

“This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws No. 1 of 2016 and By-Laws No. 2 of 2016 for Degree of Doctor of Medicine(MD) and Board Certification as a Specialist”



**POSTGRADUATE INSTITUTE OF MEDICINE  
UNIVERSITY OF COLOMBO, SRI LANKA**

**PROSPECTUS**

**DOCTOR OF MEDICINE (MD)  
AND BOARD CERTIFICATION  
IN  
HEALTH INFORMATICS**

*(To be effective from the year 2015)*

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## 1. Name of the degree programme

### 1.1. Full title

Doctor of Medicine in Health Informatics

### 1.2. Abbreviated title

MD (Health Informatics)

### 1.3. University

University of Colombo

### 1.4. Faculty/Institute

Postgraduate Institute of Medicine (PGIM)

### 1.5. Board of Study:

Specialty Board in Biomedical Informatics of the Board of Study in Multidisciplinary Study Courses

## 2. Background and Justification/Introduction:

### 2.1. Background to the Programme

The PGIM, a national institute attached to the University of Colombo, is the only organization responsible for the specialist training of medical doctors in Sri Lanka. The PGIM works in close collaboration with the Ministry of Higher Education, the Ministry of Health and Faculties of Medicine of the Universities as well as with Professional Colleges. The PGIM is governed by a Board of Management. The academic programmes are planned and executed by 21 Boards of Study, including one in Multi-Disciplinary Study Courses. This Board of Study has 3 Speciality Boards, including that in Biomedical Informatics, set up in 2008. The Speciality Board in Biomedical Informatics currently oversees the conduct of an MSc in Biomedical Informatics.

Since the first batch of graduates of the MSc in Biomedical Informatics qualified and assumed duties as Medical Officers (Health Informatics)/Dental Surgeons (Health Informatics) in various institutions in the Ministry of Health in 2010, they have been responsible for a transformational change in the field of e-Health. The Ministry of Health recognised the immense contribution made by them and requested the PGIM to produce Specialists in the field with a view to creating future career prospects for them as Consultants/Specialists in the field and retaining their services for the benefit of Sri Lanka.

The MD Programme in Health Informatics aims to equip health professionals with knowledge, skills and attitudes required to function as a Specialist in Health Informatics. The course has been designed in a structured stepwise manner to develop participants' competencies at a range of levels. The programme will also enable participants to design, deliver and evaluate interventions related to Health Informatics by applying scientific research principles. In a nutshell, this course is tailor-made for medical professionals who will in the future spearhead Information

Communication Technology (ICT) transformation of the health care sector in Sri Lanka as Specialists in Health Informatics.

## **2.2. Justification**

The World Health Organization advocates that the use of e-health and m-health should be strategic, integrated and should support national health goals. In order to capitalize on the potential of ICTs, it will be critical to agree on standards and to ensure inter-operability of systems. Health Information Systems must comply with these standards at all levels, including systems used to capture patient data at the point of care. Common terminologies and minimum data sets should be agreed upon so that information can be collected consistently, easily shared and not misinterpreted. In addition, national policies on health data sharing should ensure that data protection, privacy and consent are managed consistently and unambiguously. If Sri Lanka is to achieve these goals, then there should be a group of specialists with knowledge of both health domain and the ICT sphere who can spearhead that process. This course of MD in Health Informatics aims to produce such specialists.

## **3. Eligibility for entry into the training programme**

Prospective applicants must satisfy the following requirements to be eligible to enter the training programme:

- a. MSc in Biomedical Informatics from the PGIM  
OR
- b. Any other Master's Degree deemed to be equivalent to the MSc in Biomedical Informatics of the PGIM by the Board of Study.  
AND
- c. A minimum of one year's experience as a Medical Officer/Dental Surgeon in Health Informatics in the state health sector or in case of non-state sector or foreign applicants, similar experience. The applicants should submit written evidence of experience to the Board of Study on a prescribed format for evaluation.  
AND
- d. Comply with any other general regulations of the PGIM relevant to selection of trainees.

## **4. MD Selection Examination**

The selection examination will consist of the following components.

### Written Examination:

The written examination will consist of two structured essay question papers.

*Paper 1* will be from the information and communication technology domain. It will be a two (2) hour structured essay question paper containing four (4) questions carrying 100 marks each. Each question will be marked by 2 independent examiners. This will contribute to 40% of the total marks.

*Paper 2* will be from the Health Domain. It will be a two (2) hour structured essay question paper containing four (4) questions carrying 100 marks each. Each question will be marked by 2 independent examiners. This will contribute to 40% of the total marks.

Oral Examination:

The Oral Examination will consist of a structured *viva voce* of 15 minutes duration carrying 200 marks and it will contribute to 20% of the total marks. This will be conducted by two examiners, who award marks independently.

Requirement to Pass the Selection Examination:

To qualify for selection, the candidate should obtain an overall mark of fifty per cent (50%) i.e. 500 out of 1000 marks or more. In addition the candidate should have obtained 40% or more in each of Paper 1, Paper 2 and *viva voce*.

## 5. Number to be Selected for Training

The number of training slots will be indicated by the PGIM in the Public Circular calling for applications for the MD in Health Informatics Selection Examination. The number of training slots will be pre-determined each year by the Board of Study in consultation with the Ministry of Health and approved by the Board of Management. This pre-determined number will be selected from those who have qualified for selection at the Selection Examination, in rank order of merit and in compliance with the General Regulations of the PGIM and relevant Examination Circulars.

## 6. Objectives

The overall objective of the MD Course is to develop knowledge skills and attitudes necessary to practice as a Specialist in Health Informatics in order to promote high quality and cost-effective health care delivery to the satisfaction of all stakeholders by facilitating efficient and effective use of health information using ICTs.

The qualification holder should be able to make judgments on complex issues in the field of Health Informatics and communicate his/her ideas, views and conclusions clearly and effectively to specialist and non-specialist groups. He/she should also be able to exercise personal judgment and assume responsibility even in unpredictable situations in the professional environment.

At the end of the training programme the trainee should be able to:

1. play a lead-role in strengthening Health Information Systems and Health Information Management.
2. plan and coordinate with all relevant stakeholders and function as the main focal point for activities related to Health Informatics.
3. provide expert guidance to design, develop, implement, monitor and evaluate health related ICT projects.

4. assess and evaluate health information processes of the organisations and internal as well as external information needs on an on-going basis, and
5. provide leadership for education and training of health care professionals in Health Informatics.
6. serve as a trainer in health informatics.

## 7. Structure of the Pre-MD Training Programme

The programme will be of two years' duration.

The programme would consist of:

- Assigned Local training,
- Structured Training Programme, and
- A Research Project leading to a Thesis

### 7.1. Assigned Local Training:

The trainees will be assigned to the following Training Units in rotation for the period specified. They will be assigned to a supervisor in the Training Unit during the training period.

- Health Information Unit, Ministry of Health – 3 months
- Medical Statistics Unit, Ministry of Health – 3 Months
- Provincial or Regional Department of Health Services – 3 months
- Family Health Bureau and Epidemiology Unit – 3 months
- Eight (8) Short Appointments of 1.5 months (six weeks) each from among the following:
  - A tertiary care hospital
  - A special campaign/programme
  - A medical laboratory
  - A department of radiology
  - A department engaged in telemedicine
  - A primary care clinic
  - Health Education Bureau
  - A Medical Education Department/Unit in an University
  - A health information systems/e-Health solutions developing centre
  - A private hospital
  - An international agency

A list of training units for short appointments and the number of positions approved by the Board of Study will be made available to the trainees at the commencement of the MD training programme.

The trainee may indicate in writing, the preference for a particular Training Unit. However, the final assignment to the Training Units will be the responsibility of the Board of Study, and will be done strictly on the rank order of merit at the selection examination.

During this period, the trainee should gain experience in general Health Informatics as required by a Consultant/Specialist. The trainee shall participate in all activities of the Training Unit under the supervision of the supervisor to whom he/she is attached and should be exposed to all areas of expertise/work experience within the Training Unit during the attachment. The supervisor will be responsible for overall supervision of the training programme with a focus on achieving the specified objectives.

### **Portfolio**

The trainee should maintain a record of the activities undertaken and the experience gained during the attachment in the form of a portfolio (Annexure I). This portfolio should reflect on the training and the evidence of reflection should be endorsed by the Supervisor of the trainee. The portfolio should be submitted to the Board of Study at the end of the attachment. It is the responsibility of the trainee to submit the duly completed portfolio on the date specified. The assessment of the trainee's portfolio will be carried out by two (2) independent examiners appointed by the Board of Study and approved by the Senate of the University of Colombo. The maintenance of satisfactory portfolio as judged by the Board of Study is a mandatory requirement as an eligibility criterion to sit the MD Examination. Where the level of reflection in the portfolio is found to be unsatisfactory, the trainee will have to repeat the relevant rotations and re-submit a revised section of the portfolio for approval by the Board of Study.

### **Attendance**

A duly completed record of attendance should be attached to the portfolio. This has to be counter-signed by the relevant Supervisors. Trainees will only be allowed a maximum of four weeks of overseas leave as approved by the Board of Study during the training period of two years. It is however mandatory for the trainees to maintain 80% or more attendance in each assigned local training appointment. If the trainee fails to do so, that appointment would have to be repeated prior to sitting the MD examination.

### **Final report**

The final report of the Supervisor at the end of each attachment should describe the achievements of the trainee under each of the specific objectives (see section 6 above) and certify that the trainee has satisfactorily completed the training component.

## **7.2. Structured Training Programme**

The trainees will have to participate in structured training sessions to be conducted at the PGIM or another designated location once a week. These sessions will be in relation to the content areas listed below:

- Information Literacy

- Health Informatics
- Health/Medical Statistics and Advanced Data Analysis
- Information Management
- Information System Governance and Management
- Information for Action in Health
- Information Technology Governance and Enterprise Architecture
- Health Communication
- Medical/Health Education Informatics
- Information Technology Laws and Regulations

The details of the structured training programme are in Annexure II.

### **7.3. Research Project**

The trainee shall prepare a thesis based on a research project. The trainee will be assigned to a supervisor/s from a central pool of supervisors by the Board of Study for the purpose of providing supervision for the research project. It is mandatory that the research project is completed before the MD and published in a peer reviewed journal before the pre board certification assessment.

The trainee should submit quarterly progress reports certified by the supervisor/s to the Board of Study, on a date specified by the Board of Study, on the progress of the research project (Annexure III).

It is mandatory that prior approval of the Project Proposal is obtained from the Board of Study **before embarking on the project**. The procedure of obtaining approval to proceed with the research project is stated below:

- (a) Pre-proposal: The trainee shall submit four copies of a pre-proposal prepared as per guidelines (Annexure IV) for approval by the Board of Study, preferably within 3 months of registering in the training programme. Maximum time period allowed to obtain approval for the pre-proposal is one year from the date of registration for the pre-MD training programme. Failure to do so will result in termination of candidate's enrolment in the training programme.

It is the responsibility of the trainee to consult and obtain guidance from the supervisor at all stages of the research project and in the preparation of the scientific paper for publication.

- (b) Once the pre-proposal is approved the trainee will proceed to develop the detailed Definitive Research Proposal in consultation with the supervisor/s. The detailed Definitive Research Proposal shall include the following:
- Title of research project
  - Justification of the study
  - General and specific objectives
  - Short literature review
  - Materials and methods



- Plan of implementation with timelines and deadlines
- Plans for data analysis with timelines and deadlines
- Budget with justification
- Source of funds
- Acknowledgements
- References

Three copies of the detailed Definitive Research Proposal shall be submitted to the Board of Study through the supervisor/s. Two independent referees appointed by the Board of Study will appraise the detailed proposal and submit their observations to the Board of Study with regard to the adequacy, feasibility and scientific quality of the project.

- (c) Once the Definitive Research Proposal is approved by the Board of Study, then the Board of Study will inform the trainee to obtain relevant ethical clearance. Once the relevant certification is obtained, the Board of Study will inform the trainee that the “detailed Definitive Research Proposal could serve as the basis for the MD research project”. If not he/she will have to re-submit the project after attending to the revisions suggested by the reviewers. The responsibility for conducting publishable research remains with the candidate and his/her supervisor.

By the end of the first year, the detailed proposal should either have been approved or been submitted for approval.

- (d) It is recommended that the thesis should contain minimum of 30,000 words (excluding references, annexes, appendices etc.). It should be typewritten using 1.5 spacing on good quality A4 size paper on one side only. A margin of not less than 40 mm. should be allowed on the left-hand side to facilitate binding. Margins of 20 mm should be allowed at the top, the right-hand side and the bottom. Chapter headings should be capitalized and centred while subdivision headings should be typed from the left-hand margin in lower case and in bold type. Tables and figures should be placed as close as possible to the part of the text to which they refer.

The contents of the thesis should be given under the following headings:

1. Title, author’s name and degrees
2. Abstract
3. Table of contents
4. List of tables
5. List of figures
6. Introduction
7. Objectives of Study (last section of the introduction)
8. Review of literature
9. Method

10. Results
11. Discussion (including possible limitations of the study)
12. Conclusions
13. Recommendations
14. Acknowledgements
15. References (Referencing style should be in Vancouver format)

Three (03) copies of the thesis, loose-bound in the first instance, should be submitted to the Director, PGIM on or before a prescribed date. Only the index number of the candidate should be included and not the candidate's name and degrees and acknowledgements in the first submission. The letter certifying the originality of the candidate's work and information pertaining to ethical clearance should be submitted through the supervisors and should be handed over separately. If the thesis is accepted following examination, it should be bound in hard cover with the author's name, degree and year printed in gold on the spine (bottom upwards). The cover should be in black. The front cover should carry the title on the top, the author's name in the centre and the year at the bottom printed in gold.

Three copies of the bound thesis should be submitted to the Director, PGIM within one month of release of the results; two copies shall be the property of the PGIM while the third copy will be returned to the candidate.

## **8. Learning Activities During Pre-MD Training:**

Specify learning activities that trainees are expected to engage in, apart from routine service in the training unit. This could include the following:

- Regular meetings with other units /departments
- Participation in Continuing Professional Development activities
- Participation in national/international meetings
- Conduct of audit(s)
- Engagement in the teaching and training of undergraduate and postgraduate students
- Maintaining a reflective portfolio (7.1 above and Annexure I)
- Participating in structured training sessions (7.2 above)
- Conduct of a research project (7.3 above and Annexure IV)

## **9. Supervisors and Training Units:**

The appointment of supervisors will be done by the Board of Study. It is the responsibility of the trainee to consult and obtain guidance from the supervisors at all stages of training, research project and in the preparation of the scientific paper for publication.

Specialists with at least 3 years experience after Board Certification or appropriate professional qualifications will be appointed as supervisors. Training Units must be accredited by the Board of Study as suitable for training in Health Informatics.

#### **10. Monitoring Progress:**

The Specialty Board will monitor the progress of the trainee based on the following:

- Portfolio maintained by the trainee.
- Quarterly Progress Reports on the research project.
- Quarterly Progress Reports from the Supervisor/s.

The Specialty Board shall appoint two members to review the portfolios and the quarterly reports of each trainee. They will report to the Specialty Board on the progress of the student.

#### **11. The MD Examination:**

The MD examination will be held at the end of the second year.

To be eligible to sit for the MD examination the trainee should fulfil the following requirements:

- Satisfactory progress in Assigned Local Training as specified in 7.1 above,
- 80% attendance as specified in 7.1 above,
- Certification by supervisors in all Training Units to which the trainee was attached that he/she has successfully completed training, and
- Submit a thesis as specified in Section 7.3 above

The MD examination will consist of:

- A written examination of three (03) hours duration, consisting of 4 essay questions (2 from the information and communication technology domain and 2 from the health domain) (each question carrying 100 marks; Total 400 marks).
- A *viva voce* examination by two examiners where the candidate would be expected to defend the thesis submitted by him/her (each examiner marking out of 200; total 400 marks) (Annexure V).
- A *viva voce* examination based on the reflective portfolio by two independent examiners (each examiner marking out of 100; total 200 marks) (Annexure I).

##### **A. Requirements to pass**

To be successful at the MD examination the trainee should obtain 50% (200/400) or more for the written examination, 50% (200/400) or more for the *viva voce* examination based on the thesis and 50% (100/200) or more for the *viva voce* examination based on the portfolio. The overall pass mark will be 50% (500/1000).

##### **B. Repeat attempts**

For those who are unsuccessful at the main examination, a repeat examination may be held not more than 6 months after the main examination date. Those who are unsuccessful at the repeat examination should take the next forthcoming immediate MD examination.

1. If a candidate fails in only the written examination, he/she is required to sit for the next available written examination.
2. If a candidate fails either in thesis or portfolio examination or both, the candidate is required to take the next available written examination together with the failed component/s.
  - 2.1 Candidates who have failed the thesis are required to re-submit a revised thesis incorporating the revisions suggested by the examiners.
  - 2.2 Candidates who have failed the portfolio are required to re-submit a revised portfolio correcting the deficiencies highlighted by the examiners.

### **C. The permitted number of attempts**

The permitted number of attempts is limited to a maximum of six attempts (including attempts at one or more exam components) within eight years from the date of the first attempt at the MD examination.

## **12. Post MD Training**

On successful completion of the MD, the trainee will undergo a period of one year supervised training locally and one year supervised training abroad. During this period the trainee will be attached to one or more Centres of Excellence approved by the Board of Study.

The trainee should submit the learning objectives of the local and overseas training programmes for prior approval by the Board of Study. It is also mandatory that the Head of the overseas training unit will furnish relevant information about the training institution including the facilities that will be made available to the trainee in terms of achieving the specified learning objectives to the Director, PGIM prior to the trainee taking up the position.

The overseas training centre and supervisor has to be approved by the Board of Study prior to the trainee embarking on training. If the overseas attachment is to more than one centre, the period of attachment to any one of the centres should be for a minimum of six months. The Board of Study may however approve a shorter period, which shall be not less than three months, only under certain compelling circumstances.

In exceptional circumstances the Board of Study may consider exemption of a candidate from supervised training abroad and permit this part of the training to be undertaken in one or more Centres of Excellence in Sri Lanka.

The trainee is required to maintain a portfolio (Annexure VI) and submit quarterly progress reports through the local and overseas supervisors. At the end of the training period the trainee has to submit a final report using the prescribed format together with the portfolio from the supervisor certifying that the trainee has satisfactorily completed the training.

The Board of Study will take the above reports into consideration in deciding whether the trainee has successfully completed the Post MD overseas training.

### **13. Eligibility for Pre Board Certification Assessment**

Upon completion of the prescribed period of post MD local and overseas training, and return to Sri Lanka, the trainee should apply to the PGIM for Board Certification in Health Informatics, together with documentary evidence of the work undertaken by him/her during the period of local and overseas training. The portfolio and other relevant documents shall be assessed by the Speciality Board for contribution to knowledge through research, or acquisition of new knowledge through teaching practice and participation in training programmes (Annexure VI).

### **14. Pre Board Certification Assessment**

The trainee is eligible for Pre Board Certification Assessment on completion of post MD local and overseas training.

The trainee who is eligible for Pre Board Certification Assessment should submit 3 copies of the completed portfolio to the Examinations Branch of the PGIM.

The assessment of the trainee's portfolio will be carried out by two (2) independent examiners appointed by the Board of Study and approved by the Senate of the University of Colombo. The trainee will be called for an oral examination during which he/she will be questioned on the portfolio. The trainee will be required to start with a presentation of 10 – 15 minutes, preferably on an audio-visual format, on the post-MD Training Programme.

The overall assessment will be based on each of the main sections, which will be assessed as satisfactory or not, on an overall basis. If the examiners are of the view that the trainee's performance is unsatisfactory, and that the trainee should not be given immediate Board Certification, the examiners shall provide the trainee with written feedback on how the portfolio should be improved in order to reach the required standard. The trainee should then re-submit the portfolio within a specified period of time (up to 3 – 6 months), and face another oral examination based on the re-submitted portfolio. If the trainee is successful at this 2nd oral examination, the date of Board Certification will be backdated as per the PGIM guidelines. If unsuccessful again, the date of Board Certification will be the date of passing the next (repeat) Pre Board Certification Assessment following further training for a minimum period of six months in a Unit assigned by the Specialty Board (Annexure VI).

### **15. Board Certification**

A trainee who has successfully completed the Pre Board Certification Assessment is eligible for Board Certification as a Specialist in Health Informatics, on the recommendation of the Board of Study.

### **16. Recommended reading**

Journals:

- Applied Clinical Informatics
- BMC Medical Imaging
- BMC Medical Informatics and Decision Making
- BMC Medical Research Methodology
- BMC Public Health
- BMC Emerging Themes in Epidemiology
- BMC Health Information Science and Systems
- BMC Health Research Policy and Systems
- BMC Population Health Metrics
- ICTer - The International Journal on Advances in ICT for Emerging Regions
- IEEE Pulse
- Indian Journal of Medical Informatics
- International Journal of E-Health and Medical Communications
- Journal of Health Informatics in Developing Countries
- Journal of Telemedicine and e-Health
- Journal of Telemedicine and Telecare
- Journal of the American Medical Informatics Association
- Journal of Healthcare Informatics Research
- Methods of Information in Medicine
- SAGE Health Informatics Journal
- Sri Lanka Journal of Biomedical Informatics

Books:

- Health Information: Management of a Strategic Resource, 4e by Mervat Abdelhak PhD RHIA FAHIMA, Sara Grostick MA RHIA FAHIMA and Mary Alice Hanken PhD CHPS RHIA
- Health Information Governance in a Digital Environment (Studies in Health Technology and Informatics) by E.J.S. Hovenga and H. Grain
- Health Information Systems: Concepts, Methodologies, Tools, and Applications by Joel Rodrigues
- Health Informatics: An Interprofessional Approach, 1e by Ramona Nelson PhD RN-BC ANEF FAAN and Nancy Staggers PhD RN FAAN
- Health Informatics: Practical Guide For Healthcare And Information Technology Professionals (Fifth Edition) (Hoyt... by Robert E Hoyt, Nora Bailey and Ann Yoshihashi
- Biomedical Informatics: Computer Applications in Health Care and Biomedicine (Health Informatics) by Edward H. Shortliffe and James J. Cimino
- Introduction to Health Informatics (Health Informatics) by Patrice Degoulet, Marius Fieschi and B. Phister
- Health Informatics Research Methods: Principles and Practice [With CDROM] by Elizabeth J. Layman and Valerie J. Watzlaf

- Consumer Informatics: Applications and Strategies in Cyber Health Care (Health Informatics) by Rosemary Nelson and Marion Ball
- Public Health Informatics and Information Systems by Patrick W. O'Carroll, William A. Yasnoff, M. Elizabeth Ward and Laura H. Ripp
- Evaluation Methods in Biomedical Informatics (Health Informatics) by Charles P. Friedman and Jeremy Wyatt
- Transforming Health Care Through Information: Case Studies (Health Informatics) by Laura Einbinder, Nancy M. Lorenzi, Joan Ash and Cynthia S. Gadd
- Clinical Information Systems: A Component-Based Approach (Health Informatics) by Rudi Van de Velde and Patrice Degoulet
- ABC of Health Informatics - Frank Sullivan (Author), Jeremy Wyatt (Author)
- Biomedical Informatics: Computer Applications in Health Care and Biomedicine (Health Informatics) - Edward H. Shortliffe (Editor), James J. Cimino (Editor)
- Electronic Health Records - Jerome H. Carter
- Electronic Health Record: Standards, Coding Systems, Frameworks, and Infrastructures - Pradeep K. Sinha, Gaur Sunder, Prashant Bendale, Manisha Mantri, Atreya Dande
- From Patient Data to Medical Knowledge: The Principles and Practice of Health Informatics - Paul Taylor
- Guide to Health Informatics - Enrico Coiera
- Health Care Informatics: An Interdisciplinary Approach - Sheila P. Englebardt PhD RN CAN (Author), Ramona Nelson PhD RN BC (Author), Ramona Nelson (Author)
- Health Care Information Systems: A Practical Approach for Health Care Management - Karen A. Wager (Author), Frances W. Lee (Author), John P. Glaser (Author)
- Health Informatics - Dr Roderick Neame BA, MA, PhD, MB, BChir, FACHI
- Health Informatics for Clinicians - Shane O'Hanlon
- Health Informatics: Practical Guide for Healthcare and Information Technology Professionals By Robert E Hoyt, Nora Bailey, Ann Yoshihashi
- Health Information Technology Basics: A Concise Guide to Principles and Practice - Teri Thomas-Brogan (Author)
- Introduction to Health Informatics (Health Informatics) - Patrice Degoulet (Author), Marius Fieschi (Author)
- Managing Health Care Information Systems: A Practical Approach for Health Care Executives - Karen A. Wager (Author), Frances Wickham Lee DBA (Author), John P. Glaser (Author), Lawton Robert Burns (Foreword)
- Nursing Informatics: Where Caring and Technology Meet (Health Informatics) - Marion J. Ball (Editor), Donna DuLong (Editor), Susan K. Newbold (Editor), Joyce E. Sensmeier (Editor), Diane J. Skiba (Editor), Michelle R. Troseth (Editor), Brian Gugerty (Editor), Patricia Hinton Walker (Editor), Judith V. Douglas (Editor), Kathryn J. Hannah (Editor)
- Principles of Health Interoperability HL7 and SNOMED (Health Information Technology Standards) - Tim Benson
- Project Management for Healthcare Informatics (Health Informatics) - Susan Houston (Author), Lisa Anne Bove (Author)

- Public Health Informatics and Information Systems - Patrick W. O'Carroll (Editor), William A. Yasnoff (Series Editor), M. Elizabeth Ward (Series Editor), Laura H. Ripp (Series Editor), Ernest L. Martin (Series Editor)
- Social Media for Nurses - Educating Practitioners and Patients in a Networked World. Ramona Nelson, PhD, BC-RN, FAAN, ANEF, Irene Joos, PhD, RN, Debra Wolf, PhD, MSN, BSN, RN

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## Annexure I

### Guideline for the trainee/ trainer

#### Portfolio Format

1. Name and short description of the trainee:
2. Main objectives of the programme:
3. Reporting period:
4. Objectives covered during the reporting period:
5. Entry No: (for each portfolio entry)
6. Description of the activity relevant to **each portfolio entry**
  - a) Dates of visit:
  - b) Persons met and designations:
  - c) Organisational structure:
  - d) Functions and activities:
  - e) Resources available:
  - f) Your observation on the function of the organization/usefulness of an activity from the point of view of a health informatician
  - g) Reflection on the gaps in your knowledge related to the organization/activity before undertaking the visit/activity.
  - h) Description of how you fulfilled the said knowledge gaps and what other actions you have taken or intend to take (e.g. reading literature as evidence) in order to improve your knowledge, skills and practices relevant to the said organizational functions or activity requirements.
  - i) Critical analysis of the new knowledge you gained and how it can contribute to the organizations functions or the activity that you have observed/participated.
  - j) Plan of actions: it should clearly indicate that the reasons for not meeting individual training goals and remedial actions suggested by both the trainee and the trainer.
  - k) Signature of the trainee:
  - l) Date:
  - m) Comments of the trainer:
  - n) Name and signature of the trainer:
  - o) Date:

**Portfolio assessment form**

Index number: .....

Please encircle the appropriate cell for each item below.

**A. Reflective ability**

Rating descriptors: 0 – no reflection; i.e. has not completed the reflective cycle

1 – reflected at a descriptive level; i.e. merely described the learning experience

2 – reflected at an analytical level; i.e. analysed the reasons for the experience and the reasons for the outcome

3 – reflected at an evaluative level; i.e. evaluated how the outcome(s) would have been different if a different course of action was taken

4 – reflected at an evaluative level and has provided **high** quality evidence for implementing the action plan

1. Portfolio entry 1

0	1	2	3	4
---	---	---	---	---

2. Portfolio entry 2

0	1	2	3	4
---	---	---	---	---

3. Portfolio entry 3

0	1	2	3	4
---	---	---	---	---

4. Portfolio entry 4

0	1	2	3	4
---	---	---	---	---

5. Portfolio entry 5

0	1	2	3	4
---	---	---	---	---

6. Portfolio entry 6

0	1	2	3	4
---	---	---	---	---

7. Portfolio entry 7

0	1	2	3	4
---	---	---	---	---

8. Portfolio entry 8

0	1	2	3	4
---	---	---	---	---

9. Portfolio entry 9

0	1	2	3	4
---	---	---	---	---

10. Portfolio entry 10

0	1	2	3	4
---	---	---	---	---

**B. Coverage of module outcomes**

Rating descriptors: 0 – less than 20% of the outcomes adequately covered

1 – 20-40% of the outcomes adequately covered

2 – 41-60% of the outcomes adequately covered

3 – 61-80% of the outcomes adequately covered

4 – 81-100% of the outcomes adequately covered

1. Portfolio entry 1				
0	1	2	3	4
2. Portfolio entry 2				
0	1	2	3	4
3. Portfolio entry 3				
0	1	2	3	4
4. Portfolio entry 4				
0	1	2	3	4
5. Portfolio entry 5				
0	1	2	3	4
6. Portfolio entry 6				
0	1	2	3	4
7. Portfolio entry 7				
0	1	2	3	4
8. Portfolio entry 8				
0	1	2	3	4
9. Portfolio entry 9				
0	1	2	3	4
10. Portfolio entry 10				
0	1	2	3	4

**C. Overall presentation of the portfolio; e.g. layout, structuring of chapters, structuring within chapters, writing ability (including proper referencing)**

0	5	10	15	20
Very poor				Excellent

**Total (out of 100): .....**

**Pass mark: 50**

### **General guideline for examiners**

1. Two examiners will independently mark a given portfolio.
2. Consider all the rating scales as global ratings; e.g. even if a candidate has not composed the whole portfolio entry at an evaluative level, if the examiner is satisfied that most of the steps in Kolb's cycle have been accomplished at an evaluative level, such a candidate is eligible for a rating of 4.
3. For a given entry, if the two examiner ratings are different, then the examiners need to discuss and come to a consensus about the appropriate rating; e.g. for a given portfolio entry, if an examiner has given a rating of 2 or above, while the other examiner's initial rating has been otherwise (e.g. grade C or below), then the examiners should discuss about such an entry and arrive at a consensus rating.
4. Before the commencement of actual marking, it is highly advisable that all examiners mark and discuss the same portfolio entry as a dry run.
5. If a candidate has included more than one portfolio entry for a given chapter, such a candidate is entitled to the entry that has the highest average rating, to be considered as the portfolio entry for that part.
6. A candidate who has scored more than 50 will be eligible to face the oral examination.

## **Annexure II**

### **Details of the Structured Training Programme**

#### **(1) Information Literacy**

*Content areas:*

- Library classification and coding,
- Retrieval methods,
- Research methods,
- Research paradigms,
- Medical and research ethics.

*Duration:*

5 session of 3 hours duration

#### **(2) Health Informatics**

*Content Areas:*

- Key sources of national public health data, Mission and practice of public health and opportunities to advance public health using informatics methods and tools,
- Current and evolving relationship between clinical and public health systems, Health information exchange, including needs, challenges, and opportunities,
- Key sources of national health data,
- Fundamental informatics principles and their application
  - Clinical Information Systems,
  - Public Health Information Systems,
- Standards in health informatics and enabling system interoperability,
- Current and evolving surveillance systems and performing a basic system analysis,
- Human resources required to develop and manage health informatics projects and systems,
- Geographic Information Systems and applications.

*Duration:*

12 sessions of 3 hours duration

### **(3) Health/Medical Statistics and Advanced Data Analysis**

*Content Areas:*

- Descriptive statistics and looking at data,
- Review of study designs,
- Measures of disease risk and association,
- Probability,
- Bayes' Rule,
- Diagnostic Testing,
- Probability distributions,
- Statistical inference (confidence intervals and hypothesis testing),
- P-value pitfalls,
- Types I and type II error,
- Statistical power,
- Overview of statistical tests,
- Tests for comparing groups (unadjusted),
- Introduction to survival analysis,
- Regression analysis,
- linear correlation and regression,
- Logistic regression and Cox regression,
- R statistical tool.

*Duration:*

18 sessions of 3 hours duration

### **(4) Information Management**

*Content Areas:*

- Health Information and Electronic Records,
- Health information system architecture,
- Cognitive Science and Health Informatics,
- Health Information Architecture,
- Information in Healthcare Delivery,
- Information Management in Healthcare and Evidence Based Medicine,
- Information flow in the Curative Healthcare Sector,
- Information flow in the Preventive Healthcare Sector and various forms used in the State Healthcare System,
- Introduction to Medical Records,
- Integrated view of Patient data and patient Centered and Problem Oriented Records,
- Introduction to electronic health records (EHR),
- How an EHR differ from the Paper – Based Medical Records and functional components of an EHR and impediments to the implementation of an EHR,
- Introduction to Ontological standards and specific Terminologies - ICD 10 and SNOWMED,

- Data Interchange Standards in Healthcare - HL7,
- Telemedicine and shared care,
- Ubiquitous computing,
- Human computer interaction and usability engineering, imaging standards.

*Duration:*

17 sessions of 3 hours duration

## **(5) Information System Governance and Management**

*Content Areas:*

- Information System Audit,
- HIS Evaluation, HIS Audit,
- Open Source Governance,
- Enterprise Architecture,
- HMIS project governance and change management,
- Information system governance,
- Information system management,
- Ethical and security issues.

*Duration:*

7 sessions of 3 hours duration

## **(6) Information for Action in Health**

*Content Areas:*

- Information processing,
- Data Management,
- Data Integrity,
- Information Infrastructure and Integration,
- Information Cycle,
- Consolidation and analysis of the data,
- Data Dissemination,
- Network of Action,
- Complexity of Systems,
- Data Quality,
- Organizational Perspective of Data and Information,
- DHIS2 (User Level) and Advanced (Implementer Level) training.

*Duration:*

20 sessions of 3hours duration

## **(7) Information Technology Governance and Enterprise Architecture**

### *Content Areas:*

- IT Governance and CoBIT model,
- Enterprise Architecture and Assessment Frameworks,
- Management of health care institutions,
- Health economics related to IT project (Economic evaluation in health care, decision making in health care, global health and health insurance and financing),
- Human/resource management for IT projects (principal theories and implementations of human resources management, applying human resources management to healthcare institutions, legislative framework of human resources in healthcare institutions),
- Socio-organizational and socio-technical issues,
- Modelling and business process simulation,
- Change management in organizations and IT projects,
- Supply change management.
- Government procurement procedures.

### *Duration:*

10 sessions of 3 hours duration

## **(8) Health Communication**

### *Content Areas:*

- Strategies for planning, implementing, and evaluating health communication campaigns,
- Develop health communication approaches,
- Communication tactics,
- Reaching varied audiences,
- New technologies used to reach communities with health messages.

### *Duration:*

10 sessions of 3 hours duration

## **(9) Medical/Health Education Informatics**

### *Content Areas:*

- Theorizing training in health information systems,
- e-learning,
- m-learning,
- Multimedia learning,
- Virtual reality,
- Simulation in medical education,



- Learning theories,
- Cultivating communities of learning,
- Instructional designing,
- In-service training methods,
- Organizational knowledge building,
- Educational support tools.

*Duration:*

*12 sessions of 3 hours duration*

## **(10) Information Technology Laws and Regulations**

Content Areas:

- Laws, directives, regulations and guidelines related to information technology in the domain of health services,
- Data protection,
- Privacy,
- e-commerce,
- Intellectual property,
- Cloud and information systems development contracting,
- Health information systems policy and frameworks,
- Open source licensing.

*Duration:*

9 sessions of 3 hours duration

### **Annexure III**

#### **Progress Report - Research Project**

Name:

Reporting period:

Report No:

Activities related to research project for the specified period:

Signature:

Date:

Comments of the Supervisor:

Name:

Signature:

Date:

## **Annexure IV**

### **Guidelines for Preparation of the Pre-Proposal**

#### *Title:*

Descriptive but concise - should reflect the essence of the study

#### *Justification:*

Justify the study based on importance, national relevance and usefulness of the findings of the study referring to appropriate scientific literature and also indicate

- The extent to which information is available on the selected research question.
- Description of any solutions to the problem tried in the past, how well they have worked and need for further research.
- Description of information expected to result from the project and how this information will be useful to solve the problem.

#### *General objective:*

State what the researchers expect to achieve from the study in general terms  
Should be adequate for a MD study.

#### *Specific objectives:*

- Clearly phrased in operational terms –what is done, where and for what purpose
- Using action verbs that are specific enough to be evaluated
- Realistic considering feasibility
- Written in a logical sequence to cover the general objective

#### *Method:*

- Describe briefly in relation to all the specific objectives
- Practicality and feasibility of carrying out the study should be described

*The pre proposal should not exceed 2500 words.*

## Annexure V

### Marking scheme for assessment of the thesis for MD (Health Informatics)

1. The thesis will be marked using the following scheme:

<b>Component</b>	<b>mark</b>
Introduction	10
Literature review	40
Materials & Methods	30
Results	30
Discussion and conclusions	40
Recommendation/s	10
Presentation of thesis	10
Oral presentation and viva voce	30
<b>Total</b>	<b>200</b>
<b>Total expressed as percentage</b>	<b>100%</b>

### CRITERIA FOR ASSESSMENT OF THESIS AND PRESENTATION

#### Introduction:

- Content and structure of the project has been set out clearly.
- Has identified the problem to be examined clearly.

#### Literature Review

- Evidence of in depth reading, covering historical and current literature on the topic.
- Inclusion of locally available data
- Presentation of a critical review of relevant literature.

#### Materials and methods

- The design of the study and the appropriateness of the research methodology.
- The systematic conduct of the study and the accurate collection and recording of data and/or information.
- Use of appropriate statistics.

#### Results

- Clear and coherent presentation of the findings with statistical significance indicated where relevant.
- Clear tables and figures with appropriate legends.

#### Discussion and conclusions

- The interpretations of results are appropriate and valid from the work.
- Conclusions and recommendation are drawn from the work.
- Critical comments made on the extent and limitations of the study.

### **Recommendation/s**

- Recommendations are drawn from the work.
- Recommendations are appropriate and valid to the present context.
- Further studies/work recommended is in consistence with the present literature reviewed.

### **Presentation of thesis**

- General syntax and writing style.
  - Inclusion of References quoted.
  - Typography.
  - Appropriate use of appendices and completeness of list of abbreviations
2. Two assessors (one local examiner + foreign examiner) should mark the thesis. Examiners are expected to submit the thesis marks (except for the viva voce exam component) at least two weeks before the commencement of the final exam.
  3. The candidate will be questioned on his / her thesis during the viva voce examination at the main exam.
  4. If the difference in the total mark (out of 400) awarded by the two assessors is more than 40 marks, the assessors are expected to discuss the thesis and come to an agreed mark at the viva voce examination.
  5. Candidates are expected to carry out the changes recommended by the examiners within 3 months of the examination. The local assessor should certify that the corrections have been carried out satisfactorily. Candidates will not be permitted to proceed with their post-MD overseas training until they have submitted the corrected thesis and the local assessor has certified that the corrections are satisfactory.

## Annexure VI

### Format of the Portfolio during the Post MD Training Period

#### (a) Guideline for the trainee/trainer

The portfolio maintained by the trainee during the period of post-MD training should contain evidence of achievements during post-MD training under the following sections:

- A. Subject expertise:
  - Progress reports from trainers/supervisors (essential, should be according to prescribed format)
  - Supervisor feedback on communication skills
  - Log of projects/assignments carried out
  - Results of any work-place assessments conducted
- B. Teaching
  - Undergraduate
  - Postgraduate
  - Allied health professionals
- C. Research and Audit relevant to the speciality
  - Research papers published or accepted for publication
  - Abstracts of presentations
  - Clinical audit
- D. Ethics and Medico-legal Issues
- E. Information Technology
  - Participation in training programmes/workshops
  - Evidence of searching for information and application of findings in practice
- F. Life-long learning
  - Participation in conferences and meetings

There should be strong evidence on engagement of reflective practice.

- upon completion of overseas training, a narration of at least one learning event experienced by the trainee, in relation to each of the above outcomes, with reflection on what and how the trainee learned from this experience together with a plan to apply such learning into current context and the feedback received thus far.

**Guideline for the Assessor**

Index number: .....

Please encircle the appropriate cell for each item below.

1. Authenticity of work

0	1	2	3	4
---	---	---	---	---

0	Evidence of coping/reproducing
1	Replication of the work of someone else, but properly referenced
2	Adaptation from the work of someone else; properly referenced
3	Original work with limited applicability beyond the given portfolio entry
4	Original work with wide ranging applicability

2. Communication skills

0	1	2	3	4
---	---	---	---	---

0	Unable to communicate an idea
1	Communicates unclearly
2	Communicates clearly, but some of the content is not relevant
3	Communicates clearly and relevantly but not in the proper sequence
4	Communicates relevant material clearly and in the proper sequence

3. Reasoning skills

0	1	2	3	4
---	---	---	---	---

0	Cannot indicate the reasons for including a given portfolio item
1	Can give only limited reasons
2	Can give sufficient reasons, but cannot justify the reasons if challenged
3	Can reason and justify
4	Can reason, justify and analyse the strengths and weaknesses of own reasoning

4. Ability to apply learning beyond the portfolio item

0	20	40	60	80
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0	Cannot indicate the situations that the learning from a given portfolio item can be used
20	Can identify situations with limited relevance that the learning from a given item can be useful
40	Can identify highly relevant situations that the learning from a given item can be useful
60	Identified relevant situations but no strong evidence of feedback obtained after applying the learning to such situations
80	Identified relevant situations and obtained strong feedback after applying the learning to such situations

5. Global rating (including attitudes and professionalism with which the oral examination was taken)

0	2	4	6	8
---	---	---	---	---

**Total (out of 100):** .....

**Pass mark: 50**

**General Guideline**

1. Two examiners must mark the above scales independently.
2. Each candidate will be examined for about 20 minutes.
3. Questions must be based on a portfolio item from the candidate's portfolio.
4. Each question must be focussed on the aspects addressed by above scale.
5. The two examiners should ask questions alternatively.
6. Each scale should be marked independent of another.

To pass the entire portfolio examination (i.e. the Post MD training, not just the oral examination) a candidate should:

- a. Complete the Post MD training stated above.
- b. Obtain minimum of 50 marks at the portfolio examination (including *viva voce* examination) to be satisfactory at the Post-MD examination.