

**Guidelines**  
**For**  
**Competency Based Training Programme**  
**DrNB - Pediatric Surgery**  
**(6 Years Course)**

**2022**



**NATIONAL BOARD OF EXAMINATIONS IN MEDICAL SCIENCES**

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## I. AIM

The aim of DrNB Paediatric Surgery 6 yr course is to train a post MBBS graduate towards acquiring orientation and expertise in the superspecialty from the beginning of their basic surgical training. It seeks to facilitate the candidate's acquisition of a judicious mix of the three domains of learning – Cognitive (knowledge), Psychomotor (practice) and Affective (communication).



## II. OBJECTIVES

The first 2 years of basic training (Phase 1 & 2, 0-24 months) includes an introduction to Paediatric Surgery (Phase 1, 0-6 month) and rotation thereafter (Phase 2, 7-24 months) in adult surgical disciplines (General Surgery, Orthopedics, Neurosurgery, Trauma and Emergency), Paediatrics and Neonatology.

The exposure to Paediatrics and Neonatology are designed to familiarise the student with the theory and practice of caring for a sick child.

**At the end of 2 years, the student should have reached the following level of knowledge and practice with regard to care of adults in general.**

1. Acquire an understanding of the basic sciences related to surgical specialties.
2. Evaluate, investigate, diagnose and appropriately manage common surgical ailments.
3. Recognise situations that mandate emergent surgical intervention in acute surgical situations including trauma / multitrauma and provide it appropriately.
4. Identify the cases that need specialty assistance / referral / transfer to another centre and carry out the same at the optimal time.
5. Organise, participate and execute emergency measures in mass disaster. Counsel the patients and caretakers regarding a given disease state, proposed treatment and implications.
6. Provide adequate preoperative, intraoperative and post-operative care of a surgical patient.
7. Conversant with the operating room etiquette and its practice.
8. Plan and advise measures for the prevention of disease and rehabilitation of patients after discharge.
9. Acquire an understanding of the basic concepts in the theory and practice of general paediatrics and neonatology.
10. Abide by biomedical ethical practice in the discharge of duties
11. Capable of routine (e.g. case details, general consent, discharge summary) and specific (e.g. special informed consent, referral summary) medical documentation
12. Communication of information to patient and caretakers including grief counselling
13. Discharge the medico-legal formalities in respective situations
14. Be conversant with maintaining record of morbidity and mortality and evaluating them for a surgical audit on a regular basis.
15. Participate in departmental academic activities - presenting and attending didactic sessions (Seminar, Case discussion, Journal Club and Topic discussion) as well as bedside / operative teaching.
16. Be abreast of the recent advances in the management of surgical patients.





### III. SYLLABUS CONTENT

The content and topics listed below are suggestive and not exhaustive. The student is expected to know the basics of common surgical diseases in adults with an emphasis on their presentation in children, where applicable (e.g. thyroid nodule in adults and children; hydrocephalus in adults and children). A knowledge of the recent advances and basic sciences as applicable is included. Practical training will include exposure to relevant clinical bedside activities, ward procedures and operative procedures.

#### A. Basic principles in surgical practice

Basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology, Forensic Medicine) as applied to the specialty.

A more detailed knowledge of surgical conditions that are common to adults and children including recent advances in diagnostics and therapeutics.

1. History of surgery
2. Disinfection and sterilization. Nosocomial infection, universal precaution /control. Important hospital infections - MRSA, HIV, Hep B.
3. Bio-medical waste management (segregation and disposal), environment protection.
4. Essential drugs and rational use of drugs. Antibiotics - common & newer, rational use, antibiotic resistance
5. Wound healing - principles, factors and implications in surgical practice- Surgical sutures, drains, bandages and splints as aids.
6. Fluid, electrolyte, acid base balance, differences between adult and children
7. Nutrition in surgical patients - enteral and parenteral nutrition, methods and means.
8. Blood transfusion practices including component use. Massive blood transfusion.
9. Imaging modalities in surgical practice, common interventional procedures.
10. Minimally invasive surgery including laparoscopy, thoracoscopy, endoscopy. Principles, scope, merits and limitations.
11. Disaster management, mass casualties, triaging
12. OT engineering - design, common equipment and usage. Electrosurgical safety.
13. Emerging Surgical Technologies and applications - Newer energy sources (Cusa, harmonic, laser), Robotics, Navigation. Minimally invasive surgery.
14. Critical care and patient monitoring in surgical practice. Use of mechanical ventilation and hemodynamic support systems.
15. Anaesthesia - preparation, PAC and risk assessment, requirements, modalities. Pre and post operative analgesia
16. Sepsis, SIRS and multiorgan dysfunction syndrome (MODS)
17. Surgical infections: causes, factors, types (acute / chronic, common aerobic and anaerobic organisms) prevention and treatment. Chronic specific



infections - Bacterial (e.g. Tuberculosis), Parasitic (Filariasis, Hydatidoses), Fungal mycoses

18. Shock - etiologic types, pathophysiology and management in surgical patients.
19. Surgical aspects of diabetes mellitus, perioperative control, specific associated systemic pathology
20. Organ transplantation: Basic principles including cadaver donation, related legislation, ethical and medicolegal aspects.
21. Biomedical ethics-basic principles and practice. Professionalism.
22. Research methodology: Basic principles (formulating research study, topic selection, preparation of thesis protocol, literature search, documentation and evaluation) Bio-medical statistics - basic principles and applications in research and publication.
23. Working knowledge of computers and IT to assist medical practice, documentation, teaching and advanced surgical methods.
24. Audit of a surgical practice - morbidity and mortality, evidence-based surgical practice.
25. Medicosocial aspects of disease: Doctor-patient relationship, family adjustments in disease.
26. Communication practices and counseling.
27. Principles of palliative and terminal care - medical and ethical issues.
28. Medicolegal aspects including information to police authorities, certification of death. Consent, Consumer protection, legislation, medical negligence and safeguards.
29. Brain death and cadaveric organ retrieval
30. Care of neonates - Basic neonatal physiology and care of the normal newborn with respect to thermoregulation, fluid and electrolyte management, nutrition, immunization, neonatal screening and follow up. Introduction to common medical and surgical issues in the neonate.
31. Care of children and their special needs - growth, development, immunization, nutrition, adolescent medicine. Introduction to common medical and surgical ailments in children. Concept of community paediatrics and primary health care.

- B. A basic knowledge of the following topics (etiopathogenesis, clinical presentation, diagnosis, management) with special reference to its occurrence / counterpart in the pediatric population (where applicable) is desirable

**General Surgery – systematic**

1. Cysts and fistula in the neck
2. Cleft lip and palate
3. Cervical lymphadenopathy - nonspecific / specific, inflammatory., neoplastic - primary and secondary,
4. Thyroid -
  - Thyroglossal cyst and fistula.
  - Goitre, thyrotoxicosis and hypothyroidism





- Solitary thyroid nodule and common neoplasms
5. Arterial disorders: Acute arterial occlusion, Gangrene.
  6. Venous disorders: Varicose veins, venous malformations.
  7. Lymphatic disorders: Lymphatic malformation, lymphangitis, primary and secondary lymphedema.
  8. Deep vein thrombosis
  9. Salivary gland - sialadenitis, neoplasms
  10. Breast disorders
    - Inflammatory and neoplastic, nipple discharge, pubertal mastitis.
    - Evaluation of the breast lump
    - Outline of management of neoplastic disease.
  11. Esophagus:
    - Achalasia cardia
    - Esophageal narrowing - Gastro-esophageal reflux disease (GERD), stricture, neoplasms.
  12. Stomach:
    - Acid peptic - Ulcer disease, gastric outlet obstruction.
    - Neoplasia.
  13. Parasitic diseases of the liver: Amoebic liver abscess, Echinococcal (Hydatid) infection
  14. Upper GI hemorrhage – acute and chronic.
    - Portal hypertension – presentation, cirrhotic, non-cirrhotic / extrahepatic
  15. Lower GI bleeding - acute and chronic, sources, detection.
  16. Obstructive jaundice
  17. Choledochal cyst. Cholelithiasis, choledocholithiasis. Biliary diversion.
  18. Neoplasms of liver and liver resection.
  19. Splenomegaly, Splenectomy and consequences. Surgical implications of Hematological disease
  20. Pancreas
    - Acute pancreatitis, pancreatic divisum
    - Chronic pancreatitis – obstructive- calculous, pancreatic insufficiency.
  21. Helminthiasis: Intestinal amoebiasis, Ascariasis, other helminths and surgical presentations.
  22. Bowel perforation – peritonitis
  23. Specific types- typhoid, tuberculous peritonitis, postoperative.
  24. Abdominal tuberculosis - peritoneal and intestinal
  25. Appendix: acute appendicitis, appendicular lump and abscess
  26. Colonic disorders
    - Congenital megacolon
    - Inflammatory bowel diseases
    - Premalignant conditions of the large bowel – ulcerative colitis, adenomatous polyposis
    - Carcinoma colon
    - Colostomy



**27. Rectum and Anal Canal:**

- Anorectal anomalies
- Anal Canal: fissures, fistula – in- ano, perianal and ischiorectal abscess
- Polyps and hemorrhoids
- Prolapse of rectum
- Carcinoma anorectum

**28. Abdominal wall hernia:** Inguinal hernia, Umbilical, femoral hernia and epigastric hernia. Anatomy and repair.

**C. Trauma and emergency**

1. Epidemiology of trauma. Trauma scoring system and triaging. Transfer
2. General principles of management of surgical emergencies and trauma
3. Resuscitation including pre-hospital care, primary survey and treatment of life-threatening state, secondary survey, specific management. Damage control measures and rehabilitation
4. Types of trauma – details to include diagnostic modalities, specific initial resuscitations and management, peculiarities in children
  - Thoracic trauma – hemothorax, pneumothorax
  - Abdominal trauma - solid organ injury, hollow viscus injury
  - Genito-urinary trauma – renoureteric trauma, bladder and urethral disruption
  - Musculoskeletal trauma – soft tissue and bony injuries
  - CNS injury – head injury, spinal trauma
  - Hand & soft tissue injury, vascular Injury
5. Envenomation (Snake and insect bites), animal bite.
6. Burns– flame, scald, inhalation, electrical.
7. Child abuse, Birth Injury and falls.
8. Foreign body impaction, aspiration and ingestion through natural orifices

**D. Orthopedics**

1. Radiographic assessment of musculoskeletal diseases
2. Congenital conditions - CTEV, CDH
3. Growth deformities and principles of correction. Rickets
4. Systemic aspects of bone and joint disease: Shock, Crush syndrome, Compartment syndrome, Disseminated Intravascular Coagulation, Acute respiratory distress syndrome
5. Septic arthritis, Osteomyelitis
6. Trauma and common fractures / dislocations with falls. Limb amputation.
7. Common bone tumors
8. Principles of rehabilitation and appliances





### **E. Neurosurgery**

1. Neurological and clinical evaluation
2. Neurotrauma – head injury, spinal injury
3. Craniofacial anomalies, craniosynostoses
4. Neural tube defects and hydrocephalus
5. Infective disorders of the central nervous system, meningitis and abscess
6. Common pediatric brain tumors and outline of management.
7. Diagnostic imaging: Basic concepts in interpretation of Ct and MRI.
8. Anesthetic considerations for pediatric neurospinal surgery.
9. Neuroendoscopy – principles and practice.

**Other Surgical Specialty** -The student should be introduced to the basic principles of management in surgical subspecialties not listed above i.e. Urology, Cardiothoracic and Vascular Surgery, Plastic Surgery, Surgical Oncology GI surgery. He can choose any three of them as elective postings in Phase 2. The following topics refer to some of these specialties.

#### **Urology**

- Genitourinary symptoms and investigations of the male urogenital tract
- Urolithiasis – upper and lower urinary tract
- Phimosis, paraphimosis, hypospadias and carcinoma penis
- Testis - undescended testis, epididymo orchitis, torsion, tumors

#### **Plastic Surgery and Burns**

- Cleft lip and palate
- Wound care and cosmesis.
- Burns – types, management, rehabilitation
- Skin grafting. Common muscle flaps for tissue loss.

#### **Cardiothoracic and Vascular Surgery -**

- Congenital heart disease and management
- Pleuropulmonary infective / inflammatory states – pleural effusion and empyema. Postoperative pulmonary complications – aspiration, atelectasis
- Pneumothorax and hemothorax
- Pulmonary embolism: suspicion, prevention/recognition and treatment
- Principles of vascular anastomoses



## PRACTICAL

The student will receive graded exposure to different skills / operative procedures in the respective OPD, ward and OT of the various departments and will maintain a log book detailing his participation in these during the 2 years. They will be classified and recorded serially according to the posting as: O-Observed, A-Assists senior, PA-Performs with assistance from a senior or under supervision, P-Performed independently during the course.

**At the end of 24 months / 2 years of the course, the student should**

**A. Be able to organize and perform the following independently in adults and with assistance in children–**

1. To assess the surgical patient in detail in outpatient or inpatient basis (relevant history, physical examination) and plan investigations for reaching a diagnosis.
2. Able to document medical facts (history, examination findings, investigations, diagnosis, etc.) clearly and legibly.
3. Able to evaluate a patient of multitrauma and triage, organize a safe transfer to another facility
4. Obtain peripheral venous access and administer fluids, blood products / components, parenteral nutrition. Umbilical vessel cannulation, interosseous infusion.
5. Obtain a central venous access by open (cut-down) or percutaneous means, with or without ultrasound guidance. Routine care of a CVAD.
6. Placement of and caring for basic indwelling devices / drainage - Endotracheal tube, nasogastric tube, Urethral catheterization, peritoneal drains, intercostal tube drainage. Lumbar puncture, ventricular tap (neonates), ventricular shunt chamber tap, exteriorization of VP shunt.
7. Provide and organize routine preoperative preparation of patient and resolve pre-operative problems appropriately.
8. Able to obtain general and informed consent after due counseling and communicate plan of management to the patient / caretakers.
9. To propose and initiate surgical or non-surgical management as appropriate.
10. Provide and organize routine postoperative care of patient
11. Perform cardiopulmonary resuscitation adhering to standard guidelines (Basic/ advanced life support systems)
12. Be conversant with safe handling of surgical instruments and tissues.
13. Able to perform the basic surgical maneuvers: tie and secure knots, use surgical diathermy, secure hemostasis of superficial/small vessels, place drains.
14. Surgical management of wounds and stomas, affix wound care devices including stoma appliances





15. Perform biopsies from superficial lesions selected image-guided percutaneous biopsies
16. Conversant with basic local anesthesia for performance of minor procedures - infiltration, field and digital nerve blocks.
17. Arrest of external hemorrhage by first aid and non-operative means.
18. Incision and drainage of superficial abscesses
19. Surgery for hernia – inguinal, umbilical, epigastric, incisional
20. Management of all types of shock
21. Assessment and management of burns, wound care and dressings.  
Split thickness skin grafting
22. Excision of skin and superficial masses, lymph node biopsy
23. Thyroid – Hemithyroidectomy, excision of thyroglossal cyst
24. Breast – excision of a benign breast lump and mastectomy
25. Abdominal wall hernias - herniotomy, herniorrhaphy and hernioplasty.
26. Cholecystectomy – open and laparoscopic.
27. Liver abscess - percutaneous image-guided aspiration, open drainage
28. Drainage of pancreatic pseudocyst
29. Appendectomy- open and laparoscopic
30. Conservative management and laparotomy for intestinal obstruction, bowel resection and anastomosis / creation of stoma.
31. Fashion a gastrostomy, feeding jejunostomy, ileostomy and colostomy.
32. Inguinoscrotal procedures: Circumcision, hydrocele, varicocele, orchidopexy, orchidectomy
33. Application of a splint / cast / POP in common fractures/ dislocations for immobilization
34. Perform a fasciotomy in compartment syndrome

**B. Have observed or assisted in the following:**

**General Surgery**

- Parotidectomy, submandibular gland excision
- Total thyroidectomy
- Radical mastectomy
- Splenectomy
- Surgery for Hydatid cyst of liver
- Liver resection
- Gastric and duodenal surgery, gastrojejunostomy
- Pancreatic surgery – pancreatic resection and pancreatoenteric anastomosis
- Exposure of the kidney / ureter and nephrectomy





### Neurosurgery

- Burr hole-twist drill, craniotomy and laminectomy
- Surgical evacuation of extradural and subdural hematoma.
- Ventriculoperitoneal shunts, reservoirs.
- Surgery for craniosynostoses and spina bifida

### Orthopaedics

- Closed reduction of common dislocations.
- Surgery for cong dislocation of hip
- Non surgical and surgical management of club foot
- Drainage of septic arthritis
- Surgical management of osteomyelitis – sequestrectomy, saucerization
- Amputation of limb.

The following skills should be achieved at the end of the postings in **Paediatrics and Neonatology**. These will facilitate the training in the 3-5 year of the course in core Paediatric and Neonatal Surgery

- Examination of a neonate, gestational assessment
- Provision of routine neonatal care – temperature, fluid electrolyte, nutrition, immunization
- Assessment of normal growth and development
- Assessment and initial management of a child with common clinical presentations
  - Respiratory distress
  - Fever
  - Vomiting
  - Jaundice
  - Constipation
  - Gastroenteritis
  - Urinary infection
  - Malnutrition and obesity
  - Organ system failure – cardiac, renal, respiratory
- Provision of critical care, familiarity with equipment and protocols.

**SYLLABUS FOR PHASE 3 (3rd,4th ,5th years):** This will be identical to the syllabus outlined in the published curriculum for 3 yr DrNB Paed Surg by NMC, New Delhi.



## IV. TEACHING AND LEARNING ACTIVITIES

### A. Academic sessions

- The student will follow and attend the ongoing academic sessions (seminars, case presentations, journal reviews, teaching rounds, etc) of the department he is posted for during the period. He will be asked to present a topic of interest / clinical case etc too.
- The student will attend the prevalent ward, OPD, OT routine in the respective departments and carry out assigned activities of the level of a junior resident. The prescribed curricular requirements will be adhered to during the training.
- During Phase 2 (7-24 months), the student may attend the following courses – Basic Life Support System, Advanced Life Support System

### B. Research activity

The student must be familiar with basic research methodology, including statistical methods and will attend the structured course in Research Methodology and Basic statistics conducted by the institute in Phase 1 (0-6 month) of his course.

He / she is required to undertake a retrospective review of patients / case series during the first two years that will culminate in the the preparation of one original article that should have been accepted for publication by the completion of 24 months. The study will be assigned to the candidate under a faculty member of Paediatric Surgery at entry into entry into Phase 2(7th month) and will be completed during Phase 2 (7-24 mos.).

During Phase 3 (3rd,4t,5th years), the candidate will prepare a thesis as outlined in the published curriculum for 3 yr DrNB Paed Surg.



## V. LOG BOOK

A candidate shall maintain a log book of procedures (assisted / performed) during the training period, certified by the concerned post graduate teacher / Head of the department / senior consultant.

This log book shall be made available to the board of examiners for their perusal at the time of the final examination.

The log book should show evidence that the before mentioned subjects were covered (with dates and the name of teacher(s) The candidate will maintain the record of all academic activities undertaken by him/her in log book.

1. Personal profile of the candidate
2. Educational qualification/Professional data
3. Record of case histories
4. Procedures learnt
5. Record of case Demonstration/Presentations
6. Every candidate, at the time of practical examination, will be required to produce performance record (log book) containing details of the work done by him/her during the entire period of training as per requirements of the log book. It should be duly certified by the supervisor as work done by the candidate and countersigned by the administrative Head of the Institution.
7. In the absence of production of log book, the result will not be declared.





## VI. RECOMMENDED BOOKS & READING

The recent editions of the following standard textbooks are recommended.

1. Williams N, O'Connell PR, McCaskie A (Eds). Bailey and Love's Short Practice of Surgery, 27th edition: BocaRaton CRC press; 2018
2. Lumley JP, D'Cruz AK, Hoballah JI et al (Eds). Hamilton Bailey's Demonstration of Physical signs in Clinical Surgery ,19th edition: BrocaRaton CRC Press; 2016
3. Townsend CM Jr, Beauchamp RD, Evers BM et al (Eds). Sabiston's Text book of Surgery, 20th edition: Amsterdam Elsevier; 2016
4. Carter CD (Ed). Rob & Smith's Operative Surgery: Atlas of General Surgery, 3rd edition: Oxfordshire, Taylor and Francis; 1998
5. Staheli LT. Fundamentals of Pediatric Orthopaedics, 5th edition: Philadelphia, Wolters Kluwer; 2016
6. Campbell WW, Barohn RJ (Eds). DeJong's The Neurologic Examination, 8th edition: Philadelphia, Wolters Kluwer Health: 2019.
7. Winn HR (Ed). Youmans & Winn Neurological Surgery,7th edition: Amsterdam, Elsevier Health Sciences; 2017.
8. Hansen AR, Eichenwald EC, Stark AR et al. Cloherty and Stark's Manual of Neonatal Care, 8th edition: Philadelphia, Wolters Kluwer; 2016
9. Kliegman R, Stanton B, StGeme JWIII et al (Eds). Nelsons Textbook of Pediatrics 21st edition: Philadelphia, Elsevier; 2019
10. Holcomb GW, Murphy JP, Ostlie DJ (Eds). Aschcraft's Pediatric Surgery, 7th edition: Philadelphia, Elsevier; 2019
11. Coran AG, Adzick NS, Krummel TM et al (Eds). Pediatric Surgery, 7th edition: Philadelphia, Elsevier; 2012
12. Redkar R (Ed in chief). IAPS Textbook of Pediatric Surgery ,1st edition: New Delhi, Jaypee Brothers Medical Publishers; 2019



