Super Speciality course of DM in Cardiac Anesthesia

Rajiv Gandhi University of Health Sciences, Karnataka
4th 'T' Block, Jayanagar, Bangalore - 560 041

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4ನೇ 'ಟಿ' ಬ್ಲಾಕ್, ಜಯನಗರ, ಬೆಂಗಳೂರು-560 041

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Ref : No. UA/ORD-6/1999-2000 Date : 01.01.2000

NOTIFICATION

Sub : Revised ordinances pertaining to Post Graduate Degree, Diploma & Super Speciality Courses in Medicine.

Ref : Minutes of the 16th Syndicate Meeting held on 16.11.1999.

In exercise of the powers conferred under Sec. 35(2) of the RGUHS Act, the Syndicate at its Meeting held on 16.11.1999 has been pleased to approve the Revised Ordinances pertaining to Post Graduate Degree, Diploma & Super Speciality Courses in Medicine as given in schedule here to annexed.

The Revised Ordinances as above shall come into force immediately and is applicable for University examination of March 2000 and onwards.

By Order,

Registrar

To

1. The Principals of all Medical Colleges affiliated to RGUHS.
2. All the Members of the Syndicate / Senate / Academic Council.

Copy to :-

1. Secretary to Governor, Raj Bhavan, Bangalore-560 001.
2. Secretary to Government, Medical Education, Health & Family Welfare Department, 3rd Stage, M.S. Building, Dr. B.R. Ambedkar Veedhi, Bangalore-560 001.
3. Registrar (Eva) / Finance Officer / Consultant, CDC / Consultant, Computer Centre / PRO, RGUHS
4. All officers in the University / Examination Branch / Academic Branch.
5. PS to Vice-Chancellor / Registrar / OC.

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Ref. : ..... Date. : .....

No.UA/ORD-6/1999-2000 20/08/2005

NOTIFICATION

Sub: Revised Ordinances pertaining to Post Graduate Degree, Diploma and Super Speciality Courses in Medicine (MD Aviation Medicine)

Ref: Minutes of the Syndicate Meeting held on 8th August 2005.

Preamble:

Where as the ordinance pertaining to PG Degree MD (Aviation Medicine) has been notified on 01/01/2000. It is in force from March 2000. Now the Syllabus pertaining to the above course has been revised.

In exercise of the powers conferred under Sec 35(1) of the RGUHS Act, 1994 the Syndicate at its Meeting held on 08/08/2005 has been pleased to approve the Revised Ordinance Governing Regulations and Curriculum pertaining to Post Graduate Degree Course in MD (Aviation Medicine) as given in the schedule here to annexed.

The Revised Ordinance notified as above is effective for the admissions made from the academic session 2005-06 and onwards.

By Order,

REGISTRAR

To,

1. The Principal and Commandant, Institute of Aerospace Medicine, Vimanapura Post,Bangalore-560 017.
2. All the Members of the Syndicate/Senate/Academic Council.

Copy to:

1. The Secretary to Governor, Raj Bhavan, Bangalore –560 001.
2. The Principal Secretary to Government, Medical Education, Department of Health & Family Welfare, M.S. Building, Dr. B.R. Ambedkar Veedhi, Bangalore –560 001.
3. PA to Vice-Chancellor /Registrar (Eva)/Finance Officer/ Consultant, CDC /Consultant, Computer Center/Public Information Officer, RGUHS.
4. Deputy Registrar, Examination Section.
5. Guard file/Office Copy.

Super Speciality course of DM in Cardiac Anesthesia

1. Preamble: There is an increased incidence of cardiac diseases and patients undergoing various cardiovascular procedures. There is a need for structured training for anesthesiologist in the field of Cardiac Anaesthesia in the country. The incidence of Cardiac diseases is rising every year in the country due for various factors such as Diabetes, Hypertension, stress and lack of exercise. Similarly spectrum of Cardiac disease is also widening due to availability of various detection modalities. Either to about 50,000 to 60,000 surgery cases conducted annually in the country, now it is extended over a Lakh per year. It is expected that an average of 250 centers will be conducting 400 cases per year. Hence, we may require qualified people in about 05-10 years time. It is necessary to have about 500 DM qualified specialists. It is necessary to produce at least 50 Guides per year so, that by 10 years 500 specialists are available.

Hence the DM (Cardiac Anaesthesia) is designed to train the candidate to acquire theoretical and specific skills in this field. 2.Desired Skill sets for Specialists:

Clinical Skills:-

Cardiac Anesthesia can be defined as a Super Speciality, which is devoted to the pre-operative, intra-operative and post-operative care of adult, Pediatric, neonate and premature baby undergoing Cardiac Surgery and related invasive cardiac interventions/therapeutical procedures.

Skills:- The fellow trainee in DM Cardiac Anesthesia should acquire competency in the following areas.

1) **Patient Care, decision making and Medical expert:** - Should be able to provide safe, timely, effective efficient, anesthesia services for patients with cardiovascular disease undergoing Cardio-thoracic surgery with or without extracorporeal circulation. They should acquire following skills.
    a) Develop the knowledge skills and attitudes necessary for the safe conduct of pre-operative patient evaluation and interpretation of cardiopulmonary diagnostic data, haemodynamic monitoring, advanced level trans-esophageal echocardiography, management of cardiopulmonary bypass and preoperative critical care. They are expected to have a complete knowledge of anatomy and physiology of cardio vascular system as well as respiratory physiology.
    b) They should be experts in providing of cardio-thoracic anesthesia and should be the models of professional excellence with unique skills sets that allow them to make a significant contribution to the field of cardiothoracic surgery and Cardiology.
    c) They should develop skills required for accurate and appropriate pre-operative evaluation assessment of risk and pre-operative stabilization of the patients suffering with cardiovascular disease. They should be able to correct common derangements in metabolic and electrolytes.
    d) They should develop fluency in performance of a diagnostic or therapeutic procedure and able to conduct these procedures in emergency.

e) They should develop skills to handle a neonate born with complex cardiovascular disease, safety in ventilatory management and maintaining the balance of pulmonary and systemic circulation for which through knowledge of congenital heart disease, its patho-physiology and application of the knowledge to the patient care is must.

f) They should have skills to apply the knowledge of various cardiovascular diseases, their patho-physiological consequences and treatment modalities in the pre-operative period during cardiovascular surgery and intervention/therapeutical procedure in the catheterization laboratory/MRI suite.

g) They should know in detail about commonly prescribed medications for cardiac surgical patients, their implication for disease and the impact on anesthesia management.

h) They should know about heparin, thrombolytic, antiplatelet agents, protamine, heparin alternatives, antifibrinolytics their mechanism of action, dosages, side effect and complications.

i) They should know vasoactive drugs lucitropic agent, antiarrhythmic agents, their dosage schedules and side effects.

j) Should be familiar with use of blood, blood products, blood alternatives (albumin, starches) as well as transfusion reactions & complications.

k) They should develop accurate monitoring skills & able to interpret ECG for ischemia, infarction arrhythmias. Also should acquire skills for invasive arterial and central venous access along with insertion of PA Catheters. They should be

able to interpret non invasive monitoring like cardiac output, BIS, NIRS, and its potential applications during cardiac surgery. There should be awareness about new monitoring techniques.

l) They should be able to assess adequacy of ventilation, implication of peak and plateau ventilator pressures and various modes of ventilation, and implement this according to arterial blood gas analysis.

2) **Professionalism**: - Manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to diverse patient population. Remain clam and organized in stressful and emergency situation. They should demonstrate respectful behavior towards patients, their family and other health care providers.
3) **Medical Knowledge updation**: - A strong knowledge base should be developed regarding basic medical sciences as applicable to cardiac anesthesia.
4) **Capability to perform special techniques**: - like pulmonary artery catheterization and various techniques of cardiac output measurement.
5) **Research**: - They should have a interest in research, should be able to plan a research project and should perform the research sincerely, keeping the interest of patient, and with due moral-ethical consideration.
6) **Skills of papers publishing**:- They should develop skills for presenting the scientific research, its statistical aspect and should sent it for publication
7) **Accurate record keeping**: - They should develop a sense of record keeping and should be able to perform retrospective and prospective studies.

8) **Trans-esophageal Echocardiography**: - They should be skilled to perform an trans-esophageal echocardiography and Doppler audios to assess the cardiac patient anatomy and physiology. This is a valuable tool to guide surgical team regarding surgical decision and to evaluate the residual defect and assessment of ventricular function for further guiding the isotropic support.

9) **Interpersonal and communication skills**: - Effective information exchange and teamwork with patients, their families and health professional is required.

10) **Collaborator and Management skills**: - They should recognize the need to utilize other specialists for care and management of critical patients especially in post-operative period and faster healthy team relationship. They should acquire cardiac team approach involving nurses, perfusionist, technical staff & other specialists.

2. Evaluation and assessment of Centre:

FOR EACH UNIT SHOULD HAVE:

Centre should perform 1000 ***operations per year for each Unit i.e. for a maximum of 4 students per unit*** (CABG+ VALVES + Congenital surgeries).The composition may be as follows

600- Open Heart Surgeries

200- Closed Heart surgeries

100- Thoracic Surgeries

100- Miscellaneous surgeries (vascular etc)

These many number of cases is required for formal training and distribution because at the end of 3 years there will be 12 students from 3 batches . However First year students will be assisting (AS) ,Second

year students will be performing under supervision (PS) and Third year students will be performing independently (P I). The number of cases to be performed by individual student is indicated in the syllabus .

3. Infrastructure requirements:

Infrastructure:-

OT Equipments:

No. of OT's- Two

ICU- 10 bedded capacity (Surgical)

HDU- 24 bedded

Other specialities as per existing norms: Cardiology+ Basic specialities

- for Open Heart Surgery including IABP & other supporting equipments – ECMO, LVAD – as per MCI norms

- Anesthesia work structure – 1 per table

- Hemodynamic Monitor – 1 per table (Multi channel –ECG + Intensive pressures, ST analysis, CO, BIS)

- TEE- 01
- Defibrillator – 01/ table
- Fiberscope - 01
- PFT - 01
- TEG/ ACT - 01
- ABG Machine 01
- Portable Imaging 01

ICU:

- Ventilator 01 per bed
- Multi channel Monitor -01/ Bed
- Centralized piped Medical Gases
- TEE- 01
- Defibrillator-01
- ABG Machine- 01
- TEG-01
- Transport Monitor-01
- Transport Ventilator-01

Cardiothoracic surgery and cardiology is particularly strong and growing subject with future innovation in the areas of:-

; Valuvlar heart diseases

; Minimally invasive surgery

; Robotic surgery

; Aortic surgery and aortic stent placement, as well as hybrid procedures and thoracic surgery

; Complex surgery for congenitial heart disease.

; Palliative or curative surgery in pre-mature neonates

; Fetal heart surgery

; Extra corporeal membrane oxygenation in pre-operative period

; Invasive/ therapeutic Catheterization Lab procedures, ex. Balloon valvotomy, Device closure of ASD, VSD, Sinus of valsalva, coil emoblisation of MAPCA.

Thereby any Institution planning to commission DM(Cardiac Anesthesia) should performing these procedures to impart training to the candidates. The medical centre should have commitment to education, research and state –of-art clinical practice.

Libraries: Learning resource facility. It should be supplied with current medical books journals, CD's, audio cassette's. There should be computers with internet access learning Resource Library should contain recent an aesthesia texts and literature to keep the candidates and faculty abreast of the recent current literature.

Medical Libraries: Medical Library should also be located with in the hospital. It should have latest edition of all Cardiac-an aesthesia, Cardiology, and Cardio-thoracic Surgery books. It should also have related book on subjects like pharmacology, pathology, Radiology etc, Journals specific to Cardiac-Anesthesia and related subjects should also be available. Computer with internet access to medical resources should also be available.

Faculty: Cardio-thoracic anesthesia faculty is here to assist any way them can to make the education memorable and highly meaningful. ***Faculty should have at least 6 years of full time teaching experience in cardio-thoracic centre with intensive care, preferably with a DM Degree or 9 years of Full time Teaching experience in the Department of Cardiac Anesthesia after MD (Anesthesia).*** Their mission should be to provide high quality anesthesia to the patient, to advance the science of the speciality of Cardiac anesthesia through research and teaching. Faculty must provide education training and experience in an atmosphere with mutual respect between the faculty and the trainees so that the candidates will be stimulated and prepared to apply required knowledge independently. Faculty should be involved in research and encouraged and assist candidates for carrying out a research and help in publishing these scientific articles in journals.

Teaching:

a) Through direct clinical experience with consultant guidance during clinical work.

b) Didactic teaching session at least twice a week.

c) Special Training TEE

At the end of three years of DM (Cardiac Anesthesia) teaching: There specialists will slowly replace the existing and highly experienced Cardiac anesthesia practitioners.

To protect the existing Teachers their designation should be changed to Professor/ Associate Professor in cardiac Anesthesia since they are practicing Cardiac Anesthesia on regular and Continuous basis.

4. Required Qualification of the concerned specilaity: (As per existing MCI norms)

Staff- faculty in the Department of Cardiac anesthesia: There shall be a ***minimum of three faculty members with requisite post graduate qualification and experience – one Professor, One Associate professor / Reader and One Assistant Professor/ Lecturer.***

Of these faculty members only those who possess Eight years teaching experience as Assistant Professor/ Lecturer gained after obtaining the higher specaility degree shall be recognized as post graduate teachers.

ICU Staff:

- Associate Professor -01
- Assistant Professor-02
- Resident-01 round clockwise
- Staff Nurses- 01 per bed round the clock
- Technical staff- 01 senior & 01 junior round the clock

5. Manpower requirement (teaching and non-teaching) for the year 2015 and 2020.

Teaching & Non- Teaching staff for the year 2015:

Teaching Staff: The Ratio of the PG Teacher to the ***number of students to be admitted for Super Specialties course shall be 1:2 for Professor/Associate Professor and 1:1 remaining cadres in each unit per year subject to a maximum of 4 PG seats*** including for the Course per unit per academic year provided a complement of 10 teaching beds is added to the prescribed bed strength of 20 for the unit.

Non-teaching staffs: As per the requirement of the Concerned department

i) Nurses

ii) Medical Laboratory Technicians

iii) Cath Lab Technicians

iv) Echocardiography Technicians

v) TMT Technicians

vi) ECG Technicians

vii)O.T. Technicians

viii) Anesthesia Technicians

ix) Stenographers

x) Clerk/ Typist

xi) Computer Programmers/ operators

CUURICULUM:

1. Goal: To train and produce qualified Cardiac anesthesiologist through out the country to manage cardiac related procedures/ surgeries safely and independently. The whole objective is to give comprehensive training to qualified Anesthesiologist in the field of Cardio vascular & thoracic anesthesia. This training will also include pre-operative Cardiac intensive care, care of patients undergoing interventional Cardiology & post op intensive care in order to improve the patient outcome.

2. Specific Learning objectives: The aim of the course is to impart thorough and comprehensive training to candidate in the various aspects of this speciality to enable him/her.

a. To function as a faculty/consultant/ teacher in the speciality
b. To carry out and help in conducting research in the field of Cardiac Anaesthesia and applied sciences.
c. To plan and set-up independent Cardiac Anaesthesia units catering to Cardiothoracic Vascular Surgery and Cardiac intensive Care and Cath lab.
d. To enable the candidate to conduct neonatal cardiac surgery and to learn recent advances including cardiac Transplantation.

3. Admission Requirement

For admission to DM (Cardiac Anaesthesiology) candidate is required to possess Post Graduate degree in Anaesthesia of an Institute/university recognized by the Medical Council of India such as MD/ DNB etc.

Duration of Course

Three Academic years

Method of Selection: The selection of candidate for admission to DM in Cardiac Anaesthesia is to be made in the form of an entrance (centralized) examination and viva-voce.

Attendance progress & Conduct: A Post graduate student pursuing the course should work in the concerned department of the Institution for the full period prescribed as full time candidate. He/She is not permitted to run or work either in a private clinic/ laboratory/ Nursing home/ Hospital / any other organization, while pursuing the course.

Monitoring Progress:

Work Dairy/ Log Book – every candidate shall maintain a work dairy and record his/ her participation in the training programmes conducted by the department such as journal reviews, seminars etc. Special mention is to be made by the candidate as well as the details of clinical or laboratory procedures, if any conducted by the candidate once in every six months. The work dairy shall be scrutinized and certified by the Head of the Department and Head of the Institution and submitted to the University for review.

3A Subject specific theoretical Competencies: The candidate shall acquire complete knowledge of Cardiac diseases right from embryology, intrauterine abnormalities, Pathology of Congenital Heart Diseases & acquired heart diseases of various kinds (Rheumatic Atherosclerotic, CAD, metabolic and degenerative). He shall have sound knowledge of all modalities available for diagnostic as well as therapeutic interventions, so that he can administer his skills as an Anesthesiologist and Cardiac intensivist for better patient out come. He shall emerge as an important

member of Cardiac Care team along with Cardiologist and Cardiac Surgeon.

Course contents: There shall be four papers with the following titles:

Paper-I Basic Sciences

Paper-II Clinical Science- Adult & Cardiac Thoracic

Paper-III Clinical Science- Paediatric & Vascular Cardiac

Paper-IV Critical Care & Recent Advances

Guidelines: The candidate shall go through the basic sciences related to cardiac diseases including physics & physiology.

Knowledge: At the end of training for 3 years, the candidate shall possess full knowledge of cardiac anaesthesia for all types of Cardiac interventions including transplantation and robotics.

3B Subject specific practical competencies, skill to be taught: Over a span of three years the candidate will be expected to acquire a sound knowledge of the theory and practice of clinical Cardiothoracic and vascular anaesthesia including the diagnostic and investigative techniques in current use. This will be achieved through a closely supervised, graduated in-service training programme, involving progressive practical training and education with in the framework the department of Anaesthesiology and its related fields.

Postings:

1. Cardiac Anaesthesia	-	24 months
2. Cath Lab	-	02 months
3. Echo Lab	-	02 months
4. Surgical ICU	-	03 months
5. MICU/ CCU/ PICU	-	03 months
6. Research	-	01 month
7. Advance centre	-	01 month

Expected Number of cases or procedures to be carried out :
(AS= Assisted, PS= Performed under Supervision, PI= Performed Independently)

Procedures	AS	PS	PI
CABG	25	20	20
Valve cases	15	10	10
acyanotic	15	15	10
Cyanotic	10	10	05
Cath cases	25	20	10
Lung	05	05	05
Vascular	05	05	05
TEE	25	15	10

4. Teaching and learning methods:
Postgraduate teaching programme (Title of papers I-IV):

Paper-I BASIC SCIENCES :

Applied Anatomy :

Basic and correlative, cardio thoracic and vascular anatomy. Embryological development of heart, great vessels, lung, oesophagus and other thoracic structures.

Applied Physiology :

Cardiac Cycle, cardiac output, pressure and blood volume, cardiac contractility, pulmonary circulation, coronary circulation, blood pressure, cardiac failure, acid base balance, physiological function of lung and pulmonary function tests. Autonomic control of heart and vasculature. Physiology during extra corporeal circulation, assisted circulation and hypothermia.

Applied Pharmacology :

Basic and correlative pharmacology of drugs acting on heart, lungs and blood vessels. Cardiac glycosides, antihypertensive, diuretics, drugs for coronary disease, beta-blockers, intropic agents, antibiotics, antiarrythmic agents.

Applied pathology :

Congenital heart disease, classification and pathophysiology of rheumatic heart disease, valvular lesion, mycorditis, cardiomyopathies, pericarditis, bacterial and infective endocarditis, coronary artery disease, myocardial infraction, hypertensive heart disease, pulmonary embolism, cardiac tumors. Clinical pathology tests for assessing the coagulation mechanisms-brief methodology. Principles of the tests and interpretations of the results. Thoracic injuries, chest wall tumors, intrapleural and pulmonary suppuration, pulmonary tuberculosis, lung

tumors, benign and malignant strictures of esophagus, reflux esophagitis and pulmonary embolism.

Applied Bacteriology :

Pulmonary infections, infective endocarditis, infection following open-heart surgery, lung surgery and nosocomial infection in the intensive care units.

Applied Physics :

Basic concepts, analyzing, measuring & monitoring devices, electronics, computing of patients data. Laser in cardiac surgery, robotic technique. Equipment: Computer application, Maintenance monitoring techniques, Equipment in OT, Equipment for transport
of patients, ICU equipment.

Paper-II Clinical Science- Adult Cardiac & Thoracic:

ADULT :

Anaesthesia for Ischemic Heart Disease, Valvular Heart Disease, vascular disease, adult congenital heart surgery.

Electrophysiological & arrhythmia surgery. Heart transplant, ventilator assist devices.

Anaesthetic techniques for pulmonary surgery Diagnostic & elective. Emergency procedures for lung surgery. One- Lung anaesthesia, ventilation, Physiotherapy (gas exchange & airway dynamics).

Anaesthesia to patients for diagnostic & palliative procedures in cardiology, Radiology cath lab (outside operative rooms). Invasive cardiology procedure.

Anaesthesia for post cath patients undergoing surgery.

Anaesthesia management of Re do surgery.

Management for Post-op. ventilation care, prolonged ventilation, weaning, control of Pain-its techniques & agents, used. Postoperative pain management.

Intra op. monitoring, PAC, Cardiac output coagulation monitoring.

Paper-III Clinical Science- Paediatric & Vascular Cardiac:

Paediatric :

Congenital Heart diseases, types, complex congenital disorders.

Basic haemodynamics, palliative procedures, Pre-op. preparations & special care in Monitoring, Fluid balance, airway management.

Anaesthesia for neonatal complex cardiac surgery.

Total circulatory arrest, deep hypothermia, ECMO.

Anaesthesia management for re do surgery

Paediatric diagnostic procedures in Cath lab & Echocardiography

Invasive therapeutic techniques like ASD/ VSD devices, stent in major vessels, coil embolization.

Paper-IV Critical Care & Recent Advances:

INTENSIVE CARE MANAGEMENT:

Protocols for subsystem care, cerebral, Renal, Hepatic & others.

Ventilatory care, weaning of Ventilatory support. Parenteral Nutrition, control of infection.

End stage renal failure, bedside dialysis techniques.

Postoperative management of single ventricular repair.

Hepatic failure.

ICU monitoring technique in postoperative pain management
ICU management, especially after neonatal surgery- ventilatory support in neonates, ECMO programme for neonates and children.

Intensive coronary care.

Cerebral monitoring.

RECENT ADVANCES :

Knowledge of recent developments in field of Cardio thoracic & Vascular surgery :

- Cardiology- PTCA, Balloon embolectomy etc.
- Heart-lung transplant-physiology, pharmacology (anaesthetic consideration)- Donor-recipient selection.
- Immunosupression etc.
- Cardiac assisting devices- artificial heart, IABP, LHAD.
- Advances Pulm. Support – ECMO, H.F. Ventilation.
- Blood substitutes
- current advances and concepts in drugs, equipments, and monitoring methods, Robotic Techniques.

5. Assessment:

Regular two internal assessment at the end of I & II year both in theory and clinical should be made for every candidate. Internal assessment will be made in day to day work of the trainee, which involves patient care, teaching, and Anaesthesia management in the operation room, emergency service, bed side presentation and research.

Eligibility

Candidate will be allowed to appear for final examination after three years of training.

Board of Examiners

Cardiac Anesthesiologists with minimum 6 years for post DM (Cardiac Anaesthesia) & 9 years for post MD (Anaes) of teaching experience in the speciality.

Theory Papers

Paper-I Basic Sciences

Paper-II Clinical Science- Adult & Cardiac Thoracic

Paper-III Clinical Science- Paediatric & Vascular Cardiac

Paper-IV Critical Care & Recent Advances

Clinical Practical and Viva-Voce

One long case and two short cases will be given to the candidates and the discussion there on would last 30-40 min in each case. The candidates are also given ECG, X-rays to be interpreted. Various equipment used in OT, Intensive care, drugs, fluids, Catheter for invasive monitoring are also required to be interpreted and discussed. Vive is also held. Two examinations could be held every year in the months of June and December.

Scheme of Examination:

Paper	Pattern	Maximum Marks	Passing Minimum
Paper - I	2 Essays 2x20 6 Short notes 6x10	100	50
Paper- II	2 Essays 2x20 6 Short notes 6x10	100	50
Paper -III	2 Essays 2x20 6 Short notes 6x10	100	50
Paper- IV	2 Essays 2x20 6 Short notes 6x10	100	50
Clinical/Practical	1 Long case 2 short case	200	100
Oral	Spotters Viva-voce	50 50	50

6. Recommended Reading (Books & Journals separately) :