Australasian College of Physical Scientists & Engineers in Medicine

WINTER ACPSEM FOCUS

Message from the Editors

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The Winter Edition of the National Newsletter is proudly brought to you by Queensland, the sunshine state, and as such, we are still basking in beautiful, cloudless 21°C days. We will try not to rub this in too much, as our fellow Melbourne members have recently been battling with top temperatures of a scorching 13°C. Regardless of which state you reside in, what weather you are dealing with at the moment, we hope that this newsletter makes all our members feel warm and fuzzy about being a part of such fantastic college.

We have plenty of things to brag about living in Queensland, including our winter temperatures, but instead we will give you an insight into our treatment centres, and what great things the QLD medical physics community have been up to. We have also included the wonderful information provided to us by members around Australia and New Zealand.

A lot of great work has been happening in and around the Asia-Pacific region. Two members, Gary Arthur and Danielle Tyrrell, have recently volunteered their time in Vietnam and Myanmar, respectively. They have both provided insightful accounts of their experiences, challenges and rewards. You can also help APSIG provide training to radiotherapy physicists in developing countries by volunteering your time or by joining any of the fun runs or events listed on the Everyday hero webpage and raising money (see flyer on page 6). Australia/New Zealand have also been well represented at several global conferences this year. It is great to see so many members actively participating in the collaboration of medical physics on both a National and International scale!

After much success in its inaugural year, the Photography in Medical Physics competition and exhibition will be running again in 2015. Information can be found on pages 11-12. Along with a few sample photos to inspire you and get those creative minds ticking!

Finally, this newsletter concludes with a “Physics Phun” section. So if you need a break from plan checking, or you’re waiting for your electrometer to null, skip to the end where there are a few short medical physics themed puzzles for your enjoyment. We would like to thank everyone that helped contribute to this newsletter, as without their enthusiasm it would be a lot shorter and certainly not as interesting! For any further information on any of the articles, please don’t hesitate to contact the Editors!
I am very pleased to report that the Australian Government, through the Commonwealth Department of Health, has funded several training positions in medical physics radiopharmaceutical science under the Radiation, Diagnostic and Therapy and Workforce Programme. There will be at least five training positions funded at $59,000 per annum a piece over 3.5 years for our newest cohort of radiopharmaceutical scientist members. This success, combined with the end of the fiscal and financial reporting year for the governments in Australia and New Zealand on 30 June, have brought into focus for me some of the opportunities and challenges we find as professionals.

We can build on our experience in delivering these programs in radiation oncology medical physics and diagnostic imaging medical physics. This is an opportunity and challenge. I invite our medical physicists to share their experience of the ACPSEM Training Education and Assessment Program (TEAP) with those embarking on the new TEAP in radiopharmaceutical science. Congratulations to those who were successful in gaining funding.

We can also invite our technical and clinical colleagues in radiology, molecular and nuclear medicine, and radiation oncology to participate and collaborate in these programs. I was disappointed to hear from some of our colleagues that not many of our members reportedly discussed this funding opportunity with those outside their immediate team and professional network. I see this lack of consultation arising, partly from a combination of using existing reporting structures and not engaging in developing existing personal relationships, and mainly from the short time to respond to the request for applications. I see it as important for us to build positive trusting relationships with our colleagues so that they support us, especially when we have tight turn around times to take advantage of opportunities. Our colleagues may also help us identify opportunities we don't know exist. I realise that working with our colleagues is not always a simple challenge to meet given the sometimes strong personalities involved. I know many of us have experienced the frustration of not having our sound and logical cases for resources understood.

I was also disappointed to hear from some of our members that financial matters, relationship building and organisational change are not part of our job. The argument was that the request for resources are patently obvious and hospital administrators and some of our colleagues need to take the time to understand our needs. I strongly empathise with this thought if only for a logical world. However working in a hospital is very much an emotive world, and many decisions are made based on or strongly influenced by an emotional response. One of the strong emotional drivers is money. I think it is strange to many of us that money is a strong motivating factor at an emotional level.

Avoiding financial matters, relationship building and organisational change puts our profession at a disadvantage. Without these we would not be able to implement medical technology and ensure its efficient use in a safe manner to deliver the appropriate quality of care. Ignoring the financial, human and organisational factors would lead to inefficiencies in delivery of our professional services. This leads to increased waste in healthcare, which I think we all want to reduce. I realise that not all of us have strengths in these areas, however it may be useful for us to develop them, or at least identify those of our colleagues who can take these challenges on and open the opportunities for us.

Perhaps on opportunity is for the ACPSEM to build on our existing TEAP and provide ongoing professional development in these leadership and managerial areas. It will be challenge to design something that the ACPSEM can provide specific to our professions, however I think we need to develop the financial literacy of our members. I also think we should enhance our personal capabilities to foster positive human relationships and implement organisational change so that the modern medical technology can be stewarded successfully by our members. These topics do matter to us, whether we like it or not.
Vietnam and Volunteering

A report by Gary Arthur FACPSEM, ROMP and Australian Volunteer for International Development, 8th April, 2015

My 8 month assignment was in the Ho Chi Minh City Oncology Hospital; a large hospital dedicated to cancer treatment. Its radiotherapy section has 3 Varian linacs, a cobalt teletherapy unit and a Nucletron HDR unit. It was incredibly busy, treating 100 to 120 patients per linac per day and 20+ patients a day with the HDR brachytherapy unit. Radiotherapy was split on two sides of a busy road which created its own problems e.g. two servers running TPS and linacs, with different software versions.

There were 11 physicists, 9 males and 2 females all of varying levels of knowledge and skill and English language ability. There were also two trainees destined for a radiotherapy centre in the far south yet to be built. One of the more recently employed staff had a Masters degree, although not in medical physics and another was enrolled in a Masters course. There is no formal medical physics training in Vietnam. Graduate physicists learn onsite, just as was the case in Australia some time ago. Onsite training is primarily treatment planning, which the physicists do, although the training is not so much from a physics perspective. In general, physicists are keen to learn in areas such as dosimetry, imaging and advanced techniques such as IMRT, however the problem is availability of knowledgeable mentors and resources (textbooks, journals etc) in Vietnamese.

My brief was basically 3-fold. Develop QA programs, implement new technology and encourage a culture of continuous professional development.

As mentioned, the radiotherapy section was extremely busy and access to the treatment units was a challenge. We therefore worked Saturdays to develop and implement a monthly linac QA program. At the time I left, QA programs for the simulator, CT, cobalt unit, HDR unit and dosimetry equipment were at various stages of completion. Other challenges included lack of documentation relating to linac history, base line values, repairs etc and adapting or developing tools to do the work.

English language is a high priority of the government for its public servants including physicists. Given the availability of physics resources in English, I also saw this of strategic importance and at the request of the chief physicists I gave group English lessons and had one on one conversation sessions; usually having a 10 to 15 min conversation with most staff once or twice a week, i.e. apart from work conversations.

I also gave a series of medical physics talks covering a range of topics. Where possible these were backed up with practical work.

In terms of implementing new technology, there is a general desire throughout Vietnam to implement IMRT. Unfortunately I was unable to deliver this principally due to the lack of imaging and suitable commissioning equipment or funds to purchase them. However thanks to generous gifts of gafchromic film from Australia, I had time to commission one Leipzig applicator for HDR brachytherapy and more importantly, train one of the physicists to do the remaining applicators.

Apart from helping with the use of existing equipment, I was fortunate to be successful in a grant application to the Australian Consulate in HCMC for the purchase of a 1D water tank, a rf-Daily QA 3 daily constancy check device with associated laptop with a com port so it could be used with the 3D tank and some BNC/TNC adaptors. Unfortunately these had not arrived when I left.
Eight months was far too short and there were many things I would have liked to do or didn't complete, for example a linac data book, measurement of planning factors like Sc, PSF etc and a registry of physics equipment.

To be honest the assignment was not without its problems. Language was a restraining factor as was sensitivity to culture. At times it was also oppressively hot with little or no air conditioning. Catching buses to work and crossing the road were not without its stress. On a more personal note there was also some concern about finance and of course missing family.

On the positive side I must also say the assignment was very enjoyable. There is something about waking up each day knowing you're doing good and helping others. The food was good and the people extremely friendly and generous. It was fun and interesting to do a little travelling and explore the culture even if one did find they were inadvertently eating mice!

There are lots of other things I could say about what I did. Perhaps to conclude I think the assignment was very valuable to the HCMC Oncology Hospital and overall I found it very rewarding and enjoyable, so much so that I have accepted another ACPSEM-DFAT position, this time in Da Nang.

I’d like to thank ACPSEM and in particular the Asia Pacific Special Interest Group for partnering with DFAT to make the volunteer assignment in Vietnam possible. Second I’d like to thank again those who provided equipment, information and advice during my assignment. I look forward to this position and your continued support.

Best Regards,

Gary Arthur
Welcome to Myanmar, the land of plenty as the locals call it. The Radiation Oncology Department at Yangon General Hospital is in a period of massive expansion. In just over 12 months they have increased their services to add two linear accelerators, a CT scanner, a 3D treatment planning system along with a record and verify system and HDR brachytherapy. This equipment is in addition to their two longstanding Cobalt treatment machines. But it doesn’t stop there. Construction is currently underway for installation of their second CT scanner and they aim to have another two linear accelerators installed and be treating IMRT on all four linacs in the next 12 months.

The radiation oncology staff consists of twelve Radiation Oncologists, four Radiation Oncology Residents, eight Radiation Therapists (three of which are training to be physicists) and two qualified physicists. The eight Radiation therapists run the two Linacs, two cobalt machines and the HDR brachytherapy unit. There is also a visiting qualified Physicist who has been here for the past 12 months to support the linac install, acceptance and commissioning.

There is a lot of pressure on the department to embrace new technology and change their historical practice to include patient immobilization, 3D planning, MV imaging and eventually IMRT. However, the harrowing truth is that each day there are hundreds of patients lining the waiting rooms and footpaths outside waiting for treatment. Many of these patients have travelled up to 8 hours from their villages or from Mandalay or Nay Pyi Taw. On average, each linac treats 70-80 patients per day over a five hour period. With the low staff numbers and the high volume of patients, it is easy to see why departments such as YGH are slow to adopt 3D conformal therapy. The unfortunate fact is that there is just simply not enough qualified health professionals to ensure that these new technologies can be fully embraced and implemented safely.

I have come over to Yangon to provide training to the physicists and help the department transition into the use of this new technology in a safe manner. Most of my time here thus far has been spent with the physicists and trainee physicists. I have found them very eager to learn, although the language barrier makes it difficult to gain a clear picture of their understanding of physics concepts. As the three trainees operate as RT’s from 8am – 2pm treating patients, I spend this time in one-on-one tutorials with the 2 physicists. From 2pm each day we have access to the linacs to perform practical exercises focused on linac QA tasks and absolute and relative dosimetry. Once a week, I provide a physics lecture to the radiation oncology residents, physicists and trainee physicists. Although I feel that these lectures are not the most effective way to teach, due to their difficulties understanding English.

I am here for another 9 weeks and have a very busy time ahead of me. During this time I hope to provide enough training to give the physicists and trainees a basic understanding of dosimetry, quality assurance and radiation safety to enable them to work safely and competently with this new technology. I would like to ensure that robust QA procedures are in place for the entire treatment process and working effectively. To achieve these tasks in the time I am here is simply impossible. I believe the most effective way to implement permanent change is by not just providing them with the processes to follow, but give them the training they need to understand the need for the process. This is a long-term solution and one that will not be met in 9 weeks or even 9 months. The solution will come about by long term support and training from specialists in Medical, Radiation Therapy and Radiation Oncology. I urge you, if you are in the position to offer support to a country like Myanmar, don’t hesitate to put your hand up and do it. If you are not in the position to volunteer your time, then please support the cause by donating to APSIG’s activities to support countries such as Myanmar. We are extremely fortunate to live in a country with a world-class education system and second to none health care standards. The people in Myanmar have so little yet they give so much. In return for your sharing of knowledge, they will give you a lesson in humility. As Albert Einstein said, “A person starts to live when he can live outside himself”.

Beginnings in Myanmar
Danielle Tyrrell, 19th May, 2015
Training Medical Physicists in Developing Countries of the Asia-Pacific

Please help APSIG to provide training to physicists in developing countries of the Asia-Pacific.

Presently, Myanmar needs our support to help train their physicists to commission linear accelerators in radiotherapy. It is crucial that they are supported during this critical phase of introduction to new technology.

You can help by joining in any of the fun runs or events listed on the Everyday hero webpage this year. You can raise money for APSIG by registering yourself and this event through the Everyday Hero website. Click here to get started!

Alternatively, help raise money by sponsoring one of our members by visiting www.everydayhero.com.au and search for “ACPSEM” as a charity or the name of the person who is running. Select ‘Donate’ on the page to contribute to this great cause.

More information:
**The ultimate challenge for TEAP**

10km ! Melbourne !!

Who will sign off THIS competency?

Registrar or so called 'supervisor'????

You can help with the decision by sponsoring the winner (50/50 chance - much better than Tatts). In any case, one winner is clear: The ACPSEM foundation will receive funds to support training of medical physicists in countries with less resources than the ones we enjoy.

Our webpages are up and running (and that is what we better should be doing as well)


I've created this page because I want to make a difference. I'm inspired by the work of Training Medical Physicists in Developing Countries of the Asia-Pacific and wanted to support them by raising money as part of my participation in The Age Run Melbourne 2015. Please help me help them by giving whatever you can using the 'Give Now' button. The more people that know about Training Medical Physicists in Developing Countries of the Asia-Pacific, the greater their impact, so please also spread the word by sharing my page with your friends and family. Thank you in advance for your generosity, it means a lot!


Physics works the same all over the world. However, the resources to get the benefits from physics and specifically medical physics are not equally distributed. This is an opportunity to help with addressing this.
Australian researchers achieve international recognition

A Medical Physicist from The Alfred Hospital in Melbourne has recently been awarded the ESTRO-Elekta Brachytherapy award at the 2015 ESTRO Forum in Barcelona, Spain. Ryan Smith received the award on behalf of the research team for the most innovative abstract in brachytherapy presented at the conference.

The submitted work, ‘Clinical implementation of in vivo source position verification in high dose rate prostate brachytherapy’, describes a novel method for tracking the position of the high dose rate (HDR) source inside the patient during treatment delivery and comparing these measured positions with those expected from the treatment plan. This research, in conjunction with the Medical Physics Group at RMIT University Melbourne, reflects the clinical implementation of a study that has been ongoing for a few years.

2015 ARPANSA Practical Reference Dosimetry Course (PRDC)

Duncan Butler

The first ARPANSA course in reference dosimetry for medical physicists was conducted 21–24 April 2015. Fourteen trainees and several senior physicists joined us for a mix of lectures, dosimetry measurements and example calculations. Feedback was positive: attendees particularly appreciated seeing the primary standards and how the calibration services work. The small field dosimetry practical was also well received. The course will become an annual event – the next one is scheduled for March 2016.

The award, which represents international recognition amongst European Medical Physicists and Radiation Oncologists, is fantastic endorsement of the novel research we are performing at The Alfred Hospital and RMIT University.
World Congress 2015

Information provided by Scott Crowe

The World Congress on Medical Physics and Biomedical Engineering was held in Toronto from the 7th - 12th June, 2015. The ACPSEM had a booth at the conference, where they were actively promoting upcoming EPSM conferences, and answering questions about the Australian TEAP certification program. Australia & New Zealand were well represented, with at least a dozen physicists attending the congress. There was a strong ‘women in physics’ stream with multiple sessions (including a keynote). Eva Bezak (Royal Adelaide Hospital) gave a presentation on “Women in Physics; current status in Australia and New Zealand” (see picture on the right, with Natalka Suchowerska (Chris O’Brien Lifehouse) seen in the slide projection). Eva Bezak and Howell Round were also elected to the IUPESM committee (the umbrella organisation for IOMP and IFMBE, affiliated with ICSU). Below is also a photo of Tanya Kairn, Peta Lonski and Amy Walker, all from Australia (GCCQ, Peter Mac, University of Wollongong respectively). They are holding pamphlets for EPSM2016 in Sydney, and gave a total of 9 presentations between them at the World Congress, 2015. Thanks goes out to Paul Keall for organising the social event. The next World Congress (2018) will be held in Prague, and the following one (2021) will be in Singapore.

The feasibility of using plutonium for shielding of radiotherapy bunkers

Horatio Blogs, Radiation Oncology, Prince Charles Hospital, Brisbane, Australia

Historically materials such as concrete, steel and lead have been used to construct bunkers in which linear accelerators are placed to treat cancer. The aim of these bunkers is to stop harmful radiation accumulating in staff members and members of the public. Concrete is by far the most commonly used material\(^1\). The main disadvantage associated with concrete is the fact that it has a relatively low density (~2.35 g/cm\(^3\)), meaning that often walls several meters thick are required to adequately safeguard the public. This is not feasible if you want to treat with radiotherapy in tight spaces. Steel (density ~ 7.87 g/cm\(^3\)) and lead (density = 11.35 g/cm\(^3\)) can be used as alternatives to reduce the size of a bunker wall. However, it can be argued that even more space can be saved by using another material of even denser quality. For example an ideal bunker would not have walls larger than a standard room. This would save a lot of time and money, particularly when architects try and make linac bunkers comply with the overall aesthetics of their designs.

Plutonium is an incredibly dense material (density = 19.86 g/cm\(^3\)) that may provide the solution to having compact linear accelerator bunkers. The aim of this study was to test the feasibility of using plutonium to design linear accelerator bunkers. The attenuation of an 18 MV photon beam through 3 meters of concrete was calculated using methods from NCRP 151\(^1\). Following this, the thicknesses of steel and lead required to produce the same attenuation were calculated using the procedure in reverse. The thickness of plutonium required to produce the same attenuation as 3 metres of concrete was then calculated by comparing the density of lead to Plutonium. Atomic differences were not considered in this approach, however these values were also verified with Monte Carlo simulations.

The thickness of steel and lead required to produce equivalent shielding as a 300 cm wall of concrete were 73 cm and 38 cm respectively. When plutonium is used however, the thickness required drops to 22 cm. Therefore, when plutonium is used for linear accelerator bunker designs the space requirement is far less. When considering things like use and occupancy factors it is clear that plutonium built bunker walls approach the size of “normal” walls. This is extremely advantageous. For example one could use Plutonium to set up a radiotherapy operation out of a suburban house. Further analysis may be required in terms of the cost and pragmatics of constructing a bunker out of Plutonium. In a parallel study, a colleague was tasked with obtaining enough plutonium to construct a linear accelerator bunker out of. However, since asking he has not been heard from (at the time of print). Despite this, plutonium looks like a promising material to construct bunkers out of, due to the fact that the thicknesses required approach those of normal walls.

\(^1\) NCRP 151
The **PrIMPS** 15th PrIMPS (sponsored by alphaXRT) was held at The Norman Hotel in February 2015 with presentations from various groups. As a trial format, Paul Charles and Katrina Biggerstaff kick-started a round-table conversation with a quick presentation to point/counter-point "QA procedures are outdated and negatively impact the reduction of errors".

The PrIMPS 15 holds a record attendance of 35 medical physicists.

In June, PrIMPS 16th was sponsored by alphaXRT and Translational Research Institute (TRI). The event was hosted in the sparkling state-of-the-art TRI building near the Princess Alexandra Hospital. Members of TRI were also invited for an insight into Medical Physics. The event was attended by 32 medical physicists.

The session started off with thought provoking presentations from diagnostic imaging and radiation oncology, followed by a quick tea break then a tour into a leading medical research and biopharmaceutical facility. A more detailed recap of past PrIMPS events can be found on the ACPSEMQ website.

The next PrIMPS is scheduled for November and will be run as a poster session, so brush off your posters or bring one from a recent (e.g. EPSM) or old conference. The location will be announced at the QLD Symposium in August.

Katrina Biggerstaff
Let’s do it again! - PiMP 2015
Photography in Medical Physics - Competition and Exhibition

We had a lot of fun with our inaugural “Photography in Medical Physics” (PIMP) competition last year and many great submissions. Thanks again to all participants! A few images from PiMP 2014 are shown here, and as you may have seen, in the spirit of the initiative some of the images have been further used by ACPSEM to promote our profession, for instance to nicely enhance the website.

So, we decided to do it again.

To not overcomplicate things, we are keeping the rules pretty much the same. All Medical Physicists are invited to submit up to 5 photos per person to the 2015 “Photography in Medical Physics” (PIMP) competition. The goal is again to celebrate our exciting profession and to show off visually stimulating aspects of the work of a Medical Physicist.

The competition will again run in three categories:

P - Professionals at work
O - Other exciting aspects of Medical Physics
M - Macro: Get up close and personal with Medical Physics

Images will be judged by a jury of professionals from Medical Physics and Photography. Criteria are visual impact, storytelling aspects, and technical quality. The top three images in each category will be awarded prizes and the now highly coveted “PIMP award”. We will also again have the public’s choice prize, the “Public PIMP award”, selected by all interested members of the Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM).

The images will be shown at EPSM 2015 in Wellington. Some images will be published in the ACPSEM Newsletter, on our website (www.PhotographyInMedicalPhysics.com), related social media (www.facebook.com/go4PiMP) and other publications.

(Terms and conditions continued next page)
Terms and Conditions

- Images must be photographs. Small image corrections and modifications in image editing software are allowed, but the impact of the image needs to arise from the photo and not from a post processing effect.
- Image submission is digital via email to: photographyinmedphys@gmail.com with subject line: “Image submission”. Attach all images to one email. You will receive a confirmation email within 3 business days.
- Image size: largest dimension: 2000 pixels, colour space: sRGB
- Images are planned to be printed in the 4x5 and square aspect ratios. If your creativity requires a different aspect ratio and your image is selected to be printed we will likely add black space around it to fit 4x5.
- The submitted image file name should contain the name of the photographer, the category (P, O, or M) and the name of the image separated by spaces, e.g.: “BobHasselblad P JoysOfMonthlyQA.jpg”
- Submission is open to any Medical Physicist, irrespective of area of work (hospital, university, industry, government), employment status, country of residence, favourite ion chamber, preferred electrometer range etc.
- Each person may submit up to five images in total and specify a category for each image in the file name as described above (otherwise we will assign one).
- Copyright for all submitted images remains with you, the photographer. By submitting an image you affirm that you took the image and grant the organisers a non-exclusive license to publicly show your images (printed or in electronic form) for the purposes of this and future competitions, as well as for promotion of ACPSEM and the profession of Medical Physics
- By submitting an image you also affirm that any people shown in the image have agreed to be there, that you have permission to take the photograph in that particular locale with that particular equipment, and are ok with the image being shown publicly and possibly being printed. You further affirm that your image does not violate any copyright laws.
- Equipment can and likely will be visible in many images. We ask that all vendor identifiable equipment is treated with respect (we love our vendors!). We also ask that the display of vendor names and logos in the images is kept to a minimum.
- The organisers reserve the right to exclude any submission that they deem non-suitable

The competition is organized by Joerg Lehmann, May Whitaker and Alannah Kejda as a social activity of the NSW/ACT branch of the ACPSEM. It is made possible through the generous support of the Gamma Gurus.

We very much look forward to your entries! Submission deadline is 25 August 2015.

JMA

www.PhotographyInMedicalPhysics.com

www.facebook.com/go4PiMP
Home of meter maids, banana benders and cane toads. As your guest editing state, we would like to introduce ourselves on the following pages. Of course, this is an entirely representative view of only a few of the centres around – to meet us all you will just have to come and visit! A good opportunity might be at our 25th Annual Symposium in August, or at the Support the Duck Festival in October which sees the Brisbane River flooded with plastic yellow ducks. We welcome collaboration, so if you see something of interest, please do not hesitate to contact us!

Radiotherapy centres in QLD: Blue = Private (9), Red = Public (4), Purple = Public/Private partnership (2)  [http://sbcrowe.net/australian-centres/](http://sbcrowe.net/australian-centres/)
Oceania Oncology is a private radiation oncology provider that started trading in 2010 at Maroochydore on the Sunshine Coast with two Varian Clinacs. In 2013 a second centre was opened in Bundaberg followed by a third in Hervey Bay in 2015. Both Bundaberg and Hervey Bay clinics contain one Elekta Synergy linac.

Oceania Oncology uses Monaco and Xio treatment planning systems and utilises CT/MRI and CT/PET fusion when planning treatments. All of our patients have their treatment dose verified using Sun Nuclear diodes.

We currently have four Physicists, Kurt Byrnes, Yousif Yousif, Daniel Mason and Onno Kamst. This team is expected to grow with a fourth centre opening in North Lakes in 2015.

GCCQ has a total of 11 Varian linacs, including 2 of the first TrueBeams in QLD which were commissioned using SNC 3D water scanners. There are Siemens CT scanners at each site and GCCQ performs both LDR and HDR brachytherapy with the Nucletron SeedSelectron and MicroSelectron systems. A Gulmay kV unit rounds up the full set of machines.

The Eclipse TPS is used, with ImSure for independent MU checks, and Epiqa for RapidArc and IMRT verification. The BrainLab system has been used for cranial stereotactic treatments for many years, with SBRT recently being implemented. The QLD physics team is enjoying being part of the national Genesis network, where physicists share knowledge and resources between states.


Radiation Oncology Queensland (ROQ) started treating patients in May 2007 in Toowoomba. In 2011 ROQ commenced services at Cairns Hospital and in January 2014 ROQ Gold Coast went clinical. Three further sites are under construction in and around Brisbane (Springfield, Greenslopes and Redlands) and all are expected to be treating patients between November this year and mid next year.

Across the active sites, ROQ offers IMRT, VMAT, Stereotactic brain and lung treatments and DIBH. All sites work closely together to keep procedures aligned and share expertise.

In early 2015, Radiation Oncology Institute (ROI) joined with ROQ. ROI has established private radiation oncology facilities at Wahroonga and Gosford (NSW) and offers Tomotherapy, VMAT, Brachytherapy, IMRT and IGRT.

ROQ operate primarily in a Varian environment however Gold Coast utilises Elekta/Pinnacle/Mosaiq while the NSW sites have Varian/Tomotherapy/RayStation.

ROQ was named one of Business Review Weekly’s Top 25 Great Places to Work in 2014 and in 2015 placed in the Top 25 Great Places to Work in Asia. A strong emphasis is placed on professional development and research and all physics staff are allocated funds annually to attend relevant courses and conferences.
Queensland Health is by far the largest employer of Diagnostic Imaging Medical Physicists (DIMPs) in Queensland. Biomedical Technology Services, or BTS, operated within Health Support Queensland, and provides Medical Physics services to the Hospital and Health Services within Queensland including BreastScreen QLD. BTS has staff at 15 locations (c. 2014) with 16 Diagnostic Imaging Physicists covering Radiology and Nuclear Medicine specialties.

BTS has the benefit of being a statewide service, which allows the group to undertake large scale projects like:

- Statewide Paediatric CT dose comparison
- Statewide MDCT adult dose surveys
- Semi-automated radiation dose reporting and analysis
- Mammography tomosynthesis evaluation
- Quantitative radiographic image quality metrics for QA
- Cardiac catheter laboratory image quality and dose benchmarking

The Nuclear Medicine and Queensland PET service at the Royal Brisbane and Women’s Hospital also employs a number of Nuclear Medicine Specialised DIMPs who support the comprehensive suite of therapeutic and diagnostic examinations conducted on site, as well as PET radiopharmaceutical production and manufacturing.

Together Biomedical Technology Services and RBWH Nuclear Medicine and Queensland PET service are an accredited training organisation for the ACPSEM DIMP TEAP. With the combination of Radiology and Nuclear Medicine specialties, this combined training organisation has been approved to take on up to 8 TEAP registrars at a time. There are currently 5 registrars undergoing the training program.

Photos courtesy of Tim Ireland

The radiotherapy department at the Princess Alexandra Hospital was established in 2002, and is located ~ 5km from Brisbane CBD. We operate 5 Elekta linacs including 3 Infinities with Agility heads, 1 Access with Beam Modulator, and 1 Synergy with MLCi2. Our Access machine is also equipped with Exactrac, hexapod, and an iGuide System, to aid in accurate patient positioning. We run an active VMAT program, where we allocate up to 15 QA slots per week. We also allocate up to 2 patients per week for Stereotactic QA on our Access machine with 4 mm leaves. All our VMAT QA is performed using the Arccheck Diode Array in absolute dose mode, and our stereotactic QA is performed using EBT3 film in a Lucy phantom. Pinnacle is our primary planning system, with iPlan being used for our stereotactic treatments.

The 2015 year has been a busy one, with the expected installation of a Gamma Knife in the latter part of the year. Not only will this service be the first of its kind in Queensland, but it will also be the first in Australia to offer Gamma Knife to public hospital patients. For all things Gamma Knife Queensland, please see the following link: [http://metrosouth.health.qld.gov.au/princess-alexandra-hospital/gamma-knife](http://metrosouth.health.qld.gov.au/princess-alexandra-hospital/gamma-knife)

Other things we have implemented this year include, Elekta’s Active Breathing Coordinator, which provides internal immobilization of anatomies affected by respiratory motion, through assisted breath-hold techniques. We are expecting to treat our first patient in early July.

QLD Health DIMPs and ROMPs also got together in April to promote Medical Physics at an Allied Health Careers day in Brisbane. This involved giving a small presentation and hosting an interactive stall, for an expected 500+ people, including students, teachers, and guidance counsellors. We were up against some fierce competition, including physiotherapy, pharmacy, and occupational therapy, but we all had fun and hope to see some of those enthusiastic students in the future!

As this Newsletter promotes the sharing of ideas, we would like to leave you with our idea of using an old water tank as an ‘esky’ for end of year department celebrations. It worked well, but an obvious improvement would be attaching a holder which allows the drive to bring a drink to the surface to avoid cold hands.
25th Annual Symposium
& Winter school 2015

Future Innovations and Healthcare Technology
Come learn about the Leksell Gamma Knife, BrainLab Vero, Cyber Knife, MRI/Linacs and proton therapy

Friday, 28th Aug 2015, Princess Alexandra Hospital

Guest Speakers

Dr. Jonathan Sykes
Head of Radiation oncology Medical Physics Blacktown
Chief Research Physicist
Sydney West Radiation Oncology Network

Dr. Dale Bailey
School of Medical Radiation Sciences
Clinical Associate Professor
Faculty of Medicine (Northern Clinical School)
University of Sydney

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:00am - 9:10am</td>
<td>Welcome and introduction to Winter School</td>
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<tr>
<td>9:10am - 9:30am</td>
<td>J. Sykes - Experience with new technologies</td>
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<tr>
<td>9:30am - 10:30am</td>
<td>ACPSEM Winter School session 1</td>
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<td>10:30am - 11:00am</td>
<td>Morning tea</td>
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<td>11:00am - 12:00pm</td>
<td>ACPSEM Winter School session 2</td>
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<td>12:00pm - 1:00pm</td>
<td>QLD Branch Executive Lunch</td>
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<td>1:00pm - 1:05pm</td>
<td>Symposium introduction</td>
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<td>1:05pm - 2:15pm</td>
<td>Keynote speakers:</td>
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<td>J Skyes - Past, Present and Future of Medical Physics</td>
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<td>D Bailey - Hybrid imaging and novel imaging</td>
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<td>2:15pm - 2:45pm</td>
<td>Afternoon tea</td>
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<td>2:45pm - 3:30pm</td>
<td>Proffered papers</td>
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<td>3:30pm - 4:00pm</td>
<td>Fitch nominations, best presentation and close</td>
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Abstract submission and winter school enrolment open
RSVP by Fri. 14th Aug 2015 to bess.sutherland@genesiscare.com.au
The PA foundation is running its annual Support the Duck event Oct 18th. It’s a great opportunity to support cancer research through this fund raiser event AND promote medical physics to the wider community.

The team challenge involves designing a motorised or non-motorised duck to float down 25m or power down a 100m section of the Brisbane river. The team will receive a GIANT Race Duck, t-shirts and everything needed to get started. The best team wins a mystery prize!

I need your support!

You can help me by either joining me for the race and/or donating to the ACPSEMQ team. The team will have a reserved space by the river to watch the events, free lunch and other activities to enjoy throughout the day. The most difficult part about being on the team is getting the duck down the river. The team is limited to 10 people so hurry!

**For more information on teams, joining or donating**
for other email: katrina.biggerstaff@health.qld.gov.au

If you’d like more background details refer to the April 2015 QLD branch newsletter about last year’s experience.

Katrina
Up close with Medical Physics - Can you guess what these are??

A – Target (image courtesy of Katrina Biggerstaff)
B – Flattening filter
C – Elekta wedge
D – Elekta scattering foil
E – Thyratron
F – Varian physical wedge
Thank you for reading the Winter Issue of the ACPSEM Focus and your continual support of the ACPSEM. We hope you had a blast!

Bess and Emma
ACPSEM QLD Branch Guest Editors

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