2nd Draft Project Concept Template

Project Proposals for the RCA Programme 2022/2023
2ndRound Project Concept Template

Part 1: Information Sheet

2nd Round Concept Project proposals for the RCA Programme 2022/2023 are to be prepared USING THE 1ST ROUND CONCEPT PROJECT PROPOSAL.

The 2nd Round Concept should show the text changes that have occurred through the updating of the 1st Round Concept thorough THE USE OF TRACK CHANGE MODE.

The 2nd Round Concept Proposals will be evaluated against the response to the feedback you have received from RCA PAC on your 1st Round Concept Proposals as well as the criteria listed below:

- **Is its aims and objectives in line with priorities set out the RCA Medium Term Strategy for 2018/2023?**
- **Identify which elements of the MTS are being complied with.**
- **Why it should be a regional project.**
- **The essential role of the nuclear technology in the project.**
- **Does the proposal identify links to previous projects in this area of technology?**
- **Does the proposal overlap or duplicate current or previous RCA projects?**
- **Is a convincing case made to justify further projects in this area?**
- **Is there a strong TCDC component to exploit the benefits from the earlier projects?**
- **Is there a readily available baseline against which to measure the effectiveness of the project?**
- **If the proposal is essentially an extension of previous projects in this area that have been implemented for more than 2 TC Cycles, does the proposal include arrangements for the transfer of project leadership to others?**

Completed templates will be reviewed by the RCA PAC at the Meeting in Vienna planned to be held January / February 2020.

In addition to the above, please address the following specific questions:

Was this concept identified at the 48th RCA GCM as requiring merger with other similar concepts?	**NO.**
If "YES" – was this concept prepared as a result of consultation with the other proposers?	
If "NO" - why was this not undertaken?	

Your National Representative will be reviewing this2nd Draft Concept document to ensure that it has been prepared in compliance with the RCA special requirements.

(Please be aware that, if your concept design does not take account of the special requirements for the RCA programme, it will be rejected.)

Part 2: Concept Template[1]

Title:
The title should be as concise as possible and should summarize the objective of the project.
Improving the Safety and Quality of Radiotherapy in Asia Pacific Region through Auditing and Medical Physicist Training

Compliance with the RCA Medium Term Strategy for 2018/2023:
All RCA projects have to comply with the RCA MTS for 2018/2023 - please refer to the MTS document. Briefly indicate to which specific MTS priorities this project proposal contributes and how will these be achieved?
This project will contribute to the priority of RCA MTS for 2018-2023: Strengthen cancer management programmes in GPs, including training of radiation oncologists, medical physicists and radiation technologists (also known as radiation therapists, RTTs). The priority area number is C.2.2 (i).
We propose a quality audit project for advanced radiotherapy techniques in Asia-Pacific region, to assess the quality of radiotherapy being delivered and provide training for radiation oncology medical physicists (ROMPs) in areas needing improvement. We will use a comprehensive expanded radiotherapy audit tool developed by the IAEAfor advanced techniques based on the updated QUATRO audit tool.A team of radiation oncologists, medical physicists and RTTs, would then perform visits to some selected radiotherapy departments within the region, using this updated tool as the basis for the quality audit and training. A regional workshop focused on quality in advanced radiotherapy techniques would follow. For medical physicists, apurpose-built electronic learning management system based on CLP4NET (Cyber Learning Platform for Network Education and Training)from the IAEA would be used for the online training. Experts and resources would be supported to reach out to developing countries to provide access to needed regional resources such as a network of external and local clinical supervisors and assessors, and resources for focused training at authorized Regional Resource Units (RRUs) using the open and protected CLP4NET frameworks. Such activity would expand access to advanced radiotherapy techniques clinical medical physics training to all RCA countries.

Overall Objective:
State the objective to which the project will contribute. Note this has to be in line with the RCA MTS for 2018/2023. It should be a short description expressed as: To do ……..
To improve the safety and quality of radiotherapy in Asia Pacific Region through auditingand medical physicist training.

RCA Projects are to be designed to have a Socioeconomic Benefit:
What is the potential socioeconomic benefit that might be realised from the project concept over a 5 to 7-year horizon?
The potential socioeconomic benefit is the corresponding targets in the UN Sustainable Development Goals (SDGs) for Asia and the Pacific region -SDG 3: Ensure healthy lives and promote well-being for all at all ages; 3.5: strengthen the capacity of all countries and management of national and global health risks.

Proposed Participating Government Parties:
List the Government Parties expected to participate in the project:
China, Australia, Bangladesh, Cambodia, Fiji, India, Indonesia, Japan, Korea, Laos, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippine, Palau, Singapore, Sri Lanka,Thailand, Vietnam

[1] If you have not been involved in drafting a concept before and if you are not fully acquainted with the RCA and its Programme you are encouraged to support advice and assistance from your RCA National Representative.

Technical Cooperation among Developing Countries (TCDC) Project Component:
Review the resource documentation provided on-line – www.rcaro.org/. Outline the TCDC strategies to be used in the project to enhance regional cooperation:
This project is a good example of TCDC in that China will provide the lead in training and auditing. TCDC will be achieved through development and dissemination of training material, conduct of audits and regional training courses led by China. The following TCDC strategies will be used in this project:

(a) Sharing of a Developing Country's own expertise, technology, resources, facilities, and other capacities with another or other Developing Countries;

(b) The project input(s) will be directly from a Developing Country (DC) and implemented through defined contributions such as inputs of technical expertise or other technical inputs, or cost sharing or cost minimisation;

(c) Developing Countries will provide cost- free experts for the RCA Programme;

(d) Providing services to a Cooperative Project through the establishment by a DC of a Regional Resource Unit (RRU);

(e) Making equipment/ facilities available for the auditing and training;

(f) Bearing the costs, or part costs, of subsistence of participants in events hosted by the DC;

The overall strategy for this project will be as the following:A team of radiation oncologists, medical physicists and RTTs, would perform visits to some selected radiotherapy departments within the region, using this updated tool as the basis for the quality audit and training. A regional workshop focused on quality in advanced radiotherapy techniques would follow. A purpose-built electronic learning management system based on CLP4NET (Cyber Learning Platform for Network Education and Training)from the IAEA would be used for the online training. Experts and resources would be supported to reach out to developing countries to provide access to needed regional resources such as a network of external and local clinical supervisors and assessors, and resources for focused training at authorized Regional Resource Units (RRUs) using the open and protected CLP4NET frameworks.The audit and physicist training will link together ROMPs from high income countries and those from developing countries, through a regional workshop and purpose built electronic management system (CLP4NET). This will allow ROMPs who often work in isolation in small departments to be linked to a network of ROMPs from the region.
Will the project design feature partnering arrangements between those advanced and those less advanced in the technology?
Yes.
If so, list those expected partnerships.
The expected partnerships include GPs with advanced technology, such as Australia, China, Japan, Korea, New Zealand and Singapore et al; and other GPs with less advanced technology in the RCA region. ~~China, Australia, Bangladesh, Bhutan and Brunei,Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Mongolia, Nepal, Pakistan, Philippine, Singapore, Sri Lanka,Thailand, Vietnam, Papua New Guinea as well as in Pacific Islands if radiation oncology services were to be developed in those countries.~~

Analysis of gaps / problems / needs as applied to the RCA region:
Outline the major gaps / problems/specific needs to be addressed by the project (~ 300 words):

The modernization of radiotherapy in High Income Countries has led to the standard use of advanced radiotherapy techniques such as IMRT, VMAT and SBRT. These techniques allow more conformal radiotherapy to be delivered to patients, improving outcomes. Within the RCA region, the implementation of these techniques is varied and many countries have recently/are moving from basic 2D/3D techniques to more advanced techniques. Some countries such as Cambodia, Mongolia, Laos and Myanmar are relatively new to linac-based radiotherapy and would thus benefit from training and peer-review through audit. There have been recent RCA projects to support the uptake of such techniques e.g. RAS6065 on SBRT.However, advanced radiotherapy techniques have greater requirements for precision and accuracy in order to avoid compromising patient safety and outcomes. This includes having advanced skills in radiation dosimetry, commissioning and quality assurance and treatment planning. In some countries, these required skills are not readily available by the local medical physicists. There is a steep learning curve, as departments become more familiar with newer techniques and streamline processes. A structured auditing program is urgently needed for the consistent and effective implementing these advanced techniques.In China, the number of institutions implementing IMRT, VMAT and SBRT increased from 50.1%, 7.9% and 16.5% in 2015 to 76.6%, 29.0% and 20.3% in 2019. The total number of linac was 1931 in 2015. The new approved quota is 1552 for linac in 2018-2020. The use of advanced techniques also increased significantly in Japan, Korea, India, Indonesia, Australia, New Zealand, Bangladesh andThailand, et al. The number of linear accelerators in years 2010 and 2019 in the RCA region is given in table 1 (appendix).

The role of the medical physicist is critical in the safe and effective implementation of advanced radiotherapy techniques. Recent published surveys have shown conclusively the lack of clinically qualified ROMPs in the RCA region,in particularly in LMICs, and the lack of recognition of ROMP as a career pathway in many countries. Courses learning and skills training are urgently needed for medical physicists in terms of research, development and application of new technology, quality assurance and quality control. To strengthen the medical physics profession, a transition is needed in many countries from piecemeal on-the-job training of persons entering the medical physics profession to a structured, nationally coordinated, hospital-based clinical training with peer-reviewed assessment. Concurrently, piloted national clinical training programmes have been established in various countries in the region with other countries evolving and strengthening independent clinical training. Over this time however, it has become apparent that countries with limited radiation medicine services lack the infrastructure (supervisors, assessors, coordinators) to develop and maintain an independent structured clinical training programme. Such countries require specifically targeted innovative assistance models that involve TCDC assistance through Regional Resource Units (RRU).

Review the resource documentation and list any past RCA projects that have addressed similar problems/needs in this area of technology.

There have been RCA projects to support the education and training of medical physics e.g. RAS6038 (Strengthening Medical Physics through Education and Training, completed 2013), RAS6077 (Strengthening the Effectiveness and Extent of Medical Physics Education and Training, 2014-2017),RAS6087 (Enhancing Medical Physics Services to Develop Government Parties through Regional Leadership in Standards and Education and Training Support, started 2018, due to finish 2021). The major emphasis of these projects has been to review the status of supervision and assessment connected with clinical training of medical physicist residents,and to plan strategies to strengthen clinical training and its required assessment, to test the implementation of hospital based clinical training programmes in medical physics in various RCA countries.These programmes cover not just radiotherapy but also nuclear medicine

and radiology. These projects were also successful in developing an online Moodle-based platform for management and operation of clinical training programmes called AMPLE.
There was a previous RCA project on IMRT implementation (RAS6072, completed at the end of 2017). There was one training course on audits in Singapore in 2017. There was a previous RCA project on QUATRO more than 10 years ago. The IAEA continues to support the QUATRO process through training and coordination of audits. But, no auditing related project for advanced radiotherapy technology is implemented. Neither techniques specific practical training project based on and combined with auditing is ongoing. This proposed project will focus on the clinical practice training for advanced radiotherapy techniques for medical physicists, not degree education or certification training and assessment, and will monitor, assess and improve the clinical practice quality of advanced radiotherapy techniques across the region through auditing.

What are the major additional capabilities/skills in this area of technology that will be provided through this project (~ 200 words).
The following capabilities/skills will be provided to the medical physicists:advanced radiotherapy techniques implementation including: acceptance tests, commissioning, radiotherapy treatment planning, image-guidance and delivery, routine equipment and patient specific quality assurance, radiation dosimetry and radiation safety. The capabilities/skills provided to radiation oncologists, medical physicists, and technologists cover the whole process of advanced radiotherapy techniques, including patient setup and immobilization, imaging and simulation, target and organs at risk (OARs) contouring, plan optimization and dose calculation, plan evaluation, image guidance, motion management and treatment delivery.

Requirements for participation:
Indicate the minimum requirements that the counterpart institutions in Government Parties would need to meet in order to participate in this project.
Infrastructure for implementing advanced radiotherapy techniques, such as IMRT/VMAT, IGRT, or SBRT/SRS in clinical practice.
~~Infrastructure for implementing advanced radiotherapy techniques, such as IMRT/VMAT, IGRT, or SBRT/SRS in clinical practice; a radiotherapy department with local ROMP staff.~~

Stakeholder analysis and partnerships:
Briefly describe who are expected to be the principal beneficiaries of this project and any role that will be defined for them in the project.
The principal beneficiaries of this project would be those RCA countries new to linac-based radiotherapy and advanced radiotherapy techniques. Also, all RCA countries would benefit from updated training material and enhancing the QUATRO methodology to include audit of advanced radiotherapy techniques. Their role in this project is to attend the auditing and training.
~~The principal beneficiaries of this project are the institutions implementing advanced radiotherapy techniques in participating Government Parties.Their role in this project is to attend the auditing and training.~~
Have any extrabudgetary funding possibilities, sponsors and partners been identified?
~~NO~~Yes.
Have they been involved at this concept stage?
Yes. They have been involved at the concept stage.We have contacted the major vendors for linacs, TPS and

dosimetry equipment (Varian, Elekta, PTW and IBA) as the extra budgetary funding sponsors and partners. They will provide personnel and devices for the auditing and training for this project through coordinated auditing visits with expert mission, dosimetry school with the project training workshop, remote training, et al. ~~Not available.~~

Role of nuclear technology:

Indicate the essential nuclear technique that would be used and outline why it is suitable for addressing the problems/needs in question.

The essential nuclear technique that would be used is radiotherapyin this project. Radiotherapy is the main cancer treatment approach second to surgery. Advanced radiotherapy techniques are more and more used for curative and palliative cancer management in the RCA region recently.But, the quality of advanced radiotherapy techniques varied with countries dramatically. Auditing and training is an effective, efficient and practical improvement solution to ensure the safety and quality for patients.

Is this the only available technique?

No.

Surgery, chemotherapy, biological therapy, immunotherapy, hyperthermia et al can also be used for cancer treatment.

~~Yes.~~

Does it have a comparative advantage over non-nuclear techniques?

Yes. As the second treatment approach of cancer, radiotherapy contribute about 20% in the 55% curable cancer patients. It can be used alone or combined with other modality in curative and palliative situation in more than 60% cancer patients. It has the competitive advantages of being applicable for patients not suitable for surgery. It is more cost-effective than expensive chemotherapy.

Duration of the project:

Indicate the number of years required to complete the project.

4 years.

Appendix

Table 1. Number of linear accelerators in years 2010 and 2019

	Country	2010	2019
1	Australia	131	220
2	Indonesia	15	42
3	Malaysia	15	54
4	Philippines	20	46
5	Myanmar	0	15
6	Singapore	11	23
7	Cambodia	0	2
8	Laos	0	1
9	New Zealand	25	27
10	Thailand	42	80
11	Vietnam	12	18
12	Mongolia	0	2
13	Sri Lanka	2	5
14	Bangladesh	3	19
15	Pakistan	19	26
16	Nepal	3	5

17	India	140	288
18	Republic of Korea	104	152
19	China	1385	2210
20	Japan	842	861
21	Fiji	0	0
22	Palau	0	0

Note: The data is from the IAEA DIRAC team.Data for some countriesare not properly updated.

Part 2: National Representative Endorsement for Project Concept

This 2nd Round Concept meets the RCA project requirements and I endorse it as a priority for the RCA Programme 2022/2023.

Signed: 

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