2nd Draft Project Concept Template

Project Proposals for the RCA Programme 2022/2023
2nd Round 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 this 2nd 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.)

Concept Template

Title:
The title should be as concise as possible and should summarize the objective of the project.

Strengthening Clinical Application of Hypofractionated Radiotherapy in the RCA Region

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 proposal addresses C.2.2 Priorities in Human Health of the RCA MTS for 2018-2023, i) Strengthen cancer management programmes in GPs, including training of radiation oncologists, medical physicists and technologists, and ii) Simplify and harmonize protocols on diagnostic imaging and for treatment/palliation planning and radiotherapy treatment.
This proposal aims to strengthen the application of hypofractionated radiotherapy in the RCA region through a comprehensive approach including the clinical aspect and the medical physics aspect of the whole treatment process. Hypofractionated radiotherapy focuses on the efficient use of radiotherapy resources (equipment & staff) and the improved quality of patients' life by reducing overall treatment period. Hypofractionated radiotherapy can be applied to currently used radiotherapy technologies such as 3D CRT, IMRT, IGRT which have been enhanced through the past RCA projects, and to almost all types of cancer.
These could be achieved by;

- Regional Training Courses and Expert Missions on hypofractionated radiotherapy technology and proper protocols
- Training and consultations to improve proper application of currently used radiotherapy technologies for frequent cancers, especially in Least Developed Countries (LDCs) and GPs newly joining RCA
- Training and consultations to apply hypofractionated radiotherapy to currently used radiotherapy technologies such as 3D CRT, IMRT, IGRT
- Technical support on physics and clinical aspects in collaboration with International Society and Interest Group for sustainable radiotherapy networking
- Enhancing technical cooperation and expertise exchange between technically advanced countries and developing countries, and among developing countries in the Region.

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 enhance cancer treatment in the RCA region by strengthening comprehensive adaptation of hypofractionated radiotherapy from physics to clinic in the RCA Region.

※ This is in line with the RCA MTS strategic priorities for 2018/2023, C.2.2 i) Strengthen cancer management programmes, and ii) Simplify and harmonize protocols for treatment/palliation planning and radiotherapy treatment.

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 to ensure healthy lives and promote wellbeing for all at all ages though strengthening the capacity of all countries and management of national and global health risks (Targets for Goal 3 in the UN Sustainable Development Goals (SDGs) for Asia and the Pacific region).
To be more specific, through this project, radiotherapy centres under resource limited circumstances will be able to treat more cancer patients and also the quality of cancer patients' lives will get better by reduced overall radiotherapy treatment period (conventional radiotherapy takes about a month and patients suffer from being away from their station for a long time).

Proposed Participating Government Parties:
List the Government Parties expected to participate in the project:

Australia, Bangladesh, Cambodia, China, Fiji, India, Indonesia, Japan, Korea, Laos, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Palau, Philippine, Singapore, Sri Lanka, Thailand, Vietnam.
Potential RCA candidate GPs such as Bhutan, Brunei, Papua New Guinea are also expected to participate in the project once they newly join RCA.

NPCs will be nominated by the NRs of the participating GPs, but the followings are potential partners of the proposed countries that have worked together for need identification and project design.
Australia: Ms Fiona HEGI-JOHNSON, Peter McCallum Cancer Centre, fionahegi@gmail.com
Bangladesh: Mr Md. Moarraf HOSSEN, Dhaka Medical College, nicrh@hospi.dghs.gov.bd
Cambodia: Mr Socheat TOUCH, Khmer Soviet Friendship Hospital, touchsocheat@hotmail.com
China: Mr Anhui SHI, Beijing Cancer Hospital, anhuidoctor@163.com

India: Mr Tejpal GUPTA, ACTREC Tata Memorial Centre, tejpalgupta@rediffmail.com
Indonesia: Mr Henry KODRAT, Dr Cipto Mangunkusumo Hospital, henrykodrat@gmail.com
Japan: Mr Katsuyuki KARASAWA, Tokyo Metropolitan Cancer and Infectious Diseases Center, Komagome Hospital, karasawa@cick.jp
Korea (LCC): Mr Wonil Jang, Korea Institute of Radiological and Medical Sciences, zzang11@kirams.re.kr
Laos: Mr Soudaphone SOUKHANOUVONG, Mittaphab Hospital, Daling3888@gmail.com
Malaysia: Mr Muthukkumaran THIAGARAJAN, General Hospital Kuala Lumpur, drmuthuk@gmail.com
Mongolia: Ms Minjmaa MINJGEE, National Cancer Centre Mongolia, minjmaa@cancer-center.gov.mn
Myanmar: Ms Khin Cho WIN, Yangon General Hospital, dr.yehtutkhinchowin@gmail.com
Nepal: Mr Neupane Prakash Raj, Bhaktapur Cancer Hospital, prneupane@gmail.com

Pakistan: Ms Aisha SIDDIQA, Atomic Energy Medical Center, alimemon2k@yahoo.com

Philippine: Ms Nonette CUPINO, UP Philippine General Hospital, nacmd@yahoo.com
Singapore: Mr David Boon Harn TAN, Asian American Radiation & Oncology, Singapore, davidtan@aamg.co
Sri Lanka: Ms Damayanthi Chandrakumari PIERIS, National Cancer Institute Maharagama, dcpieris59@hotmail.com
Thailand: Ms Mantana DHANACHAI, Ramathibondi Hospital, mantana.dha@mahidol.ac.th
Vietnam: Mr Bui BIEU, Tran Hung Dao General Hospital, lengocha108@yahoo.com

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:

TCDC within the RCA Programme is defined as activities that are components of an approved RCA Project that involves the sharing of developing countries' own expertise, technology, resources, facilities and other capacities with one another.
Although the past RCA projects dealt with basic and advanced radiotherapy such as 3D CRT, IMRT, IGRT, the LDCs and newly joining GPs either still need technical support or missed the opportunities. While providing training and consultation on how to apply hypofractionated radiotherapy to currently used radiotherapy technologies in developing countries, this project will also include reviewing proper use of currently used radiotherapy for frequent cancers in the LDCs and newly joining GPs. This project will contain activities of defining regional resources and sharing them. It will review resources and needs in specific technical areas of participating GPs. Throughout the project period, developing countries will share their expertise and experiences on proper use of currently used radiotherapy for frequent cancers as well as application of hypofractionated radiotherapy. Technical exchange in specific technical areas among developing countries will be promoted. Furthermore, any success story of developing countries will also be shared as a lesson and guidance for other developing countries.

Will the project design feature partnering arrangements between those advanced and those less advanced in the technology?

Affirmative. Interest Group for sustainable radiotherapy networking, composed of advanced radiotherapy centres in GPs, will provide technical support to neighbouring developing countries. The advanced centres in INS, MAL, MON, PHI, SRL, THA, and VIE will take a role of Regional Resource Unit (RRU) to share their expertise and experiences. During the RAS/6/085 Final Project Review Meeting held in Myanmar on 4-8 November 2019, the group had agreed to provide assistance to each other and maintain the objective of promoting and strengthening the use of advanced radiotherapy in the region by sharing their expertise and technology.

If so, list those expected partnerships.

Dr Cipto Mangunkusumo Hospital of INS, General Hospital Kuala Lumpur of MAL, National Cancer Centre of MON, UP Philippine General Hospital of PHI, National Cancer Institute Maharagama of SRL, Ramathibondi Hospital of THA, Tran Hung Dao General Hospital of VIE will make a partnership and provide technical support to Bangladesh, Cambodia, Fiji, Laos, Nepal, Palau, and potential new GPs.

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):

Cancer is one of the most rapidly growing diseases in the RCA region. According to the Globocan 2018, Asia accounts for nearly half of the new cancer cases and more than half of cancer deaths globally. Estimations suggest that Asia has a higher proportion of cancer deaths (7.3%) compared with their incidence (5.8%). Technological advancement in radiotherapy has increased survival rates, reduced damage to normal tissues, and enhanced the quality of life of cancer patients. However, developing countries do not benefit fully due to lack of radiotherapy machines and specialized medical staff. According to the DIRAC database, Southeast Asia has only 0.5 machines/million population while the IAEA recommendation is 4. Comparing among the income groups, high income countries have 7.7 machines/million population while upper middle income countries have 1.5, lower middle income countries have 0.4, and low income countries have 0.05. There is a considerable gap between the radiotherapy requirements and the present availability in the low and middle income countries (LMICs). A radiotherapy facility annually treating 500 patients could eventually treat at least 7500 patients during the 15-year working life of a machine. Since healthier working population will consequently lead to a higher GDP, investments in radiotherapy infrastructure in LMICs would not only result in better survival but should also translate into positive economic growth. However, financing radiotherapy is regarded as a high capital-intensive investment. Therefore, there is a need of resource efficient treatment methods to cope with the rapidly growing demand in the region.

Hypofractionated radiotherapy is radiation treatment in which the total dose of radiation is divided into large doses and treatments are given over a shorter period of time than conventional radiotherapy. It is the delivery of fewer, larger (>2Gy) doses of radiotherapy. The short treatment period tends to lower the effects of accelerated tumor growth that typically occurs during the later stages of radiotherapy. It can also be a potential strategy for improving dose intensity. Not only is it more convenient for patients while providing equal or better outcome, it is also less demanding on staff and equipment time, making it very resource efficient and thereby provides treatment to a wider patient population.

Since hypofractionated radiotherapy have greater requirements for precision and accuracy in order to provide safe treatments and better outcomes, advanced skills are required for the radiation oncologists and medical physicists. According to the country reports from the RAS/6/085 Final Review Meeting, almost all participating GPs reported lack of infrastructure and human resources. Even in the countries with adequate infrastructure, there were lack of experience, knowledge, and protocols in applying techniques such as hypofractionated radiotherapy.

As a solution to overcome the gaps and needs due to limited resources in the region, this project proposes a new approach using hypofractionated radiotherapy by combining the clinical and medical physics aspects comprehensively. This technique is applicable to nearly all cancer types, and can be implemented in most of the participating GPs. Consequently, the aim of improving the efficiency of radiotherapy treatment and enhancing cancer care in the region is expected to follow.

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

RCA projects on radiotherapy in the early stage, such as RAS/6/027 (Quality Assurance in Radiation Therapy, 1997-2000) and RAS/6/040 (Improvement in Quality of Radiotherapy for Frequent Cancers in the Region, 2005-2008), mainly focused on quality control/assurance of radiation treatment.
RAS/6/062 (Supporting 3D Image-Guided Brachytherapy Services, 2012-2015) targets cervical cancer, one of the predominant cancers in the RCA region. But since it does not deal with teletherapy, technical focus is different from this concept.
RAS/6/065 (Strengthening Application of Stereotactic Body Radiation Therapy to Improve Cancer Treatment, 2012-2015) and RAS/6/6085 (Enhancing Stereotactic Body Radiation Therapy for Frequent Cancers in the RCA Region, 2016~2019) have improved the application of SBRT, different technical focus from this concept. Although SBRT is essentially a hypofractionated therapy, it is an extreme case of hypofractionated high-tech stereotactic radiotherapy. This project will focus on evidence-based hypofractionated treatments, not necessarily SBRT, to be able to provide treatment to a broader range of applications in a wider group of GPs with less advanced technology.
RAS/6/086 (Strengthening Cancer Management Programmes in RCA State Parties through Collaboration with National and Regional Radiation Oncology Societies, 2018~2021) has enhanced structural collaboration in the Region in terms of radiotherapy training.

However, hypofractionated radiotherapy is to be applied to the technologies improved by the following three projects. Therefore, this concept will be able to assist the LDCs and newly joining GPs in reviewing current use of these technologies and further improve the proper use.
RAS/6/048 (Application of High-Precision 3D Radiotherapy for Predominant Cancers in the RCA region, 2007-2009) improved the application of 3D CRT.
RAS/6/053 (Improving Image Based Radiation Therapy for Common Cancers in the RCA region, 2010-2014) enhanced the application of IGRT (Image-Guided Radiation Therapy).
RAS/6/072 (Strengthening Intensity Modulated Radiation Therapy Capability in the Region, 2015-2018) disseminated expertise on IMRT.

What are the major additional capabilities/skills in this area of technology that will be provided through this project (~ 200 words).

Clinical and medical physics support for treatment planning and optimal standardized QA/QC protocols, assisted by KIRAMS-KOLAS (Korea Laboratory Accreditation Scheme, SSDL) cooperative with IAEA Dosimetry Audit Network, along with Asia-Oceania Federation of Organizations for Medical Physics (AFOMP). In addition, Hypofractionated Radiotherapy Interest Group will be organized for sustainable networking platform.

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.

Linear accelerator (over 6 MV), radiation oncologists, and medical physicists, radiation therapists (capable of delivering 3D CRT) are minimum requirements for the participation in this project. Government Parties with a plan to procure the above equipment in near future are also eligible.
They can be verified by data and statistics of hospital, radiation protection agency, or by the government plan.

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 ultimate beneficiary is cancer patients receiving radiotherapy under resource limited circumstances.
The principal beneficiaries who will be trained are radiation oncologists, medical physicists, radiation therapists.
Their roles can be defined as follows.
- Radiation oncologist : Decision of treatment plan, proper fractionation and dose in hypofractionated radiotherapy.
- Medical physicist : QA/QC of radiotherapy equipment, setting of equipment for hypofractionated radiotherapy.
- Radiation therapist : Processing and operation of radiotherapy.

Radiotherapy machine manufacturers, vendors, national societies and medical institutes are also possible stakeholders. Health care policy makers, Health Ministries are also related in terms of policy design.

Have any extrabudgetary funding possibilities, sponsors and partners been identified?

Yes. The possibility of support for calibrations of dosimetry equipment in the participating GPs funded by the Korea Institute of Radiological and Medical Sciences (KIRAMS) has been identified. To be specific, KIRAMS-KOLAS (Korea Laboratory Accreditation Scheme, SSDL) in collaboration with the Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) is planning to support this service.
The Association of South Eastern Asian Nations (ASEAN) is also a potential partner to add related activities.

Have they been involved at this concept stage?

Yes. KIRAMS-KOLAS has been involved in the concept stage and put extrabudgetary funding for calibration service in its mid-term budget plan.
The Association of South Eastern Asian Nations (ASEAN) has sponsored capacity building programmes where regional needs were identified.
The Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) has been informed of this concept and discussed project activities.

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.

Radiotherapy is a main component of cancer management and is the essential nuclear technique that would be used in this project. Radiotherapy can be used as a curative aim in place of or in combination with other treatment modalities such as surgery, chemotherapy, or hormone therapy. It is required in nearly half of the newly diagnosed cancer patients in the RCA region. As the cancer incidence is expected to rise in the next decades, it will result in an increasing demand for radiotherapy. Hypofractionated radiotherapy can shorten the overall treatment period without any decrement to cancer control. Because it demands less equipment operating time, resources can be used efficiently for more patients in the RCA region. Furthermore, thanks to reduced treatment period, patients less suffer from being away from their station for a long time (one month for conventional radiotherapy). It will improve the quality of patients' life.

Is this the only available technique?

Yes. Radiotherapy is an essential, irreplaceable element of cancer treatment.

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

Yes. Radiotherapy is regarded as a powerful therapeutic modality for cancer patients according to technical advancements. It offers the benefits in terms of organ preservation, improved quality of life and survival, and effective palliation of symptoms.

Duration of the project:
Indicate the number of years required to complete the project.
4 years from 1st Jan 2022 to 31st Dec 2025

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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Director, Ministry of Science and ICT

The Republic of KOREA

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Date: 15 January 2020