



Australian Government

Radiation Health and Safety Advisory Council

25 July 2011

Dr Carl-Magnus Larsson
Chief Executive Officer
ARPANSA
619 Lower Plenty Road
YALLAMBIE VIC 3085

Dear Dr Larsson

A handwritten signature in black ink that reads "Carl-Magnus".

ADVICE ON MEDICAL RADIATION

In accordance with Council's terms of reference stipulated in the Australian Radiation Protection and Nuclear Safety Act 1998, Council has sought to engage with the medical community and ARPANSA to provide advice on current issues and future developments in medical radiation that it considers worthy of attention. A concerted effort was made earlier this year to hold discussion with sectors of the medical profession, culminating in a forum held on 14 April 2011 as part of the regular Council meeting.

Arising from this forum a number of matters have been identified for your consideration. While some of the points made may not be within ARPANSA's remit, it is still considered important they be highlighted in the context of the decision Council has made to address medical radiation as a priority in its agreed 'Strategic Directions 2011- 2012'.

In the attached 'Advice to the CEO of ARPANSA on Medical Radiation' suggested areas for a strong initial focus are indicated together with recommendations. Council seeks your views on progression of this work and any particular actions planned in relation to the recommendations.

Council will continue discussion on broader aspects of radiation protection in medicine at the next meeting in Canberra on 11 and 12 August 2011 and would benefit from your initial response at that meeting. I will be pleased to discuss or provide clarity on any matters relating to the Council advice at your convenience.

I look forward to your response and Council's continued involvement in this important area of interest.

Yours sincerely

A handwritten signature in black ink that reads "S. Kidziak".

Sylvia Kidziak AM
Chairperson

Attach:



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Radiation Health and Safety Advisory Council

ADVICE TO THE CEO OF ARPANSA ON MEDICAL RADIATION

July 2011

Introduction

At the 14-15 April 2011 meeting Council discussed current and possible future developments in Australia in the use of ionising radiation in medicine and the challenges for radiation protection. During this meeting a forum was held that included participants and presentations from the Royal Australian & New Zealand College of Radiologists (RANZCR), Australian College of Physical Scientists and Engineers in Medicine (ACPSEM), Department of Health & Ageing (DoHA) and ARPANSA. Council benefited from discussions with the various invited parties. This report covers outcomes of the forum and highlights a number of broad points Council would like to discuss with ARPANSA to assist in strategic work planning.

The largest dose of ionising radiation that any Australian is likely to receive will arise from medical radiation procedures. Such exposures whether diagnostic or therapeutic are expected to be taken in the interest of the patient with the benefit arising from the procedures outweighing any risk from the procedure i.e. the procedure is justified.

Advances in medical radiation technology have moved rapidly in recent years. While these advances may be beneficial in terms of treatment, they have increased the need for new procedures and training requirements. Council notes ARPANSA's current initiatives in medical radiation as presented at the April meeting.

The following medical radiation issues for consideration, while limited to the input and outcomes of the forum held by Council are suggested areas for a strong initial focus. In this report Council has provided comments on incident reporting, integration of medical radiation into total patient care planning, optimisation of dose in medical radiation, training, education and new technology. Recommendations are also made.

Council is committed to working with ARPANSA and providing advice on medical radiation areas of mutual interest, particularly in relation to the agency's goal on medical radiation, included in its strategic plan.

Incident reporting

Current practices for incident reporting have been raised consistently as an issue in discussion at Council meetings. Council recently corresponded with the CEO ARPANSA regarding the Australian Radiation Incident Register (ARIR) making suggestions to enhance its usefulness. Core issues that have been raised with Council include:

- The lack of nationally consistent definitions for what constitutes a near-miss, an incident or an accident leading to inconsistency in reporting of incidents across all jurisdictions.
- Multiple reporting systems leading to incidents being reported to some registers but not all registers. Multiple reporting systems (that may or may not be mandatory) with different reporting criteria which may act as a disincentive to report incidents.

- A lack of clear initiatives to encourage reporting of incidents across all professions and jurisdictions aimed at improving the quality of the service, improving professionalism and increasing public trust.
- The necessity of transparency and a no blame culture to ensure adequate feedback across all activities that will allow stakeholders and those concerned to take stock of lessons learned.

Taking into account these issues Council believes agreement across all jurisdictions on what is to be reported must be a priority. Nationally agreed definitions and improved criteria need to be developed and set, including thresholds that make it possible to report accurately and determine the impact of an incident/accident, aimed at an improved understanding of the causes.

ARPANSA should encourage and discuss with the radiation regulators the adoption of a national standard reporting form. There needs to be a consensus on the purpose of incident reporting and consideration should be given to the very different meanings and different outcomes in terms of consequences and risk. Council notes the WHO Technical Manual 'Radiotherapy Risk Profile' discussed at the RHSAC August 2010 meeting where some terms appear to be used in an interchangeable manner. For a reporting system to be successful there must be no ambiguity in the terms used in the report.

To achieve a quality uniform reporting system there needs to be an understanding of reporting systems currently being used and their intended purpose. These include, but may not be limited to RANZCR's Radiology Events Register (RaER) and Therapeutic Goods Administration's system for reporting incidents. Council acknowledges these other reporting systems may have broader reporting criteria and purposes that may include radiation incidents as a sub-set. ARPANSA should have closer communication with RANZCR and the Australian Patient Safety Foundation to ensure relevant radiation incidents reported to RaER are also being captured on the Australian Radiation Incident Register (ARIR). ARPANSA, with the assistance of Council, should consider strategies to enhance consistency in the information that is being reported. Council notes that the Radiation Oncology Reform Implementation Committee (RORIC) is about to commence work on a project relating to incident reporting. ARPANSA should engage with RORIC and ensure appropriate input is provided to benefit the outcomes of this work and again enhance consistency in reporting wherever possible.

Finally, ARPANSA should discuss strategies for developing incentives to report incidents. This may include fostering safety culture and development of a shared vision between regulators and relevant stakeholders. Reporting of incidents must be able to occur in a blame-free environment and ensure that processes to address the causes of incidents include training reviews and timely feedback. The purpose of reporting should be portrayed as positive and the importance of the data for quality assurance and patient/staff protection needs to be emphasised.

Integration of medical radiation into total patient care planning

Council notes there has been an observed increase in radiation dose to populations world wide, particularly from the use of CT technologies over the past 15 – 20 years. This increase has been noted in international and domestic literature. While the increase is often justified in terms of progress with new techniques and identification of new applications of CT technology, it remains important to ensure continual optimisation of dose and that referrals are justified.

Modern radiotherapy departments are multisystem-dependent environments that rely heavily on transfer of patient data between multiple units, systems and staff of different disciplines. The

potential for errors is high as the process involves a complete patient pathway with many links in the chain. At each link in the chain there are hand-overs between different health-care groups. The interaction of various health-care workers collaborating on highly technical measurements and calculations can in itself present a risk of error. Misinformation or errors in data transfer has been identified by the WHO as constituting the greatest bulk of incidents in modern radiotherapy services.

Council is aware that improvements could be made in how patients are managed from the first contact with health care and possible initial diagnosis of an illness, and subsequently through all phases of treatment where medical radiation is applied in a diagnostic or therapeutic manner. Council considers that a 'total care plan' approach to patient care is important, particularly for managing the total patient dose and minimising this dose to the greatest degree possible.

Council considers that it would be valuable for ARPANSA to develop a better understanding of how imaging can be fully integrated into a 'total care plan' for patients and the strategies that could be employed to achieve this. This should include the development and maintenance of collaborative relationships with DoHA, the professions (including radiologists, nuclear medicine specialists, radiation oncologists, cardiologists and others who use interventional radiology, medical radiation technologists, medical physicists and radiation safety officers) as well as regulators.

ARPANSA should promote international documents that have been issued by a number of worldwide organisations e.g. the World Health Organisation (WHO), the International Atomic Energy Agency (IAEA) and the International Commission on Radiological Protection (ICRP) on topics such as radiation treatment specific quality assurance guidelines and ensure that these are considered in the context of Australian guidelines. Council recommends better use be made of the ARPANSA website for this purpose and that inclusion of information such as this be part of the development of a comprehensive communication strategy for the agency.

Standards also need to be reviewed to support the changing work environment, and include innovative ways of sharing of information and better communication systems between professionals. Council considers that initiatives such as the Quality Use of Diagnostic Imaging (QUDI) program that are being developed by RANZCR to deal with lack of sharing of information need to be supported. Publicly applauding information sharing when it does take place will encourage participation in sharing initiatives. Council notes the RANZCR are currently working on development of Australian Practice Standards.

The Integration of care plans, the sharing of information and improved communication between professions in the field of medical radiation will rely heavily on information technology and the development of compatible software systems. While storage, transfer, accessibility and multiple uses of patient data raises issues of privacy and security, Council looks forward to discussing the eHealth program currently being undertaken by the federal government (DoHA) and use of this program to monitor patient life time radiation dose.

Optimisation of doses from medical radiation

While noting there has been an observed increase in dose to the Australian population in recent years, particularly from the use of CT technologies, this increase is often justified in terms of progress with new techniques and the identification of new applications of CT. It remains important however to ensure all dose is continually optimised and referrals are justified.

Paediatrics is of special concern (in diagnostic radiology) as the dose from CT to children may be higher than to adults, with children much more sensitive to the effects of radiation. Optimisation of settings for children is very important, particularly in centres that do not specialise in paediatrics, for example in regional areas.

In ensuring optimisation of dose to the population, and in particular paediatrics, Council believes it critical that information for consumers and guidance for referrers of patients for diagnostic imaging is readily available and that the information and guidance is evidence based and nationally consistent. Evidence based referral guidelines are critically important in controlling the number of paediatric referrals and thus doses to children. Such guidelines are also currently required for applications of MRI versus CT. Council notes that while RANZCR is currently reviewing its referral guidelines and the Western Australian guidelines there are no current national practice guidelines for evidence based referral.

Council considers that ARPANSA should be proactive in encouraging and (if appropriate) advising on the development of referral guidelines. Council recommends that ARPANSA stay informed of progress with the guideline development being led by RANZCR and the work of other professional bodies. ARPANSA should also support policies that help reduce cumulative medical radiation exposures, such as the recent government announcement regarding Medicare support for MRI funding. The movement towards Medicare support for MRI compared to CT is a step in the right direction as Medicare rebates have the potential to influence the use of specific technologies.

It would be beneficial for Council members to be updated on the goals and objectives of the Melbourne University study *'Low dose radiation - effects of CT scans in childhood'* in which ARPANSA has been involved. Council understands ARPANSA is currently monitoring the results of studies on paediatric dose and seeks to have further discussion on current research in this area. This is considered an important area where collaboration between ARPANSA and Council can influence outcomes.

Training, Education and New Technology

Council recognises the continuing role of training and education in radiation protection to ensure the competency of all persons working in the field of medical radiation practices including referrers of patients for radiological procedures. Council also recognises that each type of radiation and its application generates different radiation protection challenges, this being of particular importance when it comes to new and emerging technologies

Council also notes the shortage of skilled professionals in all medical radiation professions including radiation oncologists and radiologists, technologists in radiation oncology, radiology and nuclear medicine, and radiation oncology medical physicists and diagnostic imaging medical physicists.

Council has been advised that for newer technologies which do not attract a Medicare rebate, it is difficult to access funding through DoHA for training development. While noting this, Council considers the main priority for ARPANSA is to focus on new technology that has a demonstrated capacity to reduce radiation to patients. Council considers it would be beneficial for ARPANSA to maintain a watching brief on new technologies and develop a reporting relationship with DoHA, to notify and advise where there is the capacity to reduce radiation to patients.

ARPANSA and Council should work together to express to the DoHA possible radiation risks to patients created by a lack of sufficient skilled staff. Provision of training programs (e.g. for

diagnostic imaging medical physicists, similar to the existing training program for radiation oncology medical physicists) and sufficient clinical training places for all medical radiation professions should be encouraged.

A range of issues that lead to skills shortages includes privatisation of university systems and university funding models. While Council notes this area is outside the role of ARPANSA directly, it needs to be addressed by DoHA, the States and Territories and relevant professional bodies. Council will discuss these issues with Health Workforce Australia (HWA). Council understands HWA is developing a strategy for employment in the health sector up to 2025.

The problem of the lack of undergraduates and graduates and the ensuing skills shortages in the fields of nuclear medicine, radiation technology, and medical physics is perhaps indicative of a lack of awareness of year 11 and 12 students of the opportunities for exciting and rewarding careers in this field. Council would encourage ARPANSA to participate where possible in providing information to schools, careers expos and the like.

Council is concerned whether there is an adequate understanding of medical radiation doses and risks by various groups referring patients for X-rays such as GPs, and the specialists that utilise radiation. ARPANSA, with the assistance of Council, may consider ways to encourage awareness of radiation at a much higher level than presently taught in universities and during specialists training.

Through the radiation regulators forum, ARPANSA should encourage sharing of information with respect to new and emerging technologies in addition to sharing information about manufacturer-initiated training modules and the criteria being utilised by jurisdictions to accredit these.

Recommendations

Council seeks to work with ARPANSA in prioritising and addressing through joint consultation, issues noted in this report. In particular Council emphasises the following;

- The need for a nationally consistent incident reporting system with clear initiatives to encourage reporting of radiological incidents across all professions and jurisdictions.
- ARPANSA should encourage the use of new technologies where a lower radiation dose can be identified through notification and advice to DoHA.
- ARPANSA should be proactive in promoting the undertaking of work in conjunction with appropriate professional bodies to produce evidence based referral guidelines.
- The ARPANSA website should be expanded to provide increased reference to informed international documents by the IAEA, WHO, ICRP etc which can be used to assist the Australian public in gaining an improved understanding of medical radiation issues. Inclusion of information such as this on the website should be part of the development of a comprehensive communication strategy for the agency.