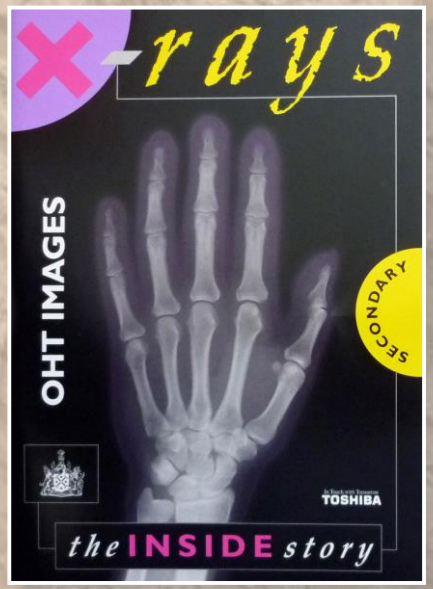
- Roentgen Anniversary Celebration Efforts (RACE) Program in 1995
  - Royal Australian and New Zealand College of Radiologists (RANZCR) to celebrate the 100 years discovery of X-ray
  - "**X-rays: the Inside Story**"
    - Objective: to promote awareness on the medical use of radiation, RS & RP by the development & distribution
      - Educational resources tailored for primary & secondary schools
- Program Partners
  - Development & implementation: Australian Science Teachers Association
  - Sponsor: Toshiba Australia

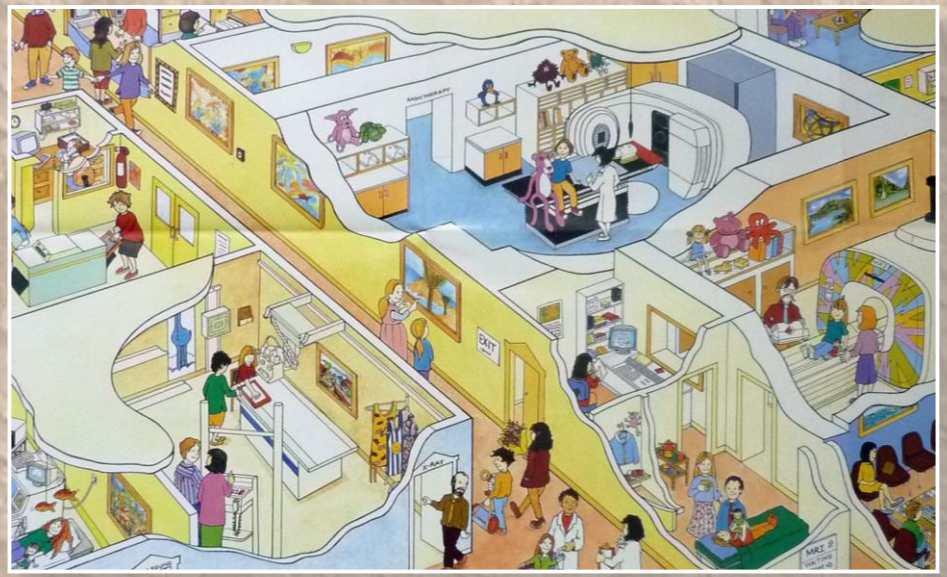
Development

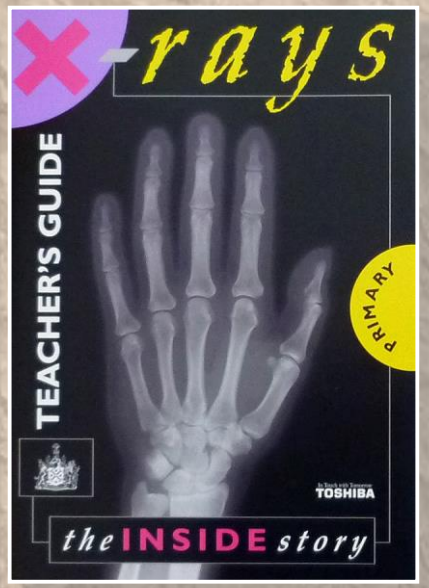


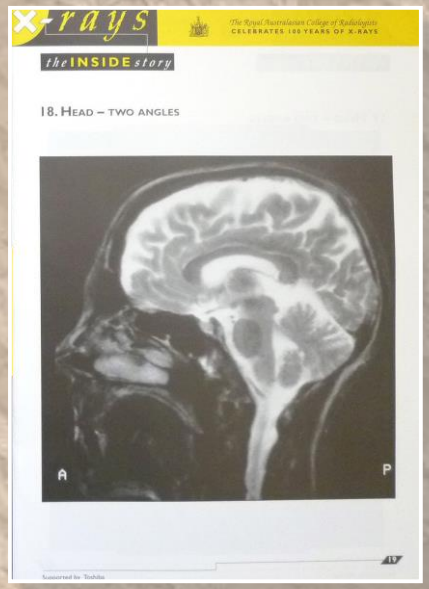
- Written by teachers, tailored for students & suitable for schools
- Radiology team provided support & advice

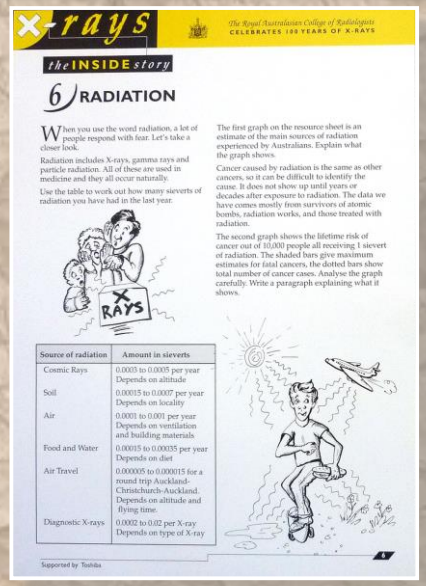
Teaching Tools

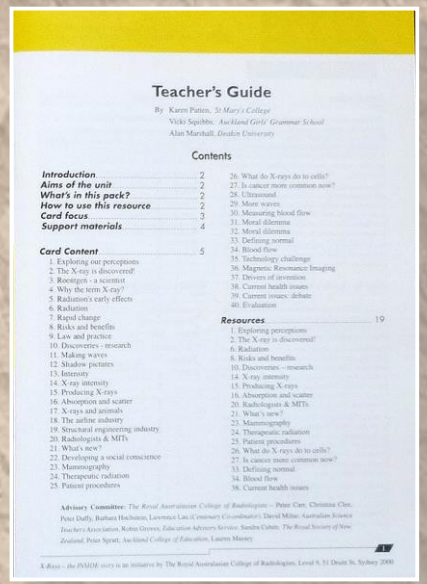












Activity Card Contents

Exploring our perception	Making waves	What's new?	Moral dilemma I
The X-ray is discovered	Shadow pictures	Developing a social conscience	More dilemma II
Roentgen – a scientist	Intensity	Mammography	Defining normal
Why the term X-ray?	X-ray intensity	Therapeutic radiation	Blood flow
Radiation's early effects	Producing X-rays	Patient procedures	Technology challenge
Radiation	Absorption and scatter	What do X-rays do to cells?	Magnetic Resonance Imaging
Rapid change	X-rays and animals	Is cancer more common now?	Drivers of invention
Risks and benefits	The airline industry	Ultrasound	Current health issues
Law and practice	Structure engineering industry	More waves	Current issues: debate
Discoveries – research	Radiologists and MITs	Measuring blood flow	Evaluation

Implementation

- Innovative approach
  - Donated by a RANZCR member to a school of his / her choice in **Australia & New Zealand**
  - ASTA informed members of project & the use of teaching tools
- Evaluation
  - Unofficial feedback: good acceptance & use .
  - No formal evaluation, i.e. degree of uptake, possible gaps & improvement opportunities unknown
- Experience useful to future projects

Timing & Opportunity

- Increase utilization: 3.6 billion XR procedures p.a.[1]
- Public interest & concern about inappropriate use & unnecessary exposure
- Education & training improve awareness & promote appropriate use
- Teaching in schools is innovative & supports this strategy .
- Leverage on past experience & develop a global project towards wider dissemination

[1] *UN Records of the General Assembly 2008*

Possible Steps

- Formation of a core group to lead, initiate & advocate vision to collaborators
- Adoption of an inclusive & multi-sectorial approach to engage stakeholders
  - Organizations, agencies & authorities in education, science, medicine & RP
  - Different experience & unique roles
- Collaboration provides strength & synergy, maximizes resources, minimizes duplication & spearheads this project
- Project scope: development, implementation, evaluation & update
  - Long-term & sustainable .
  - Bridge the gap between evidence & knowledge

Project Plan

- Development: jointly by teachers & practitioners
  - Contents, format & delivery to suit users & local setting, e.g.
    - Classroom, Internet, multimedia, social media
- Trial and implementation requires support & collaboration from education authorities, school management, teachers & students .
  - Advocacy by organizations & agencies
- End-users evaluation & on-going content improvement
- Challenges: human, financial, resources & support
- Solutions: collaborate, share knowledge & resources; patience & perseverance

Conclusion

Living with radiation – Engaging with society

Teaching of RP in schools improves awareness, enhances radiation safety, & promotes interest in physical sciences & career choice

"X-rays: The Inside Story" a RANZCR + ASTA + Toshiba, Australia project development & dissemination of a set of teaching tools for schools

Opportunity for a global project to strengthen awareness

Leadership + collaboration + participation = successful outcome

Teaching of Radiation Protection in Schools

A Regional Experience

Thank you very much for your attention

INTERNATIONAL RADIOLOGY QUALITY NETWORK

Collaboration is Strength