Indian Nursing Council

NURSE PRACTITIONER IN CRITICAL CARE (POST GRADUATE- RESIDENCY PROGRAM)

I. Introduction and Background

In India, reshaping health systems in all dimensions of health has been recognized as an important need in the National Health Policy, 2015 (NHP, 2015 draft document). It emphasizes human resource development in the areas of education and training alongside regulation and legislation. The government recognizes significant expansion in tertiary care services both in public and private health sectors. In building their capacity, it is highly significant that the health care professionals require advanced educational preparation in specialty and super-specialty services. To support specialized and super-specialized healthcare services, specialist nurses with advanced preparation are essential. Developing training programs and curriculum in the area of tertiary care is recognized as the need of the hour. Nurse practitioners (NPs) will be able to meet this demand provided they are well trained and legally empowered to practice. With establishment of new cadres and legal empowerment, master level prepared NPs will be able to provide cost effective, competent, safe and quality driven specialized nursing care to patients in a variety of settings in tertiary care centres. Nurse practitioners have been prepared and functioning in USA since 1960s, UK since 1980s, Australia since 1990s and Netherlands since 2010.

Nurse practitioners in critical care / acute care, oncology, emergency care, neurology, cardiovascular care, and anesthesia, can be prepared to function in tertiary care settings. Rigorous educational preparation will enable them to diagnose and treat patients with critical illnesses as well as preventive and promoting care relevant to such illnesses and patients' responses to illness. An attempt has been made to propose a curricular structure / framework by INC towards preparation of Nurse Practitioner in Critical Care (NPCC) at Masters Level. The special feature of this program is that it is a clinical residency program emphasizing a strong clinical component with 20% of theoretical instruction including skill lab and 80% of clinical experience. Competency based training is the major approach and NP education is based on competencies adapted from International Council of Nurses (ICN,2005), and NONPF competencies (2012).

Critical Care Nurse Practitioner Program is intended to prepare registered BSc Nurses to provide advanced nursing care to adults who are critically ill. The nursing care is focused on stabilizing patients' condition, minimizing acute complications and maximizing restoration of health. These NPs are required to practice in tertiary care centers. The program consists of various courses of study that are based on strong scientific foundations including evidenced based practice and the management of complex health systems. These are built upon the bachelor's program in nursing. When authorized by the nursing regulatory council/s, state or national laws, they may prescribe drugs, medical equipment and therapies. The NPs in CC when exercising prescriptive authority or drug administration as per institutional protocols, they are accountable for the competency in

a) Patient selection/admission into ICU and discharge
b) Problem identification through appropriate assessment
c) Selection/administration of medication or devices or therapies
d) Patients' education for use of therapeutics
e) Knowledge of interactions of therapeutics, if any
f) Evaluation of outcomes and
g) Recognition and management of complications and untoward reactions.

The NPCC is prepared and qualified to assume responsibility and accountability for the care of critically ill patients under her care.

The said post graduate degree will be registered as an additional qualification by the State Nursing Council.

Philosophy

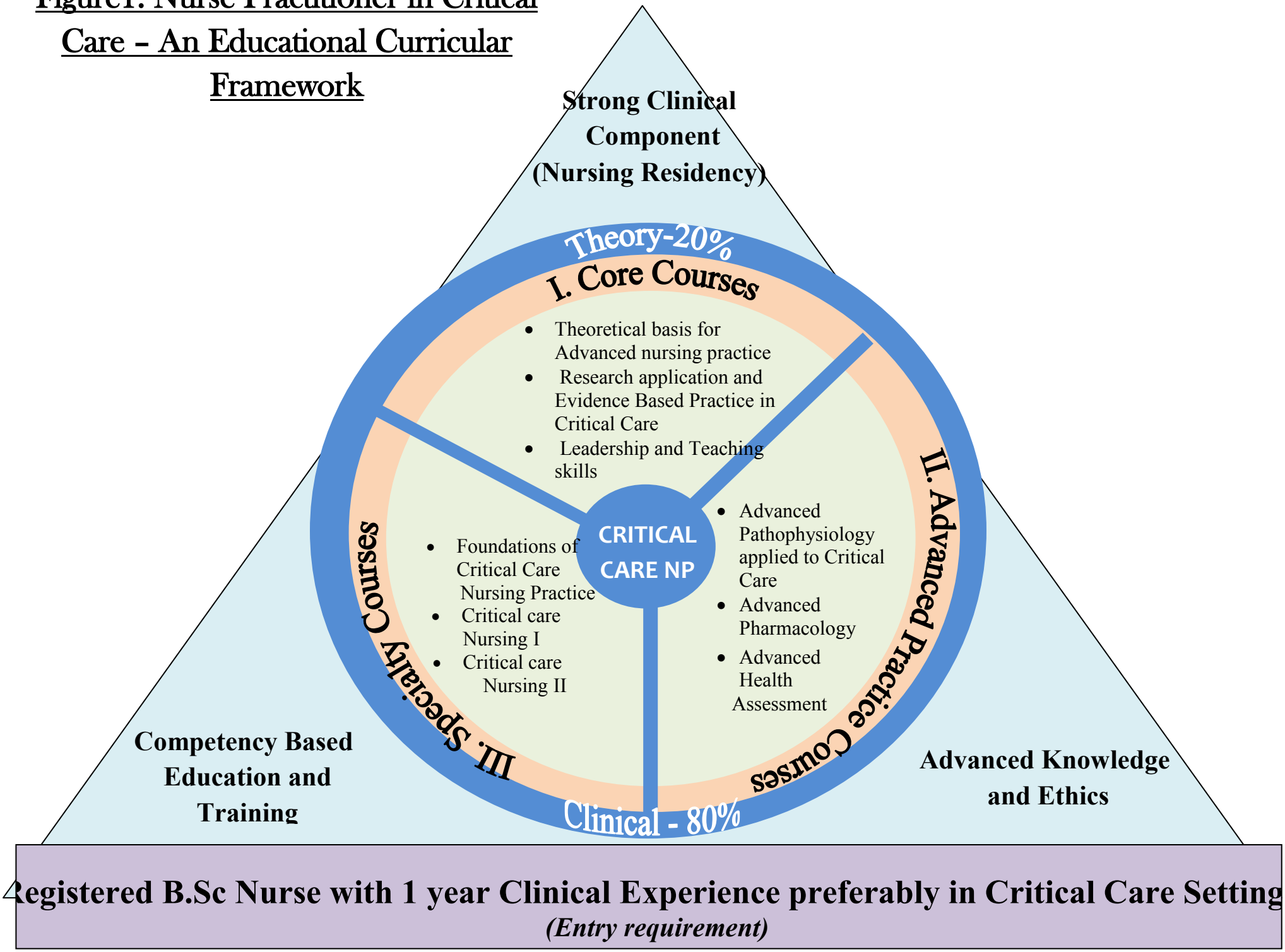
Indian Nursing Council believes that there is a great need to establish a postgraduate program titled Nurse Practitioner in Critical Care to meet the challenges and demands of tertiary health care services in India which is reflected in the National Health Policy (NHP draft document 2015) in order to provide quality care to critically ill patients and families.

INC believes that postgraduates from a residency program focused on strong clinical component and competency based training must be able to demonstrate clinical competence based on sound theoretical and evidence based knowledge. Education providers/preceptors/mentors must update their current knowledge and practices. Medical faculty/preceptors are invited to participate in this training more in the initial period of training.

INC also believes that a variety of educational strategies can be used in the clinical settings to address the deficit of qualified critical care nursing faculty. It is hoped to facilitate developing policies towards licensure and create cadre positions for appropriate placement of these postgraduate critical care NPs in tertiary care centers.

An educational framework for the NP curriculum is proposed (Figure 1).

Figure1. Nurse Practitioner in Critical Care – An Educational Curricular Framework



II Aim

The critical care NP program prepares registered BSc nurses for advanced practice roles as clinical experts, managers, educators and consultants leading to M.Sc degree in critical care NP

III Objectives

On completion of the program, the NP will be able to

1. assume responsibility and accountability to provide competent care to critically ill patients and appropriate family care in tertiary care centres
2. demonstrate clinical competence / expertise in providing critical care which includes diagnostic reasoning, complex monitoring and therapies
3. apply theoretical, patho-physiological and pharmacological principles and evidence base in implementing therapies / interventions in critical care
4. identify the critical conditions and carry out interventions to stabilize and restore patient's health and minimize or manage complications
5. collaborate with other health care professionals in the critical care team, across the continuum of critical care

IV. Program Description

The NP program is a Nursing residency program with a main focus on Competency based training. The duration is of two years with the curriculum consisting of theory that includes core courses, advanced practice courses and clinical courses besides clinical practicum which is a major component.

V. Standards/Requirements to start the NP program

The teaching institution must accept the accountability for the NP program and its students and offer the program congruent with the INC standards. The hospital should be a parent tertiary care centre with a minimum of 500 beds and above having Medical ICU, Surgical ICU, Cardio/thoracic ICU and Emergency care unit with a minimum of 10 beds and above in each ICU, to a total of 40-50 ICU beds in the hospital.

VI. Recognition for Nurse Practitioner in Critical Care (Post Graduate – Residency Program) will be given by Indian Nursing Council (INC) as per the guidelines laid down by INC.

VII. Physical and Learning Resources at college/Hospital

- One classroom/conference room at the clinical setting
- Skill lab for simulated learning (Hospital/college)
- Library and computer facilities with access to online journals
- E- learning facilities

VIII. Staff resources

- Full time faculty qualified NP in the specialty/ MSc in relevant specialty (1 faculty for every 5 students
- Professor cum coordinator 1/ Reader / Associate Professor 1
- The above faculty shall perform dual role or a senior nurse with MSc qualification employed in the tertiary centre
- Medical/nursing faculty preceptors

IX. Student Recruitment/Admission Requirements

Applicants must possess a registered B.Sc nurse with a minimum of one year clinical experience, preferably in any critical care setting prior to enrollment.

Number of candidates: 1 candidate for 5 ICU beds

Salary: 1. In-service candidates will get regular salary

2. Salary for the other candidates as per the salary structure of the hospital where the course is conducted

X. **Curriculum**

COURSES OF INSTRUCTION

		Theory(Hrs)	Lab/Skill Lab(Hrs)	Clinical (Hrs)
I Year				
	Core Courses			
I	Theoretical Basis for Advanced Practice Nursing	46		
II	Research Application and Evidence Based Practice in Critical Care	57.5	23	**322** 7wks
III	Advanced skills in Leadership, Management and Teaching Skills	57.5	23	**184** 4wks
	Advanced Practice Courses			
IV	Advanced Pathophysiology applied to Critical Care	69		**322** 7wks
V	Advanced Pharmacology applied to Critical Care	69		**368** 7wks
VI	Advanced Health/physical Assessment	69	46	**552** 12wks
TOTAL= 2208 hrs		368 (7.5wks)	92 (1.5wks)	1748 (37wks)
II year				
	Specialty Courses			
VII	Foundations of Critical Care Nursing Practice	92	46	**552** 11wks
VIII	Critical Care Nursing I	92	69	**552** 13wks
IX	Critical Care Nursing II	92	69	**644** 13wks
TOTAL=2208hrs		276 (5wks)	184 (4wks)	1748 (37wks)

{ Hours are calculated as per credits planned(1 theory credit=1hr/week/semeseter, 1practical credit=2hrs/week/semester, 1clinical credit=4hrs/week/semester)}

No of weeks available in an year =52 - 6 (Annual leave, Casual leave, sick leave = 6 weeks)=46 weeks x 48 hrs = 2208 hrs

Two years = 4416 hrs

Instructional Hours: Theory = 644 hrs , Skill lab= 276 hrs, Clinical = 3496 hrs

TOTAL= 4416 hrs

I year : 368-92-1748 hrs (Theory-skill lab-clinical) [Theory + Lab=20%, Clinical=80%]

II year : 276-184-1748 hrs ('' '') [Theory + Lab=20%, Clinical=80%]

I YEAR =46 weeks/ 2208 hrs(46x48hrs)(Theory +Lab :8 hrs/week for 45wks =360+96 hrs*)

*Theory + Lab= 96 hrs can be given for 2wks in the form of introductory block classes and workshops

II YEAR=46 weeks/ 2208 hrs(46x48hrs) (Theory +Lab : 10 hrs/week for 46wks=460hrs)

CLINICAL PRACTICE

A. **Nursing Residency clinical experience** (A minimum of 48 hrs/ week is prescribed, however, it is flexible with different shifts and OFF followed by on call duty)

Clinical placements:

I year: 44 wks (excludes 2 weeks of introductory block classes and workshop)

Medical ICU – 12 weeks
Surgical ICU – 12 weeks
Cardio/Cardio thoracic (CT) ICU – 8 weeks
Emergency Department - 6 weeks
Other ICUs (Neurology, Burns, Dialysis unit) - 6 weeks

II Year: 46 wks

Medical ICU – 12 weeks
Surgical ICU – 12 weeks
Cardio/Cardio thoracic (CT) ICU – 8 weeks
Emergency Department - 8 weeks
Other ICUs (Neurology, Burns, Dialysis unit) - 6 weeks

8hrs duty with specified OFFS and on call duty days every week or fortnight

B. Teaching methods:

T**eaching-theoretical, lab & Clinical can be done in the following methods and integrated during clinical posting**

- Clinical conference
- Case/clinical presentation
- Nursing rounds

- Clinical seminars
- Journal clubs
- Case study/Nursing process
- Advanced health assessment
- Faculty lecture in the clinical area
- Directed reading
- Assignments
- Case study analysis
- Workshops

C. Procedures/log book

At the end of each clinical posting, clinical log book (procedures/skills & clinical requirements) has to be signed by the preceptor every fortnight (Appendix 1)

D. NP Critical Care Competencies (Adapted from ICN,2005)

1. Uses advanced comprehensive assessment, diagnostic, treatment planning, implementation and evaluation skills
2. Applies and adapts advanced skills in complex and / or unstable environments
3. Applies sound advanced clinical reasoning and decision making to inform, guide and teach in practice
4. Documents assessment, diagnosis, management and monitors treatment and follow-up care in partnership with the patient
5. Administer drugs and treatments according to institutional protocols
6. Uses applicable communication, counseling, advocacy and interpersonal skills to initiate, develop and discontinue therapeutic relationships
7. Refers to and accepts referrals from other health care professionals to maintain continuity of care
8. Practices independently where authorizes and the regulatory framework allows in the interest of the patients, families and communities
9. Consults with and is consulted by other health care professionals and others
10. Works in collaboration with health team members in the interest of the patient
11. Develops a practice that is based on current scientific evidence and incorporated into the health management of patients, families and communities
12. Introduces, tests, evaluates and manages evidence based practice
13. Uses research to produce evidence based practice to improve the safety, efficiency and effectiveness of care through independent and inter-professional research
14. Engages in ethical practice in all aspects of the APN role responsibility
15. Accepts accountability and responsibility for own advanced professional judgement, actions, and continued competence
16. Creates and maintains a safe therapeutic environment through the use of risk management strategies and quality improvement

17. Assumes leadership and management responsibilities in the delivery of efficient advanced practice nursing services in a changing health care system
18. Acts as an advocate for patients in the health care systems and the development of health policies that promote and protect the individual patient, family and community
19. Adapts practice to the contextual and cultural milieu

E. <u>Institutional Protocol based administration of drugs</u>

- Administration of drugs, therapies and investigatory tests within the authorized scope of practice, guidelines and/or protocols ***(Appendix 2)***
- **Prescriptive authority as per institutional protocols**
  - Independent prescribing as per protocols (readymade protocols in emergencies/ special procedures) endorsed later by physician with written orders
  - Collaborative- As per protocols on verbal orders and endorsed by physician

Implementation of curriculum-A tentative plan

I yr. Courses	Introductory classes	Workshop	Theory integrated in clinical practicum	Methods of teaching (Topic can be specified)
1. Theoretical basis for Advanced practice Nursing (60)	13 hrs		33 hrs(22wks x 1.5=33)	• Seminar / Theory application • Lecture (faculty)
2. Research Application and Evidence Based Practice in Critical Care (80)	18.5	40 (5days)	22(22wks x1=22=22)	• Research study analysis/ Exercise / Assignment (lab)
3. Advanced skills in leadership, Management and Teaching (80)	17.5	8(1day)	55 (22wks x2.5=55)	• Clinical conference • Seminar • Exercises/Assignment (lab)
4. Advanced Pathophysiology (60)			69 (22x1.5=33+1.5, 23x 1.5=34.5)	• Case presentation • Seminar • Clinical conference
5. Advanced Pharmacology (60)			69(23x3)	• Nursing rounds • Drug study presentation • Standing orders / presentation

6. Advanced Health Assessment (92)			69+46 (23x5)	• Clinical demonstration (faculty) • Return demonstration • Nursing rounds • Physical assessment(all systems) • Case study

I year – Introductory classes= 1 week, Workshop = 1 week ,
22 weeks – 6.5 hrs/week, 22 wks – 9.5 hrs/week (This is very tentative)

II year courses	Theory integrated into clinical practicum	Methods of teaching
1. Foundations (80+72)	138 23wks x6=138	• Demonstration (lab) • Return demonstration (lab) • Clinical teaching • Case study • Seminar • Clinical conference • Faculty lecture
2. Critical Care Nursing I (80+60)	161 46x2 =92 46x1.5 =69 -------- 161	• Demonstration (lab) • Return Demonstration (lab) • Clinical conference / journal club • Seminar • Case presentation • Drug study(including drug interaction) • Nursing rounds • Faculty lecture
3. Critical Care Nursing II (80+60)	161 46x3.5=161	• Demonstration (lab) • Return Demonstration • Nursing rounds • Clinical conference / journal club • Seminar • Faculty lecture

II year 23 wks – 8 hrs/wk 23wks - 7 hrs/wk

Attendance: 100% in theory, practical and clinical.

Topic for every teaching method will be specified

XI. Assessment

Formative and Summative

- **Seminar**
- **Written assignments/Term papers**

- **Case/Clinical presentation**
- **Nursing process report**
- **Clinical performance evaluation**
- **Log book- counter signed by the medical/nursing faculty preceptor**
- **Objective Structured Clinical Examination**
- **Test papers**
- **Final examination**

Scheme of Final Examination

S. NO	Title	Theory %			Practical %		
		Hours	Internal	External	Hours	Internal	External
I Year							
1	**I Year** **Core Courses** Theoretical Basis for Advanced Practice Nursing	3 hrs	30	70			
2	Research Application and Evidence Based Practice in Critical Care	3 hrs	30	70			
3	Advanced skills in Leadership, Management and Teaching Skills	3 hrs	30	70			
4	**Advanced Practice Courses** Advanced Pathophysiology & Advanced Pharmacology relevant to Critical Care	3 hrs	30	70			
5	Advanced Health/physical Assessment	3 hrs	30	70		50	50
1	**II Year** **Specialty Courses** Foundations of Critical Care Nursing Practice	3 hrs	30	70		100	100

2	Critical Care Nursing I	3 hrs	30	70		100	100
3	Critical Care Nursing II	3 hrs	30	70		100	100
4	Dissertation and viva	3 hrs				50	50

Can be offered as semester system also

Examination Regulations

Core Courses

I. Theoretical Basis for Advanced Practice Nursing

COMPETENCIES

1. Analyses the global healthcare trends and challenges
2. Analyses the impact of Healthcare and Education policies in India on nursing consulting the documents available.
3. Develops in depth understanding of the healthcare delivery system in India, and its challenges
4. Applies economic principles relevant to delivery of healthcare services in critical care
5. Manages and transforms health information to effect health outcomes such as cost, quality and satisfaction
6. Accepts the accountability and responsibility in practicing the Nurse practitioner's roles and competencies
7. Actively participates in collaborative practice involving all healthcare team members in critical care and performs the prescriptive roles within the authorized scope
8. Engages in ethical practice having a sound knowledge of law, ethics and regulation of advanced nursing practice
9. Uses the training opportunities provided through well planned preceptorship and performs safe and competent care applying nursing process
10. Applies the knowledge of nursing theories in providing competent care to critically ill patients
11. Predicts future challenges of nurse practitioner's roles in variety of healthcare settings particularly in India

Hours of instruction Total = 46 hrs.

Sl.No.	Topic	Hours
1.	Global Health Care Challenges and Trends(Competency-1)	2
2.	Health System in India Health Care Delivery System in India – Changing Scenario(Competency-3)	2
3.	National Health Planning – 5 year plans and National Health Policy(Competency-2)	2
4.	Health Economics & Health Care financing(Competency- 4)	4
5.	Health Information system including Nursing Informatics (use of computers)(Competency-5)	4
	Advanced Nursing Practice (ANP)	
6.	ANP-Definition, Scope, Philosophy, Accountability, Roles & Responsibilities (Collaborative practice and Nurse Prescribing roles)(Competency-6&7)	4
7.	Regulation (accreditation of training institutions and Credentialing) & Ethical Dimensions of advanced nursing practice role (Competency-8)	4
8.	Nurse Practitioner – Roles, Types, Competencies, Clinical settings for practice, cultural competence(Competency-6)	4
9.	Training for NPs – Preceptorship(Competency-9)	2
10.	Future challenges of NP practice(Competency-11)	4
11.	Theories of Nursing applied to APN(Competency-10)	4
12.	Nursing process applied to APN(Competency-9)	2
	Self Learning assignments	8
1.	Identify Health Care and Education Policies and analyse its impact on Nursing	
2.	Describe the legal position in India for NP practice. What is the future of nurse prescribing policies in India with relevance to these policies in other countries ?	
3.	Examine the nursing protocols relevant to NP practice found in various ICUS in you tertiary centre	
	Total	**46 hrs.**

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Schober, M., & Affara, F. A. (2006). *Advanced nursing practice.* Oxford: Blackwell publishing.

Hickey, J. V., Ouimette, R. M., & Venegoni, S. L. (1996). *Advanced practice nursing: Changing roles and clinical application*s. Philadelphia: Lippincott Williams and Wilkins.

II. Research Application and Evidence Based Practice in Critical Care

COMPETENCIES

1. Applies sound research knowledge and skills in conducting independent research in critical care setting
2. Participates in collaborative research to improve patient care quality
3. Interprets and uses research findings in advanced practice to produce EBP
4. Tests / Evaluates current practice to develop best practices and health outcomes and quality care in advanced practice
5. Analyzes the evidence for nursing interventions carried out in critical care nursing practice to promote safety and effectiveness of care
6. Develops skill in writing scientific research reports

Hours of Instruction (57.5+23hrs)=80.5 hrs

Sl.No.	Topic	Hours
1.	Research and Advanced Practice Nursing : Significance of Research and inquiry related to Advanced nursing role (Competency 1)	2
2.	Research agenda for APN practice :Testing current practice to develop best practice, health outcomes and indicators of quality care in advanced practice (Competency 3,4,5), promoting research culture	6
3.	Research Knowledge and skills: Research competencies essential for APNs (interpretation and use of research, evaluation of practice, participation in collaborative research) **Research Methodology** Phases / steps (Research question, Review of literature, conceptual framework, research designs, sampling, data collection, methods & tools, Analysis and Reporting) writing research proposal and research report (Competency – 1 & 2)	40 (5 days workshop)
4.	Writing for publication (writing workshop – Manuscript preparation and finding funding sources) (Competency – 6)	8 (1 day workshop)
5.	Evidence based practice - Concepts, principles, importance and steps - Integrating EBP to ICU environment - Areas of evidence in critical care - Barriers to implement EBP - Strategies to promote (Competency – 3,4,5)	4
	Total	**60hrs.**

Practical / Lab & Assignments - 20.5 hrs

- Writing exercises on Research question, objectives and hypothesis
- Writing research proposal
- Scientific paper writing – preparation of manuscript for publication
- Systematic review – Analyze the evidence for a given nursing intervention in ICU

Clinical Practicum

- Research practicum: Dissertation

Bibliography:

Burns, N., & Grove, S. K. (2011). *Understanding nursing research: Building an evidence-based practice* (5th ed.). Ist Indian reprint 2012, New Delhi: Elsevier.

Polit, D. F., & Beck, C. T. (2012). *Nursing research:Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott Williams & Wilkins.

Schmidt, N. A., & Brown, J. M. (2009). Evidence – based practice for nurses appraisal and application of research. Sd: Jones and Bartlet Publishers.

III. Advanced skills in Leadership, Management and Teaching

COMPETENCIES

1. Applies principles of leadership and management in critical care units
2. Manages stress and conflicts effectively in a critical care setting using sound knowledge of principles
3. Applies problem solving and decision making skills effectively
4. Uses critical thinking and communication skills in providing leadership and managing patient care in ICU
5. Builds teams and motivates others in ICU setting
6. Develops unit budget, manages supplies at staffing effectively
7. Participates appropriately in times of innovation and change
8. Uses effective teaching methods, media and evaluation based on sound principles of teaching
9. Develops advocacy role in patient care, maintaining quality and ethics in ICU environment
10. Provides counseling to families and patients in crisis situations particularly end of life care

Hours of Instruction -80.5 Hrs

Sl.No.	Topic	Hours
1.	Theories, styles of leadership and current trends	2
2.	Theories, styles of management and current trends	2
3.	Principles of leadership and management applied to critical care settings	6
4.	Stress management and conflict management – principles and application to critical care environment, Effective time management	4
5.	Quality improvement and audit	4
6.	Problem solving, critical thinking and decision making, communication skills applied to critical care nursing practice	6
7.	Team building, motivating and mentoring within ICU set up	2
8.	Budgeting and management of resources including human resources – ICU budget, material management, staffing, assignments	6
9.	Change and innovation	2
10.	Staff performance, and evaluation (performance appraisals)	6
11.	Teaching – Learning theories and principles applied to Critical Care Nursing	2
12.	Competency based education and outcome based education	2
13.	Teaching methods / strategies, media: educating patients and staff in Critical Care settings	8
14.	Staff education and use of tools in evaluation	4
15.	APN – Roles as a teacher	2
16.	Advocacy roles, family counseling in critical care environment	2
	Total	60 hrs.

Practical / Lab = 20.5 hrs.

1. Preparation of budget
2. Preparation of staff duty roster
3. Preparation of staff patient assignment
4. Development of teaching plan
5. Micro teaching / patient education sessions
6. Preparation of teaching media for patients and staff

Assignment - ICU work place violence

Bibliography:

Bastable, S. B. (2010). *Nurse as educator: Principles of teaching and learning for nursing practice* (3rd ed.). New Delhi: Jones & Bartlett Publishers

Billings, D. M., & Halstead, J. A. (2009). *Teaching in nursing: A guide for faculty* (3rd ed.). St.Louis, Missouri: Saunders Elsevier.

Clark, C. C. (2010). Creative nursing leadership and management. New Delhi: Jones and Bartlet Publishers.

McConnel. (2008). Management principles for health professionals. Sudbury, M. A: Jones and Bartlet Publishers.

Roussel, L., & Swansburg, R. C. (2010). Management and leadership for nurse administrators (5th ed.). New Delhi: Jones and Bartlet Publishers.

Advanced Nursing Courses

IV. A. Advanced Pathophysiology Applied to Critical Care Nursing – I

COMPETENCIES

- Integrates the knowledge of pathopysiological process in critical conditions in developing diagnosis and plan of care
- Applies the pathophysiogical principles in symptom management and secondary prevention of critical illnesses
- Analyzes the pathophysiological changes relevant to each critical illness recognizing the value of diagnosis, treatment, care and prognosis

Hours of instruction: Theory: 39 hours

Unit	Hours	Content
I	(10)	**1. Cardiovascular function** Advanced pathophysiological process of cardiovascular conditions • Hypertensive disorder • Peripheral artery disorder • Venous disorders • Coronary artery diseases • Valvular heart disease • Cardiomyopathy and heart failure • Cardiac tamponade • Heart block and conduction disturbances
	(5)	**2. Pulmonary function** Advanced pathophysiological process of pulmonary conditions • Chronic obstructive pulmonary disease • Disorders of the pulmonary vasculature • Infectious diseases • Respiratory failure • Chest trauma
	(10)	**3. Neurological function** Advanced pathophysiological process of neurological conditions • Seizure disorder • Cerebrovascular disease • Infections • Spinal cord disorder • Degenerative neurological diseases • Neurological trauma • Coma, unconsciousness
	(5)	**4. Renal function** Advanced pathophysiological process of renal conditions • Acute renal failure • Chronic renal failure

	(4) (5)	• Bladder trauma **5. Gastrointestinal and hepatobiliary function** Advanced pathophysiological process of hepatobiliary conditions • Gastrointestinal bleeding • Intestinal obstruction • Pancreatitis • Hepatic failure • Gastrointestinal perforation **6. Endocrine functions** Advanced pathophysiological process of endocrine conditions • Diabetic ketoacidosis • Hyperosmolar non ketotic coma • Hypoglycemia • Thyroid storm • Myxedema coma • Adrenal crisis • Syndrome of inappropriate antidiuretic hormone secretion

IV.B. Advanced Pathophysiology Applied to Critical Care Nursing - II

Hours of instruction Theory: 30 hours

Unit	Hours	Content
I	(8)	**1. Hematological function** Advanced pathophysiological process of hematological conditions • Disorders of red blood cells - Polycythemia - Anemia - Sickle cell diseases • Disorders of white blood cells - Leucopenia - Neoplastic disorders • Disorders of hemostasis - Platelet disorders - Coagulation disorders - Disseminated intravascular coagulation
II	(2)	**2. Integumenatry function** Advanced pathophysiological process of integumentary conditions • Wound healing • Burns
III	(8)	**3. Multisystem dysfunction** Advanced pathophysiological process of neurological conditions • Shock - Hypovolemic - Cardiogenic - Distributive • Systemic inflammatory syndrome • Multiple organ dysfunction syndrome • Trauma - Thoracic - Abdominal - Musculoskeletal - maxillofacial • Drug overdose and poisoning • Envenomation

IV	(6)	**4. Specific infections** Advanced pathophysiological process of specific infections • HIV • Tetanus • SARS • Rickettsiosis • Leptospirosis • Dengue • Malaria • Chickungunya • Rabies • Avian flu • Swine flu
V	(6)	**5. Reproductive functions** Advanced pathophysiological process of reproductive conditions • Antepartum hemorrhage • Pregnancy induced hypertension • Obstructed labour • Ruptured uterus • Postpartum hemorrhage • Puerperal sepsis • Amniotic fluid embolism • HELLP (**H**emolysis, **E**levated **L**iver enzymes, **L**ow **P**latelet Count) • Trauma

Bibliography

Huether, S. E., & McCance, K. L. (2012). Understanding pathophysiology (5th ed.). St. Louis, Missouri: Elsevier

John, G., Subramani, K., Peter, J. V., Pitchamuthu, K., & Chacko, B. (2011). Essentials of critical care (8th ed.) . Christian Medical College: Vellore.

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Urden, L. D., Stacy, K. M., & Lough, M. E. (2014). Critical Care Nursing- Diagnosis and management (7th ed.). Elsevier: Missouri

V.Advanced Pharmacology relevant to Critical Care Nursing

COMPETENCIES

- Applies the pharmacological principles in providing care to critically ill patients and families
- Analyzes pharmaco-therapeutics and pharmacodynamics relevant to drugs used in the treatment of critical care conditions
- Performs safe drug administration based on principles and institutional protocols
- Documents accurately and provides follow up care
- Applies sound knowledge of drug interactions in administration of drugs to critically ill patients in the critical care settings and guiding their families in self care management

Hours of instruction
Theory: 69 hours

Unit	Hours	Content
I	2	**Introduction to pharmacology in critical care** • History • Classification of drugs and schedules
II	5	**Pharmacokinetics and Pharmacodynamics** • Introduction • Absorption, Distribution, Metabolism, Distribution and Excretion in critical care • Plasma concentration, half life • Loading and maintenance dose • Therapeutic index and drug safety • Potency and efficacy • Principles of drug administration ▪ The rights of drug administration ▪ Systems of measurement ▪ Enteral drug administration ▪ Topical drug administration ▪ Parentral drug administration
III	6	**Pharmacology and Cardiovascular alterations in Critical care** • Vasoactive Medications ▪ Vasodilator, ▪ Vasopressor, ▪ Inotropes ✓ Cardiac glycosides – digoxin ✓ Sympathomimetics – Dopamine, dobutamine, epinephrine, isoproterenol, norepinephrine,

		phenylephrine ✓ Phosphodiesterase inhibitors – amrinone, milrinone • Antiarrhythmic Medications • Cardiac critical care conditions ▪ Medications to improve cardiac contractility ▪ Medications in the management of hypertension in critical care ▪ Medications in the management of heart failure ▪ Medications in the management of angina pectoris and myocardial infarction ▪ Medications in the management of dysrhythmias, Heart block and conduction disturbances ▪ Medications in the management of Pulmonary hypertension, Valvular heart disease, Cardiomypathy ▪ Medications in the management of Atherosclerotic disease of aorta and Peripheral artery disease ▪ Medications in the management of Deep vein thrombosis • Institutional Protocols/Standing orders for cardiac critical care emergencies
IV	6	**Pharmacology and Pulmonary alterations in Critical care** • Mechanical Ventilation ▪ Introduction ▪ Medications used on patients with mechanical ventilator ▪ Mechanical ventilation impact on pharmacotherapy – Sedation and analgesia, Neuromucsular blockade, Nutrition • Pulmonary critical care conditions • Medications in the management of Status asthmaticus • Medications in the management of Pulmonary edema • Medications in the management of Pulmonary embolism • Medications in the management of Acute respiratory failure and Acute respiratory distress syndrome • Medications in the management of Chest trauma • Medications in the management of Chronic obstructive pulmonary disease • Medications in the management of Pneumonia • Medications in the management of Pleural effusion • Medications in the management of Atelectasis • Standing orders for pulmonary critical care emergencies
V	6	**Pharmacology and Neurological alterations in Critical care** • Pain ▪ NSAID ▪ Opioid analgesia • Sedation ▪ Gamma amino butyric acid stimulants

		▪ Dexmeditomidine ▪ Analgosedation • Delirium ▪ Haloperidol ▪ Atypical anti psychotics • Medications used for local and general anesthesia • Local- Amides, esters, and miscellaneous agents • General – Gases, Volatile liquids, IV anesthetics • Non anesthetic drugs adjuncts to surgery ▪ Paralytic Medications ▪ Non-depolarizing and depolarizing agents ▪ Anxiolytics • Autonomic drugs ▪ Adrenergic agents/ Sympathomimetics ▪ Adrenergic blocking agents ▪ Cholinergic agents ▪ Anti cholinergic agents • Medications in the management of anxiety and insomnia ▪ Antidepressants ▪ Benzodiazepines ▪ Barbiturates • Neurological critical care conditions ▪ Medications in the management of psychoses ▪ Medications in the management of acute head and spinal cord injury with elevated intracranial pressure ▪ Medications in the management of muscle spasm ▪ Medications in the management of spasticity ▪ Medications in the management of Cerebro vascular disease and cerebro vascular accident ▪ Medications in the management of Encephalopathy ▪ Medications in the management of Gillian Bare syndrome and Myasthenia gravis ▪ Medications in the management of Brain herniation syndrome ▪ Medications in the management of Seizure disorder ▪ Medications in the management of Coma, Unconsciousness and persistent vegetative state ▪ Appropriate nursing care to safeguard patient ▪ Standing orders for neurology critical care emergencies
VI	6	**Pharmacology and Nephrology alterations in Critical care** • Diutetics • Fluid replacement ▪ Crystalloids ▪ Colloids

		• Electrolytes ▪ Sodium ▪ Potassium ▪ Calcium ▪ Magnesium ▪ Phosphorus • Nephrology critical care conditions ▪ Medications in the management of Acute / Chronic renal failure ▪ Medications in the management of Acute tubular necrosis ▪ Medications in the management of Bladder trauma ▪ Medications in the management of Electrolyte imbalances ▪ Medications in the management of Acid base imbalances ▪ Medications used during dialysis • Standing orders for nephrology critical care emergencies
VII	6	**Pharmacology and Gastrointestinal alterations in Critical care** • Anti-ulcer drugs • Laxatives • Anti diarrheals • Anti emetics • Pancreatic enzymes • Nutritional supplements, Vitamins and minerals • Gastro intestinal critical care conditions ▪ Medications in the management of Acute GI bleeding, Hepatic failure ▪ Medications in the management of Acute pancreatitis ▪ Medications in the management of Abdominal injury ▪ Medications in the management of Hepatic encephalopathy • Medications in the management of Acute intestinal obstruction • Medications in the management of Perforative peritonitis • Medications used during Gastrointestinal surgeries and Liver transplant • Standing orders for gastro intestinal critical care emergencies
VIII	6	**Pharmacology and Endocrine alterations in Critical care** • Hormonal therapy • Insulin and Other hypoglycemic agents • Endocrine critical care conditions ▪ Medications in the management of Diabetic ketoacidosis, Hyperosmolar non ketotic coma ▪ Medications in the management of hypoglycemia ▪ Medications in the management of Thyroid storm

		▪ Medications in the management of Myxedema coma ▪ Medications in the management of Adrenal crisis ▪ Medications in the management of SIADH • Standing orders for endocrine critical care emergencies
IX	6	**Pharmacology and Hematology alterations in Critical care** • Anticoagulants • Antiplatelet drugs • Thrombolytics • Hemostatics/ antifibrinolytics • Hematopoietic growth factors ▪ Erythropoietin ▪ Colony stimulating factors ▪ Platelet enhancers • Blood and blood products ▪ Whole blood, Packed red blood cells, Leukocyte-reduced red cells, Washed red blood cells, Fresh frozen plasma, Cryoprecipitate ▪ Albumin ▪ Transfusion reactions, Transfusion administration process • Vaccines • Immunostimulants • Immunosuppressant • Chemotherapeutic drugs – Alkylating agents, anti metabolites, anti tumor antibiotics, alkaloids, hormones and hormone antagonist, corticosteroids, gonadal hormones, anti estrogens, androgen antagonists, biologic response modifiers • Hematology critical care conditions ▪ Medications in the management of Anemia in critical illness ▪ Medications in the management of DIC ▪ Medications in the management of Thrombocytopenia and acute leukemia ▪ Medications in the management of Heparin induced thrombocytopenia ▪ Medications in the management of Sickle cell anemia ▪ Medications in the management of Tumor lysis syndrome • Standing orders for hematology critical care emergencies
X	4	**Pharmacology and Skin alterations in Critical care** • Hematology critical care conditions ▪ Medications used in burn management ▪ Medications used in wound management • Standing orders for skin critical care emergencies
XI	8	**Pharmacology and Multisystem alterations in Critical care** • Medications in the management of shock, sepsis, Multiple Organ Dysfunction, Systemic inflammatory response syndrome,

		Anaphylaxis • Medications in the management of Trauma, Injuries (Heat, Electrical, Near Hanging, Near drowning) • Medications in the management of bites, Drug overdose and Poisoning • Medications in the management of fever in critical care setting ▪ Antipyretics ▪ NSAIDS ▪ Corticosteroids • Standing orders for multi system critical care emergencies
XII	8	**Pharmacology and Infections in Critical care** • Antibacterial drugs ▪ Introduction ▪ Beta lactams – Penicillins, cephalosporins, monobactams, carbapenams, ▪ Aminoglycosides ▪ Anti MRSA ▪ Macrolides ▪ Quinolones ▪ Miscellaneous – lincosamide group, nitroimidazole, tetracyclins and chloramphenicol, polymyxins, anti malarials, anti fungals, anti virals • Anti fungal drugs • Anti protozoal drugs • Anti viral drugs • Choice of antimicrobials • Infectious critical care conditions ▪ Medications in the management of HIV, Tetanus, SARS, Rickettsiosis, Leptospirosis, Dengue, Malaria, Chickungunya, Rabies, Avian flu and Swine flu • Standing orders for infectious critical care emergencies

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VI.Advanced Health/Physical Assessment in Critical Care Nursing

COMPETENCIES

- Applies the physical assessment principles in developing appropriate system wise examination skills
- Uses advanced health assessment skills to differentiate between variations of normal and abnormal findings
- Orders screening and diagnostic tests based on the examination findings
- Analyzes the results of various investigations and works collaboratively for development of diagnoses
- Documents assessment, diagnosis, and management and monitors follow up care in partnership with health care team members, patients, and families

Hours of instruction Theory: 69 hours

Practical/Lab: 46 hours

Unit	Hours	Content
	(4)	**1. Introduction** • History taking • Physical examination
	(6)	**2. Cardiovascular system** • Cardiac history • Physical examination • Cardiac laboratory studies – biochemical markers, hematological studies • Cardiac diagnostic studies – Electrocardiogram, echocardiography, stress testing, radiological imaging
	(6)	**3. Respiratory system** • History • Physical examination • Respiratory monitoring – Arterial blood gases, pulse oximetry, end-tidal carbondioxide monitoring • Respiratory Diagnostic tests – Chest radiography, ventilation perfusion scanning, pulmonary angiography, brondhoscopy, thoracentesis, sputum culture, pulmonary function test
		4. Nervous system • Neurological history • General physical examination

	(6)	• Assessment of cognitive function • Assessment of cranial nerve function • Motor assessment – muscle strength, power, and reflexes • Sensory assessment – dermatome assessment • Neurodiagnostic studies – CT scan, MRI, PET
	(6)	**5. Renal system** • History • Physical examination • Assessment of renal function • Assessment of electrolytes and acid base balance • Assessment of fluid balance
	(4)	**6. Gastrointestinal system** • History • Physical examination • Nutritional assessment • Laboratory studies – Liver function studies, blood parameters, stool test • Diagnostic studies – radiological and imaging studies, endoscopic studies
	(4)	**7. Endocrine system** • History, physical examination, laboratory studies, and diagnostic studies of - Hypothalamus and pituitary gland - Thyroid gland - Parathyroid gland - Endocrine gland - Adrenal gland
	(4)	**8. Hematological system** • History • Physical examination • Laboratory studies - blood parameters • Diagnostic studies – bone marrow aspiration
	(3)	**9. Integumentary system** • History • Physical examination • Pathological examination – tissue examination
	(6)	**10. Musculoskeletal system** • History • Physical examination – gait assessment, joint assessment, • Laboratory studies – blood parameters (inflammatory enzymes, uric acid) • Diagnostic studies - Radiological and imaging studies, endoscopic studies

	(4)	**11. Reproductive system** • History • Physical examination • Laboratory studies • Diagnostic studies
	(4)	**12. Sensory Organs** • History • Physical examination • Laboratory studies • Diagnostic studies - Radiological and imaging studies, endoscopic studies
	(6)	**13. Assessment of children** • Growth and development • Nutritional assessment • Specific system assessment
	(6)	**14. Assessment of older adults** • History • Physical assessment • Psychological assessment

List of skills to be practiced in the skill lab (46 hours include demonstration by the faculty and practice by the students)

- Comprehensive history taking
- Focused history taking (system wise)
- Comprehensive physical examination
- Focused physical examination (system wise)
- Monitoring clinical parameters (system wise)
  Invasive BP monitoring, Multi level Monitors, ECG, PiCCO, Peripheral vascular status, ABG, Pulse Oximetry, End Tidal CO2 (ETCO2), Intracranial Pressure (ICP), Glasgow Coma Scale (GCS), Cranial nerve assessment, Pain and Sedation score of critically ill, Motor assessment, Sensory assessment, Renal function tests, Fluid balance, acid base balance, electrolytes, Bowel sounds, Abdominal pressure, Residual gastric volume, Liver function tests, GRBS, Lab tests, Radiological and Imaging tests(system wise)

- Ordering and interpretation of screening and diagnostic tests (system wise) (Enclosed-Appendix 3)
- Assessment of children-neonate and child
- Assessment of Older adults
- Assessment of pregnant women

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Critical care specialty courses

(Foundations of Critical Care Nursing Practice, Critical Care Nursing I and Critical Care Nursing II)

COMPETENCIES

- Applies advanced concepts of critical care nursing based on sound knowledge of these concepts
- Uses invasive and noninvasive technology and interventions to assess, monitor and promote physiologic stability
- Works in collaboration with other healthcare team members
- Consults with and is consulted by other health care professionals
- Provides nursing care related to health protection, disease prevention, anticipatory guidance, counseling, management of critical illness, palliative care and end of life care
- Uses advanced skills in complex and unstable environments
- Applies ethically sound solutions to complex issues related to individuals, populations and systems of care
- Practices principles of infection control relevant to critical care
- Practices independently within the legal framework of the country towards the interest of patients, families and communities
- Develops practice that is based on scientific evidence

- Uses applicable communication, counseling, advocacy and interpersonal skills to initiate , develop and discontinue therapeutic relationships
- Creates and maintains a safe therapeutic environment using risk management strategies and quality improvement
- Adapts practice to the social, cultural and contextual milieu

VII.Foundations of Critical Care Nursing Practice

Hours of instruction
Theory: 92 hours
Practical/lab : 46 hours

Unit	Hours	Content
I	10	**Introduction to Critical Care Nursing** • Introduction to the course • Review of anatomy and physiology of vital organs (Brain, Spinal Cord, Lungs, Heart, Kidney, Liver, Pancrease, Thyroid, Adrenal and Pituitary gland) • Historical review- Progressive patient care(PPC) • Concepts of critical care nursing • Principles of critical care nursing • Scope of critical care nursing • Critical care unit set up (including types of ICU, equipments supplies, beds and accessories, use and care of various type of monitors & ventilators, Flow sheets, supply lines and the environment) • Personnel in ICU ➢ Nursing staff ➢ Doctors ➢ Critical care technicians ➢ Ancillary staff • Technology in critical care • Healthy work environment • Future challenges in critical care nursing
II	5	**Concept of Holistic care applied to critical care nursing practice** • Application of nursing process in the care of critically ill • Admission and progress in ICU- An overall view • Overview of ICU Management ➢ Ensure adequate tissue oxygenation ➢ Maintain chemical environment

		➢ Maintain temperature ➢ Organ protection ➢ Nutritional support ➢ Infection control ➢ Physiotherapy and rehabilitation ➢ Family visiting hours • Restraints in critical care – physical, chemical and alternatives to restraints • Death in critical care unit • Transport of the critically ill – By air ambulance and surface ambulance • Stress and burnout syndrome among health team members
III	10	**Appraisal of the critically ill** ***Triaging concept, process and principles*** ***Assessment of the critically ill*** • General assessment • Respiratory assessment • Cardiac assessment • Renal assessment • Neurological assessment • Gastrointestinal assessment • Endocrine assessment • Musculoskeletal assessment • Integumentary assessment ***Monitoring of the critically ill*** • Arterial blood gas (ABG) • Capnography • Hemodynamics • Electrocardiography (ECG) • Glasgow Coma Scale (GCS) • Richmond agitation sedation scale (RASS) • Pain score • Braden score ***Evaluation of the critically ill*** • Evaluation of pre critical illness • Evaluation of critical illness • Outcome and scoring systems ➢ Acute Physiology and Chronic Health Evaluation (APACHE I-IV) ➢ Mortality probability model (MPM I, II) ➢ Simplified acute physiology score (SAPS I, II) ➢ Organ system failure ➢ Full outline of unresponsiveness (FOUR)
IV	14	**Advanced Concepts and Principles of Critical Care**

		• Principles of cardio-pulmonary-brain resuscitation • Emergencies in critical care : CPR ➢ BLS ➢ ACLS • Airway management • Oxygenation and oximetry, care of patient with oxygen delivery devices • Ventilation and ventilator support (including humidification and inhaled drug therapy), care of patient with invasive and non invasive ventilation • Circulation and perfusion (including hemodynamic evaluation and waveform graphics) • Fluids and electrolytes (review), care of patient with imbalances of fluid and electrolytes • Evaluation of acid base status • Thermoregulation, care of patient with hyper/hypo thermia • Liberation from life support (Weaning) • Glycemic control, care of patient with glycemic imbalances
V	8	**Pain and Management** • Pain in Critically ill patients • Pain – Types, Theories • Physiology, Systemic responses to pain and psychology of pain Review • Acute pain services • Pain assessment – Pain scales, behavior and verbalization • Pain management-pharmacological (Opioids, benzodiazepines, propofol, Alpha agonist, Tranquilisers, Neuromuscular blocking agents)
VI	8	**Psychosocial and spiritual alterations: Assessment and management** • Stress and psychoneuroimmunology • Post traumatic stress reaction • ICU Psychosis, Anxiety, Agitation, Delirium • Alcohol withdrawal syndrome and delirium tremens • Collaborative management • Sedation and Relaxants • Spiritual challenges in critical care • Coping with stress and illness • Care of family of the critically ill • Counselling and communication
VII	4	**Patient and family education** • Challenges of patient and family education • Process of adult learning • Factors affecting teaching learning process • Informational needs of families in critical care

VIII	5	**Nutrition Alterations and Management in critical care** • Nutrient metabolism and alterations • Assessing nutritional status • Nutrition support • Nutrition and systemic alterations • Care of patient on enteral and parentral nutrition
IX	4	**Sleep alterations and management** • Normal human sleep • Sleep pattern disturbance • Sleep apnea syndrome
X	5	**Infection control in critical care** • Nosocomial infection in intensive care unit; methyl resistant staphylococcus aureus (MRSA) and other recently identified strains • Disinfection, Sterilization, • Standard safety measures, • Prophylaxis for staff • Antimicrobial therapy- review
XI	5	**Legal and ethical issues in critical care-Nurse's role** ***Legal issues*** • Issues giving raise to civil litigation • Related laws in india • Medical futility • Administrative law: Professional regulation • Tort law: Negligence, professional malpractice, intentional torts, wrongful death, defamation, assault and battery • Constitutional Law: Patient decision making ***Ethical Issues*** • Difference between morals and ethics • Ethical principles, ethical decision making in critical care, Strategies for promoting ethical decision making, holding and withdrawing treatment, Nurses' role • Scarce resource in critical care • Brain death, Organ donation & Counselling, • Do Not Resuscitate(DNR), Euthanasia, Living will
XII	8	**Quality assurance** • Design of ICU/CCU • Quality assurance models applicable to ICUs • Standards, Protocols, Policies, Procedures • Infection control policies and protocols

		• Standard safety measures • Nursing audit relevant to critical care • Staffing
XIII	2	**Evidence based practice in critical care nursing** • Evidence based practice in critical care • Barriers to implementation • Strategies to promote implementation
	5	**Class test**
Total	92	

List of skills to be practiced in the skill lab (46 hours include demonstration by the faculty and practice by the students)

- CPR (BLS and ACLS)
- Airway Management
  - Laryngeal mask airway
  - Cuff inflation and anchoring the tube
  - Care of ET tube
  - Tracheostomy care
  - Suctioning – open/closed
  - Chest physiotherapy
- Oxygenation and oximetry, care of patient with oxygen delivery devices
  - Devices to measure oxygen/oxygenation
    - ✓ Fuel cell
    - ✓ Para magnetic oxygen analyzer
    - ✓ PO2 electrodes-Clark electrodes
    - ✓ Transcutaneous oxygen electrodes
    - ✓ Oximetry – Pulseoximetry, Venous oximetry
  - Capnography
  - Non invasive ventilation
    - ✓ Low flow variable performance devices: nasal catheters/cannulae/double nasal prongs, face mask, face mask with reservoir bags
    - ✓ High flow fixed performance devices : Entrainment (Venturi) devices, NIV/CPAP/Anesthetic masks, T pieces, breathing circuits
  - Postural drainage
- Ventilation and ventilator support
  - Connecting to ventilator
  - Weaning from ventilator
  - Extubation
  - Humidifiers

- Nebulizers – jet, ultrasonic
- Inhalation therapy – metered dose inhalers (MDI), dry powder inhalers (DPI)

- Circulation and perfusion (including hemodynamic evaluation and waveform graphics)
  - Invasive blood pressure monitoring
  - Non-invasive BP monitoring
  - Venous pressure (Peripheral, Central and Pulmonary artery occlusion pressure)
  - Insertion and removal of arterial line
  - Insertion and removal of central line
  - Cardiac output (PiCCO)
  - Electrocardiography (ECG)
  - Waveforms
- Fluids and electrolytes
  - Fluid calculation and administration (crystalloids and colloids)
  - Administration of blood and blood products
  - Inotrope calculation, titration and administration
    - Cardiac glycosides – digoxin
    - Sympathomimetics – Dopamine, dobutamine, epinephrine, isoproterenol, norepinephrine, phenylephrine
    - Phosphodiesterase inhibitors – amrinone, milrinone
  - Electrolyte correction (Sodium, potassium, calcium, phosphrous, magnesium)
  - Use of fluid dispenser and infusion pumps
- Evaluation of acid base status
  - Arterial blood gas (ABG)
- Thermoregulation, care of patient with hyper/hypothermia
  - Temperature probes
  - Critical care management of hyper and hypothermia
- Glycemic control, care of patient with glycemic imbalances
  - Monitoring GRBS
  - Insulin therapy (sliding scale and infusion)
  - Management of Hyperglycemia – IV fluids, insulin therapy, potassium supplementation
  - Management of hypoglycemia – Dextrose IV
- Pharmacological management of pain, sedation, agitation, and delirium
  - Calculation, loading and infusion of – Morphine, Fentanyl, Midazolam, Lorazepam, Diazepam, Propofol, Clonidine, Desmedetomidine, Haloperidol
- Counselling
- Family education

VIII.Critical Care Nursing I

Hours of instruction

Theory: 92 hours
Practical : 69hours

Unit	Hours	Content
I	6	**Introduction** • Review of anatomy and physiology of vital organs • Review of assessment and monitoring of the critically ill
II	15	**Cardiovascular alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies • Cardiovascular conditions requiring critical care management ➢ Hypertensive crisis ➢ Cardiac arrhythmias ➢ Heart block and conduction distrubances ➢ Coronary heart disease ➢ Myocardial infarction ➢ Pulmonary hypertension ➢ Valvular heart disease ➢ Atherosclerotic disease of aorta ➢ Peripheral artery disease ➢ Cardiomypathy ➢ Heart failure ➢ Deep vein thrombosis • Cardiovascular therapeutic management ➢ Cardiac transplant ➢ Pacemakers ➢ Cardioversion ➢ Defibrillation ➢ Implantable cardiovert defibrillators, ➢ Thrombolytic therapy ➢ Radiofrequency catheter ablation ➢ Percutaneous Transluminal Coronary Angioplasty ➢ Cardiac surgery – CABG/ MICAS, Valvular surgery, vascular surgery ➢ Mechanical circulatory assistive devices – Intra aortic balloon pump ➢ Effects of cardiovascular medications • Recent advances and development
III	15	**Pulmonary alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies

		• Pulmonary conditions requiring critical care management
		  • Status asthmaticus
		  • Pulmonary edema
		  • Pulmonary embolism
		  • Acute respiratory failure
		  • Acute respiratory distress syndrome
		  • Chest trauma
		  • Chronic obstructive pulmonary disease
		  • Pneumonia
		  • Pleural effusion
		  • Atlectasis
		  • Longterm mechanical ventilator dependence
		• Pulmonary therapeutic management
		  • Thoracic surgery
		  • Bronchial hygiene: Nebulization, deep breathing and coughing exercise, chest physiotherapy and postural drainage
		  • Chest tube insertion and care of patient with chest drainage
		• Recent advances and development

IV	14	**Neurological alterations**
		• Review of Clinical assessment, pathophysiology, and pharmacology
		• Special diagnostic studies
		• Neurological conditions requiring critical care management
		  • Cerebro vascular disease and cerebro vascular accident
		  • Encephalopathy
		  • Gillian Bare syndrome and Myasthenia gravis
		  • Brain herniation syndrome
		  • Seizure disorder
		  • Coma, Unconsciousness
		  • persistent vegetative state
		  • Head injury
		  • Spinal cord injury
		  • Thermoregulation
		• Neurologic therapeutic management
		  ➢ Intracranial pressure – Assessment and management of intracranial hypertension
		  ➢ Craniotomy
		• Recent advances and development

V	15	**Nephrology alterations**
		• Review of Clinical assessment, pathophysiology, and pharmacology
		• Special diagnostic studies
		• Nephrology conditions requiring critical care management
		  • Acute renal failure
		  • Chronic renal failure

		• Acute tubular necrosis • Bladder trauma • Nephrology therapeutic management • Renal Replacement therapy: Dialysis • Renal transplant • Recent advances and development
VI	12	**Gastrointestinal alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies • Gastrointestinalconditions requiring critical care management • Acute GI bleeding • Hepatic failure • Acute pancreatitis • Abdominal injury • Hepatic encephalopathy • Acute intestinal obstruction • Perforative peritonitis • Gastrointestinal therapeutic management • Gastrointestinal surgeries • Liver transplant • Recent advances and development
VII	10	**Endocrine alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies • Endocrineconditions requiring critical care management • Neuroendocrinology of stress and critical illness • Diabetic ketoacidosisHyperosmolar non ketotic coma • hypoglycemia • Thyroid storm • Myxedema coma • Adrenal crisis • SIADH • Endocrine therapeutic management • Recent advances and development
	5	**Class test**
Total	92 hours	

List of skills to be practiced in the skill lab (69 hour include demonstration by the faculty and practice by the students).

- **Cardiovascular alterations**

- Thrombolytic therapy
- Use of equipments and their settings – Defibrillator, PiCCo, Pace makers, IABP

- **Pulmonary alterations**
  - Tracheostomy Care
  - Nebulization
  - Chest physiotherapy
  - Chest tube insertion
  - Chest drainage
- **Neurological alterations**
  - Monitoring GCS
  - Conscious and coma monitoring
  - Monitoring ICP
  - Sedation score
  - Brain Death Evaluation

- **Nephrology alterations**
  - Dialysis
    - Priming of dialysis machine
    - Preparing patient for dialysis
    - Cannulating for dialysis
    - Starting and closing dialysis

- **Gastrointestinal alterations**
  - Abodminal pressure monitoring
  - Calculation of calorie and protein requirements
  - Special diets – sepsis, respiratory failure, renal failure, hepatic failure, cardiac failure, weaning, pancreatitis
  - Enteral feeding – NG/Gastrostomy/ Pharyngeal/Jejunostomy feeds
  - Total parenteral nutrition

- **Endocrine alterations**
  - Collection of blood samples for cortisol levels, sugar levels, and thyroid harmone levels
  - Calculation and administration of corticosteroids
  - Calculation and administration of Insulin – Review

IX.Critical Care Nursing - II

Hours of instruction
Theory: 92 hours
Practical : 69 hours

Unit	Hours	Content
I	10	**Hematological alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies • Hematology conditions requiring critical care management ➢ DIC ➢ Thrombocytopenia ➢ Heparin induced thrombocytopenia ➢ Sickle cell anemia ➢ Tumor lysis syndrome ➢ Anemia in critical illness • Hematology therapeutic management ➢ Autologus blood transfusion ➢ bone marrow transplantation • Recent advances and development
II	8	**Skin alterations** • Review of Clinical assessment, pathophysiology, and pharmacology • Special diagnostic studies • Conditions requiring critical care management ➢ Burns ➢ Wounds • Therapeutic management ➢ Reconstructive surgeries for burns ➢ Management of wounds • Recent advances and development
III	12	**Multi system alterations requiring critical care** • Trauma • Sepsis • Shock • Multiple Organ Dysfunction • Systemic inflammatory response syndrome • Anaphylaxis • DIC • Other injuries (Heat, Electrical, Near Hanging, Near drowning) • Envenomation • Drug overdose • Poisoning

IV	8	**Specific infections in critical care** • HIV • Tetanus • SARS • Rickettsiosis • Leptospirosis • Dengue • Malaria • Chickungunya • Rabies • Avian flu • Swine flu
V	9	**Critical care in Obstetrics** • Physiological changes in pregnancy • Conditions requiring critical care ➢ Antepartum hemorrhage ➢ PIH ➢ Obstructed labor ➢ Ruptured uterus ➢ PPH ➢ Puperal sepsis ➢ Obstetrical shock ➢ HELLP syndrome ➢ DIC ➢ Amniotic fluid embolism ➢ ARDS ➢ Trauma
VI	10	**Critical care in children** • Prominent anatomical and physiological differences and implications • Conditions requiring critical care ➢ Asphyxia neonatarum ➢ Metabolic disorders ➢ Intracranial hemorrhage ➢ Neonatal sepsis ➢ Dehydration ➢ ARDS ➢ Poisoning ➢ Foreign bodies ➢ Seizures ➢ Status asthmaticus ➢ Cyanotic heart disease ➢ congenital hypertrophic pyloric stenosis ➢ Tracheoesophageal fistula ➢ imperforate anus

		➢ Acute bronchopneumonia ➢ Trauma in children • Selected pediatric challenges ➢ Ventilatory issue ➢ Medication administration ➢ Pain Management • Interaction with children and families
VII	10	**Critical Care in Older Adult** • Normal psycho biological characteristics of aging ➢ Biological issues ➢ Psychological issues ➢ Concepts and theories of ageing ➢ Stress & coping in older adults ➢ Common Health Problems & Nursing Management; • Physical challenges ➢ Auditory changes ➢ Visual changes ➢ Other sensory changes ➢ Skin changes ➢ Cardiovascular changes ➢ Respiratory changes ➢ Renal changes ➢ Gastro intestinal changes ➢ Musculoskeletal changes ➢ Endocrine changes ➢ Immunological changes • Psychological challenges ➢ Cognitive changes ➢ Abuse of the older person ➢ Alcohol abuse • Challenges in medication use ➢ Drug absorption ➢ Drug distribution ➢ Drug metabolism ➢ Drug excretion • Hospital associated risk factors for older adults • Long term complications of critical care ➢ Care transitions ➢ Palliative care and end of life in critical care
VIII	10	**Critical Care in Perianesthetic period** • Selection of anesthesia • General anesthesia • Anesthetic agents • Perianesthesia assessment and care • Post anesthesia problems an emergencies requiring critical care ➢ Respiratory-Airway obstruction, Laryngeal edema,

		Laryngospasm, Bronchospasm, Noncardiogenic pulmonary edema, Aspiration, Hypoxia,Hypoventilation ➢ Cardiovascular – Effects of anesthesia on cardiac function, Myocardial dysfunction, Dysrhythmias, postoperative hypertension, post operative hypotension ➢ Thermoregulatory – Hypothermia, shivering, hyperthermia, malignant hyperthermia ➢ Neurology- Delayed emergence, emergence delirium, ➢ Nausea and vomiting
IX	10	**Other special situations in critical care** • Rapid response teams and transport of the critically ill • Disaster management • Ophthalmic emergencies – Eye injuries, glaucoma, retinal detachment • ENT emergencies - Foreign bodies, stridor, bleeding, quinsy, acute allergic conditions • Psychiatric emergencies – Suicide, crisis intervention
	5	**Class test**
Total	92 hours	

List of skills to be practiced in the skill lab (69 hours include demonstration by the faculty and practice by the students).

- **Hematological alterations**
  - Blood transfusion
  - Bone marrow transplantation
  - Care of Catheter site
  -
- **Skin alterations**
  - Burn fluid resuscitation
  - Burn feeds calculation
  - Burn dressing
  - Burns bath
  - Wound dressing
- **Multi system alterations requiring critical care**
  - Triage
  - Trauma team activation
  - Administration of anti snake venom
  - Antidotes
- **Specific infections in critical care**
  - Isolation precautions

- Disinfection and disposal of equipments

- **Critical care in Obstetrics, children, and Older Adult**
  - partogram
  - equipments – incubators, warmers
- **Critical Care in Perianesthetic period**
  - Assisting with planned intubation
  - Monitoring of patients under anesthesia
  - Administration of nerve blocks
  - Titration of drugs – Ephedrine, Atropine, Naloxone, Avil, Ondansetron
  - Sensory and motor block assessment for patients on epidural analgesia.
  - Technical troubleshooting of syringe / infusion pumps.
- **Other special situations in critical care**
  - Disaster preparedness and protocols

The skills listed under the Specialty courses such as Foundations of Critical Care Nursing Practice, Critical Care Nursing I and Critical Care Nursing II are taught by the faculty in skill lab. The students after practicing them in the lab, will continue to practice in the respective ICUs. The log book specifies all the requirements to be completed and the list of skills that are to be signed by the preceptor once the students develop proficiency in doing the skills independently.

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Appendix 1

CLINICAL LOG BOOK FOR NP IN CRITICAL CARE
(SKILLS AND REQUIREMENTS)

CRITICAL CARE NURSING SKILLS

No	SKILLS	NUMBER PERFORMED	DATE	SIGNATURE OF THE PRECEPTOR*
A	**I and II Year** **GENERAL COMPETENCIES**			
I	**INDEPENDENT SKILLS**			
1	Admission			
2	Transfer			
3	Transport			
4	Discharge / LAMA			
5	Medico-legal compliance			
6	Family education & counselling			
7	End of life Care Brain death Organ donation			
8	After life Care			
9	Setting up, use & maintenance of Critical care equipment			
9.1	Ventilator			
9.2	Monitor			
9.3	Transducer / pressure bag			
9.4	Temperature probes			
9.5	SpO2 probes			
9.6	Sequential compressing device			
9.7	12 –lead ECG monitor			

9.8	Warmer			
9.9	Fluid warmer			
9.10	ET Cuff pressure monitor			
9.11	Defibrillator			
9.12	Pacemaker			
9.13	Syringe pump			
9.14	Infusion pump			
9.15	Alpha mattress			
9.16	CRASH trolley			
10	Triage			
11	Care during transfer by air ambulance and surface ambulance			
12	Physical assessment			
12.1	Geriatric			
12.2	Neonate			
12.3	Child			
12.4	Pregnancy			
12.5	Infectious disease (AIDS)			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	BLS			
2	ACLS			
3	Laryngeal mask airway			
4	Defibrillation			
III	**INTER-PROFESSIONAL**			
1				
B	**II Year** **RESPIRATORY CARE**			
I	**INDEPENDENT SKILLS**			

1	Assessment of respiratory system			
2	Monitoring of respiratory parameters			
2.1	Pulse oximetry			
2.2	ABG			
2.3	ET Cuff Pressure			
2.4	Capnography (ETCO2)			
3	Care of ET tube			
4	Tracheostomy care			
5	Airway application			
6	Tracheal suctioning - Open			
7	Tracheal suctioning - Closed			
8	Care of patient with Chest drainage			
9	Chest physiotherapy			
10	Nebulization			
11	Oxygen administration			
11.1	Mask			
11.2	Nasal prongs			
11.3	CPAP / BiPAP			
12	Care of patient on Mechanical ventilator			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Non – invasive ventilation			
2	Connecting to Ventilator			
3	Weaning from ventilator			
4	Extubation			
5	Use of T-tube & Venturi devices			
6	Postural drainage			
7	Weaning from tracheostomy			
8	Chest tube removal			
9	Endotracheal intubation			

III	**INTER-PROFESSIONAL**			
1	Assisting for Bronchoscopy			
2	Assisting for Chest tube insertion			
3	Assisting for ET tube change			
4	Assisting for tracheostomy			
C	**CARDIOVASCULAR CARE**			
I	**INDEPENDENT SKILLS**			
1	Assessment of cardiovascular system			
2	Monitoring of Cardiovascular parameters include cardiac output monitoring			
2.1	Invasive BP monitoring			
2.2	Non invasive BP monitoring			
2.3	ECG			
2.4	PiCCO			
2.5	Peripheral vascular status			
3	Fluid administration			
3.1	Colloid			
3.2	Crystalloid			
4	Blood & blood product administration			
5	Ionotrope administration			
6	Application of TED stocking			
7	Thrombolytic therapy			
8	Insertion and Care of CVP line			
9	Care of arterial line			
10	Care of Patient with Pacemaker			
11	IABP			
12	ECMO			

13	Continuous cardiac monitoring			
14	High alert drugs			
15	Peripheral temperature			
16	Chest auscultation			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Removal of arterial line			
2	Collection of blood samples from Central line and arterial line			
3	Use of vaccutainer			
4	Electrolyte replacement			
5	Ionotrope titration			
6	Removal of Central line			
7	Fluid balance planning			
III	**INTER-PROFESSIONAL**			
1	Insertion of arterial line			
2	Insertion of Pulmonary Artery Catheter			
D	**RENAL CARE**			
I	**INDEPENDENT SKILLS**			
1	Assessment of renal system			
2	Monitoring of renal parameters			
3	Care of patient on hemodialysis			
4	Care of patient on peritoneal dialysis			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Hemodialysis			
III	**INTER-PROFESSIONAL**			
1				

E	**NEUROLOGICAL CARE**			
I	**INDEPENDENT SKILLS**			
1	Assessment of neurological system			
2	Monitoring of neurological parameters			
2.1	Intracranial pressure			
2.2	Cranial nerves			
2.3	GCS			
2.4	Pain			
2.5	Temperature			
2.6	Peripheral neurological status			
2.7	Reflexes			
2.8	Sedation score			
3	Pain management			
4	Sensory Stimulation			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Consciousness / coma status monitoring			
2	Brain death evaluation			
III	**INTER-PROFESSIONAL**			
1				
F	**GASTROINTESTINAL & NUTRITIONAL CARE**			
I	**INDEPENDENT SKILLS**			
1	Assessment of Gastrointestinal system			
2	Monitoring of gastrointestinal system			

2.1	Bowel sounds			
2.2	Abdominal pressure			
2.3	Residual volume			
2.4	Calorie requirement			
2.5	Protein requirement			
3	Enteral nutrition			
3.1	NG feeding			
3.2	Gastrostomy / Jejunostomy feeding			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Parenteral nutrition			
III	**INTER-PROFESSIONAL**			
1				
G	**ENDOCRINE CARE**			
I	**INDEPENDENT SKILLS**			
1	Assessment of endocrine system			
2	Monitoring of endocrine parameters			
2.1	GRBS			
II	**INDEPENDENT SKILLS WITH STANDING ORDERS/INSTITUTIONAL PROTOCOL**			
1	Insulin therapy			
III	**INTER-PROFESSIONAL**			
1				

* - When the student is found competent to perform the skill, it will be signed by the preceptor

CRITICAL CARE NURSING CLINICAL REQUIREMENTS

No	CLINICAL REQUIREMENT	DATE	SIGNATURE OF THE PRECEPTOR
I	**Clinical Conference**		
II	**Case/ Clinical Presentation**		
III	**Nursing Rounds**		
IV	**Clinical Seminar**		
V	**Journal Club**		
VI	**NP Report**		
VII	**Advanced Health Assessment**		
VIII	**Faculty Lecture**		

IX	**Self directed learning**		
X	**Written Assignment**		
XI	**Case study analysis**		
XII	**Workshop**		

The number under each category will be finalized based on implementation plan of theory, practical and clinical.

Appendix 2

INSTITUTIONAL PROTOCOLS BASED DRUG ADMINISTRATION-Draft

EMERGENCIES IN CRITICAL CARE	ON VERBAL ORDER ONLY	READYMADE PROTOCOL (INSTITUTIONAL PROTOCOLS)

<table>
<tr><td rowspan="5">CARDIAC</td><td colspan="2">Cardio-Pulmonary Arrest</td></tr>
<tr><td>▪ Amiodarone HCl
▪ Nor adrenaline
▪ Lignocaine HCl (Xylocard)
▪ Magnesium Sulphate 50%
▪ Adenosine
▪ Sodium Bicarbonate 7.5%
▪ Calcium Gluconate 10%
▪ Vasopressin
▪ Dopamine HCl
▪ Atropine sulphate</td><td>▪ Inj. Adrenaline 1mg has to be administered every 3 mts.
▪ Inj. Amiodarone 300mg can be given, 2nd dose 150mg
▪ Inj. Vasopresin
▪ Inj. Dopamine
▪ Crystalloids: Normal Saline, Dextrose 5%, Dextrose Saline & Ringer Lactate
▪ Colloids: Haesteril 6%, Haemaccel 3.5%</td></tr>
<tr><td colspan="2">Chest Pain</td></tr>
<tr><td>▪</td><td>▪ Oxygen 4-6 L/min by face mask.
▪ Tab. Sorbitrate 5mg S/L or Tab. Angised 0.5mg S/L if systolic BP is >90mmHg. Repeat after 5 minutes if the pain does not subside.</td></tr>
<tr><td colspan="2">Epidural Infusion</td></tr>
<tr><td>▪</td><td>▪ Nurses are permitted to connect preloaded drugs for epidural infusion.
▪ It must be counterchecked and countersigned by another Registered Nurse at all time</td></tr>
<tr><td colspan="2">Other drugs</td></tr>
<tr><td>▪ Infusion. Magnesium Sulphate 50%
▪ Infusion. Dopamine HCl
▪ Infusion. Dobutamine
▪ Infusion. Human Serum Albumin (HSA 20%)</td><td>▪</td></tr>
</table>

	▪ Infusion. Heparin ▪ Infusion. Potassium Chloride ▪ Infusion. Frusemide (Lasix) ▪ Inj. Amiodarone (infusion) ▪ Inj. Xylocard ▪ Inj. Verapamil ▪ Inj. Isoprenaline ▪ Inj. Noradrenaline (infusion) ▪ Inj. Calcium Gluconate – Very slow IV over 10 minutes ▪ Inj. Vasopressin ▪ Inj. Clexane S/C ▪ Inj. Fragmin S/C ▪ Inj. Heparin S/C ▪ Inj. Fondaparinux Sodium S/C	
RESPIRATORY	**Pulmonary Edema**	
		▪ Oxygen 4-6 L/min by face mask ▪ Inj. Frusemide 40-60mg IV if BP >100/70 mmHg.
	Dyspnea	
		▪ Oxygen 4-6 L/min by face mask. ▪ Oxygen 15 L/min using high flow oxygen mask when saturation falls < 90 %. ▪ Administer oxygen 1L/min by nasal prongs for COPD patients. ▪ Terbutaline 5mg/ Ipratropium Bromide 0.5mg nebulizer.
NEURO	**Seizure Attack**	

	▪	▪ Inj. Valium 10 mg I.V. ▪ Inj.Phenytoin Sodium (Dilantin) 600 mg (10-15mg /Kg) ▪ Inj.Lorazepam 4mg intravenously.
	Pain Management	
	▪	▪ Inj. Ephedrine I.V. ▪ Inj. Morphine I.V. ▪ Inj. Tramadol I.V. ▪ Inj. Voveran I.V. ▪ Inj. Ketanov I.V. ▪ Inj. Naloxone I.V. ▪ Inj. Ondansetron I.V.
	Autonomic Dysreflexia	
		▪ Cap. Nifedipine 5mg S/L when B.P ≥ 140/90 mmHg.
	Other Drugs	
	▪ Pentazocin Lactate (Fortwin) ▪ Pethidine HCl ▪ Infusion. Phenytoin Sodium (Dilantin) ▪ Fentanyl Citrate	▪ Inj. Phenytoin ▪ Inj. Thiopentone ▪ Inj. Phenobarb ▪ Inj. Diazepam ▪ Inj. Lorazepam
NEPHRO	**Dialysis Disequilibrium Syndrome (DDS)**	
		▪ Inj. Phenytoin Sodium (Dilantin) 400mg in 100ml Normal Saline IV. ▪ 50 ml of Inj. Dextrose 50% intravenously.
	Allergic reaction during dialysis	

		▪ Inj.Pheniramine Maleate (Avil) 50 mg IV. ▪ Tab.Paracetamol 1g. ▪ Inj.Hydrocortisone 100mg IV.
	Hypotension during dialysis	
		▪ Normal Saline 200ml intravenously
	Air embolism	
		▪ Oxygen 4-6 L / min by face mask
	Other drugs	
	▪ Inj. Frusemide ▪ Inj. Mannitol drip ▪ Inj. Dytor	▪ Inj. Erythropoietin S/C
GASTRO INTESTINAL	**Other Drugs**	
	▪ Infusion. Pantoprazole (Pantocid) Infusion. ▪ Vitamin Supplements ▪ Infusion. Iron Sucrose	
ENDOCRINE	**Hypoglycemia**	
		▪ Inj.Dextrose 25% or 50% 20 ml bolus IV, Followed by Inj.Dextrose 10% 100ml IV over 30 minutes until the GRBS is >100mg/dl (if patient is unable to take orally)
	Hyperglycemia	
	▪ Keep Insulin for infusion/ sliding scale as per doctor's	▪ Inj. Insulin S/C ▪ Disconnect Dextrose infusion

	order ▪ Infusion. Actrapid	▪ Normal Saline IV
HEMATOLOGY	**Hyperkalemia**	
	▪ Inj. Calcium Gluconate 10% 10ml and Dextrose 10% 10ml	▪ Inj.Dextrose 50% 50ml with Inj.Actrapid 6-8 units IV as infusion ▪ Salbutamol nebulization 5mg
	Epistaxis	
	▪	▪ Tranexamic acid nasal drops / powder.
	Blood Transfusion Reaction	
	▪ Administer Inj.Pethidine 12.5 mg IV for children & 25mg for adults (if chills persist).	**Febrile reaction:** ▪ Inj.Pheniramine Maleate (Avil) 50mg IV for adults. ▪ Inj.Pheniramine Maleate (Avil) as per doctor's order for children. **Hemolytic reaction:** ▪ Normal Saline infusion.
	Other drugs	
	▪	▪ Inj. Heparin ▪ Inj. Vit. K ▪ Inj. Protamine Sulphate ▪ Inj. Streptokinase ▪ Inj. Tranexamic acid ▪ LMWH (s/c) – Low Molecular Weight Heparin
DERM		▪ Corticosteroids ▪ Avil ▪ Ketamine
MULTI	**Anaphylactic Shock**	

SYSTEM	▪	▪ Inj.Hydrocortisone 100mg IV/IM ▪ Inj.Adrenaline 1m (1:1000) IM/IV (repeat a second dose after two min)
	Allergic Reaction	
	▪	▪ Inj.Pheniramine Maleate (Avil) 50mg IV for adults ▪ Inj.Pheniramine Maleate (Avil) as per doctor's order for children ▪ Inj.Hydrocortisone 100mg IV
	Other Drugs	
	▪ Infusion. Immunoglobulin (IVIG) ▪ Inj. Dexomathasone ▪ Inj. Methyl Prednisolone ▪ Anti-snake venom ▪	▪ Atropine sulphate
INFECTIONS	**Fever**	
	▪ Infusion. Paracetamol (Febrinil)	▪ Tab. Paracetamol 500mg to 1000mg for adults if temperature is 100 degree F or 37.8^{O} C and above
	▪ Inj.Penicillin IV ▪ Acyclovir ▪ Amikacin ▪ Amoxycillin & Potassium Clavulanate (Augmentin) ▪ Amphotericin ▪ Azithromicin ▪ Cefazolin ▪ Cefipime ▪ Cefoperazone & Sulbactam (Magnex /Cebanex)	

	▪ Cefotaxime ▪ Ceftazidime ▪ Ciprofloxacin ▪ Cloxacillin ▪ Fluconazole ▪ Fungisome ▪ Gancyclovir ▪ Gentamicin ▪ Meropenem /Imipenem ▪ Metronidazole ▪ Piperacillin/Tazobactam (Piptaz) ▪ Teicoplanin ▪ Vancomycin	
	Febrile Reaction Following Amphotericin	
	▪ Inj.Pethidine 12.5 mg IV for children & 25mg for adults. (if chills persist).	▪ Tab.Paracetamol 1 g / Inj.Paracetamol (Febrinil) 500mg IV in 100ml Normal Saline over 1 hour, if temperature > 100º F. ▪ Inj.Pheniramine Maleate (Avil) 50mg IV for adults. ▪ Inj.Pheniramine Maleate (Avil) as per doctor's order for children.
	Other Drugs	
	▪	▪ Vaccines

- Protocols may differ from hospital to hospital

Appendix 3

INVESTIGATIONS AND THERAPIES THAT CAN BE REQUESTED BY NP

ORDERING INVESTIGATIONS	ORDERING THERAPIES
▪ ECG ▪ ABG ▪ Chest X ray ▪ Basic Bio chemistry investigations – Hb, PCV, TIBC, WBC Total, WBC differentials, ESR, Electrolytes, platelets, PT, aPTT, bleeding and clotting time, procalcitonin, D diamer, creatinine, HbA1C, AC, PC, HDL, LDL, TIG, Cholesterol total, HIV, HbsAg, HCV, ▪ Basic Microbiology investigations – blood samples for culture and sensitivity, tips of vascular access and ET tube for culture,	▪ Nebulization ▪ Chest physiotherapy ▪ Distal colostomy wash ▪ Insertion and removal of urinary catheter for female patients. ▪ Test feeds ▪ TEDS ▪ Surgical dressing ▪ Starting and closing dialysis ▪ Administration of TPN infusion with written order ▪ Application of Icthammol Glycerin / Magnesium Sulphate dressing for Thrombophlebitis / extravasation. ▪ Pin site care for patients on external fixators ▪ Isometric and isotonic exercises ▪ Hot and cold applications