



**PRAVARA INSTITUTE OF MEDICAL SCIENCES
(DEEMED TO BE UNIVERSITY)**

**Loni, Tal. Rahata, Dist. Ahmednagar 413736
NAAC Re-accredited with 'A' Grade**

SYLLABUS

**Post Doctoral Fellowship in Intensive Care Physiotherapy
(Dept. of Cardiorespiratory Physiotherapy)
(Dr. APJ Abdul Kalam College of Physiotherapy)
(Academic Council Meeting Dated 28th October 2021)**

TITLE: POST-DOCTORAL FELLOWSHIP IN INTENSIVE CARE PHYSIOTHERAPY

1. Preamble:

A number of patients with various life-threatening conditions are admitted to intensive care unit. Many critical illnesses are often associated with long-term bed rest and inactivity and may lead to intensive care unit-acquired physical impairments. Such patients frequently suffer long-term physical and psychological complications. Prolonged stays in the intensive care unit are also associated with impaired quality of life, functional decline and increased morbidity, mortality, cost of care and length of hospital stay. Therefore, they require a multidisciplinary team in intensive care who are uniquely qualified with skills and expertise to work with the assessment and management of respiratory complications, physical deconditioning, and neuromuscular and musculoskeletal conditions.

Growing evidence exists that early physiotherapy interventions in critically ill intensive care patients may influence or even prevent physical impairments.

Physiotherapy treatment as part of a multi-disciplinary approach to care is integral in reducing physical impairments and promoting safe and early discharge from the intensive care unit.

The aim of the Post-Doctoral Fellowship in Intensive Care Physiotherapy under Department of Cardiorespiratory Physiotherapy, Dr. APJ Abdul Kalam College of Physiotherapy, Pravara Institute of Medical Sciences, Loni is to empower the physiotherapists working in intensive care units with advanced knowledge and skills necessary for managing critically ill patients.

2. Goal:

The mission of the fellowship program is to develop physical therapists to become leaders in providing patient centric, evidence-based care to adult, paediatric and neonatal patients admitted in intensive care unit. Our acute care hospital and faculty are recognized providers of acute care, education and research.

3. Objectives:

The objectives of the Post-Doctoral Fellowship in Intensive Care Physiotherapy are: Immediate Assessment, therapy and management: The trainee should be able to make an accurate assessment of the life-threatening problems in a critically ill patient, have knowledge of life supporting therapy and patient management in intensive care unit.

- a. Medical Assessment, Problem Solving and Decision Making: The trainee should have knowledge about the medical and physiotherapy management of acutely ill patient.
- b. 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.
- c. System Failure: The trainee should have a knowledge of the signs and symptoms of patients with a single or multiple system failure.
- d. Retrieval and Transport: The trainee should know the care and precautions needed during transfer of a critically ill or injured patient to a hospital from the place of injury or site of a mass disaster.
- e. Disease and Disease Processes - General Medical and Surgical Conditions: The trainee should have a broad and sound understanding of general medical and surgical conditions along with knowledge of medical and surgical emergencies and their physiotherapy management.
- f. Paediatric Knowledge and Skills: The trainee should be able to recognise life threatening conditions in paediatric age group patients and the basic or advanced life support management and physiotherapy skills needed in such children.
- g. Anaesthesia: The trainee should understand the pre and postoperative management of patients receiving general, regional or local anaesthesia.
- h. Therapeutic Agents: The trainee should have a sound knowledge of the principles and practice of the various therapeutic agents used in the critically ill patient.
- i. Adverse Reactions to Drugs: The trainee should know the adverse effects of drugs.
- j. Monitoring, Investigations and Interpretation of Data: The trainee should have a detailed knowledge of the investigations and monitoring techniques commonly used in intensive care and a general knowledge of the procedures in medicine and surgery.
- k. Principles of Monitoring and patient equipment: The trainee should understand the principles of the measurement of biological variables and have a knowledge of the equipment on which critically ill patients have an everyday dependence.

- l. **Technical Skills:** The trainee should know the indications, contraindications and complications of procedures commonly performed in intensive care.
 - m. **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.
 - n. **Administration, Organisation and Education:** By the end of training, the trainee should have some knowledge and skill of the administration and organisation of an intensive care unit so that clinical care, research and teaching are carried out optimally.
4. **Duration of the Course:** The duration of the fellowship program is one year.
 5. **Eligibility Criteria:** Master in Physiotherapy (MPT) in any discipline/PhD in Physiotherapy (any discipline).
 6. **Core Department:**
Department of Cardiorespiratory Physiotherapy, Dr. A.P.J. Abdul Kalam College of Physiotherapy, Pravara Institute of Medical Sciences, Deemed to be University, Loni.
 7. **Associated Departments:**
Clinical departments of Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni.
 8. **Course Strategy:**
 - Post Doctoral Fellowship in Intensive Care Physiotherapy is offered as a one-year course.
 - The one-year course will be covered through 1200 hours of teaching.
 - These 1200 hours will be divided into Knowledge (30%): Skill training (70%)

	Percentage	Teaching Hours	Credit Hours
Knowledge	30%	360	24
Skill Training	70%	840	28
	100%	1200	52

- For knowledge 1 Credit equals 15 hours.
 - For skill training 1 Credit equals 30 hours.
 - Knowledge will be covered through Didactic Lectures, Seminars, Journal Club, Self-Study etc.
 - Skill training will be covered through Case presentations, Case discussions & Hands-on training.
9. **Training schedule:**
This is a full time, one-year training programme with emphasis on physiotherapy management in an intensive care unit. The training shall comprise of rotation in the following departments:

- a. ICU (Multispecialty: Surgical/ Medical/ Neuro/ Cardiac) – 8 months.
- b. Trauma & Emergency Care Unit – 1 month.
- c. Paediatric and Neonatal ICU -2 months
- d. Externship: 1 month

10. Program content:

The candidate must gain experience in the diagnosis and physiotherapy management of patients with acute, serious, and life-threatening medical and surgical conditions. The present document defines the core curriculum of cognitive knowledge and procedural skills that a physiotherapist working in an intensive care unit is expected to be equipped with to effectively approach the complex problems encountered in a critically ill patient.

11. Teaching Methodologies:

1. Didactic Lectures
2. Case Discussion
3. Student Directed Learning
4. Case Based Learning
5. Role Playing
6. Simulator Based learning
7. Web Based learning
8. Self-Study

Teaching component will include:

- I. Didactic learning (theory lectures, seminars, journal club sessions and group discussions),
- II. Non-didactic/practical/clinical learning - (bed-side, treatment procedure, clinical demonstration, case discussion, laboratory observation sessions).
- III. Combined Rounds
- IV. Interdepartmental conferences/Case presentations

12. Clinical Posting:

1. Academic and practical training commences in the Intensive Care Unit.
2. Second month of training will involve identification of project and synopsis submission for Ethical Committee approval.
3. Didactic and clinical training will be held within the unit.
4. Student will be expected to acquire good clinical practice skills pertaining to the curriculum.
5. Team work, bed-side practice, out-patient care skills should be acquired by the end of course duration.

13. Course Content

I. Knowledge Component: 360 Teaching Hrs.

1. Cardiovascular physiology, pathology, Pathophysiology and Physiotherapy management of Cardiovascular Conditions in Intensive Care Unit.
2. Respiratory Physiology, Pathology, Pathophysiology, and Physiotherapy management of respiratory conditions in Intensive Care Unit.
3. Central Nervous System (CNS) Physiology, Pathology, Pathophysiology, and Physiotherapy management of neurological disorders in Intensive Care Unit.
4. Metabolic and Endocrine Effects of Critical Illness.
5. Physiotherapy management of infectious conditions in Intensive Care Unit.
6. Physiotherapy management of Acute Hematologic and Oncologic Disorders.
7. Physiotherapy management of acute Gastrointestinal (GI), Genitourinary (GU) and Obstetric-Gynaecological (Obs. &Gynae) Disorders.
8. Intensive care management of polytrauma patients.
9. Environmental Hazards.
10. Organ Transplantation.
11. Monitoring, Bioengineering and Biostatistics.

II. Skill Component: 840 Teaching Hrs.

1. Respiratory mechanics and assessment of gaseous exchange.
2. Endotracheal Intubation and maintenance of artificial airways.
3. IPPV, Manual Hyperinflation and use of Resuscitation Bag.
4. Tracheostomy and mini-tracheostomy-procedure and care.
5. Airway Suctioning.
6. Mechanical ventilation, weaning from ventilation and care of patient on mechanical ventilation.
7. Oxygen Therapy.
8. Management of shock and CPR-Basic and advanced life support.
9. ICD- its care, complications and management.
10. Bronchoscopy and bronchoalveolar lavage.
11. Arterial and mixed venous gas analysis.
12. ECG interpretation of various cardiac disorders, bed-side ultrasonography and echocardiography.
13. Measurement and interpretation of hemodynamic variables.
 - i. Non-invasive hemodynamic monitoring.
 - ii. Invasive hemodynamic monitoring including cardiac catheterisation.
14. PCI -Coronary Angiography and Angioplasty. Care and management of patient following PCI.
15. Chest Physiotherapy and advanced physiotherapy management of patients in critical care unit.
16. Research Methodology.

14. Detailed Syllabus:

Knowledge Component

S. No.	Competency	Learning Domain	Level in Miller's Pyramid	T-L Methods	Assessment Methods	Teaching Hours
1.	<p>Cardiovascular physiology, pathology, Pathophysiology and Physiotherapy management of Cardiovascular Conditions in Intensive Care Unit:</p> <p>a. Shock and its complications</p> <p>b. Myocardial infarction and its complications</p> <p>c. Cardiac rhythm and conduction disturbances.</p> <p>d. Indications for and types of pacemakers</p> <p>e. PCI, Angiography and imaging techniques of the cardiovascular system</p> <p>f. Cardiac Catheterisation</p> <p>g. ICD and its complications</p> <p>h. Perioperative management of patient undergoing cardiovascular surgery.</p> <p>i. Pulmonary embolism – thrombus, air, fat, amniotic</p> <p>j. Pulmonary oedema; cardiogenic, noncardiogenic</p> <p>k. Cardiac tamponade and other acute pericardial diseases</p> <p>l. Acute and chronic life-threatening valvular disorders</p> <p>m. Acute aortic and peripheral vascular disorders, including A-V fistulas</p> <p>n. Acute complications of cardiomyopathies and myocarditis</p> <p>o. Vasoactive and inotropic therapy</p> <p>p. Pulmonary hypertension and cor pulmonale</p> <p>q. Complications of angioplasty</p> <p>r. Principles of oxygen transport and utilization</p> <p>s. Hemodynamic effects caused by ventilatory assist devices</p> <p>t. Thrombolytic and anticoagulant therapy</p> <p>u. Recognition, evaluation, and management of hypertensive emergencies</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning Student-Directed Learning, Simulation Based Learning, Self study	LAQ, SAQ	70
2.	<p>Respiratory Physiology, Pathology, Pathophysiology, and Physiotherapy management of respiratory conditions in Intensive Care Unit:</p> <p>a. Acute respiratory failure</p> <p>i. Hypoxemic respiratory failure including acute respiratory distress syndrome</p> <p>ii. Hypercapnic respiratory failure</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning Student-Directed	LAQ, SAQ	70

	<ul style="list-style-type: none"> iii. Acute on chronic respiratory failure b. Status asthmaticus c. Smoke inhalation, airway burns d. Aspiration e. Flail chest, chest trauma, pulmonary contusion f. Bronchopulmonary infections g. Upper airway obstruction h. Near drowning i. Pulmonary mechanics and gas exchange j. Oxygen therapy k. Hyperbaric oxygenation l. Mechanical ventilation <ul style="list-style-type: none"> i. Pressure and volume ventilators ii. Positive end-expiratory pressure, intermittent mandatory ventilation, continuous positive airway pressure, high-frequency ventilation, inverse ratio ventilation, pressure-support ventilation, negative pressure ventilation, differential lung ventilation, pressure control, and non-invasive ventilation iii. Indications for and hazards of mechanical ventilation iv. Barotrauma and Volutrauma v. Criteria for weaning and weaning techniques vi. Extracorporeal membrane oxygenation vii. Permissive hypercapnia viii. Liquid ventilation m. Airway maintenance <ul style="list-style-type: none"> i. Emergency airway management ii. Endotracheal intubation iii. Tracheostomy – open and percutaneous iv. Long-term intubation vs. tracheostomy n. Ventilatory muscle physiology, pathophysiology including polyneuropathy of the critically ill, and prolonged effect of neuromuscular blockers o. Pleural diseases <ul style="list-style-type: none"> i. Empyema ii. Massive effusion iii. Pneumothorax iv. Haemothorax p. Pulmonary haemorrhage and massive haemoptysis 			Learning, Self study		
3.	Central Nervous System (CNS) Physiology, Pathology, Pathophysiology, and Physiotherapy management of neurological	K	KH	Didactic Lectures, Seminar,	LAQ, SAQ	40

	<p>disorders in Intensive Care Unit:</p> <p>a. Coma</p> <ol style="list-style-type: none"> i. Metabolic ii. Traumatic iii. Infectious iv. Mass lesions v. Vascular-anoxic or ischemic vi. Drug induced <p>b. Hydrocephalus</p> <p>c. Psychiatric emergencies</p> <p>d. Perioperative management of patient undergoing neurologic surgery</p> <p>e. Brain death evaluation and certification</p> <p>f. Diagnosis and management of persistent vegetative states</p> <p>g. Management of increased intracranial pressure (ICP), including ICP monitors</p> <p>h. Status epilepticus</p> <p>i. Neuromuscular disease causing respiratory failure</p> <ol style="list-style-type: none"> i. Guillain-Barré Syndrome ii. Amyotrophic Lateral Sclerosis iii. Myasthenia Gravis <p>j. Nontraumatic intracranial bleed: Subarachnoid, Intracerebral and Others</p>			Discussion Case Based Learning Student-Directed Learning Role Play, Self study		
4.	<p>Metabolic and Endocrine Effects of Critical Illness:</p> <ol style="list-style-type: none"> i. Disorders of thyroid function ii. Adrenal crisis iii. Disorders of antidiuretic hormone metabolism iv. Diabetes mellitus <ol style="list-style-type: none"> (1) Ketotic and nonketotic hyperosmolar coma (2) Hypoglycaemia v. Insulinoma vi. Disorders of calcium and magnesium balance 	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning, Student Directed Learning, Self Study	LAQ, SAQ	20
5.	<p>Physiotherapy management of infectious conditions in Intensive Care Unit:</p> <p>a. Antibiotics</p> <ol style="list-style-type: none"> i. Antibacterial agents ii. Antifungal agents iii. Antitubercular agents iv. Antiviral agents v. Agents for parasitic infections <p>b. Infection control for special care</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning, Student Directed Learning, Self Study	LAQ, SAQ	20

	<p>units</p> <ul style="list-style-type: none"> vi. Development of antibiotic resistance vii. Universal precautions viii. Isolation and reverse isolation <ul style="list-style-type: none"> d. Anaerobic infections e. Tetanus f. Hospital acquired and opportunistic infections in the critically ill g. Adverse reactions to antimicrobial agents h. Intensive care unit (ICU) support of the immunosuppressed patient <ul style="list-style-type: none"> i. Acquired Immunodeficiency Syndrome (AIDS) ii. Organ Transplant iii. Oncologic iv. Infectious risks to healthcare workers 					
6.	<p>Physiotherapy management of Acute Hematologic and Oncologic Disorders:</p> <ul style="list-style-type: none"> a. Acute defects in haemostasis <ul style="list-style-type: none"> i. Thrombocytopenia/ thrombocytopathy ii. Disseminated intravascular coagulation b. Anticoagulation; fibrinolytic therapy c. Principles of blood component therapy d. Acute haemolytic disorders including thrombotic microangiopathies e. Acute syndromes associated with neoplastic disease and anti-neoplastic therapy f. Prophylaxis against thromboembolic disease 	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning, Student Directed Learning, Self Study	LAQ, SAQ	20
7.	<p>Physiotherapy management of acute Gastrointestinal (GI), Genitourinary (GU) and Obstetric-Gynaecological (Obs. & Gynae) Disorders:</p> <ul style="list-style-type: none"> a. Acute pancreatitis with shock b. Upper and lower GIT bleeding c. Acute perforations of GIT d. Ruptured oesophagus e. Acute inflammatory disease of intestine f. Acute uropathy and urinary retention g. Urinary tract bleeding h. Toxaemia of pregnancy i. Perioperative management of post-surgical patients 	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning Self-Directed Learning	LAQ, SAQ	30

8	<p>Intensive care management of polytrauma patients:</p> <p>b. Maintenance of open airway</p> <p>c. Endotracheal intubation (oral and nasal)</p> <p>d. Intermittent positive pressure ventilation on resuscitation bag</p> <p>e. Setting and turning on the respirator with various modes of ventilation</p> <p>f. Chest physiotherapy and suctioning of airway</p> <p>g. Oxygen therapy and assessment and measurement of arterial and mixed venous blood gas analysis</p> <p>h. Assessment of gas exchange and respiratory mechanics</p> <p>i. Various modes of weaning from mechanical ventilation</p> <p>j. Knowledge about placement of intercostal drainage tube</p> <p>k. Fiberoptic bronchoscopy and bronchoalveolar lavage</p> <p>l. Knowledge about cricothyrotomy, minitracheotomy and percutaneous dilational tracheostomy</p> <p>m. Knowledge about placement of central venous catheter through various approaches.</p> <p>n. Knowledge about arterial catheterisation</p> <p>o. Placement of pulmonary artery (Swan Ganz) catheter and measurement & interpretation of hemodynamic variables</p> <p>p. Implementation of cardiovascular support and antiarrhythmic therapy and thrombolysis.</p> <p>q. Bedside Ultrasound screening of lungs & abdomen</p> <p>r. Bedside Echo screening</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning Self-Directed Learning Simulation Based Learning	LAQ, SAQ	30
9.	<p>Environmental Hazards:</p> <p>a. Drug overdose and withdrawal</p> <p>i. Barbiturates</p> <p>ii. Narcotics</p> <p>iii. Insecticides and pesticides</p> <p>iv. Alcohols</p> <p>v. Cocaine</p> <p>vi. Tricyclic Antidepressants</p> <p>vii. Acetaminophen</p> <p>viii. Others</p> <p>b. Temperature-Related Injuries</p> <p>i. Hyperthermia</p> <p>ii. Hypothermia</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based Learning Self-Directed Learning	LAQ, SAQ	30
10.	<p>Organ Transplantation:</p> <p>a. Principles of transplantation (organ donation, procurement, maintenance of organ donors,</p>	K	KH	Didactic Lectures, Seminar, Discussion Case Based	LAQ, SAQ	30

	<p>preservation, transportation, allocation, implantation, national organization of transplantation activities)</p> <p>b. Immunosuppression</p> <p>c. Indications and postoperative care of organ transplantation</p>			<p>Learning, Student Directed Learning, Role Play, Simulation Based Learning, Self Study</p>		
11.	<p>Monitoring, Bioengineering and Biostatistics:</p> <p>a. Prognostic indices, severity, and therapeutic intervention scores</p> <p>b. Principles of electrocardiographic monitoring, measurement of skin temperature and resistance, transcutaneous measurements</p> <p>c. Invasive hemodynamic monitoring</p> <p>i. Display techniques</p> <p>ii. Principles of arterial, central venous, and pulmonary artery pressure catheterization and monitoring</p> <p>iii. Assessment of cardiac function and derived hemodynamic parameters</p> <p>d. Non-invasive hemodynamic monitoring</p> <p>e. Respiratory monitoring (airway pressure, intrathoracic pressure, tidal volume, pulse oximetry, dead-space-tidal volume ratio, compliance, resistance, capnography, pneumotachography)</p> <p>f. Thermoregulation</p> <p>g. CNS brain monitoring (intracranial pressure, cerebral blood flow, cerebral metabolic rate, electroencephalogram, jugular venous bulb oxygenation, transcranial Doppler)</p> <p>h. Metabolic monitoring (oxygen consumption, carbon dioxide production, respiratory quotient)</p> <p>i. Use of computers in critical care units</p> <p>j. Research Methodology</p> <p>k. Electrical safety</p>	K	KH	<p>Didactic Lectures, Seminar, Discussion Case Based Learning, Student Directed Learning, Role Play, Simulation Based Learning, Self Study</p>	LAQ, SAQ	10

II. Skill Component

S. No.	Competency	Learning Domain	Level in Miller's Pyramid	T-L Methods	Assessment Methods	Teaching Hours
1.	Respiratory mechanics and assessment of gaseous exchange	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	10
2.	Endotracheal Intubation and maintenance of artificial airways	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	50
3.	IPPV, Manual Hyperinflation and use of Resuscitation Bag	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	50
4.	Tracheostomy and mini-tracheostomy-procedure and care	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	30
5.	Airway Suctioning	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	30
6.	Mechanical ventilation, weaning from ventilation and care of patient on mechanical ventilation	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	50
7.	Oxygen therapy	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	40
8.	Management of shock and CPR-Basic and advanced life support	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	40
9.	ICD and its care and management	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	20
10.	Bronchoscopy and bronchoalveolar lavage	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	50
11.	Arterial and mixed venous blood gas analysis	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	30
12.	ECG interpretation of various cardiac disorders, bed-side ultrasonography and echocardiography	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	40
13.	Measurement and interpretation of hemodynamic variables- i. Non-invasive hemodynamic monitoring	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	100

	ii. Invasive hemodynamic monitoring including cardiac catheterisation					
14.	PCI interventions- Coronary Angiography and Angioplasty Care and management of patient following PCI	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	70
15.	Chest Physiotherapy and advanced physiotherapy management of patients in critical care unit	S	SH	Demonstrations, Case Presentations, Practicals	Viva voce, OSCE/OSPE	200
16.	Research methodology	S	SH	Short Term Project	Viva voce	30

Skill Competencies To Be Acquired During Externship (Minimum 180 hrs.):

1. PCI
2. Advanced Management of peri and post operative patients in critical care
3. Knowledge of Cardiovascular surgery
4. Knowledge of Pulmonary surgery
5. Knowledge of Neurosurgery
6. Advanced patient monitoring devices and methods

Skill Competencies to Be Acquired at Virtual Skill Lab (Minimum 60 hrs.):

1. CPR-Basic and advanced life support
2. Airway suctioning
3. ECG interpretation of various cardiac disorders
4. ICD
5. Bronchoscopy

S. No.	Themes	CO. No.	Inclusions
1.	Cardiovascular physiology, pathology, Pathophysiology and Physiotherapy management of Cardiovascular Conditions in Critical Care Unit	CO 1.1	Discuss physiology, pathology and pathophysiology of general cardiovascular conditions
		CO 1.2	Discuss the pathophysiology of shock and its complications Discuss the pathophysiology of
		CO 1.3	Myocardial Infarction and its complications
		CO 1.4	Discuss disturbances of cardiac rhythm and conduction
		CO 1.5	Discuss PCI procedures and imaging techniques of cardiovascular system
		CO 1.6	Describe cardiac catheterisation
		CO 1.7	Discuss peri-operative management of patient in critical care unit

2.	Respiratory Physiology, Pathology, Pathophysiology, and Physiotherapy management of respiratory conditions in Critical Care Unit	CO 2.1	Discuss physiology, pathology and pathophysiology of general respiratory disorders
		CO 2.2	Describe acute respiratory failure and conditions causing it
		CO 2.3	Describe pulmonary mechanics and gaseous exchange
		CO 2.4	Discuss insertion and maintenance of artificial airways
		CO 2.5	Discuss mechanical ventilation, modes and hazards
		CO 2.6	Discuss ventilatory muscle physiology, pathophysiology and training in critical care unit
		CO 2.7	Discuss pathophysiology and management of pleural diseases
3.	Central Nervous System (CNS) Physiology, Pathology, Pathophysiology, and Physiotherapy management of neurological disorders in Critical Care Unit	CO 3.1	Discuss physiology, pathology and pathophysiology of neurological disorders
		CO 3.2	Discuss pathophysiology and management of coma
		CO 3.3	Discuss perioperative management of patient undergoing neurosurgery
		CO 3.4	Discuss evaluation and management of brain death
		CO 3.5	Discuss management of persistent vegetative state
		CO 3.6	Discuss management of neurological disorders causing respiratory failure
		CO 3.7	Discuss causes of non-traumatic intracranial bleeding
4.	Metabolic and Endocrine Effects of Critical Illness:	CO 4.1	Discuss the metabolic and endocrine effects of critical illness
		CO 4.2	Discuss the disorders of thyroid function
		CO 4.3	Discuss the disorders of adrenal function
		CO 4.4	Describe Diabetes Mellitus and its systemic effects
		CO 4.5	Discuss the effects of calcium and magnesium imbalance
5.	Physiotherapy management of infectious conditions in Critical Care Unit	CO 5.1	Discuss physiotherapy management of common infectious conditions
		CO 5.2	Describe the role of common anti-bacterial, anti-fungal and anti-viral agents
		CO 5.3	Discuss about infection control measures in critical care unit
		CO 5.4	Discuss anaerobic and hospital acquired infections
		CO 5.5	Discuss critical care management of AIDS
		CO 5.6	Discuss critical care management of organ transplant

6.	Physiotherapy management of Acute Hematologic and Oncologic Disorders	CO 6.1	Discuss physiotherapy management of acute haematological disorders in critical care unit
		CO 6.2	Discuss physiotherapy management of oncological diseases in critical care unit
		CO 6.3	Discuss about acute defects of haemostasis
		CO 6.4	Describe acute haemolytic disorders
		CO 6.5	Describe principles of blood component therapy
		CO 6.6	Discuss neoplastic diseases and anti-neoplastic therapy
		CO 6.7	Discuss thromboembolic disorders and their management in critical care unit
7.	Physiotherapy management of acute Gastrointestinal(GI), Genitourinal(GU) and Obstetric-Gynaecological(Obs-Gyn)Disorders	CO 7.1	Discuss physiotherapy management of acute Gastrointestinal(GI), Genitourinal(GU) and Obstetric-Gynaecological(Obs-Gyn)Disorders in critical care unit
		CO 7.2	Discuss management of acute pancreatitis
		CO 7.3	Discuss upper and lower GIT bleeding
		CO 7.4	Discuss management of urinary tract disorders
		CO 7.5	Discuss management of pregnancy induced toxemia
8.	Intensive care management of polytrauma patients	CO 8.1	Describe insertion and Maintenance of open airway
		CO 8.2	Describe endotracheal intubation (oral and nasal)
		CO 8.3	Describe Intermittent positive pressure ventilation and use of resuscitation bag
		CO 8.4	Discuss setting and turning on the respirator with various modes of ventilation
		CO 8.5	Discuss chest physiotherapy and suctioning of airway
		CO 8.6	Discuss oxygen therapy and assessment and measurement of arterial and mixed venous blood gas analysis
		CO 8.7	Discuss assessment of gas exchange and respiratory mechanics
		CO 8.8	Discuss various modes of mechanical ventilation and weaning
		Co 8.9	Discuss bronchoscopy and bronchoalveolar lavage
		CO 8.10	Discuss Arterial and venous catheterisation
9.	Environmental Hazards	CO 9.1	Describe drug overdose and withdrawal
		CO 9.2	Describe temperature related injuries
10.	Organ Transplantation	CO 10.1	Discuss principles of organ transplant
		CO 10.2	Describe immunosuppression
		CO 10.3	Discuss post-operative care following organ transplant
11.	Monitoring, Bioengineering and Biostatistics	CO 11.1	Discuss prognostic indices, severity, and therapeutic intervention scores in critically ill patients
		CO 11.2	Discuss principles of electrocardiographic monitoring
		Co 11.3	Discuss measurement of skin temperature and resistance and transcutaneous measurements

	CO 11.4	Discuss invasive and non-invasive hemodynamic monitoring in critical care unit
	CO 11.5	Discuss respiratory monitoring for the critically ill patient
	CO 11.6	Discuss monitoring of CNS in critical care unit
	CO 11.7	Discuss metabolic monitoring of the critically ill patient
	CO 11.8	Discuss about the important tools in research methodology

15. Scheme of Examination

A total of 150 credits for the fellowship programme will be evaluated with following break up.

SR NO	HEAD OF ASSESSMENT	% WEIGHTAGE	CREDITS ALLOTTED
Formative Examination			
1	Seminars	10 %	15
2	Viva-Voce	10%	15
Summative Examination			
3	Theory	20%	30
4	Practical	20%	30
5	Short Term Project & open defence viva	20%	30(20+10)*
Electives			
6	Externship	20%	30
Total		100 %	150

*20 Credits for carrying out the short-term research project and 10 credits for open defence viva.

During the semester of fellowship, fellow will be continuously evaluated through seminars. After the fellow has completed six months of the programme, he/she will be evaluated for Semester Ending Examination in the form of viva voce.

Proposed

A total of 50 Credits for the FELLOWSHIP programmes will be evaluated with following Break up.

SR NO	HEAD OF ASSESSMENT	% WEIGHTAGE	CREDITS ALLOTTED
Formative Examination			
1	Mid Term Practical Examination	20%	02
2	Prelims Theory		03
3	Prelims Practical		05

Summative Examination			
4	Theory	40%	05
5	Practical		10
6	Project presentation		05
Electives			
7	Externship	20%	10
8	Log Book / E-portfolio	20%	10
Total		100 %	50

After the fellow has completed six months of the programme, he/she will be evaluated for Midterm Practical Examination.

I. FORMATIVE ASSESSMENT

A. Mid Term Practical Examination: Score card

PARTICULARS		Max credits allotted	Marks	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
1	Practical Viva-voce (20marks)	02					

$$\text{SGPA} = \text{Credit point} / 02$$

After the fellow has completed ten months of Fellowship programme, he/she will be evaluated for Prelims Examination.

B. Prelims Theory

S. No.	PARTICULARS	Max credits allotted	Marks secured	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
A	THEORY (100 marks)	03					

$$\text{SGPA} = \text{Credit point} / 03$$

C. Prelims Practical

S. No.	PARTICULARS	Max credits allotted	Marks secured	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
B	PRACTICAL (100 marks)	05					

$$\text{SGPA} = \text{Credit point} / 05$$

II. SUMMATIVE EXAMINATION**A. THEORY**

S.No.	PARTICULARS	Max credits allotted	Marks secured	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
A	THEORY (100 marks)	05					

SGPA = Credit point / 05

B. PRACTICAL

S. No.	PARTICULARS	Max credits allotted	Marks secured	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
B	PRACTICAL (100 marks)	10					

SGPA = Credit point / 10

C. Project presentation

S. No.	PARTICULARS	Max credits allotted	Marks secured	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
C	Open Defense viva on Short term research project (50 marks)	05					

SGPA = Credit point / 05

III Externship

S. No.	Externship (Elective)	Max credits allotted	Marks	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
1	Externship (50 marks)	10					

SGPA = Credit point / 10

IV E-portfolio

S. No.	E-portfolio	Max credits allotted	Marks	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)
1	Academic Milestones	03					
2	Research Milestones	03					
3	Goal Setting	01					
4	Certifiable Competencies achieved	03					

SGPA = Credit point / 10

Final Score Card

S. No.	Items	Max credits allotted	Marks	% secured	Letter Grade	Grade points	Credit point (maximum credit X grade points)	SGPA
1	Mid Term Practical Examination	02						
2	Prelims Theory	03						
3	Prelims Practical	05						
4	Final Theory	05						
5	Final Practical	10						
6	Project presentation	05						
7	Externship	10						
8	E-portfolio	10						
	Total	50						

Cumulative grade point average CGPA = Total SGPA / 8

Final CGPA

Content of Theory paper will be as follows:

There will be only one paper of 100 marks of three hours duration details are as follows

The pattern of theory paper: Maximum Marks 100

6 Short answer questions (SAQs) 10 Marks Each- All Compulsory: 60 Marks

2 Long answer questions (LAQs) 20 Marks Each- All Compulsory: 40 Marks

Subject:

Time: 03 Hrs

Max. Marks:(100)

Instructions: -

1. All questions are compulsory.
2. Number to the right indicates full marks.
3. Draw neat diagrams, wherever necessary.
4. Use single answer book for answering both sections.

1. Short Answer Questions: -

- a. -----10
- b. -----10
- c. -----10
- d. -----10
- e. -----10
- f. -----10

2. Long answer questions: -

a. -----20

b. -----20

Calculation Of Grades:-

Grade is an evaluation of a student's performance in an examination, a paper or in a course & normally expressed by letter on a scale of A-F.

The marks obtained will be converted into grades as shown below:

Table: 1 - CALCULATION OF GRADES

Percentage secured by student	Letter Grade	Grades point
90 - 100	A+	10.0
80 - 89	A	9.0
70 - 79	B+	8.0
60 - 69	B	7.0
50 - 59	C+	6.0
40 - 49	C	5.0
30 - 39	D+	3.0
20 - 29	D	2.0
10 - 19	E	1.0
Less than 40	F	REAPPEAR
O	Ab	ABSENT

Thus, if a fellow secures 60% marks, she/he secures "B" grade and her/his grade point score will be 7.

Credit point is equal to maximum credit X grade points

The grade point will be given on total marks obtained in the said examination. A student will be said to have passed in the subject if he/she secures MINIMUM 50% marks (course grade C+).

Semester Grade Point Average (GPA):

The average of grades earned in all passing heads of a particular semester/heading divided by the number of credits is GPA for that particular semester/heading.

Thus, GPA= Total earned credit points/Total allotted credits.

Cumulative Grade Point Average (Final Result):

The up to date assessment of the overall performance of the student [PCT, Elective (Externship) Theory & Practical and Research project] will be obtained by calculating a number called CUMULATIVE GRADE POINT AVERAGE (CGPA). This is weighted as the average of the grade points obtained in all units since the student has entered in the course.

- Final CGPA = GPA(PCT) +GPA (Externship)+GPA(Theory) + GPA (Practical)+GPA (Research Project)/5*
- The fellow will be declared as successful for the award of FELLOWSHIP if she/he scores the cumulative grade point average score of "B" or more at the end of one year/ programme.
- Final grading will be awarded based on grades of all assessment heads taken together.*(Explanation Above)

The GPA & CGPA is rounded up to one decimal place.
The final grade earned will be as per following table.

CGPA	Grade
8.0-10	A+
7.0-7.9	A
6.0-6.9	B+
5.5- 5.9	B
4.5-5.4	C+
4.0-4.4	C
0-3.9	F

16. Books recommended:

TEXT BOOKS:

1. Intensive Care Medicine: Rippe, Irwin Alpert & Funk, Little Brown.
2. Textbook of Critical Care: Shoemaker Ayres Grekvik, Holbrook & Thompson Saunders.
3. Critical Care: Civetta. Taylor & Kirby, J.B. Lippincott
4. Principles of Critical Care: Hall, Schmidt & Wood, McGraw Hill.
5. Cardiopulmonary Critical Care: Dantzker, Saunders.
6. Pharmacologic Approach to the Critically Ill patient: Chernow, Williams & Wilkins
7. Respiratory Physiology - The Essentials: West, Williams Wilkins.
8. Textbook of advanced cardiac life support. American Heart Association.

POCKET MANUALS:

1. Critical Care Secrets: Parsons, Wiener-Kronish, Jaypee Brothers
2. Washington Manual of Critical Care

JOURNALS:

1. Indian Journal of Critical Care Medicine
2. Journal of Critical Care
3. Journal of Emergency and Critical Care Medicine
4. British Journal of Anaesthesia

17. Evaluation:-

Term end examination will be arranged and conducted by Dept. of Cariorespiratory Physiotherapy, Dr. APJ Abdul Kalam College of Physiotherapy and declare the result.

18. Examination Scheme

Paper – I : Post-Doctoral Fellowship in Intensive Care Physiotherapy

Paper – II : Recent advances in Post-Doctoral Fellowship in Intensive Care Physiotherapy

Theory Examination:- (2 Paper of 100 marks each)

2 LAQ x 20 Marks = 40 Marks

6 SAQ x 10 Marks = 60 Marks

Practical Examination:-

One Long Case / Long experiments = 50 Marks

Three Short Cases (3 x 30) = 90 Marks

Viva Voce / Oral / OSPE / Spottes = 60 Marks

Minimum Passing:-

i) Minimum 50% in Theory papers (Each paper minimum is 40%)

ii) Minimum 50% in Practical / Clinical & Viva Voce

iii) Overall 50% Theory & Practical/Clinical

Award of class:-

50% to 59.5% = IInd class

60 to 74.5% = Ist Class

Above 75% = Ist Class with Distinction

Attempts:-

- A student shall clear the Examination only within three attempts or within 4 years of admission.
- Result / Issue of Mark Sheet - Head of Institute & HOD will jointly issue the Mark Sheet.

Certification:-

A) Title - Post Doctoral Fellowship in Intensive Care Physiotherapy.

B) A fellowship is awarded upon successful completion of the prescribed study program, which will state that i) Candidate has completed the prescribed course of Post Doctoral Fellowship in Intensive Care Physiotherapy. ii) Candidate has completed prescribed clinical experience. iii) Candidate has passed the prescribed examination.

- C) Certificate will be issued with the signatures of concern Principal & Vice-Chancellor, Pravara Institute of Medical Sciences (Deemed to be University).
- D) Certificates to be prepared by concern College.

19. **Intake Capacity:** Intake Capacity for this programme is 05 candidates.

20. **Fees:** Nominal fees proposed to be charged from each candidate is Rs. 10,000/- which is intended for registration, documentation and certification of this programme.

21. Mandatory Fullfilment:-

- 1) To participate in UG teaching / PG teaching.
- 2) Presentation of 6 assignments.
- 3) One Research Methodology Workshop.
- 4) Participation / Presentation with minimum One Research article in Seminars/Conferences/workshop etc.
- 5) One Research Paper in Indian / Scopas / UGC Care list journal.

22. Conditions for admission to examination

The Student:

1. has attended not less than 80% of the theoretical instruction hours in each subject during the year.
2. has done not less than 80% of the clinical practical hours. However, students should make up 100% of attendance for integrated practice experience in term of hours and activities before awarding the certificate.

