Curriculum for Fellowship in Critical Care Nephrology

Department of Critical Care, Sir H N Reliance Foundation Hospital And Research centre, Mumbai

The department of Critical Care is managing a 50 bedded fully equipped Adult ICU since the IPD services were started in 2014, in Sir H N Reliance Foundation Hospital And Research centre, Mumbai

The ICU is equipped with ICU beds, high end mechanical ventilator, advanced monitoring including invasive haemodynamic monitoring, blood gas analyser, fiberoptic bronchoscope, bedside ultrasound and transthoracic Echocardiography, haemodialysis and CRRT machines. Also have well equipped dialysis unit in hospital. All patients with acute renal failure requiring SCUF/SLED/HD/CRRT/Acute peritoneal dialysis are being managed.

General Objectives

1. Immediate Assessment and Therapy (Resuscitation): The trainee should be able to make a quick and accurate assessment of the life threatening acute renal problems in a critically ill patient and apply life supporting therapy including medical management and if required renal replacement therapy.

2. Formal Medical Assessment, Problem Solving and Decision Making Following resuscitation: The trainee should be able to undertake or contribute to the continuing management of the acutely ill renal patient.

3. Consultation and Collaboration: The trainee should understand that consultation with medical, nursing, support staff and family plays a vital role in the management of critically ill patients.

4. Management of System(s) Failure: The trainee should be able to manage a patient with a single or multiple systems failure.

5. Retrieval and Transport: The trainee should be able to supervise the movement of a critically ill or injured patient to a hospital from another hospital, place of injury or site of a mass disaster.

6. Disease and Disease Processes - General Medical and Surgical Conditions: The trainee should have a broad and sound understanding of general medical and surgical conditions together with a detailed knowledge of diagnosis and management of renal emergencies.

7. Therapeutic Agents: The trainee should understand the principles and practice of the various therapeutic agents used in the critically ill renal patient.

8. Adverse Reactions to Drugs: The trainee should be able to diagnose and manage the nephrotoxic adverse effects of drugs.

9. Monitoring, Investigations and Interpretation of Data: The trainee should have a detailed knowledge of the investigations and monitoring techniques commonly used in nephrology intensive care and a general knowledge of the procedures in critical care nephrology.

10. Principles of Monitoring and patient equipment: The trainee should understand the principles of the measurement of biological variables and have a working knowledge of the practicalities and trouble-shooting of equipment on which critically ill renal patients have an everyday dependence.

11. Selection of Monitoring Equipment, etc.: The trainee should know the indications for and the selection of suitable methods of monitoring or investigation taking into account their accuracy, convenience, reliability, hazards, cost and servicing and relevance to the patient's condition.

12. Ionising Radiation: The trainee should appreciate its uses and hazards in the practice of intensive care.

13. Interpretation of Data: The trainee should know how to critically evaluate and use the data that he/she collects.

14. Technical Skills: The trainee should know the indications, contraindications and complications of procedures commonly performed in intensive care.

15. Attitudes: The trainee should have those attitudes which cause him/her to act in the best interests of the patients, their relatives and the staff of the intensive care unit.

16. Administration, Organisation and Education: By the end of training, the trainee should have some knowledge and skill of the administration and organisation of an renal intensive care unit so that clinical care, research and teaching are carried out optimally.

Training schedule:
This is a full time, one-year training programme with emphasis on adult nephrology critical care.

The training shall comprise of rotation as follows:

1.
2.
3.

Programme content:
The candidate must gain experience in the diagnosis and treatment of patients with acute, serious, and life-threatening acute and chronic renal diseases. The present document defines the core curriculum of cognitive knowledge and procedural skills that an Intensivist is expected to be equipped with to effectively approach the complex problems encountered in the critically ill patient.

Programmatic aspects of Critical Care Nephrology

1. Ensure that review of potential safety events is discussed and addressed.
2. Clearly defining the roles of each member of the delivery of critical care nephrology team.
3. Engagement in hospital leadership to secure the resources necessary to provide the program with the tools/personnel to succeed.
4. Formation of a hospital wide leadership team, including nursing and pharmacy personnel, nephrology and ICU personnel participation. This strong and engaged multidisciplinary core team should be accountable for quality, cost, outcomes, and training of staff.
5. Establishment of policies for all critical care nephrology procedures in the ICU.
6. Developing a regular systematic process to assess the delivery of critical care nephrology procedures.
7. Determining the CRRT hardware necessary for care.
8. Support, encourage, model robust communication between nephrology & ICU teams regarding daily goals of acute RRT

Teaching methodologies and duties
1. Lectures
2. Discussion
3. Student Directed Learning
4. Case Based Learning
5. Role Playing
6. Simulators Based learning
7. Web Based learning

Teaching components will consist of

1. Didactic learning (theory lectures, seminar and journal club sessions),
2. Non-didactic/practical/clinical learning - (bed-side, treatment procedure, clinical demonstration, case discussion, laboratory observation sessions).
3. Combined Round/ Grand round
4. Mortality/ Morbidity meetings
5. Quality Assurance meeting
6. Radiology conferences

CLINICAL POSTING
1. Academic and practical training commences in the Critical Care.
2. Second month of training, identification of project and synopsis submission for Ethics approval.

3. Didactic and clinical training within the unit
4. Learning the good clinical practice skills pertaining to the curriculum

CURRICULUM

(A) Theoretical Knowledge
The nephrology critical care specialist (Intensivist) must understand the pathophysiology, construct a differential diagnosis and apply the appropriate prophylactic and therapeutic interventions in the following disorders.

1. Renal Physiology, Pathology, Pathophysiology, and Therapy
2. Water and fluid balances: Renal regulation of fluid balance and electrolytes,
3. Derangements secondary to alterations in osmolality and electrolytes
4. Arterial base gas analysis: Acid-base disorders and their management
5. Interpretation of urine routine/microscopy and electrolytes
6. Evaluation of oliguria
7. AKI: Renal failure: Prerenal, renal, and post renal
8. Renal replacement therapy: Principles of haemodialysis, peritoneal dialysis, ultrafiltration, continuous arteriovenous hemofiltration (CAVHF), and continuous veno-venous hemofiltration (CVVHDF)
9. Understanding how to quantify dose, ideal flows, limits of access pressures, monitoring filter patency, and optimization of filtration fraction are aspects of CRRT that should be mastered by nephrologists. Nephrologists need to decide which method of anticoagulation is best suited for their institution and take measures to limit potential complications.
10. Extracorporeal organ support: ECMO/ molecular absorbent recirculating systems (MARS)
11. Drug dosing in renal failure
12. Plasmapheresis, Cytosorb
13. Use of RRT in poisonings

(B) General Interventions and Procedures

The Nephrology Intensivist must be able to perform a number of specific procedures; for all candidates experience is desirable but not mandatory in the following areas:
- Insertion and maintenance of haemodialysis catheter - mandatory
- Kidney biopsy
- Assessment and measurement of arterial and mixed venous blood gas analysis - mandatory
- Placement of peritoneal dialysis catheter
- Bedside ultrasound screening of kidneys and urinary bladder - mandatory
- Bedside echo screening (TTE/TEE). – TTE is mandatory

(C) Assessment Procedures:
The candidates would maintain 1 logbook of procedures performed /assisted which would be countersigned by the departmental faculty members.

(D) Professional Duties and Ethics
Obligation and responsibilities in medical practice; knowledge of relevant laws of the country governing the practice of medicine; knowledge of medical ethics and principles of good practice; doctor-patient relationship, doctor-doctor relations, relationship with medical organisation and hospitals, para-medical services, Including pharmacists and druggists.

(E) Medico-legal aspects of nephrology critical care
Knowledge of health legislation and duties of doctor attending to cases, certification Court evidence, expert advice; medical negligence and consumer protection act.

(F) palliation and communication in nephrology critical care – the various methods of communication like breaking bad news, handling workplace conflict, handling an aggressive relative will be taught to the trainee.

Research:
1. See 20 cases of quality analysing and discussing which will be certified by the faculty of the department.
2. Present at least one at national conference.
3. One publication is desirable