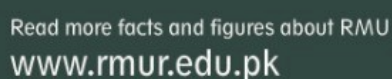




Postgraduate Research Curriculum



FOREWORD BY VC RMU:

Importance of research curriculum

RMU up-gradation

MD/MS Scholars programme

Support to CPSP PGT's

*Significance and contribution of this Guidance document in
research*

AFTER APPROVAL BY VC....

INTRODUCTION

With advent of Evidence Based Practice over last two to three decades in medical science, merging the best research evidence with good clinical expertise and patient values is inevitable in decision making process for patient care. Therefore, apart from receiving per excellence knowledge of the essential principles of medicine and necessary skills of clinical procedures, the trainees should also be well versed and skillful in research methodologies. So the training in research being imperative is integrated longitudinally in all four year's training tenure of the trainees.

The purpose of the research training is to provide optimal knowledge and skills regarding research methods and critical appraisal. The expected outcome of this training is to make trainees dexterous and proficient to practically conduct quality research through amalgamation of their knowledge, skills and practice in research methodologies.

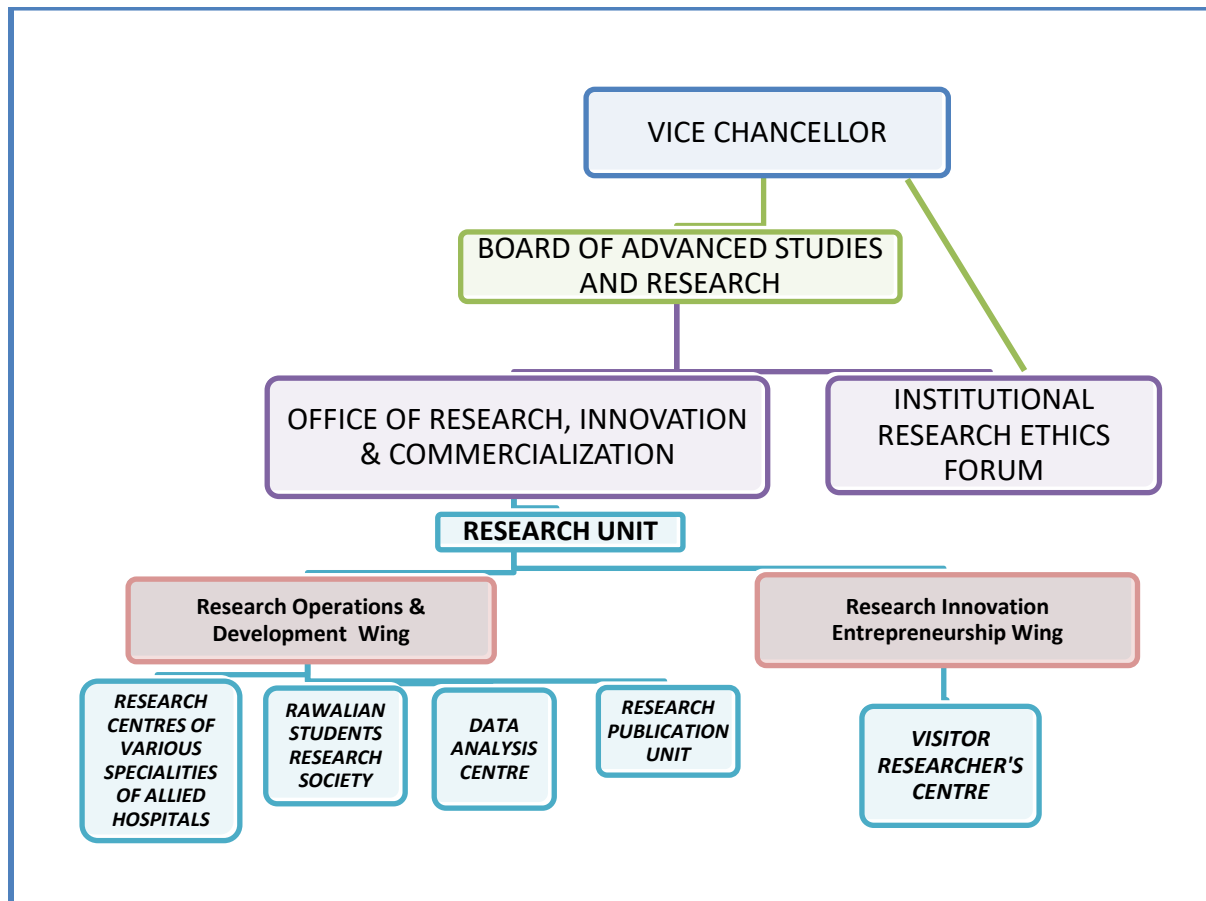
In the following document post graduate trainees would refer to all MD/MS/CPSP Post graduate trainees for Fellowship programme, generally in the text, but wherever there will be demarcation of the activities of MD/MS and CPSP post graduate fellowship trainees, it will be specified for each accordingly.

ORIENTATION SESSION FOR TRAINEES:

- I. At the beginning of the research course, an orientation session or an introductory session of one-hour duration will be held, organized by Director, Deputy Directors of ORIC (Office of Research Commercialization and Innovation) of RMU to make trainees acquainted to the research courses during four years post graduate training, the schedule of all scholarly and academic activities related to research and the assessment procedures.
- II. Trainees will also be introduced to all the facilitators of the course, organizational structure of ORIC and the terms of references of corresponding authorities (Annexure 1) for any further information and facilitation.
- III. All the curriculum details and materials for assistance and guidance will be provided to trainees during the orientation session.
- IV. The research model of RMU as given in Figure 1 and will be introduced to the newly inducted trainees of RMU.
- V. By the end of the orientation session, *Baseline competency assessment Performa's* will be administered, after their informed written consent, to assess baseline knowledge, attitudes

and skills of the trainees, regarding research and its various aspects. These Performa's will not only enable the trainees and the trainers to have a comprehension of their existing status of proficiencies in research that they can compare with the *end of training competency assessment Performa's*, for their self evaluation. Apart from other aspects, they will also be requested to mention their expectations from the research training course and also regarding any area/s in research that they will prefer and prioritize to learn and according to their feedback those aspects will be incorporated into the course or they will be guided either individually or in groups with special emphasis. The information gathered through those baseline Performa's will be kept confidential for each trainee and will be scores to reckon their status so that it can be quantitatively referred to and compared to the *end of training competency assessment Performa's*

Figure 1. MODEL OF RESEARCH AT RAWALPINDI MEDICAL UNIVERSITY



The research training component for Post Graduate Trainees comprises of four years and the Distribution and curriculum for each year is mentioned as follows:

***RESEARCH COURSE OF
FIRST POST
GRAUDATION
TRAINING YEAR
R-Y1***

PURPOSE OF R-Y1 RESEARCH COURSE:

The RESEARCH YEAR 1 or R-Y1 research course of the post graduate trainees intends to provide ample knowledge to trainees regarding the importance of research, its necessity and types. This course will provide them clarity of concepts that what are the priority problems that require research, how to sort them out and select topics for research. It will also teach them the best techniques for exploring existent and previous evidences in research through well organized literature search and also how to critically appraise them. The course will not only provide them comprehensive knowledge but will also impart optimum skills on how to practically and logically plan and design a research project by educating and coaching them about various research methodologies. The trainees will get familiarized to research ethics, concepts of protection of human study subjects, practice-based learning, evidence based practice in addition to the standard ethical and institutional appraisal procedures of Rawalpindi medical University by Board of Advanced Studies and Research and Institutional and Ethics Research Forum of RMU.

LEARNING OUTCOMES OF R-Y1 RESEARCH COURSE

After completion of R-Y1 course the trainees should be efficiently able to:

1. Discuss the value of research in health service in helping to solve priority problems in a local context.
2. Identify, analyse and describe a research problem
3. Review relevant literature and other available information
4. Formulate research question, aim, purpose and objectives
5. Identify study variables and types
6. Develop an appropriate research methodology
7. Identify appropriate setting and site for a study
8. Calculate minimally required sample size for a study.
9. Identify sampling technique, inclusion and exclusion criteria
10. Formulate appropriate data collection tools according to techniques
11. Formulate data collection procedure according to techniques
12. Pre-test data collection tools
13. Identify appropriate plan for data analysis
14. Prepare of a project plan for the study through work plans and Gantt charts
15. Identify resources required for research and means of resources

16. Prepare a realistic study budget in accordance with the work plan.
17. Critically appraise a research paper of any national or international journal.
18. Present research papers published in various national and international journals at journal club.
19. Prepare a research proposal independently.
20. Develop a strategy for dissemination and utilisation of research results.
21. Can efficiently plan and conduct a clinical audit in their own respective clinical units.
22. Familiarization with application Performa for submission of a research proposal to BASR or IREF.
23. Familiarization with format of presentations and procedure of presentation and defence of a research proposal to BASR or IREF.
24. Familiarization with the supervisor, nominated by the Dean and to develop a harmonious rapport with supervisor.

RESEARCH COURSE OF FIRST TRAINING YEAR

Following academic and scholarly activities will be carried out during year 1 ie R-Y1 of Research course catering the post graduate trainees.

A. RESEARCH WORKSHOPS:

Research will be taught to the trainees during first year of training in two Research methodology workshop titled as Basic Research Methodology Workshop and a Workshop on Undertaking a clinical Audit. The former workshop will comprise of three days' duration while later will be of one-day duration, that will be conducted using combination of five of the following techniques;

1. Didactic lectures through power-point presentations.
2. On spot individual exercises.
3. On spot group exercises.
4. Take home individual assignment
5. Take home group assignment.

The facilitators of these workshops will be staff members (that are director, deputy directors (managers), research associates, statistician and publication in charge) of Office of Research Innovation and commercialization (ORIC) of RMU. While visitor lecturers including renowned

national and international public health consultants, researchers, epidemiologists and biostatisticians will also be invited, according to their availability, for some modules of these courses.

Course content of Basic Research Workshops:

- i. The course materials of Basic research workshop will be based on an updated modified version of course titled as “Designing Health Services Research (Basic)” that was developed in collaboration of Rawalpindi Medical College & Nuffield Institute for Health, University of Leeds, UK based adapted from “Designing and Conducting Health Systems Research Projects” by CM. Varkevisser KIT Publishers, Amsterdam (International Development Research Centre) in association with WHO Regional Office for Africa.
- ii. The trainees will be provided hard copies as well as soft copies of the course content in a folder at the initiation of the course.
- iii. In addition to it they will be provided various soft copies and links of updated and good resource materials regarding research by the course facilitators.

Modules of the Basic Research Methodology Workshop:

The details of the course module of basic research workshop along with the tentative time frame work, teaching strategies, content and objectives/Learning outcomes of each module are displayed in table 1.

**TABLE 1.A. MODULAR SESSIONS OF BASIC RESEARCH METHODOLOGY WORKSHOP
OF YEAR 1 OF TRAINEES OF POST GRADUATE TRAINEES/MD SCHOLARS OF RMU**

SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>
DAY 1 SESSION 1 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by both individual exercise & Group exercise	A. Introduction to health systems research B. Identifying and Prioritizing Research Problems	<ul style="list-style-type: none"> • Describe the purpose, scope and characteristics of health systems research • Identify criteria for selecting health-related problems to be given priority in research
DAY 1 SESSION 2 <i>Duration:30 minutes</i>	Lecture through power point presentation followed by Individual exercise	Analysis and statement of problem & Introduction to Literature review	<ul style="list-style-type: none"> • Analyze a selected problem and the factors influencing it and understand how to prepare the statement of the problem for research. • Describe the reasons for reviewing available literature and other information for preparation of a research. • Identify the resources that are available for carrying out such a review.
DAY 1 SESSION 3 <i>Duration: 45minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Literature review Referencing systems; Vancouver & Harvard referencing systems	<ul style="list-style-type: none"> • Describe the methods for reviewing available literature and other information for preparation of a research. • Should be familiar with referencing systems and its importance. • Use Vancouver and Harvard referencing systems and should be able to differentiate between them.

SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>
DAY 1 SESSION 4 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Literature review Referencing managing systems	<ul style="list-style-type: none"> • Describe the methods for reviewing available literature and other information for preparation of a research. • Should be familiar with use and importance of reference managing systems; Endnote & Mendeley. • Use the literature review and other information pertaining to a research topic that will adequately describe the context of study and strengthen the statement of the problem.
DAY 1 SESSION 5 <i>Duration:30 minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Plagiarism	<ul style="list-style-type: none"> • Describe the significance and necessity of plagiarism detection • Use online plagiarism detection tools and turn-it-in for detecting plagiarism through assessment of originality scores/similarity index for plagiarism
DAY 1 SESSION 6 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by Individual exercise	Formulation of research objectives	<ul style="list-style-type: none"> • State the reasons for writing objectives for a research project. • Define and describe the difference between general and specific objectives. • Define the characteristics of research objectives. • Prepare research objectives in an appropriate format.

SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>
DAY 1 SESSION 7 <i>Duration:30 minutes</i>	Lecture through power point presentation followed by Individual Assignment	Formulation of Hypothesis for a research	<ul style="list-style-type: none"> • State the reasons and scenario for formulating research hypothesis. • Define and describe the types difference between one sided and two sided hypotheses. • Formulate Null hypothesis and Alternate hypothesis in an appropriate format. • Identify importance of hypothesis testing and to identify type I & type II errors.
DAY 1 SESSION 8 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by a group exercise.	Research methodology; Variables and Indicators	<ul style="list-style-type: none"> • Define what study variables are and describe why their selection is important in research. • State the difference between numerical and categorical variables and define the types of scales of measurement. • Discuss the difference between dependent and independent variables and how they are used in research designs. • Identify the variables that will be measured in a research project and development of operational definitions with indicators for those variables that cannot be measured directly.
SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>

<p>DAY 2</p> <p>SESSION 9</p> <p><i>Duration: 45 minutes</i></p>	<p>Lecture through power point presentation followed by individual exercise.</p>	<p>Research methodology;</p> <p>Study types</p>	<ul style="list-style-type: none"> • Describe the study types mostly used in HSR. • Define the uses and limitations of each study type. • Describe how the study design can influence the validity and reliability of the study results. • Identify the most appropriate study design for a study.
<p>DAY 2</p> <p>SESSION 10</p> <p><i>Duration:30 minutes</i></p>	<p>Lecture through power point presentation followed by individual exercise.</p>	<p>Data collection techniques</p>	<ul style="list-style-type: none"> • Describe various data collection techniques and state their uses and limitations. • Advantageously use a combination of different data collection techniques. • Identify various sources of bias in data collection and ways of preventing bias. • Identify ethical issues involved in the implementation of research and ways of ensuring that informants or subjects are not harmed. • Identify appropriate data-collection techniques.
<p>DAY 2</p> <p>SESSION 11</p> <p><i>Duration:45 minutes</i></p>	<p>Lecture through power point presentation Followed by group exercise.</p>	<p>Data collection tools</p>	<ul style="list-style-type: none"> • Prepare data-collection tools that cover all important variables.
<p>SESSIONS & TIMINGS</p>	<p>TEACHING STRATEGY</p>	<p>TOPIC OF SESSION</p>	<p>SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i></p>

DAY 2 SESSION 12 <i>Duration:30 minutes</i>	Lecture through power point presentation	Sampling	<ul style="list-style-type: none"> • Identify and define the population(s) to be studied • Describe common methods of sampling. • Decide on the sampling method(s) most appropriate for a research design.
DAY 2 SESSION 13 <i>Duration:45 minutes</i>	Lecture through power point presentation Group exercises	Sampling	<ul style="list-style-type: none"> • List the issues to consider when deciding on sample size. • Calculate minimally required sample size according to study designs • Use WHO's (World Health Organization's) sample size calculator. • Decide on the sample size(s) most appropriate for a research design.
DAY 2 SESSION 14 <i>Duration:20 minutes</i>	Lecture through power point presentation	Plan for Data Entry , storage and Statistical Analysis	<ul style="list-style-type: none"> • Identify and discuss the most important points to be considered when starting to plan for data collection. • Determine what resources are available and needed to carry out data collection for study. • Have knowledge of resources, available for data recording, storage and to carry out data analysis of a study? • Describe typical problems that may arise during data collection and how they may be solved. • Identify important issues related to sorting, quality control, and processing of data. • Introduction to Statistical Package of Social Sciences.
SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>

			<ul style="list-style-type: none"> • Describe how data can best be analyzed and interpreted based on the objectives and variables of the study • Prepare a plan for the processing and analysis of data (including data master sheets and dummy tables) for the research proposal being developed.
<p>DAY 3</p> <p>SESSION 15</p> <p><i>Duration:50 minutes</i></p>	Lecture through power point presentation and individual exercises	Pilot and project planning	<ul style="list-style-type: none"> • Describe the components of a pre-test or pilot study that will allow to test and, if necessary, revise a proposed research methodology before starting the actual data collection. • Plan and carry out pre-tests of research components for the proposal being developed. • Describe the characteristics and purposes of various project planning and scheduling techniques such as work scheduling & GANTT charting. <p>Determine the various tasks and the staff needed for a research project and justify any additional staff (research assistants, supervisors) apart from the research team, their recruitment procedure, training and supervision.</p> <ul style="list-style-type: none"> • Prepare a work schedule, GANTT chart and staffing plan for the project proposal.
SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	<p>SESSION OBJECTIVES</p> <p><i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i></p>

<p>DAY 3</p> <p>SESSION 16</p> <p><i>Duration:25 minutes</i></p>	<p>Lecture through power point presentation and individual exercises</p>	<p>Budgeting for a study</p>	<ul style="list-style-type: none"> • Identify major categories for a budget. • Make reasonable estimates of the expenses in various budget categories. • List various ways a budget can be reduced, if necessary, without substantially damaging a project. • Prepare a realistic and appropriate budget for the project proposal
<p>DAY 3</p> <p>SESSION 17</p> <p><i>Duration: 30 minutes</i></p>	<p>Lecture through power point presentation.</p>	<ul style="list-style-type: none"> • Project administration • Plan for dissemination • Research ethics & concepts of protection of human study subjects 	<ul style="list-style-type: none"> • List the responsibilities of the team leader and project administrator related to the administration and monitoring of a research project. • Prepare a brief plan for administration and monitoring of a project. • Identify the ethical considerations mandatory during execution of a research project and their importance. • Prepare a plan for actively disseminating and fostering the utilization of results for a research the project proposal.
<p>DAY 3</p> <p>SESSION 18</p> <p><i>Duration:20 minutes</i></p>	<p>Lecture through power point presentation</p>	<p>Differences between original articles, short communication, case reports, systematic reviews and meta-analysis</p>	<ul style="list-style-type: none"> • Differentiate between original articles, short communications, case reports, systematic reviews and meta-analysis
<p>SESSIONS & TIMINGS</p>	<p>TEACHING STRATEGY</p>	<p>TOPIC OF SESSION</p>	<p>SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i></p>

<p>DAY 3</p> <p>SESSION 19</p> <p><i>Duration:30 minutes</i></p>	<p>Lecture through power point presentation and group exercises</p>	<p>Writing a Case report</p>	<ul style="list-style-type: none"> • Identify important components of a good case report. • Formulate a quality case report of any rare case presented in the clinical unit during the training period
<p>DAY 3</p> <p>SESSION 20</p> <p><i>Duration: 45 minutes</i></p>	<p>Lecture through power point presentation and group project</p>	<p>Critical Appraisal of a research paper</p>	<ul style="list-style-type: none"> • Identify the importance and purpose of critical appraisal of research papers or articles. • Have ample knowledge of important steps of critical appraisal • Can effectively critically appraise a research paper published in any national or international journal.
<p>DAY 3</p> <p>SESSION 21</p> <p><i>Duration:30 minutes</i></p>	<p>Lecture through power point presentation and individual exercises</p>	<ul style="list-style-type: none"> • Making effective power-point presentations • Making effective poster presentations • Presenting a research paper 	<ul style="list-style-type: none"> • Determine various tips for making effective power-point presentations. • Determine various tips for making effective poster and its presentations. • Identify important components of research paper that essentially should be communicated in a presentation. <p>Can effectively and confidently make a power-point presentation of a research paper published in any national or international journal.</p> <ul style="list-style-type: none"> • Can formulate a poster of a research paper published in any national or international journal.

TABLE 1.B. CONTENT OF WORKSHOP OF CLINICAL AUDIT FOR YEAR 1 TRAINEES OF POST GRADUATE TRAINEES/MD SCHOLARS OF RMU

WORKSHOP TIMINGS	TEACHING STRATEGY	TOPIC OF WORKSHOP	OBJECTIVES OF WORKSHOP <i>i.e. BY THE END OF COURSE THE TRAINEES SHOULD BE ABLE TO;</i>
ONE DAY WORKSHOP OF 6 HOURS DURATION	Lectures through power point presentation followed by individual and and group exercises	Undertaking a clinical audit.	<ul style="list-style-type: none"> • Identify Clinical audit as an essential and integral part of clinical governance. • Differentiate between research and clinical audit. • Identify types of Clinical Audit • Understand steps of process of Clinical Audit • Understand clinical audit process. • Decide exactly why particular audit is conducted and what is to be achieved through carrying out the audit. • Determine, how clinical audit relates to other activities related to accountability for the quality and safety of patient care. • Select the right subject for audit & to use evidence of good practice in designing clinical audits. • Formulate measures of quality based on evidence of good practice, as the basis for data collection and also to develop data collection protocols and tools and advise on data collection for clinical audits. • Understand how to handle data protection issues related to clinical audit & how to use statistics for analyzing and presenting findings of data collection • Apply principles and strategies for taking action to achieve changes in clinical practice & to recognize ethics issues related to clinical audit. • Review clinical audit findings & to prepare clinical audit reports.

Minimal Attendance of Research Workshops:

The trainees must attend both of the Research workshops mentioned above, during year 1 and attendance will be duly recorded and monitored in each session of workshop and any participant

missing even a single day of workshop without any valid reason will not be issued certificate of the workshop. It will be mandatory for such trainee or any of those missing the workshop due to any valid reason or illness, to attend the workshop in next year with the next batch.

Assessment of individual and group exercises:

- i. The quality, correctness and completeness of the individual as well as group exercises conducted during the workshops will be assessed during the workshops, when they will be presented by the end of each session by trainees either individually or in groups respectively.
- ii. The mode of presentations will be oral using media of charts, flip charts & white boards.
- iii. There will be no scores or marks specified for the individual or group exercises but the feedback of evaluation by the facilitators will be on spot by end of presentations.

Assessment of individual or group; take home tasks/assignments:

- i. The correctness, quality and completeness of the individual or group exercises will be determined once these will be submitted after completion to the facilitators after period specified for each task. Assignments should be submitted in electronic version and no manually written assignment will be accepted.
- ii. Each assignment will be checked for plagiarism through turn-it-in soft ware. Any assignment that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission.
- iii. Assignments will be assessed and scored by the facilitators who had taken the session.

B. PARTICIPATION IN JOURNAL CLUB SESSIONS

- i. The journal club of every department will comprise of an academic meeting of the head of department, faculty members, trainees and interneers at departmental level.
- ii. The purpose of journal club will be to collectively attempt to seek new knowledge through awareness of current and recent research findings and also to explore best current clinical research and means of its implementation and utilization.
- iii. Apart from the teaching sessions of the trainees should attend the journal club sessions of the departments and should attempt to actively participate in them too.
- iv. One journal club meeting must be organized in the department in every two months of the year and its attendance by the trainees will be mandatory.
- v. The journal club meeting will be chaired by the Dean of specialty.

- vi. The purpose of participation of the trainees in journal club will be to enhance their scientific literacy and to have optimal insight of the relationship between clinical practice and evidenced-based medicine to continually improve patient care.

Format of Journal Club Meetings:

- i. In a journal club meeting, one or two research paper/s published in an indexed national or international journal, selected by the Dean of the department will be presented by year 2 trainees; R-Y2 trainees.
- ii. The research paper will be presented through power-point and the critical appraisal of the paper will follow it.
- iii. The topic will also be discussed in comparison to other evidences available according to the latest research.
- iv. The year one trainee i.e. R-Y1 trainee will only participate in the journal club and will not present during first year of training. He/she will be informed regarding the selected paper one and a half month prior to the meeting and should do extensive literature search on the topic and also of the research paper that will be presented in meeting.
- v. The trainees should actively participate in question & answer session of the journal club meeting that will be carried out following the presentation of the critical appraisal of the research paper. It will be compulsion for each R1 trainee to ask at least one question or make at least one comment relevant to the topic and/or the research paper, during the journal club meeting.

Minimal Attendance of Journal Club meetings by R-Y1 trainee:

The R-Y1 trainees should attend at least 5 out of 6 journal club meetings during their first year of training.

Assessment of Trainees for Journal Club sessions:

There will be no formal quantitative or qualitative assessment of the trainee during year one for their participation in the journal club.

C. OBSERVATION OF MONTHLY MEETING OF INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREF) OF RMU

- i. In order to provide exposure to R-Y1 trainees regarding standard operational procedures and protocols of the research activities of Rawalpindi Medical University, each R-Y1 trainee

should attend at least two monthly meetings of the Institutional Research Ethics Committee of RMU and should observe the proceedings of the meeting.

- ii. He/she will be informed by the research associates of ORIC about the standard procedures of application to IREF step wise including guidance regarding how an applicant should access the RMU website and download the application Performa and then how to electronically fill it in for final submission. They will also be provided format of presentation for their future presentations at IREF meetings.

Minimal Attendance of IREF meetings by R-Y1 trainee:

The R-Y1 trainees should attend at least at least two (out of 12) monthly meetings of IREF during their first year of training.

Assessment of Trainees for participation in the IREF meetings:

There will be no formal quantitative or qualitative assessment of the trainee during year one for their participation in the IREF meetings.

D. NOMINATION OF THE SUPERVISOR OF THE TRAINEE FOR THE DISSERTATION PROJECT

- i. During the first year of training, the supervisor of each trainee must be nominated within first six months. The Dean of the specialty will decide the nomination of the supervisor for the post graduate trainee as well as MD scholars.
- ii. A meeting will be held in the middle of the year, in June preferably, that will be attended by all heads of the departments and the Dean. The list of all the first year trainees and the available supervisors in each department will be presented by respective heads of each department in meeting. All of the eligible trainees and supervisors will also be around for brief interviews during the meeting.
- iii. The head of departments, prior to interviews of the trainees and supervisors, will inform the Dean in the meeting, their own personal observation of the level of performance, talent personality and temperament of both the trainees and the supervisors. Based on their consideration of the compatibility of both eligible trainees and the supervisors, Head of departments (HOD's) will recommend or propose most suitable supervisors for each trainee after eloquent discussions and justifications.

- iv. The Dean will then call each trainee individually to inform him/her the suggested Supervisor for him/her and will also give right and time for objection or reservation in nomination, if any. The Dean will seek the trainee's final consent and then after asking the trainee to leave the meeting room, will call the supervisor for final consent.
- v. If the supervisor will also be willing to happily supervise the trainee, then the Dean will finally approve the nomination.
- vi. A tentative list will be issued by the office of the Dean, within three days of the meeting, copied to the HOD's and the trainees and supervisors.
- vii. Both the trainees and the supervisors will be given two weeks to challenge the nominations, in case either of the two have any qualms or objections regarding the nominations. They will also be given right to personally approach the Dean for any request for change. In case of any objection, the Dean will make changes in consultation with the HOD's, after final consent and satisfaction of both trainee and supervisor
- viii. The final revised list of nominations will be then issued by the office of Dean and will be sent to the Board of Advanced studies and Research of RMU (BASR).
- ix. The Board of Advanced studies and Research of RMU will issue final approval of the list and the Vice chancellor will endorse the nominations as final authority.
- x. During the last few months of the first year of training, the trainees and supervisors will be advised by the Dean, to get familiar with each other and try to identify their abilities to efficiently and successfully work together as a team, especially during the project of Clinical Audit, mentioned in next section.
- xi. In case of any issues, either of both will have right to request any change in nomination to the Dean, till last week of first year of training. The Dean will then consider the case and will seek modification in nomination from the BASR.
- xii. After completion of first year of training, no substitution in nomination will be allowed. In case of any serious incompatibility between the trainee and the supervisor, the issue will be brought to the Vice chancellor directly by the Dean as a special case, who will make the final decision accordingly, as the final authority.
- xiii. As regards the MD scholars, the external supervisors will also be nominated and those nominations will be made by Vice chancellor of RMU in consultation with the Dean of specialty. The consent of the trainees and supervisors will follow the same protocol as specified above and the final list of nominations will then be submitted to BASR for final approval.

- xiv. After finalization of nominations a letter of agreement of supervision will be submitted by the trainee to the office of Dean, including consent and endorsement of both trainee and the internal and/or external supervisor, with copies to HOD, ORIC and BASR.
- xv. The supervisor and the trainee will be bound to meet on weekly basis exclusively for research activity with documented record of the activity done during the meeting in the log book.

E. UNDERTAKING A CLINICAL AUDIT PROJECT

- i. During ninth month of training year 1; R-Y1 the head of department will form groups of trainees, either two or three trainees in one group (along with each supervisor of each trainee), depending on the total number of trainees available in that respective first year.
- ii. These groups will undertake clinical audits on various aspects of the department as a project assignment, on one topic assigned to each group by the Dean and Heads of Departments.
- iii. If the group will compromise of two trainees and their supervisors' then there will be four group members in that group and if three trainees in one group, then there will be six members of that group after inclusion of their supervisors.
- iv. The trainees during the workshop of Clinical Audit conducted within in first eight months of training R-Y1, will already have been taught how to undertake a clinical audit and this task of undertaking a clinical audit will be assigned to them as mandatory group project of year R-Y1. This project will also provide the trainees and the supervisors an opportunity to work closely and will help them understand and foresee their group dynamics for future dissertations.
- v. The clinical audits completed in groups will be published as Annual Audit Reports of the departments by the Dean and HOD's and each member of the group will be acknowledged as author in the Annual Audit reports or if also published in any research journal.
- vi. The clinical audit will also be presented in weekly Clinico-pathological conferences (CPC) of the University, if approved by the Dean. The presentation will be supervised by HOD.
- vii. The contribution of the post graduate trainees'/ MD trainees in audits will be qualitatively assessed by the supervisors and the head of departments.

F. ROTATION OF THE TRAINEES AT ORIC:

- i. All MD/MS trainees will attend *one week's rotation* during year 1 at the Research Unit, Office of Research Innovation and commercialization (ORIC) of RMU.
- ii. For the rotations, the trainees will be allocated batches by ORIC, comprising of 20 to 25 trainees per batch. The Deans' of the specialties will formulate these batches during the first year, to include only one trainee from each department for rotation in a batch, so that the the clinical and academic activities of that department are not effected.
- iii. This one week for each of the batches of the trainees will be scheduled in a manner, that four days of that week will be expended in the research workshops (3 days for the Basic Research Methodology Workshop and one day for the workshop on Undertaking a clinical Audit). For the remaining 2 working days the trainees will receive individual or group consultations by the staff members of ORIC (that are director, deputy directors/managers, research associates, statistician and/or publication in charge) according to their own requirements or preferences, regarding any topic or aspect of Research.
- iv. Regular attendance register will be maintained at ORIC to record the physical presence of the trainees. In case any trainee will require a leave or becomes absent during workshop days, the rules specified for the attendance of workshops, already in a previous section, will be applicable. Whereas for the remaining two days of consultations and individual/group learning, the trainees must be present and in case of any emergency or illness he/she must attend with any other batch but with a settlement and permission of the Director ORIC, in writing.
- v. As regards the CPSP post graduate trainees they will not have to do the rotations during their training period but will follow all others activities as specified. However, they can visit ORIC, as per appointment schedule that will be given by ORIC, for their individual consultations, in any area of research.

G.MONITORING OF RESEARCH COURSE OF YEAR 1

- i. All the concerned faculty members, at department, research units of specialties (including supervisors, senior faculty members and Head of Department) and the Deputy Directors and Director at the Office of Research Innovation & Commercialization of RMU will keep vigilant and continuous monitoring of all the academic activities of each trainee.
- ii. There will be a separate section of research in Structured Log books of trainees and also section of Research in portfolio record of the trainees specific to research component of the training that will be regularly observed, monitored and endorsed by all the concerned faculty

members, supervisor and facilitators. The Log and portfolio for the research curriculum of each training year will be entered separately.

- iii. The Structured Research section in Log books specific to research curriculum of training year 1 will include the record of attendance of all the workshops of the trainee that will be updated and endorsed by the Department of Medical Education (DME) of RMU.
- iv. There will also be submission record and scores attained for the individual and group assignments of the trainees, endorsed by the facilitators of ORIC including Deputy Directors and Research Associates.
- v. The log books will also include the attendance of the trainees in the Journal club sessions of the department and with qualitative assessment of the trainee regarding any active participation of the trainee during the journal club. It will specifically mention whether any question or comment was raised by the trainee during each journal club session. This information will be endorsed by the supervisor of the trainee and the Head of Department.
- vi. The attendance record of the trainees in the monthly meetings of the Institutional Research Ethics Forum (IREF) of RMU will also be part of the Log Book that will be endorsed by the convener of the IREF by the end of each attended meeting.
- vii. The HOD will monitor the weekly meetings through observation of the documented record of meetings in log books by the end of every month.
- viii. The research portfolio of the trainee R-Y1 will be qualitative and quantitative self assessment of the trainee in narrative form. It will also include the individual assessment of the objectives and aims defined by the trainee during the year and elaboration of the extent of attainment of these. The trainee will be able to specify his/her achievements or knowledge gained in any aspect of research that was not even formally part of the research curriculum. It will include reporting of any research courses, online or physically attended by the trainee, contribution in any research paper or publication, any participation and/or presentation in any research conference, competition etc during year R-Y1.
- ix. The research portfolio will assist the trainees to reinforce the importance of strategic thinking as a way to understand their context and look to the future. By having a recorded insight of the individual achievements, weaknesses and strengths, the trainee will be able to maximize his/her talent and potential of all the activities and projects of research with an aim of further progression in career development.

H. OVERALL ASSESSMENT OF PERFORMANCE OF TRAINEES FOR YEAR 1

- i. Quantitative assessment of the performance and accomplishment of trainees will be done in an unbiased, impartial and equitable manner by the supervisor, ORIC department and the senior faculty members at the department.
- ii. The assessment of trainees will not only serve as an effective tool for evaluation of the extent and quality of knowledge gained and skills learnt by trainees but it will also effectively provide an evidence of the level of standards of teaching and training by the facilitators, supervisor and the faculty members.

I. EVALUATION/ FEEDBACK OF RESEARCH COURSE OF YEAR 1

Success of any academic or training activities greatly rely on the honest and constructive evaluation that opens pavements of improved and more effective performances and programs. The research course of the trainees will not only be evaluated by the trainees themselves but also by the deputy directors of ORIC, supervisors and HOD's through end of sessions forms and then collectively through end of course feedback forms.

- i. ***Self evaluation of the trainees at the baseline:*** All the trainees will be handed over *Baseline competency assessment Performa's* during the orientation session that will comprise of questions related to the baseline knowledge, attitude and proficiencies of the trainees regarding various aspects of Research and its methodologies. These Performa's will not only enable the trainees and the trainers to have a comprehension of their existing status of proficiencies in research but also they can compare it with their *end of training competency assessment Performa's*, for self evaluation. Apart from other aspects, they will also be requested to mention their expectations from the research training course and also regarding any area/s in research that they will prefer and prioritize to learn and according to their feedback those aspects will be incorporated into the course or they will be guided either individually or in groups with special emphasis.
- ii. ***The feedback of trainees*** will include structured evaluation of each workshop through structured and anonymous feedback forms/questionnaire that will be regularly distributed amongst the trainees. Anonymity will ensure an honest and unbiased response. They will be requested to provide their feedback regarding various aspects of teaching sessions eg content, medium used, facilitators performance and knowledge, extent of objectives

attained etc through Likert scale. They will mark, through their personal choice without any pressure or peer consultation, one particular category amongst five scales specified ranging from 1-5, 1 representing the poorest quality while 5 representing excellence. Apart from this structured assessment, open ended questions will also include an in depth perspective and insight. Similarly, an overall annual feedback questionnaire will also be rotated amongst trainees.

- iii. ***The feedback of trainers*** will include structured evaluation of each teaching session by the facilitators, supervisors and senior faculty members involved in the Research training course. They will provide their feedback through structured and anonymous feedback forms/questionnaire, including closed and partially closed questions that will be regularly provided by them. They will provide their inputs and opinions regarding effectiveness of the course contents, curriculum, teaching methodologies, teaching aids and technologies, content and usefulness of the exercises and assessments etc.
- iv. ***Three focus group discussions;*** one of the R-Y1 trainees, second of the facilitators and third of the supervisors will also be organized by the ORIC to evaluate the research course, its benefits and weaknesses and scope for improvement.
- v. ***The research portfolio*** will be checked and endorsed by the supervisor and the Director of ORIC.
- vi. ***A final evaluation report of the Research Course R-Y1*** will be formulated and compiled by the ORIC of RMU. The report will be presented all concerned stake holders, since the course evaluations will play a significant role in curriculum modification and planning.

J. QUALITY ASSURANCE OF RESEARCH COURSE OF YEAR 1

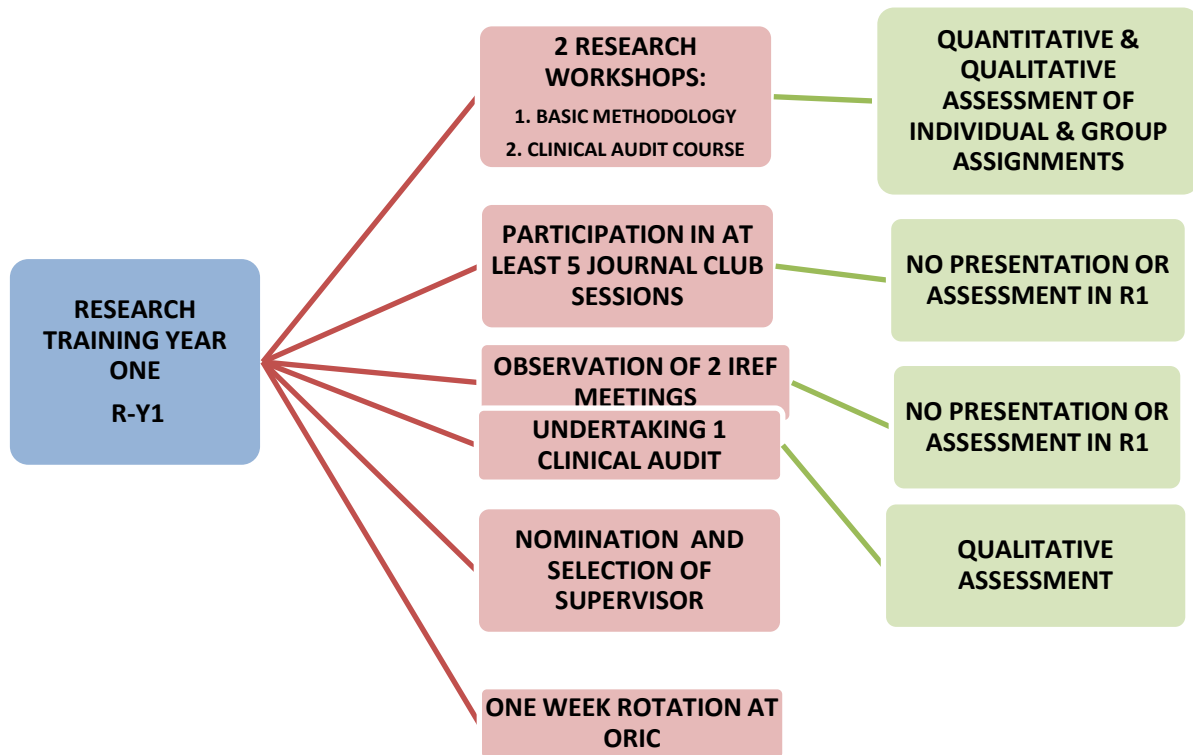
- i. The final quality evaluation report along with all the feedback material, randomly selected log books, research portfolios, submitted individual & groups assessments and randomly selected annual research course examination papers will be observed by an evaluation team of Research course. The quality evaluation team of research course will include the Head of departments, Deans, selected representatives of BASR, IREF, Director DME (Department of Medical Education), Director of ORIC, Director of Quality enhancement cell (QEC) and Vice chancellor of RMU, individually. The selection of representatives of the concerned departments will be made by the Vice chancellor of RMU.

- ii. All the materials will be observed and evaluated by the above mentioned once during the course and finally by the end of course year.
- iii. The evaluation during the year will be done at any random occasion by members of evaluation teams individually or in teams and will be done without any prior information to the trainees and trainers.
- iv. The evaluation will include not only physical observation of the materials but the evaluators may also make a visit to observe any proceedings or activities of the research course e.g. a lecture, a group exercise, a journal club session and/or an IREF meeting.
- v. ORIC will be responsible for submission of the evaluation content to all including a copy to the Quality Enhancement Cell (QEC) of RMU for internal evaluation.
- vi. The QEC will organize an external evaluation too through involvement of a third party that may include members of Quality assurance department of Higher Education Department based on their availability.
- vii. An annual meeting of the quality assessment and enhancement will also be organized by the Quality Enhancement Cell of RMU, including representatives of supervisors, Head of Departments, Dean, representative members of BASR, ORIC, DME, QEC & IREF and will be chaired by Vice chancellor. During the meeting all participants will review and discuss all the evaluation material. The quality evaluation team will also share their experiences of their evaluation visits and observations to validate the existing materials.
- viii. In perspective of the quality assessment, the Vice Chancellor and the Board of Advanced study and Research will finalize any modifications or enhancement in the next Research course.

The activities related to research training of post graduate trainees is also displayed in figure 1. Successful completion of above mentioned requirements of research course is one component of the all clinical and scholarly requirements for mandatory advancement to the next Post Graduate Year level i.e. year 2 training year or R-Y2.

Figure 3. A FLOW CHART OF RESEARCH ACTIVITIES OF R-Y1 POST GRADUATE/MD TRAINEE OF RMU AND THEIR ASSESSMENT





RESEARCH COURSE OF SECOND POST GRADUATION TRAINING YEAR R-Y2

PURPOSE OF R-Y2 RESEARCH COURSE:

The YEAR 2-R2 research course of the post graduate trainees will provide optimum skills to trainees to actually formulate their individual research proposal of the research project/dissertation,

prerequisite to their degrees, in perspective of the knowledge acquired during year one of the training i.e. R-Y1. This course will provide them clarity of basic epidemiological and biostatistics concepts that they essentially require to transform their data into substantial evidences, to answer their research questions for their individual research project/dissertation. The course will also make them proficient to follow the standard ethical and institutional appraisal procedures of Rawalpindi medical University by Board of Advanced Studies and Research and Institutional and Ethics Research Forum of RMU. It will also impart them expertise to explore evidences in research through well organized literature search and also how to critically appraise them.

LEARNING OUTCOMES OF R-Y2 RESEARCH COURSE

After completion of R-Y2 course the trainees should be efficiently able to:

1. Identify and define the basic concepts of Epidemiological measures and biostatistics.
2. Formulate and pretest to finalize all the data collection tools for the research projects
3. Identify and execute proficiently all procedures required for data analysis and interpretation.
4. Analyze and interpret the data collected for a research project and draw conclusions related to the objectives of study.
5. Write a clear and concise research report (paper for a peer reviewed journal/dissertation) and a summary of the major findings and recommendations for each of the different parties interested in the results.
6. Present the major findings and the recommendations of a study to policy-makers managers and other stakeholders to finalize the recommendations.
7. Prepare a plan of action for the dissemination, communication and utilization of the findings and (if required) make recommendations for additional future research.
8. Critically appraise a research paper of any national or international journal.
9. Present research papers published in various national and international journals at journal club.
10. Prepare final draft of the research proposal of the Dissertation project, requisite to the post graduation degree of trainee, under the guidance of the nominated supervisor.
11. Fill in an application Performa for submission of Dissertation's research proposal to BASR or IREF.
12. Present and defend a research proposal to BASR or IREF.

RESEARCH COURSE OF SECOND TRAINING YEAR

Following academic and scholarly activities will be carried out during year 2 ie R-Y2 of Research course catering the post graduate trainees.

A. ADVANCED RESEARCH METHODOLOGY WORKSHOP:

Basic and advanced Biostatistics and Epidemiological concepts will be taught to the trainees through following methods in three days' workshop. Each session of workshop will comprise of all or either one or two or all four of the following techniques;

1. Didactic lectures through power-point presentations.
2. On spot individual exercises.
3. Take home individual assignment
4. Take home group assignment.

The facilitators of this workshops will be staff members of Office of Research Innovation and commercialization (ORIC) of RMU including Director, Deputy Directors, Research Associates, Statistician and Publication In charge. While visitor lecturers including renowned national and international public health consultants, researchers, epidemiologists and biostatisticians will also be invited, according to their availability, for some modules of these courses.

Format of workshop:

- i. During year 2 i.e. R-Y2, Advanced research methodology workshop will be conducted in three days.
- ii. Each session of workshop will comprise of a didactic lecture delivered initially, to attain the mentioned learning outcomes. Each didactic lecture will be delivered using the power-point medium that will be followed by on spot individual exercises of trainees during the same session.
- iii. Since most of the curriculum will comprise of quantitative calculations so trainees will be encouraged to work individually on exercises assigned both manually as well on Statistical Package of Social Sciences, instead of group exercises. These exercises will require calculations and numerical solving too.
- iv. By the end of day of workshop, take home individual assignment/s will be given to trainees, that too preferably individually rather than in groups, that will be duly evaluated and marked by facilitators later.

Course content of teaching sessions:

- i. The course materials will be based on an updated modified version of course titled as "Designing Health Services Research (Advanced)" that was developed in collaboration of

Rawalpindi Medical College & Nuffield Institute for Health, University of Leeds, UK based adapted from “Designing and Conducting Health Systems Research Projects” by CM. Varkevisser KIT Publishers, Amsterdam (International Development Research Centre) in association with WHO Regional Office for Africa.

- ii. The trainees will be provided hard copies as well as soft copies of the course content in a folder at the initiation of the course.
- iii. In addition to it they will be provided various soft copies of various data sets for practicing data analysis in addition to links of updated and good resource materials regarding research by the course facilitators.

Curriculum of modules of workshop:

The details of the sessions of the Advanced research workshop during year two R-Y2 along with the tentative time frame work, teaching strategies, content of workshop curriculum and objectives/Learning outcomes of each sessions are displayed in table 2.

**TABLE 2. CONTENT OF ADVANCED RESEARCH METHODOLOGY OF YEAR 2 OF
TRAINEES OF POST GRADUATE TRAINEES/MD SCHOLARS OF RMU**

SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>
DAY 1 SESSION 1 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by individual exercise and Take home individual assignments	<ul style="list-style-type: none"> • Introduction to Biostatistics • Description of Variables • Numerical methods of Data summarization (Manual as well as through Statistical Package of Social Sciences) 	<ul style="list-style-type: none"> • Describe the purpose, scope and importance of Biostatistics in Health systems research • Identify basic four steps of Biostatistics. • Introduction to Statistical Package of Social Sciences (SPSS). • Describe data in terms of frequency distributions, percentages, and proportions. • Explain the difference between mean, median and mode. • Calculate the frequencies, percentages, proportions, ratios, rates, means, medians, and modes for the major variables of a study manually as well as through Statistical Package of Social Sciences (SPSS).
DAY 2 SESSION 2 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by individual exercises &Take home individual assignments.	Graphical presentation of data	<ul style="list-style-type: none"> • Identify various types of graphs • Identify the graphical presentations appropriate for each type of variables • Describe data in terms of figures • Use of Microsoft Excel and SPSS in formulation of graphs.
SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES

TIMINGS			<ul style="list-style-type: none"> <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i>
DAY 1 SESSION 3 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Cross-tabulation of quantitative data	<ul style="list-style-type: none"> Describe the difference between descriptive and analytical cross-tabulations. Construct all important cross-tabulations which will help meet the research objectives manually as well as through SPSS. Interpret the cross-tabulations in relation to study objectives and study questions.
DAY 1 SESSION 4 <i>Duration:50 minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Measures of Association based on risk	<ul style="list-style-type: none"> Define incidence, risk, relative risk and odds ratio. Calculate relative risk for appropriate study designs (cross-sectional comparative studies, cohort studies, case-control studies and experimental studies) Calculate measures of association manually and also through SPSS and med-calculator.
DAY 1 SESSION 5 <i>Duration:30 minutes.</i>	Lecture through power point presentation followed by Individual exercise & Take home assignment	Confounding and methods to control confounding	<ul style="list-style-type: none"> Identify what is confounding and what are confounder variables Explain different ways of dealing with confounding at the design and analysis stage of a study. Evaluate whether an association between two variables may be influenced by another confounding variable/risk factor. Calculate association in a way that takes into consideration the effect of potential confounding by another variable/risk factor

SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;
DAY 1 SESSION 6 <i>Duration:45 minutes</i>	Lecture through power point presentation followed by Individual exercise & Take home individual assignments	Basic statistical concepts; Measure of dispersion and confidence Intervals	<ul style="list-style-type: none"> • Explain what is meant by a range, a percentile, a standard deviation, a normal distribution, a standard error and a 95% confidence interval. • Calculate ranges, standard deviations, standard errors and 95% confidence intervals for data, manually as well as through SPSS.
DAY 2 SESSION 7 <i>Duration:45 minutes</i>	Lecture through power point presentation	Hypothesis testing for a research	<ul style="list-style-type: none"> • State the concept of hypothesis testing. • Define and describe the types difference between one sided and two sided hypotheses. • Formulate Null hypothesis and Alternate hypothesis in an appropriate format. • Identify importance of hypothesis testing and to identify type I & type II errors.
DAY 2 SESSION 8 <i>Duration:30 minutes</i>	Lecture through power point presentation followed by a Take home individual assignment.	Tests of Significance	<ul style="list-style-type: none"> • Explain what a significance test is and what its purpose is. • Explain what is probability value or p-value • Identifying various tests of significances • Identifying appropriate test of significance for a specific research design.
SESSIONS & TIMINGS	TEACHING STRATEGY	TOPIC OF SESSION	SESSION OBJECTIVES i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;
DAY 2 SESSION 9	Lecture through power point	Determining difference	<ul style="list-style-type: none"> • Decide when to apply the chi-square test. • Calculate chi-square values.

<p><i>Duration:45 minutes</i></p>	<p>presentation followed by an individual exercise & a Take home individual assignment.</p>	<p>between two groups- categorical data Paired & unpaired observations</p>	<ul style="list-style-type: none"> • Use the chi-square tables to assess whether calculated chi-square values are significant. • Decide when to apply the McNemars test and calculate its values. • Make a decision concerning whether these tests can be used on give data and, if so, what test should be used on which data. • Perform these tests on data manually as well as through SPSS.
<p>DAY 2 SESSION 10 <i>Duration:45 minutes</i></p>	<p>Lecture through power point presentation followed by an individual exercise & Take home individual assignment.</p>	<p>Determining difference between two groups- numerical data Paired & unpaired observations</p>	<ul style="list-style-type: none"> • Decide when to apply the independent and dependent t-test. • Calculate paired and unpaired t- values. • Use the t tables to assess whether calculated t values are significant. <p>Decide when to apply the independent and dependent t test and calculate its values.</p> <ul style="list-style-type: none"> • Make a decision concerning whether these tests can be used on give data and, if so, what test should be used on which data. • Perform these tests on data manually as well as through SPSS.
<p>SESSIONS & TIMINGS</p>	<p>TEACHING STRATEGY</p>	<p>TOPIC OF SESSION</p>	<p>SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i></p>

<p>DAY 2</p> <p>SESSION 11</p> <p><i>Duration: 30 minutes</i></p>	<p>Lecture through power point presentation followed by an individual exercise & Take home individual assignment.</p>	<p>Determining difference between more than two groups- numerical data ANOVA (Analysis of Variance)</p>	<ul style="list-style-type: none"> • Decide when to apply the ANOVA test. • Calculate F- values. • Use the F tables to assess whether calculated t values are significant. • Make a decision concerning whether this tests can be used on give data and, if so, what test should be used on which data. • Perform ANOVA tests on data through SPSS.
<p>DAY 3</p> <p>SESSION 12</p> <p><i>Duration:45 minutes</i></p>	<p>Lecture through power point presentation followed by an individual exercise</p>	<p>Determining Correlation between variables</p>	<ul style="list-style-type: none"> • Decide when to apply the Pearson's and Spearman's correlation tests. • Calculate Pearson's correlation coefficient and Spearman's Pearson's correlation coefficient. • Use the p-values to assess whether calculated coefficients are significant. • Perform correlation tests on data through SPSS.
<p>DAY 3</p> <p>SESSION 13</p> <p><i>Duration:45 minutes</i></p>	<p>Lecture through power point presentation followed by an individual exercise</p>	<p>Regression Analysis</p>	<ul style="list-style-type: none"> • Explain what is a regression analysis • Differentiate between simple linear and multiple logistic regression analysis. • Decide when to apply the regression analysis and how to interpret. • Make a decision concerning whether these tests can be used on give data and, if so, what test should be used on which data. • Perform these tests on data through SPSS.
<p>SESSIONS & TIMINGS</p>	<p>TEACHING STRATEGY</p>	<p>TOPIC OF SESSION</p>	<p>SESSION OBJECTIVES <i>i.e. BY THE END OF SESSION THE TRAINEES SHOULD BE ABLE TO;</i></p>

<p>DAY 3</p> <p>SESSION 14</p> <p><i>Duration: 30 minutes</i></p>	<p>Lecture through power point presentation and individual exercises</p>	<p>Diagnostic Accuracy of a test</p>	<ul style="list-style-type: none"> • Identify what is a diagnostic accuracy of a test compared to gold standard tests. • Identify what are true positives, true negatives, false positive and false negatives in a diagnostic testing. • Calculate Sensitivity, specificity, Positive and negative predictive values of a diagnostic test using standard formulae.
<p>DAY 3</p> <p>SESSION 15</p> <p><i>Duration:45 minutes</i></p>	<p>Lecture through power point presentation and individual exercises</p>	<p>Writing a research paper</p>	<ul style="list-style-type: none"> • List the main components of a research paper. • Make an outline of a research paper. • Write drafts of report in stages. • Check the final draft for completeness, possible overlaps for clarity and smoothness of style. • Draft recommendations for action based on research findings.
<p>DAY 3</p> <p>SESSION 16</p> <p><i>Duration:30 minutes</i></p>	<p>Lecture and individual exercises</p>	<p>Writing a dissertation</p>	<ul style="list-style-type: none"> • List the main components of a dissertation • Explain how a research paper differs from a dissertation • Make an outline of a dissertation.

Minimal Attendance of Advanced Research Workshop:

The trainees must attend the Advanced Research workshop during year 2 and attendance will be duly recorded and monitored for each session of workshop and any participant missing even a single day of workshop without any valid reason will not be issued certificate of the workshop. It will be mandatory for such trainee or any of those missing the workshop due to any valid reason or illness, to attend the workshop in next year with the next batch.

Assessment of individual exercises:

- i. The quality, correctness and completeness of the individual exercises will be evaluated during the teaching sessions, when they will be presented by the end of each session by trainees.
- ii. The mode of presentations will be oral, electronic or written accordingly and if needed using media of charts, flip charts & white boards.
- iii. Most of the individual exercises will be observed and evaluated by the facilitators directly on computers since it mostly will involve skills of data analysis through Statistical Package of Social Sciences.
- iv. There will be no scores or marks specified for the individual exercises but the feedback of evaluation by the facilitators will be on spot.

Assessment of individual; take home tasks/assignments:

- i. The take home assignments of the trainees will be checked once these will be submitted after completion to the facilitators after period specified for each task.
- ii. Most of the take home assignments will be related to numerical problem solving, calculations or tasks of analysis in SPSS.
- iii. Assignments should be submitted in electronic version and no manually written assignment will be accepted.
- iv. Each assignment will be checked for plagiarism through turn-it-in soft ware. Any assignment that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission.
- v. They will be assessed and scored by the facilitators.

B. PRESENTATION IN JOURNAL CLUB SESSIONS

- i. During year 2 of training, the trainees should actively participate in the journal club sessions of the department regular basis.
- ii. One journal club meeting must be organized in the department within every two months of a year and apart from mandatory more than 80% yearly attendance, the trainees must present two research paper in year 2 of training individually.
- iii. The purpose of presentation of the second year trainees in journal club is teach them how to form a bridge between research and practice, how to confidently appraise recent research and then how to practically apply best research findings into their clinical setting as their first steps evidenced-based medicine.

Format of Journal Club Meetings:

- i. In a journal club meeting, two research papers, published in an indexed national or international journal, selected by the Dean of the department must be presented by second year trainee during R-Y2 training year, in two different meetings.
- ii. Trainee will be given the selected paper one and a half month prior to the meeting by the Dean of the department.
- iii. After thoroughly going through the research a paper, trainee should do extensive literature search on the topic also and must be familiar with all the recent and current research done on the similar topic by other researchers.
- iv. An approximately 30 minutes long oral presentation will be made by the trainee, in monthly journal club session on the selected research paper. The research paper will be presented through power-point and the critical appraisal of the paper will follow it.
- v. The topic will also be discussed in comparison to other evidences available according to the latest research.
- vi. The other second year trainees should actively participate in question & answer session of the journal club meeting that will be carried out following the presentation of the critical appraisal of the research paper. It will be compulsion for each R-Y2 trainee to ask at least one question or make at least one comment relevant to the topic and/or the research paper, during the journal club meeting.

Minimal Attendance of Journal Club meetings by R-Y2 trainee:

The R-Y2 trainees should attend at least 5 out of 6 journal club meetings during their second year of training. Out of these 6 journal clubs, he/she must make presentation in any two sessions as a compulsion.

Assessment of presentation of the trainee at Journal Club:

- i. During the presentation, the head of department and two other senior faculty members will evaluate, trainee's ability to make effective presentation of the research paper and also his/her skills to critically appraise a research paper.
- ii. The scoring will not be done for the first paper presentation by the trainee, since that will be the first ever presentation by the trainee. During the first presentation the evaluators will generally qualitatively evaluate the skills of presenter without any quantitative assessment. They will inform the presenter by the end of first paper presentation, his/her mistakes,

weaknesses and scope for improvement. The strengths and competences, on the other hand, will also be appreciated for encouragement.

- iii. A structured checklist for scoring the skills and abilities of trainee will be used by the above mentioned senior faculty members. The average of the three total scores will be calculated, out of total attainable score of 25 that will then be used in overall assessment of the trainee.
- iv. The evaluation will include aspects like the presenter's aptitude to identify the strengths and weaknesses of a research article, apart from assessment of the usefulness and validity of research findings. He/she should be able to determine the appropriateness of the study methodology and design for the research question, apart from suitability of the statistical methods used, their appropriate presentation, interpretation and discussion. He/she should also be able to identify and justify relevance of the research to one's own practice.

C. FORMULATION OF RESEARCH PROPOSAL/S OF DISSERTATION/RESEARCH PAPERS AS REQUISITE TO POST GRADUATE DEGREE/MD DEGREE

- i. Till the beginning of year 2, the trainee will start sorting out various research questions for his/her research project as dissertation requisite for the post graduation degree.
- ii. Trainee must submit and seek approval of the research proposal/s from the concerned institutions till end of year 2 i.e. R-Y2.
- iii. Since post graduate trainees seeking Fellowship from the College of Physicians and surgeons of Pakistan (CPSP) have either of the two following options, as per guidelines of CPSP:

OPTION A: Submission of one dissertation in specialty field as requisite to FCPS degree OR

OPTION B: Publication of two original research articles in any CPSP recognized journals, being first author, as requisite to FCPS degree

They will have to submit one research proposal for the dissertation till end of second year of training, if following option, A and two research proposals of the original articles, if following option B accordingly.

- iv. The MD scholars will also have to submit one research dissertation, in specialty field, to Rawalpindi Medical University, so they will also submit one research proposal for the dissertation till end of second year of training.

- v. Whatever is the post graduation academic scenario; the trainee must decide the research question/s under the guidance of the supervisor till third month of R-Y2 and hence decide the final title of the research project/s.
- vi. During these first three months of R-Y2, the trainee under guidance of the supervisor and ORIC will do extensive review of the literature, relevant to topic. He/she will do online as well physical search of printed, Journal articles, reports, books, conference papers, dissertations, Research and program reports- published/ unpublished. He/she will also access the libraries of Rawalpindi medical University, repositories of various institutions.
- vii. The trainee will also consult the research Associates and Deputy Directors at the ORIC for the feasibility of the research question and any modification. The trainees will be encouraged to preferably select research questions that will be better answered through cross sectional comparative, analytic and experimental study designs instead of simple descriptive cross sectional or case series design. Descriptive cross sectional, exploratory or case series design will be allowed only in special cases when the research question will deal with an exceedingly significant and priority issue, not addressed previously even though published work either locally/nationally or internationally.
- viii. Once the research question and topic is finalized with mutual understanding of the supervisor, trainee will submit the selected topic to the Head of Department and Dean of specialty.
- ix. The Dean of the specialty will give approval of the topic after scrutiny and will confirm that there is no duplication of the topic in the department, after consultation with HOD's.
- x. Then the Dean will finalize the list of the topics of research proposals of all trainees during fourth month of R-Y2 and will submit the list to BASR.
- xi. BASR will give the final approval of all topics within same month.
- xii. For the post graduate trainees following aforementioned option B (Publication of two original research articles in any CPSP recognized journals, being first author, as requisite to FCPS degree) must submit their topics (already approved from BASR) to CPSP for its approval. Once the topics are approved by CPSP, they will initiate research proposal development for these research projects that they will publish as original articles.
- xiii. Once the trainee gets the approval of the topic/s from all concerned authorities, the formal write up of proposal/s must be initiated within fifth month of R-Y2 in consultation with supervisor and the research associates of ORIC for guidance in methodology.

- xiv. The research proposal/s will be brief outline of trainees' future research project/s (approx of 1000-1500 words) and must comprise of the following topics:
1. Title of research project.
 2. Introduction and rationale (with Vancouver/Harvard in text citations)
 3. Research aim, purpose and objectives
 4. Hypothesis, if required according to the study design.
 5. Operational Definitions
 6. Research Methodology:
 - a) Setting
 - b) Study Population
 - c) Study Duration
 - d) Study Design
 - e) Sampling: *Sample size with statistical justifications, sampling technique, inclusion criteria & exclusion criteria.*
 - f) Data Collection technique/s
 - g) Data Collection tool/s
 - h) Data Collection procedure
 - i) Plan for Data entry & Analysis
 7. Ethical Considerations
 8. Work plan/Gantt chart
 9. Budget with justifications
 10. Reference list according to the Vancouver referencing style
 11. Annexure (*including data collection tool or Performa, consent form, official letters, scales, scoring systems and/or any other relevant material*)
- xv. The research proposal should be completed in eighth month of R-Y2 and should also be reviewed and finalized by the Supervisor of the trainees.
- xvi. The finalized research proposal will be reviewed by publication in charge of ORIC for plagiarism through turn-it-in soft ware. Any proposal that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission. Only when the eligible scores will be reached, then the proposal will be further processed.
- xvii. The statistician at data analysis centre of ORIC will facilitate the trainees in sample size calculation through sample size calculators according their study designs.

- xviii. The trainees should formulate all the data collection tools under guidance of supervisor and research associates of ORIC and should also pretest to finalize all the data collection tools for their research projects.
- xix. These research proposals along with the tools will be submitted to all concerned authorities for appraisal.
- xx. The supervisors and research associates of ORIC will also ensure that the duration of research project should be adequate and realistic so that trainees will be able to complete their project/s during third year of training leaving enough time for its write up during year 4 of training. For the post graduate trainees following option of Publication of two original research articles as requisite to FCPS degree, the study duration will be even briefer.

D. PRESENTATION OF RESEARCH PROPOSAL/S TO INSTITUTIONAL RESEARCH ETHICS COMMITTEE (IREF) OF RMU

- i. The R-Y2 trainees will already be aware of the standard operational procedures and protocols of the Institutional Research Ethics Committee of RMU as they had, as a mandatory activity, participated and observed the proceedings of the meeting during R-Y1. However, he/she will be informed about any modifications or updates regarding the standard procedures of application to IREF if will have occurred during last one year.
- ii. Trainees will be individually provided an updated step wise guidance by the research associates of ORIC, regarding how an applicant should access the RMU website and download the application Performa and then how to electronically fill it in for final submission. They will also be provided updated format of presentation for their Research Proposal presentations at IREF meetings.
- iii. The trainees must submit ten sets of hard copies of all the documentation including the research proposal with all annexes, plagiarism detection report and application performa to ORIC, at least ten days prior to the monthly meeting. ORIC will provide them date and month of the IREF meeting for presentation and the trainee must present in the meeting along with his/her supervisor.
- iv. The trainee must make a five to ten minutes' presentation through power-point at Institutional Research Ethics Forum during 9-10 months of R-Y2. By the end of presentation, he/she will respond to all the queries of the forum and the supervisor will facilitate in defense of the proposal.

- v. The IREF will appraise and scrutinize every aspect of the proposal/s and if found acceptable then will provide on spot verbal approval of the project followed by written approval letter within next two weeks to the trainees.
- vi. If members of IREF will find any modifications required in the proposal/s they will recommend them to trainee and supervisor. The trainee must incorporate those changes and will resubmit the corrected version of proposal/s within next one week's period.
- vii. The written approval letter of IREF will be issued within next two weeks of meeting, to the trainee.
- viii. In case the trainee will be working on option B of CPSP i.e. publication of two research papers, instead of writing dissertation, then he/she will present both research proposals to IREF for the two topics already approved by CPSP.

E. ASSURANCE OF FEASIBILITY & AVAILABILITY OF RESOURCES FOR RESEARCH PROJECTS

- i. The trainee will ensure that for his/her research project/s ample resources in terms of monetary, human or physical will be available to complete the project. He will also provide documented proof and justification to avoid any unforeseen problems that may lead to incompleteness of research project/s.
- ii. No individual funding will be provided to the trainees for their research projects requisite to their post graduation degrees by Rawalpindi Medical University. The trainee may be bearing all the expenses on individual basis or may be applying to any of national or international funding agencies for research project/s.
- iii. In case the trainee will be applying for any external source of funding from any national or international funding agency, the funding application and approval process must be completed by the end of year 2 of training.
- iv. The trainee may also be pursuing the degree, through any scholarship that also will include the research project expenses.
- v. In either of the above mentioned circumstances, the trainee must provide and submit the budget details and documented evidences of the funding or availability of monetary resources to the supervisor and Dean who will ensure the feasibility of the resources available to the trainees.

- vi. Moreover, if any tools, kits, equipment or physical materials will be required for research project, the trainee will provide documented evidence of its availability.
- vii. If the data collection will require hiring of additional human resources, then the trainee will provide documented evidence like consent of staff members contributing to his/her research or details of training expenses or honorarium details if any to the supervisor.
- viii. The supervisor will also consult the Dean and HOD's in ensuring the feasibility and availability of resources of a trainee during second year of training.

F. SUBMISSION OF RESEARCH PROPOSAL/S TO CPSP/BASR OF RMU

- i. Post graduate trainees applying for their CPSP fellowship using aforementioned option A (Submission of one dissertation in specialty field as requisite to FCPS degree) after receiving appraisal of IREF of RMU, must submit their proposal to CPSP during last quarter of second year of training. The approval process from CPSP takes approximately 3 months on an average but in case any corrections are suggested the resubmission and acceptance procedure may take 6 months on an average. These trainees will initiate data collection as soon as they receive the acceptance by CPSP authorities.
- ii. However, the post graduate trainees who will opt to publish two original research articles in any CPSP recognized journals, as requisite to FCPS degree, will not require any submission of their proposals to CPSP. They will directly initiate the data collection as soon as they will receive the IREF acceptance letter. Hence their data collection phase of both research projects will begin in last quarter of R-Y2.
- iii. The MD scholars of RMU will submit their research proposals to the Board of Advanced Studies and Research (BASR) of RMU for appraisal. BASR will issue an acceptance letter of the research proposal endorsed by the Vice chancellor of RMU copied to the concerned stakeholders and authorities including office of Dean and ORIC. If members of BASR will find any modifications required in the proposal they will recommend them to trainee and supervisor. The trainee must incorporate those changes and will resubmit the corrected version of proposal to BASR within next one-week period. The written approval letter of BASR will then be issued within next two weeks to the trainee. The trainees will thus receive formal permission to initiate data collection phase through this acceptance of BASR.
- iv. All trainees who will require data collection from any RMU or its teaching hospitals that are Benazir Bhutto Hospital, District Headquarters Hospital and Holy Family Hospital, will not

require any permission from the administration of these hospitals. The appraisal letters of IREF and BASR will be considered as acceptance by all authorities of the RMU.

- v. If any trainee will need to collect data from any institution other than RMU or its teaching hospital, they must seek that institution's approval too according to their standard protocols parallel to the period when they will have submitted proposals to CPSP/BASR to save their time.
- vi. All the post graduate trainees will follow the guidelines regarding the format and content of the research proposals provided by the authorities to whom they will be presenting their research proposals that are Board of Advanced Studies and Research (BASR) for MD scholars or College of Physicians and surgeons of Pakistan (CPSP).

G. ROTATION OF THE TRAINEES AT ORIC:

- i. During second year of training, All MD/MS trainees will attend *two week's rotation* at the Research Unit, Office of Research Innovation and commercialization (ORIC) of RMU.
- ii. For the rotations, the trainees will follow the same batches as allocated during year 1 of training by ORIC or if feasible then the batches will be reformulated, by the Director of ORIC. according to the study designs. The trainees with similar study designs will be preferably kept in same batches, if feasible.
- iii. These two weeks for each of the batches of the trainees will be scheduled in a manner, that three days of that week will be consumed in the Advanced research workshop while for the remaining working days of two weeks, the trainees will receive individual or group consultations by the staff members of ORIC (that are director, deputy directors/managers, research associates, statistician and/or publication in charge) for finalization of their research synopsis/proposal.
- iv. Regular attendance register will be maintained at ORIC to record the physical presence of the trainees. In case any trainee will require a leave or becomes absent during workshop day/s, s/he must attend the complete 3 days' workshop with any other batch during the same year with a settlement and permission of the Director ORIC, in writing. Whereas in case of absence or leave for the remaining days of rotation, the trainees must s/he must complete the exact number of missing days of 2 weeks' rotation, with any other batch during the same year 2, with a settlement and permission of the Director ORIC, in writing.

- v. As regards the CPSP post graduate trainees they will not have to do the rotations during their training period but will follow all others activities as specified. However, they can visit ORIC, as per appointment schedule that will be given by ORIC, for their individual consultations, in any area of research and for finalization of their research synopsis/proposal.

H. MONITORING OF RESEARCH COURSE OF YEAR 2

- i. An alert and continuous monitoring of all the scholarly activities of each trainee will be carried out by all the concerned faculty i.e. research units of specialties, supervisor, Head of Department and the deputy Directors and research fellows at the Office of Research Innovation & Commercialization of RMU.
- ii. The structured Research component of Log books and Research portfolio of the trainees specific to research component of the training of year 2; R-Y2 will also be regularly observed, monitored and endorsed by all the concerned faculty members, supervisor and facilitators.
- iii. The Log books section R-Y2 specific to research curriculum of training year 2 will include the record of attendance of all sessions of workshop of the trainee that will be updated and endorsed by the department of Medical Education (DME) of RMU.
- iv. It will also comprise of all the submission record and scores attained for the individual and group assignments of the trainees, endorsed by the supervisor and the research associates and Deputy Directors of ORIC.
- v. The log books will also include the attendance and presentation scores of the trainees in the Journal club sessions of the department. It will also include observation notes catering to qualitative evaluation for active participation by the trainee during each journal club session. This information will be endorsed by the supervisor of the trainee and HOD.
- vi. The record of the trainees regarding timely completion and quality of each activity related to completion of research proposals and its presentation in the monthly meeting of the Institutional Research Ethics Forum (IREF) of RMU will also be part of the Log Book that will be endorsed by the supervisor, research associates of ORIC and conveners of the IREF and BASR.
- vii. The research portfolio of the trainee R-Y2 will again include qualitative and quantitative self assessment of the trainee in narrative form. It will include the individual assessment of the objectives and aims defined by the trainee during the second year of training and extent of their successful attainment. The trainee will also mention individual achievements or

knowledge and skills acquired in any aspect of research that was either formally part of the research curriculum or even not. It will also include reporting of any research courses, online or physically attended by the trainee, contribution in any research paper or publication, any participation and/or presentation in any research conference, competition etc during year R-Y2.

I. OVERALL ASSESSMENT OF PERFORMANCE OF TRAINEES FOR YEAR 2

- i. The overall assessment of performance of trainee for R-Y2 will rely on marks attained where 25 marks will be included from the home tasks assignments (by conversion of 50 marks of the home task assignments into 25 marks) and actual 25 marks of presentation of journal club will be included in assessment (without any conversion), to get an aggregate of 50 total marks. 50 marks will be allocated to completeness and quality of research synopsis.
- ii. Out of the total attainable 100 total marks, 40% will be passing marks of this Research course and in case of failure in it, second attempt will be allowed to the trainees by appearing in second attempt accordingly.

J. EVALUATION/ FEEDBACK OF RESEARCH COURSE OF YEAR 2

Like evaluation of year one of research course R-Y1, the second year of training R-Y2 will also be evaluated not only by the trainees themselves but also by the Deputy Directors, supervisors and senior faculty through end of sessions forms and then collectively through end of course feedback forms.

- i. ***The feedback of trainees*** will include structured evaluation of each teaching session of workshop of R-Y2 through structured and anonymous feedback forms/questionnaire that will be regularly distributed amongst the trainees. The forms will include questions phrased as Likert scales (1-5 categories) inquiring their responses regarding various aspects of teaching sessions. Category 1 will represent the poorest quality increasing till category 5 representing excellence and the trainees will choose either of 5 based on their honest and unbiased personal choice. The open ended questions in form will indicate qualitative evaluation of the trainees. There will also an overall feedback questionnaire for entire second year of training course administered to trainees.
- ii. ***The feedback of trainers*** will be obtained through structured and anonymous feedback forms/questionnaire, including closed and partially closed questions that will be regularly

provided by them. They will provide their inputs and opinions regarding effectiveness of the R-Y2 course contents, curriculum, teaching methodologies, teaching aids and technologies, content and usefulness of the exercises and assessments etc.

- iii. *Three focus group discussions;*** one of the R-Y2 trainees, second of the facilitators and third of the supervisors will also be organized by the ORIC to evaluate the research course, its benefits and weaknesses and scope for improvement.
- iv. *A final evaluation report of the Research Course R-Y2*** will be formulated and compiled by the ORIC of RMU. The report will be presented all concerned stake holders.

K. QUALITY ASSURANCE OF RESEARCH COURSE OF YEAR 2

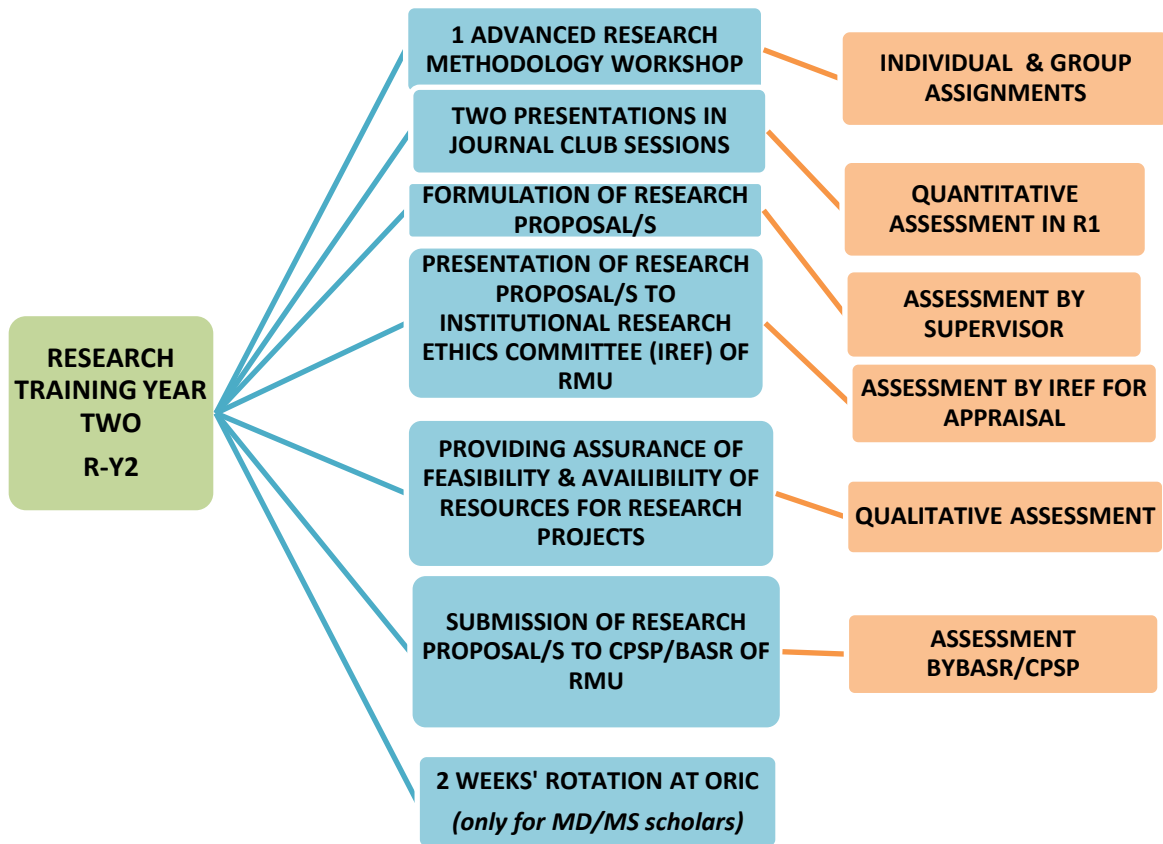
- i. The evaluation of research course of R-Y2 will follow exactly the same pattern of R-Y1, but all the feedback material will pertain to R-Y2 course (including feedback forms of R-Y2, randomly selected log books, research portfolios, individual & group assessment record and randomly selected annual research course examination papers).
- ii. The evaluation team that will observe all these R-Y2 course evidences will be same team that will evaluate R-Y1 course. The team of R-Y2 will include the Head of departments, Deans, selected representatives of BASR, IREF, Director of ORIC, Director DME, Director of Quality enhancement cell (QEC) and Vice chancellor of RMU, individually.
- iii. The random visit for physical observation of the materials and also of all the academic activities through uninformed visits will also follow same protocol as mentioned in quality assurance procedure of R-Y1.
- iv. ORIC will be responsible for submission of the evaluation content of R-Y2 to all including a copy to the Quality Enhancement Cell (QEC) of RMU for internal evaluation.
- v. The QEC will organize an external evaluation too through involvement of a third party that may include members of Quality assurance department of Higher Education Department based on their availability.
- vi. An annual meeting of the quality assessment and enhancement, by end of year 2, will also be organized by the Quality Enhancement Cell of RMU, including representatives of supervisors, Head of Departments, Dean, representative members of BASR, ORIC, DME, QEC & IREF, who will be then collectively, review all the evaluation material of R-Y2. The evaluation team will also share their experiences of their evaluation visits and observations to validate the existing materials.

- vii. The quality of R-Y2 course will be determined with recommendations for further enhancement and modifications.

Successful completion of above mentioned requirements of research course will be mandatory requirement for advancement to the next Post Graduate Year level i.e. year 3 training year or R-Y3. An over view of activities related to research training in third year, R-Y3 is also displayed in figure 3.

Figure 3. A FLOW CHART OF RESEARCH ACTIVITIES OF R-Y2 POST GRADUATE/MD/MS TRAINEE OF RMU AND THEIR ASSESSMENTS





RESEARCH COURSE OF THIRD POST GRADUATION TRAINING YEAR R-Y3

PURPOSE OF R-Y3 RESEARCH COURSE:

Utilizing all the knowledge and skills in research, accrued during first two years, the post graduate trainees of RMU, will be dexterous enough to actually execute a research project and implement

efficiently and proficiently all the activities of the research project that they will have planned during period of R-Y1 to R-Y2. During the third year of training post graduate trainees will collect all the information and data and to explore answer to their research questions formulated for their individual research project/dissertation, prerequisite to their degrees. This course will provide them an opportunity to revitalize and update their concepts, knowledge and skills in research methodologies.

LEARNING OUTCOMES OF R-Y3 RESEARCH COURSE

After completion of R-Y3 course the trainees should be efficiently able to:

1. Revise and rejuvenate all the basic concepts of Epidemiological measures and biostatistics.
2. Collate the information gathered through an extensive literature review relevant to study topics finalized and formulate an extensive write up of literature for research project.
3. Collect and store high quality information for their research project in an honest and unambiguous way.
4. Utilize skills to enter, analyze and interpret the data collected for a research project
5. Write a clear and concise research report (research paper for a peer reviewed journal/dissertation) and a summary of the major findings and recommendations for each of the different parties interested in the results.

RESEARCH COURSE OF THIRD TRAINING YEAR

During the third year of training, revision and refreshing up of previously secured knowledge and concepts related to research will enhance the productivity and efficiency of the post graduate trainees.

A. ELECTIVE REFRESHER SHORT COURSES/WORKSHOPS:

The elective refresher short courses of one day to three days' duration will be held to rejuvenate concepts Basic and advanced Biostatistics and Epidemiological concepts that will be taught to the trainees during initial first two years of training. The short courses will comprise of one to three days' workshops. These workshops will provide the trainees hands on training of all the components of research methodologies, basic and advanced biostatistics and epidemiological calculations. Each workshop will comprise of following teaching methodologies

- Power-point presentations of basic theoretical concepts during workshops.

- On spot individual/group exercises.

These short courses will be conducted by the staff members of Office of Research Innovation and commercialization (ORIC) of RMU including the Statistician, Deputy Directors and Director while they will be facilitated by the Research Associates. Visitor lecturers; including renowned national and international public health consultants, researchers, epidemiologists and biostatisticians will also be invited, according to their availability, for some workshops.

Format of short courses:

- A total of 10 short courses will be offered and the post graduate trainee must attend a minimum of 5 of these short courses during R-Y3, according to their needs, choice and preferences.
- Each workshop will comprise of 8-12 modules in total.
- For each module, power-point presentations will be delivered initially, to restore the memories of the trainees regarding the previous knowledge attained by them in R-Y1 and R-Y2. These presentations will be on an average 15-20 minutes of duration for each module and will teach the basic and advanced concepts.
- Following the presentations, on an average 30-60 minutes of individual and group exercises will be supervised by the facilitators to provide the trainees hands on experience. Depending on the type and content of courses, trainees will mostly work through computer soft-wares. These exercises will require calculations and numerical solving too.
- By the end of each day of workshop, brief take home individual or group task/assignments will be given to trainees that will be duly evaluated by facilitators within three days of the short course and will provide their feed back to each trainee individually.

Content of short courses:

- The course materials for these workshops will be formulated by the Deputy Directors and Director of ORIC, specific to the needs and requirement of the post graduate trainees, using various national and international resource materials.
- The trainees will be provided hard copies as well as soft copies of the course content in a folder at the initiation of the course. This take away resource material will also include handouts of presentations of all the modules taught during the workshops.

Following ten short courses will be offered to the post graduate trainees during year three; R-Y3 along with the tentative time frame work and title of workshops in table 3. However the details of modules, duration and objectives/Learning outcomes of each workshop are not specified right now

as these will be formulated based on the needs and requirements of the trainees and also the will depend on the visitor facilitators choice, that will be decided and confirmed at least one month prior to conducting each workshop.

TABLE 3. TEN ELECTIVE SHORT COURSES TO BE OFFERED DURING TRAINING YEAR 3.

<i>TIME FRAME WORK DURING THIRD YEAR R-Y3</i>	<i>TOPICS OF SHORT REFRESHER COURSES</i>
MONTH 1	End note referencing manager
MONTH 2	Mendeley referencing manager
MONTH 3	Effective write up of Literature review
MONTH 4	Data entry in Statistical Package of Social Sciences
MONTH 5	Graphical presentation of data in Microsoft Excel
MONTH 6	Univariate, Bivariate and Multivariate analysis in Statistical Package of Social Sciences
MONTH 7	Effectively writing up of a dissertation.
MONTH 8	Research article write up
MONTH 9	Critical appraisal of research
MONTH 10	How to Present Research through power-point or posters

Assessment of Trainees for short courses:

No formal assessment through any examination paper will be carried out during year three since they will be already involved in data collection and entry of their research projects. So they will not be strained with any formal examinations.

Assessment of individual and group exercises:

- i. The quality, correctness and completeness of the individual as well as group exercises will be assessed during the workshops by the facilitators.
- ii. The exercises will be presented during each module of workshops by trainees either individually or in groups accordingly.

- iii. The mode of presentations will be oral using media of charts, flip charts & white boards or through power-point presentations depending on the nature of the tasks.
- iv. There will be no scores or marks specified for the individual or group exercises but the feedback of evaluation by the facilitators will be on spot by end of presentations.

Assessment of individual or group; take home tasks/assignments:

- i. The correctness, quality and completeness of the individual or group exercises that will be given during the short courses/workshops will also be determined.
- ii. These will be submitted after completion to the facilitators within three days of the workshop. No Assignments will be acceptable after three days.
- iii. The assignments will be assessed and checked by facilitator within one week of submission along with extensive feedback of these assignments.
- iv. No formal quantitative assessment or scoring of any of these take home tasks/assignments of R-Y3 will be done.

B. PRESENTATION IN JOURNAL CLUB

- i. During third year of training, the trainees should continue to actively participate in the journal club sessions of the department on regular basis.
- ii. The R-Y3 trainees must present at least one research paper in journal club. The format of presentation and procedure for year 3 trainee will exactly be same as it will be for R-Y1 and R-Y2 trainees as mentioned before.
- iii. After oral presentation in monthly journal club session on the selected research paper and the critical appraisal of the paper R-Y3 trainee should actively participate in question & answer session of the journal club too. It will be compulsion for each R-Y3 trainee to ask at least one question or make at least one comment relevant to the topic and/or the research paper, during the journal club meeting.

Minimal Attendance of Journal Club meetings for R-Y3 trainee:

The R-Y3 trainees must attend at least 5 out of 6 journal club meetings during their third year of training and should make at least one presentation as a compulsion.

Assessment of presentation of the trainee at Journal Club:

- i. During the presentation of R-Y3 trainee in journal club, even though the head of department and two other senior faculty members will evaluate trainee's ability to make effective presentation of the research paper and also his/her skills to critically appraise a research paper, but no formal scoring will be done
- ii. The assessment will be qualitative rather than a quantitative assessment. Even though not scored in numbers, but by the end of paper presentation, evaluators will inform the strengths, mistakes, weaknesses and scope for improvement to each trainee.
- iii. The evaluators will assess that how far the presenter was successful to identify the strengths and weaknesses of a research article, to determine the appropriateness of the study methodology and design for the research question and to assess suitability of the statistical methods used. The appropriateness of presentation, interpretation and discussion will also be considered.

C. DATA COLLECTION, ENTRY AND ANALYSIS OF RESEARCH PROJECT/S OF DISSERTATION/RESEARCH PAPERS

- i. By the beginning of year 3, the trainees will have received the approval from the IREF, BASR and respective examination authorities for their research proposals of dissertations or research papers. Moreover, till then all the data collection tools for their research projects will also have been ready after pretesting.
- ii. During first quarter of year 3, it will be mandatory for the trainees to initiate the data collection phase of their project/s. If the trainee will be collecting the data individually for his/her research project, it will be started under continuous guidance of their supervisors and continuous facilitation by the research centers of specialties, the data analysis center and Research Associates of ORIC of RMU.
- iii. In case the data collection will require more human resources, other than trainee himself/herself, either as honorary or hired data collection staff, they should be properly trained for data collection by the trainee. The supervisor will also ensure that the additional data collection staff will be adequate in number within data within the time framework and should also make sure that they will be proficient enough to collect high quality and authentic data.
- iv. The data storage will also be finalized by trainee under the guidance of Supervisor and research center of specialty.

- v. The trainee will initiate data collection phase and will seek assistance of statisticians at Data analysis centre of ORIC for compilation of data sheets in SPSS/or any other statistical software for data coding and entry. The trainees will be encouraged by statisticians to collect the data and enter it simultaneously after cleaning into the soft ware to save time.
- vi. By the end of R-Y3, the data collection and entry of data must be completed.
- vii. In case the trainee will be working on option B of CPSP i.e. publication of two research papers, keeping in consideration, the lengthy period required for submission and then acceptance of papers by journals, he/she should be vigilant in data collection and must do it at faster pace as compared to those writing dissertation. So such trainees should complete data collection of both papers within first half of year 3 of training simultaneously. Otherwise they can also collect data for first paper within first three months of year 3 of training and then will initiate data collection of second paper from sixth to ninth month of year 3 of training. Whatever is the option followed by the trainee, the data collection phase should not extend beyond ninth month of R-Y3, in order to complete both papers for submission till end of R-Y3.
- viii. The trainees and MD scholars writing dissertation must also complete data collection and analysis till last month of R-Y3.

D. ROTATION OF THE TRAINEES AT ORIC:

- i. All MD/MS trainees will attend *one week's rotation* during year 3 at the Research Unit, Office of Research Innovation and commercialization (ORIC) of RMU.
- ii. For the rotations, the trainees will follow the batches compiled during 3rd year.
- iii. During this one week for each of the batches of the trainees will be facilitated by the statisticians at Data analysis centre of ORIC for compilation of data sheets in SPSS/or any other statistical software for data coding and entry.
- iv. This one week of rotation in third year *WILL BE EXCLUSIVE* of the elective workshop days.
- v. Regular attendance register will be maintained at ORIC to record the physical presence of the trainees. In case any trainee will require a leave or becomes absent during he/she must attend the days missed, with any other batch but with a settlement and permission of the Director ORIC, in writing.
- vi. As regards the CPSP post graduate trainees they will not have to do the rotations during their training period but will follow all others activities as specified. However, they will visit ORIC,

as per appointment schedule that will be given by ORIC, for their individual consultations, for their data entry and analysis for the research papers/dissertations.

E. COMPLETION AND SUBMISSION OF TWO RESEARCH PAPERS AS REQUISITE TO CPSP FELLOWSHIP DEGREE

This section D implies only for the trainees who will be following option B of CPSP i.e. publication of two research papers, as requisite to fellowship of CPSP, instead of submitting a dissertation.

- i. The trainees opting for publication of two research papers should complete and submit manuscripts of both research papers by the end of third year of training. Keeping in consideration, the lengthy period required for submission and then acceptance of papers by journals (that varies from journal to journal and may range from 3 months to even one year) he/she should be vigilant in data collection and paper completion at faster pace as compared to those writing dissertation.

- ii. These trainees will be provided the following options and they will choose either of it based on their will and their supervisor's advise:

OPTION 1: The trainees should complete data collection of both papers within first 6 months of year 3 of training simultaneously. Then after analyzing data and completing write up of original article in next 5-6 months must submit both papers during last month of R-Y3 to journals of choice.

OPTION 2: The trainees should complete data collection of first paper within first three months of year 3 of training and then submit first paper after completion of manuscript till sixth month of R-Y3 to journal of choice. Then the trainee will initiate data collection of second paper till ninth month of year 3 of training and then submit second manuscript after completion till last month of R-Y3 to journal of choice.

- iii. Whatever is the option followed by the trainee, both of his/her paper should be submitted to journals of choice before initiation of year 4 of trainee, keeping adequate time secured in advance, in case any paper will not be accepted and will have to be sent to another journal accordingly.
- iv. During the data collection and entry phase, trainees will receive continuous assistance from the Research Associates and Data analysis unit of ORIC of RMU.

- v. When the data entry will be completed in the statistical software, the trainee will be provided full assistance in data analysis, interpretation and write up of results by the statisticians of ORIC.
- vi. The supervisors and publication in charge of ORIC will also guide the trainee to write the section "Discussion" based on the comparison of the findings of their study with the previously available research nationally as well as internationally.
- vii. They should also be able to identify strengths and weaknesses of their studies and should make recommendations with statement of final conclusion.
- viii. The trainees will identify the target journals for publication and after formatting their write up according to the specific format required by both journals.
- ix. The research papers will be reviewed by publication in charge of ORIC for plagiarism through turn-it-in soft ware. Any article that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission. Only when the eligible scores will be reached, then the trainee will be allowed to proceed further and to submit their research in the form of original articles under continuous assistance of Publication unit of ORIC.
- x. The trainee should also submit copies of submitted papers to the Dean, Director of ORIC and Chairperson of BASR that will be kept with them as confidential documents.
- xi. In case the research paper/s is/are sent back with recommended corrections or modifications, the supervisor and associated staff at ORIC will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days' time.
- xii. In case any of the paper is refused publication by a journal even then the supervisor and publication unit at ORIC will assist the trainee on urgent basis, to get it rectified and resubmitted to another target journal of choice within next 10 days' time and not delaying it all.

Since the trainees who will be submitting dissertation in specialty field as requisite to FCPS degree or as a requisite to their MD degree will not comply with this section D, they will continue with data collection and entry and will also initiate write up of literature review for their dissertations during this last half of R-Y3.

F. MONITORING OF RESEARCH ACTIVITIES OF YEAR 3

- i. Continuous monitoring of all the research activities of each trainee will be carried out by research centers of specialties, supervisors, Head of Departments and the research fellows & Deputy Directors at the Office of Research Innovation & Commercialization of RMU.
- ii. The structured Log books specific to research component of the training of year 3; R-Y3 and Research portfolio of the trainees will also be regularly observed, monitored and endorsed by all the concerned faculty, supervisor and facilitators.
- iii. The section of research training in Structured Log books of R-Y3 will be specific to short refresher courses of research conducted during training year 3. It will also include the record of attendance of all the short course/workshops attended by the trainee endorsed by the facilitators of each course and Office of Research Innovation & Commercialization (ORIC) in addition to the Department of Medical Education of RMU.
- iv. It will also comprise of all the submission record of the individual and group assignments of the trainees, endorsed by the facilitators of ORIC along with their comments.
- v. The log books will also include the attendance and presentation details of the trainees in the Journal club sessions of the department. The observation notes catering to qualitative evaluation for active participation by the trainee during each journal club session will also be inclusive. This information will be endorsed by the supervisor of the trainee and HOD.
- vi. The record of the trainees regarding timely completion and quality of each research activity related to completion of data collection and entry phase will also be part of the Log Book that will be endorsed by the supervisor, research associates and relevant facilitators of ORIC.
- vii. The research portfolio of the trainee R-Y3 will again include qualitative and quantitative self assessment of the trainee in narrative form. It will include the individual assessment of the objectives and aims defined by the trainee during the third year of training and extent of their successful attainment. The trainee will also mention individual achievements or knowledge and skills acquired in any aspect of research that was either formally part of the research curriculum or even not. It will also include reporting of any research courses, online or physically attended by the trainee, contribution in any research paper or publication, any participation and/or presentation in any research conference, competition etc. during year R-Y3.
- viii.

G. OVERALL ASSESSMENT OF PERFORMANCE OF TRAINEES DURING R-Y3

- i. The overall assessment of performance of trainee will be more qualitative in R-Y3, so it will not rely on any scores or marks attained by trainees hence there will not be any examination paper of research or scoring for the home tasks assignments or presentation of journal club.
- ii. The Heads of department and the director of ORIC will observe the log books for assessments of facilitators of short courses, their comments regarding the home tasks/assignments, comments of evaluators of presentation at journal club and the remarks of supervisor regarding his/her opinion regarding the trainee's overall performance during third year of training.
- iii. The Heads of department and the director of ORIC will also observe the research portfolio of the trainees. Based on their observations, they will evaluate the completeness and quality of performance of each trainee.
- iv. In case of any deficiencies or weaknesses they will personally call the trainee and supervisor and will guide them how to correct or improve accordingly.

H. EVALUATION/ FEEDBACK OF RESEARCH COURSE OF YEAR 3

The research course and activities of third year of training will be evaluated by the trainees, facilitators of ORIC and supervisors.

- i. ***The feedback of trainees*** will include structured evaluation of short courses/workshops of R-Y3 through structured and anonymous feedback forms/questionnaire that will be administered by the end of each short course/workshop. The forms will include questions phrased as Likert scales (1-5 categories) inquiring their responses regarding various aspects of workshops. Category 1 will represent the poorest quality while category 5 will represent excellence and the trainees will choose either of 5 based on their honest and unbiased personal choice. The open ended questions in form will indicate qualitative evaluation. There will also an overall feedback questionnaire for entire third year of research training.
- ii. ***The feedback of trainers*** will be obtained through structured and anonymous feedback forms/questionnaire to provide their inputs and opinions regarding effectiveness of the R-Y3 short course contents, curriculum, teaching methodologies, teaching aids and technologies, content and usefulness of the exercises and assessments etc.
- iii. ***Three focus group discussions;*** one of the R-Y3 trainees, second of the facilitators and third of the supervisors will also be organized by the ORIC to evaluate the research course, its benefits and weaknesses and scope for improvement.

- iv. ***A final evaluation report of the Research Course R-Y3*** will be formulated and compiled by the ORIC of RMU. The report will be presented to all concerned stake holders.

I. QUALITY ASSURANCE OF RESEARCH COURSE OF YEAR 3

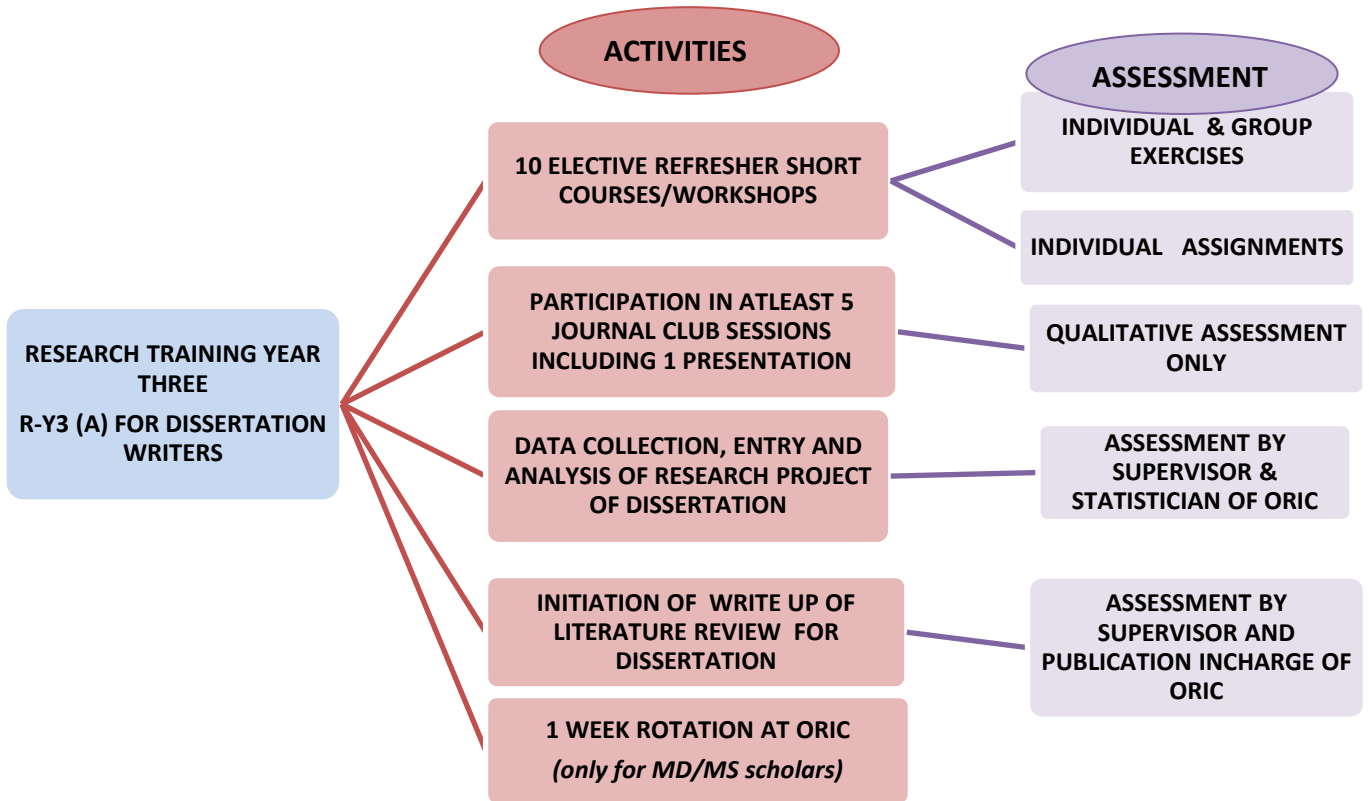
- i. The quality assessment of research course of R-Y3 will involve meticulous review of materials of R-Y3 course (including randomly selected data sheets and completed data collection tools, feedback forms of R-Y3 short course/workshops, log books, research portfolios, individual & group assessment records).
- ii. The quality evaluation team of R-Y3 will include the Head of departments, Deans, selected representatives of BASR, IREF, Director of ORIC, Director DME (Department of Medical Education), Director of Quality enhancement cell (QEC) and Vice chancellor of RMU. The random visits for physical observation of the materials and also of all the short courses proceedings through uninformed visits will also follow same protocol as mentioned in quality assurance procedure of R-Y1 and R-Y2.
- iii. The research papers submitted by post graduate trainees following option of publication of two original articles to CPSP accredited journals will be observed as confidential evidences by Director of ORIC, Dean and chairperson of BASR for quality assessment. No other person will have access to these manuscripts in order to avoid any risk of potential plagiarism.
- iv. ORIC will submit evaluation content of R-Y3 to all stake holders including a copy to the Quality Enhancement Cell (QEC) of RMU for internal evaluation.
- v. The QEC will organize an external evaluation too through involvement of a third party that may include members of Quality assurance department of Higher Education Department based on their availability.
- vi. Since the R-Y3 will primarily comprise of the data collection phase of research projects of trainees, therefore, Quality Enhancement Cell (QEC) in liaison with the research centers of the specialty, will ensure the originality, transparency and unambiguity of data, during entire data collection.
- vii. An annual meeting of Quality assurance, by end of year 3, will be organized by the Quality Enhancement Cell of RMU, including representatives of supervisors, Head of Departments, Dean, representative members of BASR, ORIC, DME, QEC & IREF, who will be then collectively, review all the evaluation material of R-Y3. The meeting will be chaired by the

Vice Chancellor of RMU. The evaluation team will also share their experiences of their evaluation visits and observations to validate the existing materials.

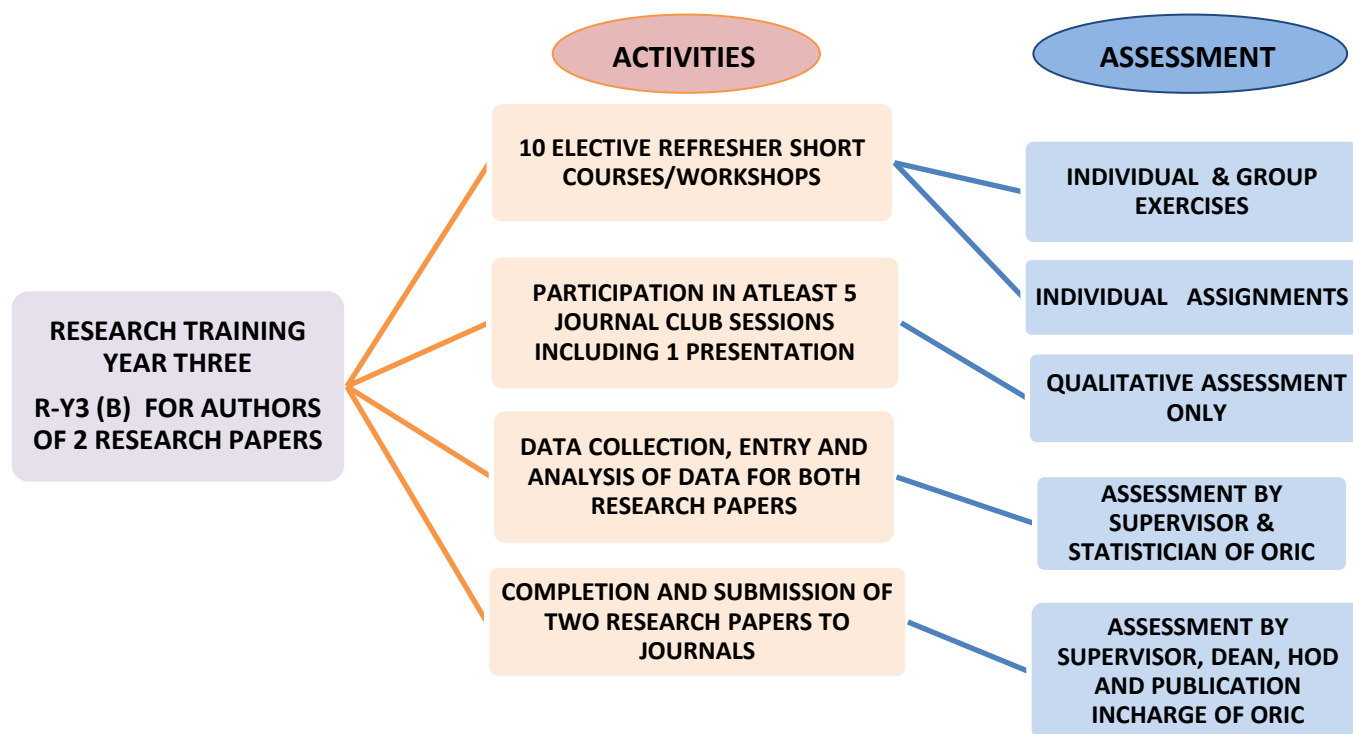
- viii. The quality of R-Y3 course will be stringently determined with recommendations for further quality enhancement.

Successful completion of above mentioned requirements of research course, also outlined in Figure 4 ((A) and 4 (B), will be mandatory requirement for advancement to the next Post Graduate Year level i.e. last, final or fourth year or R-Y4.

**Figure 4 (A) . A FLOW CHART OF RESEARCH ACTIVITIES AND ASSESSMENTS
OF R-Y3 POST GRADUATE/MD/MS TRAINEES OF RMU WHO WILL OPT FOR DISSERTATION
WRITING**



**Figure 4 (B) . A FLOW CHART OF RESEARCH ACTIVITIES AND RELEVANT ASSESSMENTS
OF R-Y3 POST GRADUATE TRAINEES OF RMU OPTING FOR PUBLICATION OF TWO RESEARCH
PAPERS AS REQUISITE TO CPSP FELLOWSHIP DEGREE**



RESEARCH COURSE OF FOURTH POST GRADUATION TRAINING YEAR R-Y4

PURPOSE OF R-Y4 RESEARCH COURSE:

During the fourth year of training the post graduate trainees will receive extensive practical hands on experience of conducting individual research project and then transformation of this project's

report into a dissertation or original articles, in perspective of the knowledge and skills they will acquire during year initial three years of post graduate training. This course will make them proficient to conduct extensive literature search and using available information delve into existent findings and evidences of research, critically appraise them and then explore how to transform them into clinical practice. The fourth year of training will be purely practical where no formal didactic lectures or sessions will be held.

LEARNING OUTCOMES OF R-Y4 RESEARCH COURSE

After completion of R-Y4 course the trainees should be efficiently able to:

1. Identify and execute proficiently all procedures required for data analysis and interpretation.
2. Analyze and interpret the data collected for a research project and draw conclusions related to the objectives of study.
3. Write a clear and concise research report (paper for a peer reviewed journal/dissertation) and a summary of the major findings and recommendations for each of the different parties interested in the results.
4. Present the major findings and the recommendations of a study to policy-makers, managers and other stakeholders to finalize the recommendations.
5. Prepare a plan of action for the dissemination, communication and utilization of the findings and (if required) make recommendations for additional future research.
6. Critically appraise a research paper of any national or international journal.
7. Present research papers published in various national and international journals at journal club.
8. Prepare and complete final research Dissertation/ original articles, requisite to the post graduation degree of trainee, under the guidance of the nominated supervisor.
9. Present and defend a research final research Dissertation/ original article project to concerned authorities.

RESEARCH COURSE OF FOURTH TRAINING YEAR

The fourth year of post graduate of training will be purely practical where no lectures, courses or workshops will be held and the trainee will be directly involved under the supervisor's and staff

members (of ORIC) guidance in actual implementation of research. The following activities related to research will be carried out by the trainee during the last and final year of research course.

A. COMPLETION OF RESEARCH PROJECT AND ITS WRITE UP AS A DISSERTATION

This section A implies only for the trainees who will be either MD scholars or those post graduate trainees following option A of CPSP i.e. writing dissertation, as requisite to fellowship of CPSP.

- i. The trainees writing dissertations should have completed their data collection and entry by the end of third year of training and will have also initiated write up literature view for the dissertation.
- ii. As soon as the year four of training commences, these trainees should complete the introduction and literature review sections of their dissertations along with proper referencing during first three months of R-Y4. They will be continuously guided in this task by their supervisors, research associates and the publication in charge at the ORIC.
- iii. The trainees, In the meanwhile, will also seek continuous assistance of statisticians of Data analysis unit of ORIC for data analysis in statistical soft ware. Trainees will be guided how to interpret the results, how to determine the statistical significances and how to write these results in textual, tabulated and graphical forms. They will have to complete their data analysis and write up of results till fourth month of year 4.
- iv. The supervisor and publication in charge at ORIC will also guide the trainee to write the section of “discussion” for their dissertations based on the comparison of the findings of their study with the previously available research nationally as well as internationally.
- v. The trainees will also identify strengths and weaknesses of their study and should make recommendations with statement of final conclusion.
- vi. According to the required referencing systems the reference lists and in text citation will also be completed correctly.
- vii. After writing the abstract and cover pages and annexure of the dissertation, the trainee will submit his/her dissertation’s final draft to publication in charge ORIC for plagiarism detection through turn-it-in soft ware. Any dissertation that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing till the eligible scores will be reached.

- viii. Then the trainee should submit final draft of dissertation to the supervisor and head of department till end of fifth month of year for final modifications. Since the supervisor will be incessantly involved in every aspect of the project since the beginning and will be persistently guiding the procedure, so he/she should not take more than 10 days to give final review to dissertation of the trainee with written feedback that will be entered in a structured performa with recommendations for improvement or corrections. The Head of Department will also provide his feedback within 10-15 days.
- ix. Based on the feed back of the reviews, the trainee will make final editing and will get the dissertation printed and submitted to the degree awarding authority accordingly (BASR for MD trainees and CPSP for post graduate trainees of fellowship) for review for acceptance before third week of sixth month of year 4.
- x. The trainee will also submit a copy of dissertation to head of department, the Dean, Director of ORIC and Chair person of BASR that will be dealt as a confidential document in order to avoid potential risk of plagiarism.
- xi. While the dissertations will be under review by the degree awarding authority for acceptance, the trainees will be continuously guided by the supervisor and the research associates at ORIC regarding defense of their dissertation. They will be guided how to make effective presentations according to the format provided by the examination authorities and also how to successfully and confidently respond to the queries of examiners.
- xii. In case the dissertation is sent back with recommended corrections or modifications, the supervisor and research associates at ORIC will assist the trainee on urgent basis to get it rectified and resubmitted within at least 10 days' time and not more than it.

B. RESUBMISSION OF RESEARCH PAPER/S IN CASE MODIFICATIONS

ADVISED OR REJECTED FOR PUBLICATION BY A JOURNAL

This section B implies only for the post graduate trainees who will be opt for two research paper submission as requisite to fellowship of CPSP and provided one or both of their research paper/s is/are sent back for modifications or rejected publication.

- i. In case the research paper/s is/are sent back with recommended corrections or modifications, the supervisor, publication in charge and concerned facilitators at ORIC will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days' time.

- ii. In case any of the paper is refused publication by a journal even then the supervisor and publication unit at ORIC will assist the trainee on urgent basis, to get it rectified and resubmitted to another target journal of choice within next 10 days' time without any delay.

C. SUBMISSION OF ACCEPTANCE LETTERS OF APPROVED RESEARCH PAPER/PAERS AND SUBMISSION OF HARD AND SOFT COPIES OF PUBLISHED RESEARCH PAPER/S TO CPSP

This section C implies only for the post graduate trainees who will be opt for two research paper submission as requisite to fellowship of CPSP and provided their research paper/s is/are approved by journals and are published.

- i. In case the research paper/s is/are approved by the target journals, the trainee will submit the letter of acceptance/s to CPSP in addition to copies to supervisor, HOD, Dean and Publication in charge of ORIC.
- ii. When the original article will be published in journal/s, then the trainee will submit hard and soft copies of the original journal with his/her published articles to CPSP in addition to copies to supervisor, HOD, Dean and Publication in charge of ORIC and BASR.

D. PARTICIPATION IN JOURNAL CLUB SESSIONS

- i. Since the journal club is one of the best sources to provide awareness of best current clinical research, its implementation and utilization so its importance cannot be overlooked. In spite of a demanding and eventful fourth year of training, the participation of trainee in the journal club will still be mandatory.
- ii. The participation of trainees in journal club during R-Y4 will complement their knowledge and skills that will be beneficent in write up as well as defense of dissertation but also enhance their evidence based clinical skills.
- iii. However, to decrease the trainees' workload during final year of training, only participation in journal club will be mandatory and he/she will be exempted from making a presentation during R-Y4.
- iv. The R-Y4 trainee will still be expected to actively participate in discussion and also in question & answer session of the journal club meeting. It will be compulsion for each R-Y4 trainee to

ask at least one question or make at least one comment relevant to the topic and/or the research paper, during the journal club meeting.

Minimal Attendance of Journal Club meetings by R-Y4 trainee:

The R-Y4 trainees should attend at least 5 out of 6 journal club meetings during their last year of training.

Assessment of Trainees for Journal Club sessions:

There will be no formal quantitative or qualitative assessment of the trainee and they will also not make any formal presentation in the journal club during R-Y4.

E. ROTATION OF THE TRAINEES AT ORIC:

- i. All MD/MS trainees will attend *one week's rotation* during year 4 at the Research Unit, Office of Research Innovation and commercialization (ORIC) of RMU.
- ii. For the rotations, the trainees will follow the batches compiled during 3rd year.
- iii. During this one week for each of the batches of the trainees will be facilitated by the staff members of ORIC for all procedures required for data analysis and interpretation, formulating conclusions, proposing recommendations, writing clear and concise research report, making power-point presentation for the examiners and how to defend their research proposals etc.
- iv. Regular attendance register will be maintained at ORIC to record the physical presence of the trainees. In case any trainee will require a leave or becomes absent during he/she must attend the days missed, with any other batch but with a settlement and permission of the Director ORIC, in writing.
- v. As regards the CPSP post graduate trainees they will not have to do the rotations during their training period but will follow all others activities as specified. However, they will visit ORIC, as per appointment schedule that will be given by ORIC, for their individual consultations, for finalization of report writing for their research papers/dissertations.

F. MONITORING OF RESEARCH ACTIVITIES OF YEAR 4

- i. During the last year of training of post graduate trainees, they will be scrutinized for each and every activity of dissertation completion by research centers of specialties, supervisors, Head of Departments and the research associates and Deputy Directors at the Office of Research Innovation & Commercialization of RMU.
- ii. The structured component of research in Log books of fourth training year will pertain to various components of their research projects including timing and completeness of data analysis, result write up, introduction, literature review's write up, methodology, discussion, recommendations, conclusions and cover pages.
- iii. The log books will also include the attendance details of the trainees in the Journal club sessions of the department during R-Y4. This information will be endorsed by the supervisor of the trainee and the HOD.
- iv. The Log Books of the trainees in addition to the Research portfolio during fourth year will be endorsed by the supervisor and Deputy Directors of ORIC. The research portfolio of the R-Y4 will again include self assessment regarding research activities of the trainee in narrative form. In addition to individual assessment of the objectives and aims formulated for fourth year of training and their successful attainment, it will also include participation in any research course/s, conference/s and/or competition/s etc. during year R-Y4.

G. OVERALL ASSESSMENT OF PERFORMANCE OF TRAINEES DURING R4

- i. The overall assessment of performance of trainee will not rely on any scores or marks attained by trainees since there will not be any examination Paper or scoring for the home tasks assignments or presentation of journal club.
- ii. The Heads of department and the director of ORIC will observe research portfolio of trainees in addition to the log books for attendance record and the remarks of supervisor regarding his/her opinion regarding the trainee's overall performance during fourth year of training. Based on their observations, they will evaluate the completeness and quality of performance of each activity of trainee during fourth year.
- iii. In case of any deficiencies or weaknesses, the trainee and supervisor will be called by the Heads of department and the director of ORIC who will direct them on how to improve accordingly.

H. EVALUATION/ FEEDBACK OF RESEARCH COURSE OF YEAR 4

The research course and activities of third year of training will be evaluated by the trainees, facilitators ORIC and supervisors.

- i. ***The end of year R-Y4 and end of four years' research training feedback of trainees*** will include structured evaluation through feedback questionnaire not only for fourth year but also for entire four year of research training. It will be anonymous and apart from questions phrased in Likert scale, open ended questions will also be included for the opinions of trainees.
- ii. ***The end of year R4 and end of four years' research training feedback of trainers*** will also reflect the anonymous feedback for the opinions of all supervisors and facilitators regarding benefits, drawbacks or weaknesses of R-Y4 course as well as of entire four year's research training course.
- iii. ***Three focus group discussions;*** one of the R-Y4 trainees, second of the concerned facilitators and third of the supervisors will also be organized by the ORIC to evaluate the entire four year's research course, its benefits and weaknesses and scope for improvement.
- iv. ***Self evaluation Performa's of trainees:*** By the end of the fourth year of training, *End of training competency assessment Performa's* will be administered where the trainees will provide information that will help to assess their status of proficiencies and knowledge in various aspects of research that can be compared with the baseline statuses. These Performa's will not only enable the trainees and the trainers to have a comprehension of any change in their knowledge and skills in research and will also will be quantitatively reflect upon the direction and extent of change. The information gathered will be kept confidential for each trainee and will be scored to quantitatively compare to the *end of training competency assessment Performa's*
- v. ***A final evaluation report of the Research Course R-Y4 and entire 4 years' research training Course*** will be formulated and compiled by the ORIC of RMU. The report will be presented to all concerned stake holders.

vi.

I. QUALITY ASSURANCE OF RESEARCH COURSE OF YEAR 4

- i. The quality assessment of research course of R-Y4 as well as the entire four years' research course will be carried out through review of materials and observations of proceedings by the evaluation team of RMU.
- ii. The research dissertations submitted by post graduate trainees will be observed as confidential evidences by Director of ORIC, Dean and chairperson of BASR for quality assessment. No other person will have access to these manuscripts in order to avoid any risk of potential plagiarism.
- iii. ORIC will submit evaluation content of R-Y4 to all stake holders including a copy to the Quality Enhancement Cell (QEC) of RMU for internal as well as external evaluation.
- iv. An annual meeting of the trainers by end of year 4, will be organized by the Quality Enhancement Cell of RMU, including representatives of supervisors, Head of Departments, Dean, representative members of BASR, ORIC, QEC, DME & IREF, to review and discuss all the evaluation materials of R-Y4, its quality and any recommendations for quality enhancement, under the chairman ship of Vice chancellor of RMU.

The activities of trainees of RMU are displayed in figure 5(A) and 5 (B), according to their concerned options. Successful completion of above mentioned requirements of research course will be mandatory requirement for completion of Post Graduate training final year as well as for MD scholar's training at RMU.

OF R-Y4 POST GRADUATE/MD TRAINEE OF RMU WHO WILL OPT FOR DISSERTATION WRITING

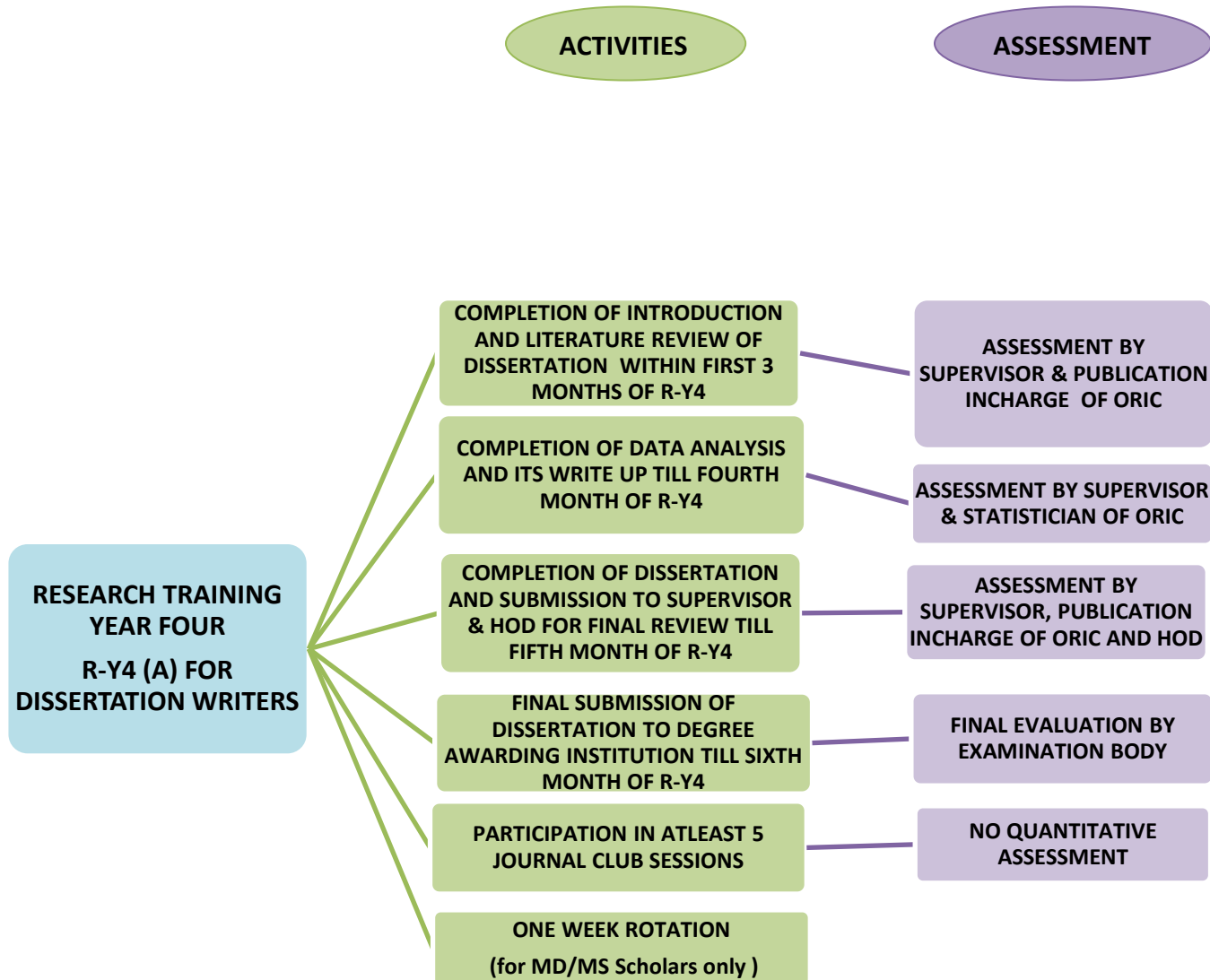
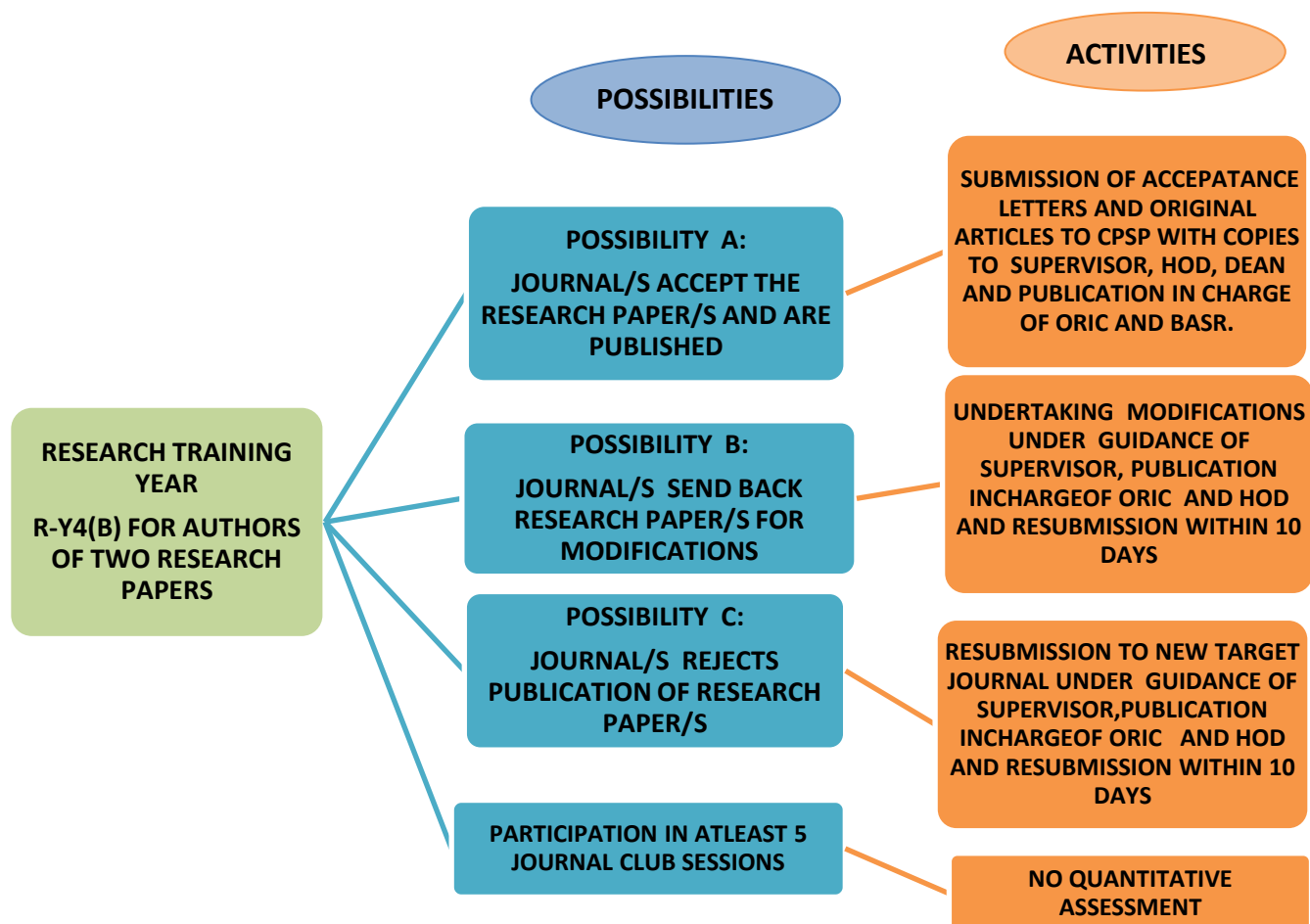


Figure 6 (B) . A FLOW CHART OF RESEARCH ACTIVITIES AND ASSESSMENTS

**OF R-Y4 POST GRADUATE OF RMU WHO WILL OPT FOR 2 RESEARCH PAPERS AS REQUISITE TO
CPSP FELLOWSHIP DEGREE**



ANNEXURE 1.

TERMS OF REFERENCES OF STAFF MEMBERS OF RMU WITH REFERENCE TO THE RESEARCH TRAINING PROGRAM OF POST GRADUATE TRAINEES OF RMU

A. THE VICE CHANCELLOR:

1. The vice chancellor of RMU will be final authority to approve nominations of external supervisors of MD scholars, in consultation with the Dean of specialty.
2. Regarding nominations of the internal supervisors of MD trainees and also of Post graduate trainees of fellowship of CPSP, after completion of first year of training, i.e. R-Y1, no substitution in nomination will be allowed. But in case of any serious incompatibility between the trainee and the supervisor, the issue will be brought to the Vice chancellor, directly by the Dean, as a special case. And only the vice chancellor will make the final decision accordingly, as the final authority.
3. The vice chancellor will also be the head of the quality evaluation team of research training courses that will also include the Head of departments, Deans, selected representatives of BASR, IREF, Director of ORIC and Director of Quality enhancement cell (QEC). The selection of above mentioned team members will be made by the Vice chancellor of RMU.
4. The Vice chancellor will have the authority through the research training course, to make surprise visits, evaluations, rounds and checking (without any prior information to the trainees and trainers) at any random occasion, being member of quality evaluation team individually or in team.
5. An annual meeting of the trainers will also be organized by the Quality Enhancement Cell of RMU, including representatives of supervisors, Head of Departments, Dean, representative members of BASR, ORIC, QEC & IREF and this meeting will be chaired by the Vice chancellor.
6. In perspective of the quality assessed through extensive procedure all the year round and also during the Annual meeting of quality assessment and enhancement, the Vice Chancellor and the Board of Advanced study and Research will finalize any modifications or enhancement in the next Research course.
7. When the MD scholars of RMU will submit their research proposals to the Board of Advanced Studies and Research (BASR) of RMU for appraisal, BASR will issue an acceptance letter of the research proposal that will be endorsed by the Vice chancellor of RMU.

B. MEMBERS OF BOARD OF ADVANCED STUDIES AND RESEARCH:

1. The Board of Advanced studies and Research of RMU will finalize, approve and issue final approval list of the supervisors of the trainees of RMU.
2. The Board of Advanced Studies and Research (BASR) of RMU will receive the submitted research proposals of MD scholars of RMU for appraisal. BASR will issue an acceptance letter of the research proposal endorsed by the Vice chancellor of RMU copied to the concerned stake holders and authorities including office of Dean and ORIC. If members of BASR will find any modifications required in the proposal they will recommend them to trainee and supervisor. The trainee must incorporate those changes and will resubmit the corrected version of proposal to BASR within next one-week period. The written approval letter of BASR will then be issued within next two weeks to the trainee. The trainees will thus receive formal permission to initiate data collection phase through this acceptance of BASR.
3. The quality evaluation team of research training course will include selected representatives of BASR who will be nominated and selected by BASR and Vice chancellor of RMU. The members may pay random visits for physical observation of the proceedings and materials of all the research related activities of the trainees and supervisors for quality assessment and assurance.
4. The copies of research papers or dissertations submitted by post graduate trainees following option of publication of two original articles to CPSP accredited journals will also be submitted to the chairperson of BASR for quality assessment to be observed as confidential evidences
5. Representative members of BASR will attend the annual meeting of Quality assurance, by end of each research training year and will also share their experiences of their evaluation visits and observations to validate the existing materials.
6. The quality of Research Training course will be stringently determined by BASR in their meetings and the members will provide recommendations for further quality enhancement and will have the authority for policy formulation or modification regarding the research training course.

C. MEMBERS OF INSTITUTIONAL RESEARCH AND ETHICS FORUM OF (IREF) RMU:

1. Institutional Research Ethics Forum will organize monthly meetings for approval of research proposals of the trainees of RMU in which the trainee must present along with his/her supervisor for presentation and defense of proposals of dissertations/research papers.
2. The members will be provided hard copies of the research proposals prior to the meetings that they will review before coming to the meeting.
3. Members will listen and visualize five to ten minutes' presentation through power-point by the trainees and by the end of presentation will make relevant queries to the trainees.
4. The IREF will appraise and scrutinize every aspect of the proposal/s and if found acceptable then will provide on spot verbal approval of the project followed by written approval letter within next two weeks to the trainees.
5. If members of IREF will find any modifications required in the proposal/s they will recommend them to trainee and supervisor. The trainee must incorporate those changes and will resubmit the corrected version of proposal/s within next one week's period.
6. The written approval letter of IREF will be issued within next two weeks of meeting, to the trainee.
7. In case the trainee will be working on option B of CPSP i.e. publication of two research papers, instead of writing dissertation, then he/she will present both research proposals to IREF for the two topics already approved by CPSP.
8. The quality evaluation team of research training course will include selected representatives of IREF who will be nominated and selected by chairperson of IREF and Vice chancellor of RMU. The members may pay random visits for physical observation of the proceedings and materials of all the research related activities of the trainees and supervisors for quality assessment and assurance.
9. Representative members of IREF will attend the annual meeting of Quality assurance, by end of each research training year and will also share their experiences of their evaluation visits and observations to validate the existing materials.
10. The quality of Research Training course will be stringently determined by IREF in their meetings and the members will provide recommendations for further quality enhancement to BASR, if any, regarding research training course.

D. THE DEAN OF THE SPECIALITY:

1. The Journal club meetings will be chaired by the Dean of specialty.

2. In a journal club meeting, one or two research paper/s published in an indexed national or international journal will be selected by the Dean and will be notified to the departments at least one and a half month prior to the meeting.
3. The Dean of the specialty will decide the nomination of the supervisor for the post graduate trainee as well as the internal supervisors of MD scholars within first six months of the first year of training R-Y1.
4. For the selection of supervisors, the Dean will chair meeting for selection of supervisors that will be held in the middle of the first research training year, preferably in June.
5. The list of all the first year trainees and the available supervisors in each department will be presented to the Dean, by respective heads of each department in meeting.
6. The Dean will consider the recommendations and proposals of most suitable supervisors for each trainee after eloquent discussions and justifications with the Head of Departments.
7. The Dean will then call each trainee individually to inform him/her the suggested Supervisor for him/her and will also give right and time for objection or reservation in nomination, if any. The Dean will seek the trainee's final consent and then after asking the trainee to leave the meeting room, will call the supervisor for final consent.
8. If the supervisor will also be willing to happily supervise the trainee, then the Dean will finally approve the nomination.
9. A tentative list will be issued by the office of the Dean, within three days of the meeting, copied to the HOD's and the trainees and supervisors.
10. Both the trainees and the supervisors will be given two weeks to challenge the nominations and will also be given right to personally approach the Dean for any request for change. In case of any objection, the Dean will make changes in consultation with the HOD's, after final consent and satisfaction of both trainee and supervisor
11. The final revised list of nominations will be then issued by the office of Dean and will be sent to the Board of Advanced studies and Research of RMU (BASR).
12. During the last few months of the first year of training, the trainees and supervisors will be advised by the Dean, to get familiar with each other and try to identify their abilities to efficiently and successfully work together as a team.
13. The batches of MD/MS scholars for rotation at ORIC during year 1 will be formulated by the Dean, ensuring that trainees for the rotation are selected in a way that the clinical and academic activities at each department are not effected with ample number of trainees left in the meanwhile at each department.
14. In case of any issues, either of both will have right to request any change in nomination to the Dean, till last week of first year of training. The Dean will then consider the case and will seek modification in nomination from the BASR.

15. After completion of first year of training, no substitution in nomination will be allowed. In case of any serious incompatibility between the trainee and the supervisor, the Dean will have authority to bring it to the notice of the Vice chancellor as a special case.
16. As regards the MD scholars, the external supervisors will also be nominated and those nominations will be made by Vice chancellor of RMU in consultation with the Dean of specialty. After finalization of nominations a letter of agreement of supervision will be submitted by the trainee to the office of Dean, including consent and endorsement of both trainee and the internal and/or external supervisor.
17. Regarding the project of undertaking clinical audits on various aspects of the department during first year of research training, on one topic assigned to each group by the Dean in consultation with Heads of Departments.
18. The clinical audits completed in groups will be published as Annual Audit Reports of the departments by the Dean
19. The Dean will make the decision regarding the presentation of clinical audit weekly Clinico-pathological conferences (CPC) of the University.
20. Once the research question and topic is finalized with mutual understanding of the supervisor, the Dean will also be handed over the selected topic by the trainee. The Dean of the specialty will give approval of the topic after scrutiny and will confirm after consultation with HODs that there is no duplication of the topic in the department.
21. The Dean will finalize the list of the topics of research proposals of all trainees during fourth month of R-Y2 and then will submit the list to BASR.
22. Dean will also ensure the feasibility and availability of resources during second year of research training of the trainees of RMU, before initiation of the research project.
23. The office of Dean will receive a copy of approval of the acceptance letter of BASR once the MD scholars of RMU will get their research proposals approved by to the Board of Advanced Studies and Research (BASR) of RMU.
24. The Dean will receive the copies of final manuscript by post graduate trainees following option of publication of two original articles to CPSP accredited journals that will be observed as confidential evidences by Dean for quality assessment. It will be kept strictly confidential by the office of the Dean in order to avoid any risk of potential plagiarism
25. The Dean will also receive the copies of final dissertation manuscript by post graduate trainees and MD trainees that will be observed as confidential evidences by Dean for quality assessment. It will be kept strictly confidential by the office of the Dean in order to avoid any risk of potential plagiarism.
26. The office of Dean must also receive the letter of acceptance/s by the trainees, in case the research paper/s is/are approved by the target journals. When the original article will be published in journal/s, then the trainee will submit hard and soft copies of the original journal with his/her published articles to Dean of specialty for evidence.

27. The Dean of specialty will be member of the quality evaluation team of research course and he/she will have right to make any surprise visit during the four years training research course, at any random occasion, either individually or in teams, without any prior information to the trainees and trainers.
28. The Dean will also attend the annual meeting that will be organized by the Quality Enhancement Cell of RMU. During the meeting, the Dean will share his/her experience of evaluation visits and observations to validate the existing materials

E. THE HEAD OF THE DEPARTMENT OF EACH SPECIALITY/SCIENCES:

1. The Head of the Department (HOD) will oversee all the research activities of the trainees, in close consultation with the Dean and the supervisors at the departmental level.
2. The HOD will attend all the journal club sessions of department.

3. During the first six months of research training year 1 i.e. R-Y1, the HOD will be responsible for consideration of the nominations of the internal supervisor of each trainee. The HOD will decide these nominations based on his/her own personal observation of the level of performance, talent personality and temperament of both the trainees and the supervisors. Based on his/her personal observation of the compatibility of both eligible trainees and the supervisors, Head of department will recommend or propose most suitable supervisors for each trainee after eloquent discussions and justifications to the Dean during a nomination meeting, that will be especially held for this purpose.
4. The nominations will be finalized in a special meeting by all heads of the departments and the Dean. The list of all the first year trainees and the available supervisors in each department will be presented by respective heads of each department in meeting.
5. In case of any objection to nominations of supervisors, the Dean will make changes after direct consultation with the HOD's, apart from final consent and satisfaction of both trainee and supervisor.
6. After finalization of nominations a copy of letter of agreement of supervision will be received by the office of HOD, submitted by the trainee.
7. The weekly meetings of the supervisor and the trainee will be monitored by the HOD through observation of the documented record of meeting in log books, by the end of every month.
8. During ninth month of training year 1; R-Y1 the head of department will supervise the project of clinical audit of the trainees. In this regard HOD will firstly form groups of trainees, either two or three trainees in one group (along with each supervisor of each trainee), depending on the total number of trainees available in that respective first year.
9. The HOD in consultation with the Dean of specialty will assign topics of audits to each group.
10. The clinical audits completed in groups will be published as Annual Audit Reports of the departments under supervision of HOD's.
11. The presentation of clinical audit in weekly Clinico-pathological conferences (CPC) of the University, will also be supervised by HOD's.
12. The contribution of the trainees in execution and publication of clinical audit will also be qualitatively assessed by the head of departments.
13. Once the trainee finalizes research question and topic in mutual understanding with supervisor, the HOD will also be handed over the selected topic by the trainee who in consultation with the Dean of the specialty will confirm for non duplication of the topic in the department.
14. HOD will also ensure the feasibility and availability of resources during second year of research training of the trainees of RMU, before initiation of the research project.
15. The trainee should submit final draft of dissertation to the head of department till end of fifth month of year for final modifications and the Head of Department will also provide his /her feedback within 10-15 days.

16. The HOD will receive a copy of final dissertation by the trainee during fourth year of research training that will be kept by him/her as a confidential document in order to avoid any potential risk of plagiarism.
17. In case the research paper/s of the trainees is/are approved by the target journals, the office of HOD trainee will also receive a copy of the letter of acceptance/s and when the original article will be published in journal/s, even then the trainee will submit hard and soft copies of the original journal with his/her published articles to HOD.
18. All the Head of Departments along with other staff members of Office of Research Innovation & Commercialization of RMU will keep vigilant and continuous monitoring of all the research activities of each trainee.
19. The HOD will monthly check and endorse the sections of research in Structured Log books of trainees and also section of Research in portfolio record of the trainees specific to research component of the training.
20. The HOD will also endorse the attendance of the trainees in the Journal club sessions of the department in the log books along with his/her quantitative and/or qualitative assessment of the trainees' active participation and/or presentation during the journal club session. HOD will also endorse the information whether any question or comment was raised by the trainee during each journal club session or not. The Heads of department will observe the log books for assessments of facilitators of short courses during third year of research training and their comments regarding the home tasks/assignments apart from the remarks of supervisor regarding his/her opinion regarding the trainee's overall performance during third year of training.
21. In case of any deficiencies or weaknesses, HOD will personally call the trainee and supervisor and will guide them how to correct or improve accordingly.
22. The research course of the trainees will also be evaluated by the HOD's through end of sessions forms and then collectively through end of course feedback forms.
23. The HODs will also be members of the quality evaluation team of research training course and will vigilantly and equitably observe and evaluate all the documented records and materials during the course and finally by the end of each course year for quality assessment.
24. They will also make surprise visits at any random occasion, without any prior information to the trainees and trainers, individually or in team.
25. HODs will also attend the annual meeting quality assessment and enhancement where they along with other participants will actively review and discuss all the evaluation material. And will also share their experiences of evaluation visits and observations to validate the existing materials.

F. THE DIRECTOR OF OFFICE OF RESEARCH INNOVATION AND COMMERCIALIZATION (ORIC):

1. The Director ORIC (Office of Research Commercialization and Innovation) of RMU will conduct an orientation session or an introductory session of one-hour duration along with Deputy Directors of ORIC at the commencement of first research training year of all post graduate trainees of RMU. During the session, the Director will make trainees acquainted to the complete research course of four years'

post graduate training, its schedule of all scholarly and academic activities and the assessment procedures. He/she will also introduce the model of research at RMU, organizational structure of ORIC and all requisites of training along with introduction to the staff members of ORIC who will be involved in their training.

2. The Director ORIC will take few research training sessions of research workshops during first two training years (R-Y1 & R-Y2) that will comprise of didactic lecture followed by taking exercises and then also be responsible for giving and checking the home task assignments (if any) related to session.
3. During the third year of training the Director ORIC will conduct few of short refresher courses/workshops along with other staff members of Office of Research Innovation and commercialization. For the specific course, Director will have to carry out a 20-25 minutes' power-point presentation to restore the memories of the trainees regarding the previous knowledge attained by them in R-Y1 and R-Y2. The director ORIC will also facilitate the individual or groups exercises of trainees in the training session following the presentation and also check the take home assignments.
4. Director at the Office of Research Innovation & Commercialization of RMU will keep vigilant and continuous monitoring of all the academic activities of each trainee related to Research courses.
5. Director of ORIC will check the research portfolio of the trainee and will endorse it.
6. Based on his/her observations, the completeness and quality of performance of each trainee will be evaluated and in case of any deficiencies or weaknesses he/she will personally call the trainee and supervisor and will guide them how to correct or improve accordingly.
7. Director ORIC will supervise the formulation of evaluation report of the research training course and after its endorsement will send it to all concerned departments and stake holders. The director ORIC will also be responsible for submission of the evaluation content to the Quality Enhancement Cell (QEC) of RMU for internal evaluation and external evaluation.
8. The Director will also be member of the quality evaluation team of research training course and will also evaluate all the documented records and materials during the course and finally by the end of each course year for quality assessment.
9. Like all other members of Quality evaluation team, the director will also have the right to make a surprise visit at random individually or in team. The evaluation will include not only physical observation of the materials but the evaluators may also make a visit to observe any proceedings or activities of the research course e.g. a lecture, a group exercise, a journal club session and/or an IREF meeting.
10. The Director will attend the annual meeting quality assessment and enhancement where he/she will actively review and discuss all available material of training course will also share his/her experience of evaluation visits and observations to validate the existing materials.
11. The Director of ORIC will supervise the rotations of the MD/MS trainees during each training year and will ensure their maximum participation and their utmost facilitation. In case of switching or swapping the batch by the trainees due to any absence or leave or any other justifiable issue, Director ORIC will

have the final right of decision and awarding writing permissions. Director ORIC will also reformulate the batches of rotation from second year of training onwards with an attempt to create homogeneity in the batches based on the study designs.

12. The trainees who will opt for publication of research papers to journals will submit copy of submitted papers to Director of ORIC who will check and keep them secured in records as confidential documents.
13. The Director will receive a copy of dissertation of the trainee for record as a confidential document in order to avoid potential risk of plagiarism.

G. THE DEPUTY DIRECTORS OF OFFICE OF RESEARCH INNOVATION AND COMMERCIALIZATION (ORIC):

1. The Deputy Directors ORIC (Office of Research Commercialization and Innovation) of RMU, along with Deputy Director and other staff members of ORIC will conduct an orientation/introductory session of one-hour duration at the initiation of first research training year of all post graduate trainees of RMU. The Deputy Directors will provide introduction to trainees regarding the research course of four years' post graduate training, its schedule of all scholarly and academic activities and the assessment

- procedures. They will also inform the trainees organizational structure of ORIC and all requisites of training along with introduction to the staff members of ORIC who will be involved in their training.
2. The Deputy directors ORIC will take research training sessions of workshops first two training years (R-Y1 & R-Y2) that will comprise of didactic lecture followed by taking exercises and then also be responsible for giving and checking the home task assignments (if any) related to session.
 3. The submitted record and scores of trainees attained for the individual and group assignments during first two training years will be endorsed by the Deputy Directors of ORIC.
 4. During the third year of training the Deputy Directors ORIC will conduct a few of short refresher courses/workshops. For the specific course, they will have to carry out a 20-25 minutes' power-point presentation to restore the memories of the trainees regarding the previous knowledge attained by them in R-Y1 and R-Y2. In addition, they will also facilitate the individual or groups exercises of trainees in the training session following the presentation and will also check the take home assignments.
 5. The submitted record and scores of trainees attained for the individual and group assignments of the short training courses of third year of training will also be endorsed by the Deputy Directors of ORIC.
 6. The research course will be evaluated by the deputy directors of ORIC too through end of sessions forms and then collectively through end of course feedback forms.
 7. During these first three months of R-Y2, the Deputy Directors at the ORIC will provide consultation to the trainees regarding feasibility of their research questions and will be advised if any modification required.
 8. The deputy directors will be continuously involved in an alert and continuous monitoring of all the scholarly activities of each trainee.
 9. The structured Research component of Log books and Research portfolio of the trainees specific to research component of all the training years R-Y1 to R-Y4 will also be regularly observed, monitored and endorsed by the Deputy Directors of ORIC. Based on his/her observations, the completeness and quality of performance of each trainee will be evaluated and in case of any deficiencies or weaknesses he/she will personally call the trainee and supervisor and will guide them how to correct or improve accordingly.
 10. The Deputy Director will also monitor the submission of the evaluation content to all including a copy to the Quality Enhancement Cell (QEC) of RMU for internal evaluation.

**H. THE RESEARCH ASSOCIATES OF OFFICE OF RESEARCH INNOVATION
AND COMMERCIALIZATION (ORIC):**

1. The Research Associates of ORIC (Office of Research Commercialization and Innovation) of RMU, along with Deputy Director and other staff members of ORIC will facilitate the orientation/introductory session of one-hour duration at the initiation of first research training year of all post graduate trainees of RMU.

2. The Research Associates will take few research training sessions of workshops during first two training years (R-Y1 & R-Y2) that will comprise of didactic lecture followed by taking exercises and then also be responsible for giving and checking the home task assignments (if any) related to session.
3. The Research Associates will also be present and will be actively involved in facilitation of all the training sessions that will be taken by Director, Deputy Directors or guest facilitators. They will actively facilitate the individual and group works of the trainees during the sessions.
4. The Research Associates will be responsible for record keeping of the post graduate trainees regarding the training sessions and the records and scores of trainees for the individual and group assignments during all four training years that will also be endorsed by the Deputy Directors of ORIC. They will not only collate the record at the ORIC in computerized versions as well as in the form of hard copies. The Research Associates will also fill in the record in research sections of the log books relevant to the training sessions and other relevant activities that will be supervised by them.
5. During the third year of training, the Research Associates will also be present in the short refresher courses/workshops for facilitating the Director, Deputy Directors or guest facilitators. They will actively facilitate the individual and group works of the trainees during the workshops.
6. During the first three months of R-Y2, the Research Associates at the ORIC will provide consultation to the trainees regarding feasibility of their research questions and will advise trainees if any modification required.
7. Once the trainee gets the approval of the topic/s from all concerned authorities during R-Y2 and will initiate the formal write up of proposal/s, the research associates of ORIC will guide them regarding the research methodologies.
8. The research associates of ORIC will also ensure that the duration of research project should be adequate and realistic so that trainees will be able to complete their project/s timely during training leaving enough time for its write up.
9. The research associates of ORIC will also guide the trainees regarding the research formulation of data collection tools, their pre-testing and execution of data collection phase
10. Trainees will be individually provided an updated step wise guidance by the research associates of ORIC, regarding submission of their synopsis to IREF for appraisal. They will be supervised by Research Associates regarding how to access the RMU website, to download the application Performa and then how to electronically fill it in for final submission. They will also be provided updated format of presentation by the Research Associates for their Research Proposal presentations at IREF meetings.
11. The record of the trainees regarding timely completion and quality of each activity related to completion of research proposals and its presentation in the monthly meeting of the Institutional Research Ethics Forum (IREF) of RMU will also be part of the Log Book that will be entered by the research associates of ORIC and conveners of the IREF and BASR.

12. As soon as the year four of training commences, these trainees should complete the introduction and literature review sections of their dissertations along with proper referencing during first three months of R-Y4 and the Research Associates will also guide them along with the supervisors and the publication in charge at the ORIC.
13. While the dissertations will be under review by the degree awarding authority for acceptance, the trainees will be continuously guided by the supervisor and the research associates at ORIC regarding defense of their dissertation. They will be guided how to make effective presentations according to the format provided by the examination authorities and also how to successfully and confidently respond to the queries of examiners.
14. In case the dissertation is sent back with recommended corrections or modifications, research associates at ORIC will guide the trainee along with supervisor on urgent basis to get it rectified and resubmitted within at least 10 days' time.

I. THE PUBLICATION IN CHARGE OF OFFICE OF RESEARCH INNOVATION AND COMMERCIALIZATION (ORIC):

1. The Publication in charge will be actively involved in the Research training course and for the academic sessions relevant to literature search, review and write up, he/she will take didactic lectures, followed by facilitating individual and group exercises and checking of relevant home tasks and assignments.
2. The post graduate trainees and MD scholars submit a copy of their finalized research proposal/s for the dissertation/research papers to the publication in charge of ORIC who will review for plagiarism through turn-it-in soft ware. Any proposal that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission. Only when the eligible scores will be reached, then the publication in charge will approve and the proposal will be further processed.
3. The publication in charge of ORIC will also guide the trainees to write the literature review sections and the section of “Discussion” based on the comparison of the findings of their study with the previously available research nationally as well as internationally.
4. The final research papers/dissertations of trainees will also be reviewed by publication in charge of ORIC for plagiarism through turn-it-in soft ware. Any article that will have originality score less than 90% or similarity index more than 10% will be returned back to trainees for rephrasing and resubmission. Only when the eligible scores will be reached, then the trainee will be allowed to proceed further and to submit their research in the form of original articles under continuous assistance of Publication unit of ORIC.
5. In case the research paper/s of trainees is/are sent back with recommended corrections or modifications publication in charge along with the supervisor and concerned facilitators at ORIC will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days’ time.
6. In case any of the paper of trainee is refused publication by a journal then the publication unit at ORIC along with the supervisor and concerned facilitators at ORIC will assist the trainee on urgent basis, to get it rectified and resubmitted to another target journal of choice within next 10 days’ time and not delaying it all.

J. THE STATISTICIANS AT DATA ANALYSIS UNIT OF OFFICE OF RESEARCH INNOVATION AND COMMERCIALIZATION (ORIC):

1. The statisticians at the Data Analysis Unit of ORIC at data analysis centre of ORIC will also be actively involved in the Research training course specifically those of Basic and advanced Biostatistics and

Epidemiological concepts. The statisticians will take didactic lectures, followed by facilitating individual and group exercises and checking of relevant home tasks and assignments.

2. The statisticians will facilitate the trainees in sample size calculation through sample size calculators according to their study designs.
3. Trainees will also be assisted by the statisticians in planning the Data analysis for the research projects and also data coding, cleaning and sorting accordingly.
4. The statisticians will facilitate the trainees in formulation of the data entry sheets in SPSS or other data analysis soft wares and will be continuously assisted in the process till data entry is completed.
5. The trainees will perform the data analysis of their research projects for research papers or dissertations, under continuous guidance and supervision of the statisticians who will also guide them how to interpret analyzed files and to write up results in textual forms, tabulated versions or figures/graphs.
6. In case the research paper/s or dissertation/s of trainees is/are sent back with recommended corrections or modifications in results section then the statisticians along with the supervisor, publication in charge and concerned facilitators at ORIC will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days' time.

K. STAFF OF DEPARTMENT OF MEDICAL EDUCATION:

1. The quality evaluation team of research training course will include Director of Department of Medical Education who may pay random visits for physical observation of the proceedings and materials of all the research related activities of the trainees and supervisors for quality assessment and assurance.

2. The Director DME will also attend the annual meeting of Quality assurance, by end of each research training year and will also share his/her experiences of evaluation visits and observations to validate the existing materials.
3. The demonstrator at the DME will keep record of attendances of all the post graduate trainees and MD scholars for all the academic sessions attended by them regarding the research training course along with the record of all assessments, scores, marks of annual papers. They will monitor the log books and research portfolio for the completeness and regularity too. The record will not only be kept and maintained at DME as hard copies as well as computerized version, but they will also regularly share records with ORIC and Quality enhancement cells of RMU.

L. THE SUPERVISOR OF THE TRAINEE FOR THE DISSERTATION PROJECT

1. The supervisor of the trainee must be nominated within first six months of the research training. The Dean of the specialty will decide the nomination of the supervisor for the post graduate trainee as well as MD scholars. In this regards a meeting will be held that will be attended by all heads of the

- departments and the Dean. The list of all the first year trainees and the available supervisors in each department will be presented by respective heads of each department in meeting. All of the eligible trainees and supervisors will also be around for brief interviews during the meeting. The supervisor for the trainee will be nominated based on the level of performance, talent, personality and temperament of both the trainees and the supervisors by the HOD. If the supervisor will also be willing to happily supervise the trainee, then the Dean will finally approve the nomination, apart from other requirements.
2. After finalization of nominations a letter of agreement of supervision will be submitted by the trainee to the office of Dean, including consent and endorsement of both trainee and the internal and/or external supervisor, with copies to HOD, ORIC and BASR.
 3. The supervisor will be bound to meet with the trainee, on weekly basis exclusively for research activity and will document the activity performed during the meeting in the log book along with endorsement.
 4. During ninth month of training year 1; R-Y1 the supervisor/s will supervise trainees together in groups and will undertake clinical audit on various aspects of the department as a project assignment, on one topic assigned to each group by the Dean and Heads of Departments. The contribution of the post graduate trainees'/ MD trainees in audits will be qualitatively assessed by the supervisors and the head of departments.
 5. The supervisor will keep vigilant and continuous monitoring of all the research related academic activities of each trainee.
 6. The supervisors will provide their feedback through structured and anonymous feedback forms/questionnaire, including closed and partially closed questions that will be regularly provided by them. They will provide their inputs and opinions regarding effectiveness of the course contents, curriculum, teaching methodologies, teaching aids and technologies, content and usefulness of the exercises and assessments etc.
 7. One Focus group discussion of supervisors will also be organized by the ORIC to evaluate the research course, its benefits and weaknesses and scope for improvement, each year.
 8. The supervisor will keep a close and continuous check on the Log books, Research portfolio of the trainee and will endorse it regularly. Based on his/her observations, the supervisor will evaluate the performance of the trainee and will discuss it in monthly meeting with the Head of Department or Dean of the specialty if required.
 9. The supervisor will not only guide and facilitate the trainee in preparation of presentation of Journal Club but will also ensure that trainees should actively participate in question & answer session of the journal club meeting and will also ensure the attendance of the trainees in Journal club as per set requirements.
 10. During these first three months of R-Y2, supervisor will guide and supervise the trainee to do extensive review of the literature, relevant to topic and finalize the research question/s and research topic/s with mutual understanding and will submit the selected topic to the Head of Department and Dean of specialty.

11. The supervisor will facilitate the trainee at every step, the formal write up of research proposal/s in consultation with the research associates of ORIC for guidance in methodology. The research proposal should be completed in eighth month of R-Y2 and should also be reviewed and finalized by the Supervisor of the trainees.
12. The trainees should formulate all the data collection tools under guidance of supervisor and should also pretest to finalize all the data collection tools for their research projects.
13. The supervisors will also ensure that the duration of research project should be adequate and realistic so that trainees will be able to complete their project/s during third year of training leaving enough time for its write up during year 4 of training. The supervisor will also consult the Dean and HOD's in ensuring the feasibility and availability of resources of a trainee during second year of training.
14. The supervisor will help the trainee to make a five to ten minutes' presentation through power-point at Institutional Research Ethics Forum during 9-10 months of R-Y2. By the end of presentation, the supervisor will facilitate in defense of the proposal.
15. During first quarter of year 3, it will be mandatory for the trainees to initiate the data collection phase of their project/s under continuous guidance of their supervisors. In case the data collection will require more human resources, other than trainee himself/herself, the supervisor will ensure that the additional data collection staff will be adequate in number within data within the time framework and should also make sure that they will be proficient enough to collect high quality and authentic data.
16. The data storage will also be finalized by trainee under the guidance of Supervisor and research center of specialty.
17. Whether the trainee is opting for dissertation writing or research paper publication, the supervisor will ensure that every step and procedure is being followed effectively and timely meeting all set requirements as per standard operational procedures.
18. The supervisor will actively assist the trainee in write up of dissertation/ research papers.
19. The trainee should submit final draft of dissertation to the supervisor till end of fifth month of year 4 for final modifications. Since the supervisor will be incessantly involved in every aspect of the project since the beginning and will be persistently guiding the procedure, so he/she should not take more than 10 days to give final review to dissertation of the trainee with written feedback that will be entered in a structured performa with recommendations for improvement or corrections.
20. In case the dissertation or research paper/s is/are sent back with recommended corrections or modifications, the supervisor will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days' time. In case any of the paper is refused publication by a journal even then the supervisor will assist the trainee on urgent basis, to get it rectified and resubmitted to another target journal of choice within next 10 days' time and not delaying it all.
21. In case the research paper/s is/are sent back with recommended corrections or modifications, the supervisor will assist the trainee on urgent basis to get it rectified and resubmitted within next 10 days'

time. In case any of the paper is refused publication by a journal even then the supervisor and publication unit at ORIC will assist the trainee on urgent basis, to get it rectified and resubmitted to another target journal of choice within next 10 days' time and not delaying it all.

22. While the dissertations will be under review by the degree awarding authority for acceptance, the trainees will be continuously guided by the supervisor regarding defense of their dissertation. They will be guided how to make effective presentations according to the format provided by the examination authorities and also how to successfully and confidently respond to the queries of examiners.

