Sri Lakshmi Narayana Institute of Medical Sciences

Date 3/6/2019

From
Dr Asayas Bosco Chandra Kumar,
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY** , 30 Hours course on **JULY2019- DEC 2019**. We solicit your kind permission for the same.

Kind Regards

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

DR ASAYAS BOSCO CHANDRA KUMAR

HOD, GENERAL SURGERY

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR G. JAYALAKSHMI

The HOD: DR ASAYAS BOSCO CHANDRA KUMAR

The Expert: DR M. SENTHIL VELAN

The committee has discussed about the course and is approved.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dean	Subject Expert	HOD
(Sign & Seal)	(Sign & Seal)	(Sign & Seal)

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affiliated to Bharath University, Chennai - TN]

Circular

07.06.2019

Sub: Organising Value-added Course: RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, **Bharath Institute of Higher Education and Research** is organizing a value added course on **"RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY "**.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 1ST July 2019. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. G. JAYALAKSHMI, BSC., MBBS., DTCD., M.D.,
DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram, Kudapakkam Post,
Villianur Commune, Puducherry - 605502.

Dean

Course Proposal

Course Title: RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

Course Objective:

1. Recent advances in radiotherapy
   a. Introduction
   b. Technological Advances in Radiotherapy:
   c .Dimensional Radiotherapy
   d. Intensity Modulated Radiotherapy
   e. Stereotactic Radiosurgery(SRS) and Radiotherapy(SRT)
   f. Stereotactic Body Radiotherapy(SBRT)
   g. Particle Beam therapy: (Electron, proton and neutron beam therapy)
   h. Advances In Radiotherapy Delivery System

2. Recent advances in Assessment of response to chemotherapy
   a. tumor response to chemotherapy
   b. molecular markers for prediction of response
   c. serum markers for monitoring response
   d. monitoring response by molecular imaging
   e .RECIST criteria

Course Outcome:

Course Audience: MBBS UNDERGRADUATES

Course Coordinator: DR ASAYAS BOSCO CHANDRA KUMAR

Course Faculties with Qualification and Designation:

1. **Dr Asayas Bosco Chandra Kumar , Prof and HOD General Surgery**
2. **Dr K Balagurunatha, Prof General Surgery**
3. **Dr M Senthil Velan , Prof General Surgery**

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours	Faculty
1.	20/7/2019	1.Recent advances in radiotherapy	4-6PM	2	**Dr M Senthil Velan**
2.	22/7/2019	a. Introduction	4-6PM	2	**Dr K Balagurunatha**
3.	24/7/2019	b. Technological Advances in Radiotherapy:	4-6PM	2	**Dr M Senthil Velan**
4.	25/7/2019	c. Dimensional Radiotherapy	4-6PM	2	**Dr Asayas Bosco**
5.	26/7/2019	d. Intensity Modulated Radiotherapy	4-6PM	2	**Dr M Senthil Velan**
6.	28/7/2019	e. Stereotactic Radiosurgery(SRS) and Radiotherapy(SRT)	4-6PM	2	**Dr K Balagurunatha**
7.	30/7/2019	f. Stereotactic Body Radiotherapy(SBRT)	4-6PM	2	**Dr M Senthil Velan**
8.	2/8/2019	g. Particle Beam therapy: (Electron, proton and neutron beam therapy)	4-6PM	2	**Dr Asayas Bosco**
9.	5/8/2019	h. Advances In Radiotherapy Delivery System	4-6PM	2	**Dr K Balagurunatha**
10.	8/8/2019	Recent advances in Assessment of response to chemotherapy	4-7PM	3	**Dr M Senthil Velan**
11.	11/8/2019	a. tumor response to chemotherapy	4-6PM	2	**Dr K Balagurunatha**
12.	13/8/2019	b. molecular markers for prediction of response	4-6PM	2	**Dr Asayas Bosco**
13	14/8/2019	c. serum markers for monitoring response	4-6PM	2	**Dr M Senthil Velan**
14	17/8/2019	d. monitoring response by molecular imaging	4-6PM	2	**Dr Asayas Bosco**
15	18/8/2019	e. RECIST criteria	4-5pm	1	**Dr M Senthil Velan**
			TOTAL HOURS	30	

REFERENCE BOOKS: (Minimum 2)

1. **Schwartz's Principles of Surgery, 11th Edition**
2. **Bailey And Love's Short Practice of Surgery 27th Ed**

VALUE ADDED COURSE

1. Name of the programme & Code

Recent Advances in Radiotherapy and chemotherapy & GS11

2. Duration & Period

30 hrs & JULY 2019- DEC 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Multiple choice questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7. No. of times offered during the same year:

1 TIME JULY 2019- DEC 2019

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- JULY 2019- DEC 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength & Year**
1	GS11	Recent Advances in Radiotherapy and chemotherapy	Dr M SENTHIL VELAN	MBBS	20 (july 19-dec 19)

10. Course Feed Back

Enclosed as Annexure- V

Dr. M. SENTHILVELAN, MS.,
Reg. No 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

RESOURCE PERSON

DR M SENTHIL VELAN

(PROF GENERAL SURGERY)

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

CO-ORDINATOR

DR ASAYAS BOSCO CHANDRAKUMAR
(HOD GENERAL SURGERY)

RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

PARTICIPANTS HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Recent advances in radiotherapy and chemotherapy
Course Code	GS11
Objective	1. Recent advances in radiotherapy a. Introduction b. Technological Advances in Radiotherapy: c .Dimensional Radiotherapy d. Intensity Modulated Radiotherapy e. Stereotactic Radiosurgery(SRS) and Radiotherapy(SRT) f. Stereotactic Body Radiotherapy(SBRT) g. Particle Beam therapy: (Electron, proton and neutron beam therapy) h. Advances In Radiotherapy Delivery System

	2. Recent advances in Assessment of response to chemotherapy a. tumor response to chemotherapy b. molecular markers for prediction of response c. serum markers for monitoring response d. monitoring response by molecular imaging e .RECIST criteria
Further learning opportunities	-
Key Competencies	On successful completion of the course the students will have knowledge regarding recent advances about recent advances in radiotherapy and chemotherapy
Target Student	MBBS Students
Duration	30hrs JULY 2019- DEC 2019
Theory Session	10hrs
Practical Session	20hrs
Assessment Procedure	Multiple choice questions

INTRODUCTION

Radiotherapy plays an an important role in the multimodal management of cancer with approximately 50 % of all cancer patient receiving radiation therapy during their course of illness; it contributes towards 40% of curative treatment. Radiotherapy has evolved over the period of time moving from conventional 2 Dimensional technique where only rectangular or square field were used for treating cancer to conformal radiotherapy technique such as 3DCRT(3 Dimensional Radiotherapy), IMRT(Intensity Modulated Radiotherapy), IGRT(Image Guided Radiotherapy), Stereotactic Radiotherapy and Stereotactic Radiosurgery These technique allows more precision in Radiotherapy dose delivery to the tumor as well as reduces the radiation to the adjacent normal structures and critical strucures, thus reducing the acute and late radiation toxicities. The progress in Radiotherapy delivery technique continues to be boosted

by advances in imaging technique(from two Dimensional imaging to 4 Dimensional Imging allowing us real time tumor tracking), computerized treatment planning System, radiation treatment Machines as well as improved understanding of the radiobiology of radiotherapy.

Technological Advances in Radiotherapy:

3Dimensional Radiotherapy:

Three-dimensional conformal radiotherapy (3DCRT) is a complex process that begins with the creation of individualized, 3D digital data sets of patient tumors and normal adjacent anatomy. These data sets are then used to generate 3D computer images and to develop complex plans to deliver highly "conformed" (focused) radiation while sparing normal adjacent tissue. Because higher doses of radiation can be delivered to cancer cells while significantly reducing the amount of radiation received by surrounding healthy tissues, the technique should increase the rate of tumor control while decreasing side effects.

Intensity Modulated Radiotherapy

This is a technique of conformal radiotherapy optimizing the the delivery of irradiation to irregularly shaped volume whilst simultaneously avoiding critical organs. IMRT is made possible through : a) inverse Planning software and b) computer controlled intensity modulation of multiple radiation beam during radiation delivery. Thus the therapeutic ratio for tumors can be improved

Image Guided Radiotherapy(IGRT)

As the treatment margin becomes tighter, potential to miss tumor due to organ motion and patient setup variation become greater. When the critical organs are close to tumor a slight positional error may lead to inadvertent radiation to the normal organ

IGRT is a technique aimed at increasing the precision of radiotherapy by frequently imaging the target or normal tissue just before the treatment or by real time tracking during the treatment and thus enhancing the therapeutic ratio for the tumor and reducing the error arising from the internal organ motion or patient set up. Present era's linear accelerators have inbuilt KV/ MV Imaging, Cone Beam CT and US imaging system enabling the IGRT possible.

Stereotactic Radiosurgery(SRS) and **Radiotherapy(SRT)**

SRS and SRT are techniques to administer precisely directed, high dose irradiation that tightly conforms to an intracranial target to create a desired radiobiological response while minimizing radiation dose to surrounding normal tissue, thus reducing the risk of radiation toxicity

The term stereotactic refers to using precise three dimensional mapping technique to guide a procedure. Stereotactic radiosurgery (SRS) is used for stereotactically guided conformal irradiation of a defined target volume in single session. SRS can be delivered with Gamma Knife(where Gamma rays from multiple Co-60 sources are utilised for treating the tumor or functional brain disease) or X X ray knife(X rays produced in modified LINAC radiosurgery system, including Cyberknife, Novalis Tx are used for treating functional brain diseases or Brain tumors), and protons beam therapy.

Stereotactic Radiotherapy refers to stereotactically guided delivery of highly conformal radiation to adefined target volume in multiple fractionstypically using non invasive positioning technique

Stereotactic Body Radiotherapy(SBRT)

SBRT is the term applied by the American Society of Therapeutic Radiology and Oncology (ASTRO) for the management and delivery of image-guided high-dose radiation therapy with tumor-ablative intent within a course of treatment that does not exceed 5 fractions.

SBRT for early staged Lung cancer and SBRT for Hepatocellular carcinoma in surgically unfit patient has given promising result and randomized trials in surgically Fit patients are still awaited. SBRT spine has evolved as a much effective technique increasing the therapeutic ratio for tumor control and symptom relief.

Particle Beam therapy: (Electron, proton and neutron beam therapy)

Electron beam produced from linear accelerators are commonly used to treat superficial tumors as they do not penetrate deeply into the tissues. External beam radiotherapy is also carried out with heavy particles such as neutrons produced by neytrons generators or cyclotrons; protons produced from cyclotrons and synchrotrons; and heavy ions(helium, carbon, nitrogen, argon and neon) produced by synchrocyclotrons

Proton beams are newer form of particle beam irradiation used to treat deep seated cancer. It delivers very high dose to tumor and minimal dose to s normal structure in their path due to its characteristic absorption profile in tissues called Bragg's peak. Intensity modulated proton therapy(IMPT) allows modulation of the Bragg's peak of protons of different energies making it ideal for deep seated tumors at skull base, brain and spinal cord and also paediatric tumors

Advances In Radiotherapy Delivery System:

The First linear accelerator principle was invented by Rolf Wideroe in 1930 which was followed by development of first linear accelerator for therapy in 1949 by Newberry developed first linear in England. Then the first linearcompact linear accelerator was developed by Varian /Electa system in 1950s. The basic linear accelerators were of single photon energy and they had basic collimator rendering them fit for conventional radiotherapy only Linear accelerators have undergone various upgradation over the decades, resulting in present day linear accelerator with dual photon energy, multiple electron energies, enabled with multileaf collimators, KV and MV imaging and cone beam CT , exac trac, USG imaging system making IMRT , IGRT, SRS, SRT and SBRT possible.

Apart from the External beam Radiotherapy delivery system, Brachytherapy delivery system has also evolved over the period of time from manual loading to manual afterloading and then remote afterloading technique and thus reducing the radiation hazards to the radiation workers. In present era incorporation of USG, CT scan and MRI based brachytherapy treatment planning renders effective tumor control and reduces the radiation induced toxicities.

Summary

In present era, technological advances in radiotherapy conforms the radiation to the target lesion reducing the dose to the surrounding critical organs. As a dose escalation in radiotherapy becomes feasible enhancing the therapeutic ratio for the tumor. Concurrent chemordiotherapy has evolved as an alternative to surgery in many head and neck tumors, Bladder cancer, Limb salvage surgeries strengthening the principle of organ preservation.

Assessment of response to chemotherapy

History

Objective response of a tumour to cancer therapy were made in the early 1960s. In the mid- to late 1970s, the definitions of objective tumour response were widely disseminated and adopted when it became apparent that a common language would be necessary to report the results of cancer treatment in a consistent manner. The World Health Organization (WHO) published a handbook in 1979 which used common definitions and criteria of response used by various investigators1.

However because of some problems, modification of WHO criteria was made which later on led to origin of RECIST criteria.

Introduction

Tumour response is a fundamental concept in clinical oncology but perhaps the least understood. In fact, the need to classify tumours as responding or non-responding can be seen as a direct consequence of our currently limited understanding of tumour biology. In essence, tumour response simply describes the phenomenon whereby some patients benefit from a particular therapy whereas others, despite apparently identical clinical and histopathological characteristics, do not. Monitoring tumour response to therapy is therefore a crucial part of clinical oncology. The definitive proof of the effectiveness of a therapy is improvement in clinical symptoms and survivorship. Current response assessment is based primarily on changes in tumour size as measured by CT scan or other anatomic imaging modalities. Criteria for tumour response have been refined over more than 25 years but fundamental limitations remain. The aim of this article is to describe accurate methods for monitoring tumour response to therapy.

TUMOUR RESPONSE TO THERAPY

There are various methods by which tumour response can be assessed. These methods range from clinical to molecular markers for prediction of response depending upon tumour type.

Clinical examination. By Clinical examination we can find site, size and nature of lesion. These lesions will only be considered measurable when they are superficial (e.g., skin nodules and palpable lymph nodes). For the case of skin lesions, documentation by colour photograph and measurement by a ruler is recommended.

Chest x-ray. Lesions on chest x-ray are acceptable as measurable lesions when they are clearly defined and surrounded by aerated lung. However, CT scan is preferable.

CT scan and MRI. CT and MRI are the best currently available and most reproducible methods for measuring target lesions selected for response assessment. Conventional CT and MRI should be performed with contiguous cuts of 10 mm or less in slice thickness. Spiral CT should be performed by use of a 5-mm contiguous reconstruction algorithm; this specification applies to the tumours of the chest, abdomen, and pelvis, while head and neck tumours and those of the extremities usually require specific protocols.

Ultrasound

Ultrasound measures objective response evaluation..Ultrasound may be used as a possible alternative to clinical measurements for superficial palpable lymph nodes, subcutaneous lesions, and thyroid nodules. Ultrasound might also be useful to confirm the complete disappearance of superficial lesions usually assessed by clinical examination. It should not be used to measure tumour lesions that are clinically not easily accessible. Endoscopy and laparoscopy. The utilization of these techniques for objective tumour evaluation has not yet been fully or widely validated. Their uses in this specific context require sophisticated equipment and a high level of expertise that may be available only in some centres. Therefore, utilization of such techniques for objective tumour response should be restricted to validation purposes in specialized centres.

Tumour Markers

Tumour markers alone cannot be used to assess response. However, if markers are initially above the upper normal limit, they must return to normal levels for a patient to be considered in complete clinical response when all tumour lesions have disappeared.

Cytology and histology.

Cytological and histological techniques can be used to differentiate between partial response and complete response in rare cases (e.g., after treatment to differentiate between residual benign lesions and residual malignant lesions in tumour types such as germ cell tumours).

Molecular Markers for Prediction of Response

There are various molecular markers for prediction of response in various malignant disorders like HER 2 Over expression in Breast cancer, KRAS Mutation in colorectal cancer and Specific somatic mutations of the EGFR kinase domain which greatly increase the sensitivity of non–small cell lung cancer (NSCLC) cells to EGFR kinase inhibitors such as gefitinib and erlotinib. Therefore, EGFR kinase mutations may be a prognostic marker in NSCLC.

Serum Markers for Monitoring Response

In clinical practice , two approaches have been used to monitor tumour response to therapy. One is to measure markers specifically secreted by cancer cells into the blood; the other approach, which is much more common, uses changes in tumour size as a criterion for tumour response. The use of changes in serum markers as a measure of tumour response to therapy is appealing because it is non invasive, can be repeated frequently, and has a relatively low cost. Furthermore, it offers the opportunity to measure tumour response at multiple sites with a single parameter. In some of the malignant tumours, tumour markers (prostate-specific antigen in prostate cancer, CA125 in ovarian cancer, and thyroglobulin in thyroid cancer) are frequently used to monitor tumour response for patient management.

MONITORING RESPONSE BY MOLECULAR IMAGING

Because of these well-recognized limitations of current approaches for monitoring tumour response to therapy, there has been considerable interest in new functional or molecular imaging techniques. This interest has been further stimulated by a growing number of alternative treatment regimens. For many malignant diseases, several treatment regimens have become available, acting on different targets in the tumour tissue. For treatment of metastatic colon cancer, ten chemotherapy combinations are listed in the Physician Data Query database of the National Institutes of Health, which summarizes evidence-based treatment options for all malignant diseases. Among several pursued molecular imaging approaches for treatment monitoring, such as dynamic contrastenhanced MRI, diffusion-weighted MRI, MR spectroscopy, optical imaging, and contrast-enhanced ultrasound , PET

with the glucose analogue 18F-FDG are currently routinely used as molecular imaging for monitoring response in malignant tumours.

RESPONSE EVALUATION CRITERIA IN SOLID TUMORS(RECIST Criteria)

RECIST criteria explores the definitions, assumptions, and purposes of tumour response criteria. The guidelines that are offered may lead to more uniform reporting of outcomes in tumour response assessment2. The tumour response can be evaluated by following methods.

Assessment of overall tumour burden and measurable disease.

To assess objective response, it is necessary to estimate the overall tumour burden at baseline to which subsequent measurements will be compared. Only patients with measurable disease at baseline should be included in protocols where objective tumour response is the primary end point. Measurable disease is defined by the presence of at least one measurable lesion .

Baseline documentation of "target" and "non-target" lesions

All measurable lesions up to a maximum of five lesions per organ and ten lesions in total, representative of all involved organs, should be identified as target lesions and recorded and measured at baseline. Target lesions should be selected on the basis of their size (those with the longest diameter) and their suitability for accurate repeated measurements (either by imaging techniques or clinically). A sum of the longest diameter for all target lesions will be calculated and reported as the baseline sum of longest diameter.

Response Criteria

1. Evaluation of target lesions. Evaluation of target lesions can be done by defining the criteria used to determine objective tumour response for target lesion. Complete response is defined as the disappearance of all target lesions;

partial response—at least a 30% decrease in the sum of the longest diameter of target lesions, taking as reference the baseline sum of longest diameter; progressive disease—at least a 20% increase in the sum of the longest diameter of target lesions, taking as reference the smallest sum of longest diameter recorded since the treatment started or the appearance of one or more new lesions; stable disease—neither sufficient shrinkage to qualify for partial response nor sufficient increase to qualify for progressive disease, taking as reference the smallest sum of longest diameter since the treatment started.

2. Evaluation of non-target lesions. The evaluation of tumour response for non-target lesions include: complete response—the disappearance of all non target lesions and normalization of tumour marker level; incomplete response/stable disease—the persistence of one or more non-target lesion(s) and/or the maintenance of tumour marker level above the normal limits; and progressive disease—the appearance of one or more new lesions and/or unequivocal progression of existing non-target lesions.

Evaluation of best overall response. The best overall response is the best response recorded from the start of treatment until disease progression/recurrence (taking as reference for progressive disease the smallest measurements recorded since the treatment started). In general, the patient's best response assignment will depend on the achievement of both measurement and confirmation criteria.

Frequency of tumour re-evaluation. Frequency of tumour re-evaluation while on treatment should be protocol specific and adapted to the type and schedule of treatment. However, in the context of phase II studies where the beneficial effect of therapy is not known, follow-up of every other cycle (i.e., 6–8 weeks) seems a reasonable norm.

Confirmation. The main goal of confirmation of objective response is to avoid overestimating the response rate observed. This aspect of response evaluation is particularly important in nonrandomized trials where response is the primary end point. In this setting, to be assigned a status of partial response or complete response, changes in tumour measurements must be confirmed by repeat assessments that should be performed no less than 4 weeks after the criteria for response are first met. In the case of stable disease, measurements must have met

the stable disease criteria at least once after study entry at a minimum interval (in general, not less than 6–8 weeks) .

Duration of overall response. The duration of overall response is measured from the time that measurement criteria are met for complete response or partial response (whichever status is recorded first) until the first date that recurrent or progressive disease is objectively documented (taking as reference for progressive disease the smallest measurements recorded since the treatment started). The duration of overall complete response is measured from the time measurement criteria are first met for complete response until the first date that recurrent disease is objectively documented.

Duration of stable disease. Stable disease is measured from the start of the treatment until the criteria for disease progression is met (taking as reference the smallest measurements recorded since the treatment started). The clinical relevance of the duration of stable disease varies for different tumour types and grades. Therefore, it is highly recommended that the protocol should specify the minimal time interval required between two measurements for determination of stable disease. This time interval should take into account the expected clinical benefit that such a status may bring to the population under study 3.

Conclusion: This article has described a standard approach to solid tumour measurement and definitions for objective assessment of patients suffering from cancer. It is expected that these criteria will be useful in all solid tumours where objective response is the primary study endpoint, and where assessment of stable disease, tumour progression or time to progression analyses are undertaken. The article has provided definitions and criteria for assessment of tumour response. It has also provided guidelines and recommendations regarding standard reporting of the results that utilise tumour response as an endpoint.

Annexure- II

VALUE ADDED COURSE

RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY GS11

List of Students Enrolled JULY 2019- DEC 2019

MBBS Students			
Sl. No	**Name of the Student**	**Roll No**	**Signature**
1	KAJAL MISHRA	U17MB311	
2	KAVIYA E V	U17MB312	
3	KAYANAT FARHEEN	U17MB313	
4	KEVIKONO BIO	U17MB314	
5	KEVIN RAHUL S	U17MB315	
6	KURRI BHARGAV REDDY	U17MB316	
7	LALITHA PRIYA G	U17MB317	
8	MAGESHWAR G V	U17MB318	
9	MALLI SOHAN	U17MB319	
10	MANVITHA GOTTUMUKKALA	U17MB320	
11	MEDEMPUDI REETHIKA JYOTHI	U17MB321	
12	MINGAM RUMI	U17MB322	
13	MOHAMED HAARISH C	U17MB323	
14	MOHAMMED SAJITH	U17MB324	
15	MOHAN S	U17MB325	
16	MOINAK PAL	U17MB326	
17	MONISHA C	U17MB327	
18	MONISHA B	U17MB328	
19	MUKESH KANNAN K	U17MB329	
20	MUNAINA K V	U17MB330	

Kaviya EV U17MB312

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

MULTIPLE CHOICE QUESTIONS

I. ANSWER ALL THE QUESTIONS **Course Code: GS11**

1. RECIST criteria

   a. response evaluation criteria in solid tumors

   b. response and cinical evaluation in tumors

   c. both a and b

   d. none

2. Complete response

   a) disappearance of all target lesions

   b) at least a 30% decrease in the sum of the longest diameter of target lesions

   c) both a and b

   d.none of the above

3. partial response

   a) disappearance of all target lesions

   b) at least a 30% decrease in the sum of the longest diameter of target lesions

   c) both a and b

   d.none of the above

4. progressive disease

   a) disappearance of all target lesions

   b) at least a 30% decrease in the sum of the longest diameter of target lesions

c. at least a 20% increase in the sum of the longest diameter of target lesions, taking as reference the smallest sum of longest diameter recorded since the treatment started

d. all of the above

5 stable disease—

a. at least a 30% decrease in the sum of the longest diameter of target lesions

b neither sufficient shrinkage to qualify for partial response nor sufficient increase to qualify for progressive disease

c. Both A & B are Correct

d. None of the above

6. . SRS can be delivered with

a.Gamma Knife

b. X ray knife

c. protons beam therapy.

d. all of the above

7. IMRT

a. Intensity modulated radiotheapy

b. intensity medited radiotheapy

c. Both A & B are Correct

d. None of the above

6/7

ASSESSOR NAME :

SIGNATURE :

DATE : 18/8/2019

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

KAJAL MISHRA
U17MB311

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - IV

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SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

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d. all of the above

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a.Gamma Knife

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7. IMRT

(a.) Intensity modulated radiotheapy

b. intensity medited radiotheapy

c. Both A & B are Correct

d. None of the above

ASSESSOR NAME :

SIGNATURE :

DATE : 18/8/2017

Dr. M. SENTHILVELAN, MS.,
Reg No 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Science

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that MOHAN S has actively participated in the Value Added Course on RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY held during JULY 2019 – DEC 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.

Dr. M Senthil Velan

Resource Person

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr.Asayas Bosco Chandra Kumar

Coordinator

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that KAJAL MISHRA has actively participated in the Value Added Course on RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY held during JULY 2019 – DEC 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. M. SENTHILVELAN, MS.,
Reg. No: 53175
Professor General Surgery
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Kudapakkam, Puducherry-605 502.
Dr. M Senthil Velan

RESOURCE PERSON

PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502
Dr.Asayas Bosco
Chandra Kumar

COORDINATOR

Student Feedback Form

Course Name: **RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY**

Subject Code: **GS11**

Name of Student: Monisha C Roll No.: U17MB327

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned			✓		
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	✓4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 18/8/2019

Monisha
Signature

Student Feedback Form

Course Name: RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY

Subject Code: GS11

Name of Student: Kavya E V Roll No.: U17MB312

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course				✓	
8	Overall rating of the course	1	2	3	4	✓5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Date: 18/8/2019

Signature

Date 24/12/2019

From
Dr Asayas Bosco Chandra Kumar
Professor and Head,
General Surgery,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To
The Dean,
Sri Lakshmi Narayana Institute Of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

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Sub: Completion of value-added course: Recent Advances In Radiotherapy And Chemotherapy

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled **RECENT ADVANCES IN RADIOTHERAPY AND CHEMOTHERAPY** for 20students on JULY 2019 – DEC 2019. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

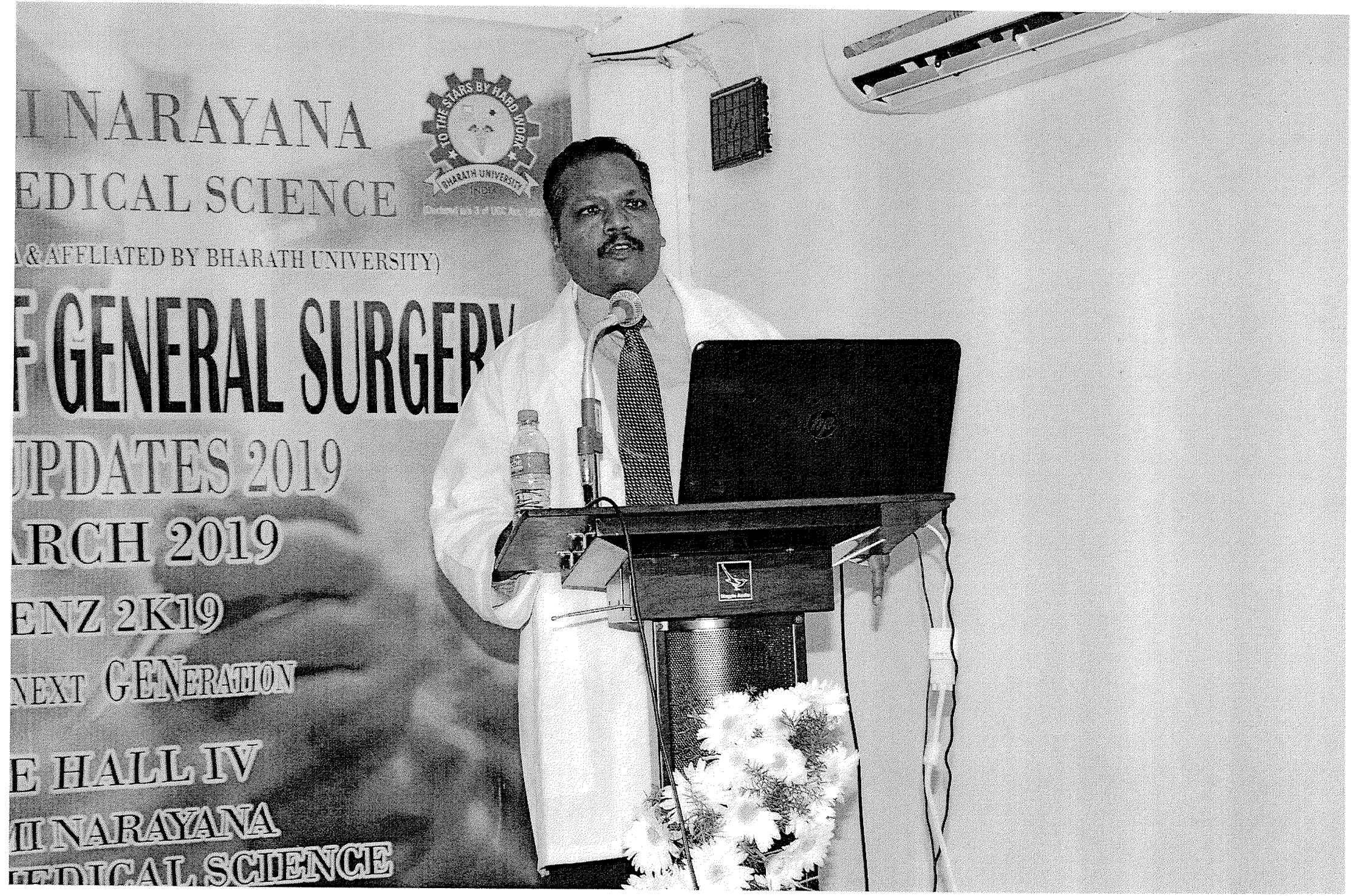
PROFESSOR & HOD
DEPARTMENT OF GENERAL SURGERY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502

Dr. ASAYAS BOSCO CHANDRA KUMAR

HOD General Surgery

Encl: Certificates

Photographs


I NARAYANA
EDICAL SCIENCE
& AFFLIATED BY BHARATH UNIVERSITY)
F GENERAL SURGER
UPDATES 2019
RCH 2019
ENZ 2K19
NEXT GENERATION
E HALL IV
II NARAYANA
EDICAL SCIENCE