King George's Medical University, U.P. Lucknow (UP), India

Post MD-Ph.D. A Super-Specialty Program

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1. Introduction

Post MD-Ph.D. program, a super-specialty program, has been initiated at King George's Medical University, U.P., (KGMU) primarily in specialties where there is currently no super specialty degree program. This is based on the following observations and premises:

a. Clinical work is overwhelming in basic clinical subjects. With no protected time for research and academic pursuits, 'academicians' as well as residents are not trained to deliver state of art research or produce and synthesize knowledge.
b. Most of the research work done as thesis and subsequently is repetitive and thus not adding to knowledge.
c. Most of research in medical institutions is not collaborative. There is thus minimum challenge to innovate and improve. Hence the quality of work is often compromised.
d. The quality of medical education is directly linked with the quality of research done within an institution. Therefore, to improve medical education, the basic mandate of medical colleges and universities, there is a need to protect and promote quality research.
e. The quality of patient care is directly linked with the quality of medical research and education imparted within an institution. Hence to improve patient care we have to improve research work done within it.
f. By integrating research ethos in the post-graduate program from inception the quality of training is likely to improve and the resultant product would be a professional with an analytical mind who is at par with products of other competitive technical institutions.
g. Since the drive to excel must be inherent in the culture of a university, King George's Medical University, U.P. will take a lead role in improving medical education through creation of post MD-PhD and create a new breed of medical professionals with cross-disciplinary skills.

This super specialty program has been initiated in accordance to recommendations of the Indian Council of Medical Research (ICMR) to promote state- of- the art interdisciplinary research and to mentor scholars their area of specialization. Cross-disciplinary collaboration with other institutions will be essential and promoted to develop diverse skills. In addition, these candidates will be trained in essentials areas like clinical research methodology, bio-

statistics, diagnostics, medical education techniques, scientific communication and writing skills, critical appraisal computer use, etc. This will ensure general proficiency in research and bio-informatics thereby ensuring quality and increasing likelihood of their pursuing a successful career in bio-medical research as well as create a special breed of academic researchers for improving quality of medical education. KGMU has therefore taken the lead in establishing post MD-PhD super specialty program and envisages linkages with premier technical institutions, like Indian Institute of Technology, Kanpur (IIT-K). This will create a new breed of physicians, which have unique exposure and training in engineering disciples and thus equipped to work in medical as well as engineering environments.

Successful candidates will be awarded the super specialty degree of "DOCTOR OF PHILOSOPHY" from KING GEORGE'S MEDICAL UNIVERSITY, U.P. The title of PhD thesis will also be mentioned in the degree. The university will ensure that outputs of Post MD-PhD program are original works of excellence leading to discovery of new facts in science or evolution of fresh approach towards the interpretation of existing facts. This document lists the rules and regulations for the Post MD-PhD program at the university. These can be reviewed and modified from the time to time in the interest of the program.

2. Subjects:

Any Department that is recognized for post-graduate training program or super-specialty training program and confers MD/MS/M.Ch./D.M. degree, and is equipped to carry out research work can register a Post MD-Ph.D. candidate under a KGMU faculty who will guide the work in any basic and/or clinical medical sciences in collaboration with a guide from a collaborating institution, like IIT-K. The KGMU guide, however, will have to seek approval from the University.

3. Eligibility Criteria:

3.a. For candidates:

3.a.1. To register in the Post MD-PhD program**,** a MBBS and either MD or MS or equivalent examination as per MCI norms are essential, with a good academic record. For each attempt 2% marks will be reduced from the subject specific passing marks.

3.a.2. Financial assistance will be given to the candidate by the University as per the existing norms.

3.a.3. It will be a full time teaching program. Candidates will not be allowed private practice of any kind during the tenure.

3.a.4. Candidates will sign a bond for completion of Course. Leaving the course in the mid way may involve recovery of salary and a fine upto Rs. 2 lacs based on the decision of the Doctoral Committee which will be appointed for each Post MD-PhD candidate. The appealent (Post MD-PhD candidate) can request the Vice Chancellor, KGMU for review of the decision of the Doctoral Committee.

3.a.5. Candidates will have to obtain No Objection certificate from the University prior to applying for any post/employment/official document/academic courses and the like.

3.a.6. Candidates who get a permanent employment after completion of 2 years of Post MD-PhD program can continue their PhD work as non-residential candidates for a minimum of one year and thereafter submit their PhD thesis, after fulfilling all the requirements, only after approval from the Vice Chancellor on a case-to-case basis. Candidates who do not submit their thesis within 5 years after registration will be removed, unless the annual review committee recommends otherwise (see section 4.2). This will be treated at par with leaving the course (under section 3.a.4) and will involve recovery of salary and a fine of Rs. 2 lacs.

3.b. For the registration of KGMU guides:

3.b.1. For a KGMU faculty to register as a guide for a Post MD-PhD candidate, s/he must have a minimum of 15 years of teaching and research experience post MD/ MS. This must include a minimum 10 years of PG teaching experience.

3.b.2. It is necessary that the guide be currently involved in research with ongoing research project/s through extramural funding. Preference will be given to faculties who have collaborative research projects with cross-disciplinary institutions.

3.b.3. The guide must have a proven research track record, with at least 15 publications in indexed, peer- reviewed journals, out of which at least 2 are within last 5 years.

3.b.4. Preference as Post MD-PhD guides will be given to faculty with reputed, recognized national awards/citations for research by ICMR, MCI, Govt of India, DST, INSA etc.

3.b.5. Only one candidate per year can be enrolled under each guide.

3.b.6. Either the guide or the co-guide from KGMU and likewise from collaborating institution must have at least five years of service before superannuation, respectively. After superannuation of the guide the co-guide will automatically take his/her place. .

3.b.7. Ordinarily, a guide with registered candidate will not be entitled for long leave of more than three months. In exceptional cases the Dean can permit long leave if the co-guide certifies in writing that he/she will substitute for the guide and not take long leave during that period.

3.b.8. In exceptional cases where both Guide and Co-guide have to avail long leave of more than 3 months or cease to be the faculty of KGMU the candidate may request the Head Department of Medical Education to allot him/her an alternative guide from the same department. Based on recommendation of the Head Department of Medical Education, the Dean/Vice Chancellor can permit a change of Guide.

3.b.9. Faculty guides will be selected competitively from potential faculty applicants to match the interests and preferred choice of the candidate by the Post MD-PhD Guide Allocation Committee. The members will be:

1) Vice Chancellor or nominee
2) Director – Collaborating institution (for example, IIT –K) or nominee
3) Dean
4) Head, Department of Medical Education (Convener)
5) Two external scientists of eminence on recommendations of the Vice Chancellor

3.c. For the registration of External guides:

3.c.1. Since Post MD-PhD program will involve work in external institutions like IIT, it is preferable that there be an external guide. The rules and regulations of the parent institution will be applicable to him/her.

4. Duration of the post M.D.-Ph.D. program:

4.1. Ordinarily the Post MD-PhD program will be for a minimum period of three years from the date of registration.

4.2. Candidates who do not submit their thesis within 5 years after registration will be removed, unless the annual review committee recommends otherwise. This will be treated at par with leaving the course (under section 3.a.4) and will involve recovery of salary and a fine of Rs. 2 lacs.

5. Quality assurance Procedures:

5.a.1: Doctoral Committee:

For close, continuous monitoring over the Post MD-PhD candidates, there will be a Doctoral Committee for each candidate. It will consist of:

1. One Expert (National) External
2. Two Experts Internal

} To be selected from a list of 5 potential candidates (provided by the Guide & Co-Guide), in each category after Vice Chancellor's approval

3. Head of Concerned Department
4. Guide, KGMU
5. Co-Guide, KGMU

5.a.2: Selection process: Separate all India Selection Procedure

Since Post MD-PhD is a super-specialty program, admissions will follow the norms of super-specialty courses. It is preferred that the medical university follows a separate admission procedure, in conjunction with major collaborating institution like IIT-K, Merit determination would include assessment of

a. Diligence – through MBBS marks and performance in postgraduate examination (25% marks)
b. Reasoning and mathematical skills – through conduct of written test (50% marks)
c. Research aptitude – through viva-voce (25% marks)

An institutional selection committee will be constituted for assessing research aptitude. The members will be

1) Vice Chancellor or nominee
2) Director – Collaborating institution (for example, IIT –K) or nominee
3) Dean
4) Head, Department of Medical Education (Convener)
5) Two external scientists of eminence on recommendations of the Vice Chancellor
6) Director-General ICMR or nominee

Thereafter, KGMU will register the candidate for MD-Ph.D program

5.b. Review Committee:

An annual institutional review committee will evaluate the progress of on-going Post MD-PhD works for their adequacy and scientific merit. It will consist of

1) Vice Chancellor or nominee
2) Dean

3) Head, Department of Medical Education (Convener)
4) Director – Collaborating institution (for example, IIT –K) or nominee
5) Heads of the department of concerned or allied specialties (Maximum 3)
6) Director-General ICMR or nominee
7) External scientist/s of eminence (Nominee of the Vice – Chancellor)

5.c. Courses:

This is a primary research program. During this, academic courses, essential as well elective, will have to be taken in KGMU and collaborating institution. The guides will decide the essential and elective courses. In addition, the Post MD-PhD scholars will be involved with under-graduate and post graduate teaching, in fixed proportion of their time, that is about 12 hours a month, as well as facilitating scholarly activities as well as writing for competitive grants.

Year	Essential Courses	Elective Courses
1	*Courses:* A. Clinical Research Methodology & Protocol Development B. Medical Ethics (Basic) C. Biostatistics (Preliminary) D. Bio-Computing (Preliminary) E. Diagnostic research methodology	*To be identified by guide and scholar (at least two)*
2	F. Medical Education G. Medical Communication (Verbal and written) H. Essentials of Management I. Qualitative Research Methodology (Preliminary)	*To be identified by guide and scholar (at least one)*
3		*To be identified by guide and scholar (at least one)*

To ensure a separate tract for the Post MD-PhD candidates their administrative coordination will be done through the Research Cell.

Essential Subjects will include

a. Clinical Research Methodology
b. Bio-statistics (Preliminary)
c. Diagnostic research methodology
d. Bio-Computing (Preliminary)
e. Medical Communication (Verbal and written)
f. Qualitative Research Methodology
g. Medical Education
h. Essentials of Management
i. Medical Ethics (Basic)

The candidate has to obtain 50% marks (combining marks of viva voce and written examination) to pass each essential subject. There will be 2 internal and 2 external examiners, selected on the recommendations of the Vice Chancellor for this. Semester system will be followed for examination.

Elective subjects can include some of the following and other allied subjects:

1. Advanced Bio-statistics
2. Advanced Computing
3. Genetics
4. Molecular diagnostics
5. Health Economics
6. Animal Experimentations
7. Medical Ethics and Medico-Legal Issues
8. Bio-informatics
9. Biological Sciences

5.d. Ethical Clearances:

Post MD-PhD research work will only be conducted after approval from the institutional ethics committee. All national norms for bio-medical research and research work on animals will be followed.

5.e. Published research work:

Before submission of Post MD-PhD thesis it is essential for the candidate to have 3 papers, either published or accepted for publication in peer reviewed indexed journals with his/her name as the first or second author.

6. Evaluation procedures:

After completion of PhD work, candidate shall submit four printed copies of thesis in English, along with a summary of 2000 words, to the Research cell. Published matter may also be incorporated as part of thesis. Post MD-PhD guides and co-guides will give a written certificate stating that the thesis is the original work of candidate conducted under his/her supervision along with the duration of work.

PhD thesis will have external and internal evaluation. In addition, the candidate will defend the work at oral presentation.

6.c.i. External and internal evaluations for PhD component:

6.c.i.1. All completed works will be presented before the annual review committee. On approval of the review committee, the PhD thesis will be sent for external evaluation.

6.c.i.2. Guide will give in writing names of eight examiners (board of examiners) for external evaluation of thesis. Thesis will be sent for review to two external examiners.

6.c.i.3. Thesis guide will be the internal examiner for the PhD work.

6.c.i.4. The examiners (external and internal) have to make clear recommendations whether thesis can is accepted with or without modifications or rejected. Suggestions for modifications and reasons for rejection have to be submitted in writing.

6.c.i.5. If modifications are needed, candidate will revise the thesis accordingly and resubmit the revised version along with point-wise response to all suggestions. Four copies of the revived PhD thesis will be submitted and re-evaluated by 2 external and 1 internal (guide) examiner. The external examiners will ordinarily be the same who did the initial evaluation. However, if they are not available new external examiners can be selected from the board of examiners suggested by the guide.

6.c.i.6. In the event of divergence of opinion between the external examiners regarding the thesis, the thesis shall be sent for assessment to a fourth examiner appointed by the Vice chancellor out of the panel recommended by supervisor.

6.c.i.7. In case all the examiners approve the thesis, or in the event of divergence of opinion, the fourth examiner approves the thesis, the candidate shall be called upon to appear for a viva voce examination before a Board of two examiners comprising of the supervisor and one of the two external examiners, who have approved the thesis. The latter shall be named by the Vice Chancellor.

6.c.ii. Oral Defense

6.c.ii.1. Oral examination will be a centralized, open house affair held within the University campus at least twice a year with prior information to all departments. It will be open to all faculty and students of KGMU. Other individuals interested in attending this can do so with permission from the administrative office of the PhD program.

6.c.ii.2. Examination Committee will be constituted for the oral examination at least twice a year. It will consist of the following members:

(a) Vice-Chancellor or the nominee
(b) Scientist/s of eminence (if and when recommended by the Vice Chancellor)
(c) One external examiner for each thesis (preferably one who evaluated the thesis; if not available any other member from the examination board)
(d) Dean or the nominee
(e) Head, Department of Medical Education
(f) Guide or Co-guide from all the collaborating institutions

6.c.ii.3. The examination committee may form sub-committees internally for effective evaluation of research works of common interest. The examination committee will submit a written report either recommending or reasons for not recommending the award of PhD.

6.c.ii.4. If a candidate fails to defend thesis on oral examination, s/he will be allowed for one more attempt for defense at least 5 months after the first attempt.

7. Award of the degree:

A candidate will be eligible for the award of PhD degree on recommendation of the PhD examination committee. A provisional certificate can be given to the candidate from the Vice Chancellor' office after clearing the oral exams.

8. Hostel accommodation:

Hostel accommodation will be subject to availability and will be given only after the full payment of accommodation fee according to the existing norms.

9. Post MD-Ph.D. Program general administration:

All the administrative work related to the Post MD-Ph.D. program will be done at the **institutional research cell**. A staff at research cell will be entrusted with the responsibility of handling any work/papers related to the program. An application for appearing in the selection examination for candidates is attached as Annexure 2. Application of expression of interest of KGMU faculty to be guide is attached as Annexure 3. These will be distributed from the research cell or downloaded from KGMU web-site.

10. KGMU Post MD-PhD Calendar:

10.1 Applications will be invited by KGMU in a prescribed format through an advertisement in local notice boards, leading national newspapers and KGMU web-site in the month of February – April every year.

10.2 The annual calendar of Post MD-PhD activities will be as follows:

i.	Submission of forms:	Up to 15th March every year
ii.	Written & Oral examination:	1st Friday and Saturday of April every year
iii.	Guide Allocation Committee	Between 1- 14 Aug. every year
iv.	Date of Annual Review Committee:	Between 1- 15 March every year
v.	Dates of Examination Committee:	Between 1-14 Nov. every year & Between 15 – 30 April every year

11. Fee Structure

Processing Fees: *(for Candidates)*	Rs. 1500.00
Registration Fee*for Post MD-PhD candidate:	Rs. 10000.00
Hostel fees	As applicable
Examination fee**: *(to be deposited along with thesis)*	Rs. 10000.00

(*This can be deposited latest within 30 days of recommendation with late fees of Rs. 1000.00 after 7th day

** This fee will be charged for each attempt)

Application forms can be obtained from Research Cell, KGMU or downloaded from the KGMU web-site. Application forms can only be submitted with processing fees of Rs. 1500.00 submitted as demand draft in the name of *"KGMU- PhD Program A/c"* payable in Lucknow. Processing fees are non-refundable. Registration, annual renewal, academic courses and examination fees will only be submitted as demand drafts in the name of *"KGMU- PhD Program A/c"* payable in Lucknow.

12. Financial Support:

- Each selected candidate will receive ICMR fellowship s per Central Government norms (subjected to modification of budget from time to time by ICMR).
- In addition to above each candidate will receive a maximum contingency of Rs. 30,000.00 per annum.

13. Other rules: (e.g. leave, disciplinary action, cancellation of registration etc.)

13.1 Other rules will be as applicable to postgraduate students registered in super specialty courses of the University.

13.2 The candidates are eligible for maternity/paternity leave for a period of 135 days, once during the tenure in the program. Such leave period will be in addition to the period of award, if it exceeds the leaves permissible to post-graduates in the university.

13.3 The registration in Post MD-PhD program is liable to be cancelled in case of non-deposition of fees, misconduct, unsatisfactory progress of research work, absence from work without information or if the candidate is found ineligible at a later time.

Annexure 1

Syllabus for Post MD -PhD Essential Courses

Clinical Research Methodology

1. Development of a Research Question
2. Sharpening objectives - Identifying a problem
3. Evidence based medicine: the gap between evidence and practice
4. Research designs and Method Evaluation
5. Tools for data Collection and Questionnaire designing
6. Case studies and practical
7. Outcome measurements
8. Confounding and Bias
9. Molecular and Genetic Epidemiology
10. Survey Methods
11. Translational Research
12. Ethical Issues
13. Critical Review of published literature
14. Principles of Evidence Based Medicine
15. Essentials of Clinical Economics
16. Types of clinical economic analysis
17. Medical Decision Analysis

Bio-statistics (Preliminary)

1. Introduction & overview. Statistical pattern recognition
2. Descriptive statistics - Summarizing and displaying data
   (i) Basic concepts and jargon used to denote various features of a set of observations
   (ii) Distributions - Population Vs. Sample Random Vs. Selected Shapes
   (iii) Common summary statistics used to describe a single distribution
      (a) location: mean, median, mode
      (b) Variation: variance, standard deviation, range, interquartile range
   (iv) Methods of data display which preserve the raw numbers
   (v) Methods of data display which utilize summary statistics
3. Probability: The binomial and normal distributions

4. Sampling distribution: basic concepts and understanding the concept of a statistical test of significance including:
    - the null and alternative hypothesis
    - type I (alpha) and Type II (beta) errors
    - one and two sided tests
    - Confidence intervals
5. Sampling distributions - Computer simulation of clinical trial scenarios
6. Inference on means - Single sample
7. Inference on means - Comparing two groups.
8. Inference on Proportions - Binomial and normal approximation
9. Proportions - Diagnostic test risk, odds ratio and Kappa
10. Introduction to Linear Regressions:
11. Introduction to Multiple Regressions and Logistic Regression:
    Non-parametric tests:

Diagnostic research methodology

1. DNA structure and function
2. Basic lab techniques
3. Transformation
4. Electrophoresis
5. Restriction analysis
6. PCR and sequencing
7. Cultures
8. Cell Lines
9. Applications of molecular diagnostics
10. Principles of Pharmaco-dynamics
11. Basic Radio-imaging techniques
12. Bioinformatics
13. Bioethics
14. Virtual laboratories
15. Optional labs and activities

Bio-Computing (Preliminary)

1. Introduction to Personal Computer
2. Introduction to DOS

3. MS Office and Typing exercises
4. Questionnaire design
5. Data base
6. Computer graphics - charts, diagrams
7. Net surfing and literature search
8. Epi Info 2002, SAS and SPSS usage
9. Collection, storage, organization (documents - classification, cataloguing and indexing) and dissemination of information.
10. Informatics
11. Practical Exercises

Medical Communication (Verbal and written)

1. Principles of effective communication
2. Verbal and non-verbal communication
3. Analyzing communication
4. Principles of Communication: doctor-patient, doctor-staff and staff-patient relationships
5. Technical communication problems in the medical field
6. General overview of medical writing
7. Different medical writing environments
8. How to get started in medical writing
9. Good writing style
10. Presentations

Qualitative Research Methodology

1. Understand the nature of qualitative research procedures and how they compare to more traditional quantitative procedures (i.e., relative advantages/disadvantages of each approach);
2. Identify a number of different ways to collect qualitative data (i.e., individual/group interviewing; participant-observer journaling) and compare the relative tradeoffs of each approach;
3. Interviewing in Qualitative Research
4. Understand how to summarize, compile and report qualitative data, in both narrative and visual matrix or other graphic/tabular display formats;

5. Strategies for Qualitative Research
6. The quantification of qualitative research
7. Ethnographic experience
    - Philosophical traditions
    - Application of qualitative methods to evidence based health care

Using qualitative methods within evaluation research, action research, and case studies Methods

- Common data collection methods by methodology
- Approaches to data collection
- Data collection tools

Ethics in qualitative research

Qualitative data analysis

- Common approaches for different types of methodologies
- Strategies for presenting and describing data

Medical Education

1. Theory and practice of learning and teaching,
2. Curriculum Foundations
3. Principles and Practice of curriculum development (Example MCI)
4. Educational leadership: information management, Knowledge management
5. Program development and evaluation
6. Techniques of student and self-assessment
7. Techniques of Feedbacks
8. Principles of Counseling
9. Distance learning
10. Self directed learning
11. Group Teaching
12. Mentorship
13. Role Modeling
14. Peer Group activities
15. Peer support and assessment
16. Administrative and support services

Essentials of Management

1. Introduction to Managing and Management
2. The External Environment
3. Managerial Decision Making
4. Planning and Strategic Management
5. Ethics and Corporate Responsibility
6. International Management
7. New Ventures
8. Organization Structure
9. The Responsive Organization
10. Human Resource Management
11. Managing the Diverse Workforce
12. Leadership
13. Motivating for Performance
14. Managing Teams
15. Communicating
16. Managerial Control
17. Managing Technology and Innovation
18. Creating and Managing Change

Medical Ethics (Basic)

1. Introduction to Professional Ethics &Introduction to Medical Ethics
2. History and Development of Medical Ethics
3. Informed Consent
4. Good Clinical Practices
5. Good Laboratory Practices
6. The Role of Ethics in Clinical Medicine
7. The Clinical Importance of Patients' Rights
8. Ethical Issues in Human Reproduction, Stem Cell and Genetic Research
9. Issues in Professional Ethics:

   Physician-Assisted Dying; Managing Medical Mistakes