

NATIONAL POSTGRADUATE MEDICAL COLLEGE OF  
NIGERIA



SUBSPECIALTY TRAINING CURRICULUM IN  
PAEDIATRIC EMERGENCY MEDICINE

FACULTY OF PAEDIATRICS

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# Curriculum for Training in Paediatric Emergency Medicine

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## Preamble

Nigeria has a population of about 182,202,000; under-5 and under-18 year olds account for 17.1% and 50.4% respectively.[1] The under-5 mortality rate is 108/1000 and alone contributes 10% of the world disease burden caused mostly by preventable infectious diseases.[1-3]

In Nigeria, the Federal Ministry of Health administers tertiary health care facilities whilst secondary and primary health care are by the State ministry of health and local government councils respectively. [4] In reality the State Governments are also involved in provision of health facilities at all tiers. The state of health care services are drifting due to insufficient provision of funds. The primary health care services are inefficient with the facilities that are supposedly to provide the health care in the villages not being patronized by the population they are to serve. In consequence the people patronise all manners of providers; patent medicine vendors, herbalists, prayer houses, charlatans who masquerade as "experts". The resultant effect is deterioration in morbidity and late presentation to secondary and tertiary health facilities.

With the aforementioned scenario the most affected are children and pregnant women giving rise to the poor health indices recorded in the country. If there was in place an efficient and working emergency care services these situations would be obviated. Unfortunately there are no organized emergency health services to take care of these serious cases at all levels. The scene is that individuals provide for themselves; move the ill ones with whatever means, pay for the hospital bills with their money. In a country where the per capita is less than 250 USD, the consequence is poor health outcome. The path to better health is to provide universal health insurance, and an effective emergency service.

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## **A. Introduction**

The state of emergency medicine practice in developing countries is that most of the facilities are deficient in equipment, medication, consumables and support services due largely to lean healthcare funding and misuse of scarce resources.[5-9] Studies have shown that most facilities in low and middle income countries (LMIC) are manned by staff without subspecialty training in emergency medicine while in tertiary care facilities, Children Emergency Rooms (CHERs) are manned by general Paediatricians and with subspecialists who may assume responsibility for their particular aspect of the emergency care of children, and most of them have little basic paediatric experience.[5,10-12] In Nigeria, all dedicated Children Emergency Rooms are based in tertiary health care facilities only, while other levels of care still operate general ED's (casualty) and undifferentiated out-patient-clinic (OPD). These units are generally manned by nurses, intern physicians, medical officers, paediatric residents and a rostered consultant paediatrician who leads clinical rounds but is not based in the CHER.

Emergency Department (ED) will not reach their full potential for its patients without proper coordination between pre-hospital, primary care and hospital care. [13] Unfortunately, in most low and middle income countries the EDs are stand alone with little or non-existent prehospital care support services. Out of pocket health expenditure is another challenge to quality services delivery.

A systematic review of studies conducted in low and middle income countries (LMIC), shows that death from emergency departments is responsible for about 10-15% of the total 1.6 million annual deaths in Nigeria. The median mortality rate in LMIC paediatric and adult emergency facilities was 4.8% and 0.7% respectively, whereas the median mortality rate in sub-Saharan African paediatric emergency facilities was reported as 5.1%.[5] The review further showed that only 28% of included paediatric emergency facilities employed a full time physician consultant and only 18 facilities employed a specialist in emergency medicine with four having full time coverage. Statistics revealed that over 50% of mortalities in paediatric emergency units occur within the first 24 hours of admission and this highlights an urgent need to review paediatric acute care facilities in Nigeria and the need for subspecialisation.[5,14-16]

Paediatrics is a medical specialty focused on the knowledge and skills required for the prevention, diagnosis and management of all aspects of illness and injury affecting children of all age groups (0-18 years). [13,17] It also is responsible for child health covering all aspects of growth and development and the prevention of disease and influencing variables of family and environmental factors with a seamless transition of care to other specialties.[13,17]

Paediatric Emergency Medicine is a sub-specialty of both Paediatrics and Emergency Medicine that delivers a highly specialised acute health care to children of all ages with undifferentiated presentations. [13,17] Paediatric Emergency Medicine practitioners as prerequisite must possess General Paediatrics competences before proceeding for sub-speciality training in Paediatric Emergency Medicine. [13,17,18] Paediatric Emergency Medicine, though an emerging subspecialty has been tentatively recognized by the National Postgraduate Medical College of Nigeria (NPMCN) this 2017 by the call for submission of proposal for training protocol.

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and middle income countries the EDs are stand alone with little or non-existent prehospital care support services. Out of pocket health expenditure is another challenge to quality services delivery.

This curriculum is an adapted version of the International Federation of Emergency Medicine (IFEM) and European Syllabus for Paediatric Emergency Medicine 2017. [13, 17]

This document attempts to set out the minimum requirements for training in Paediatric Emergency Medicine in a tertiary health care facilities with appropriate faculty in Nigeria.

### **Aim of PEM training in Tertiary health care facilities.**

1. Harmonise Paediatric Emergency Medicine Program (PEMP) training between different tertiary health care facilities in Nigeria.
2. Establish clearly defined standards of knowledge and skill required to practice Paediatric Emergency Medicine at the tertiary care level.
3. Foster the development of Nigerian network of competent tertiary care centres for Paediatric Emergency Medicine.
4. Improve the level of care for children with Paediatric Emergency Medicine.

### **Specific Objectives**

- A. Trainee should have the ability to look after patients with a wide range of pathologies, from the life threatening to the self-limiting, within all paediatric age groups in the Emergency Department setting.
- B. All decisions should be made in the best interests of the child or young person in their care.
- C. The PEMP is able to safely and effectively identify those children needing admission and those that can be discharged.
- D. The PEMP is able to conduct a primary assessment and take appropriate steps to stabilise and treat critically ill and injured children.
- E. The PEMP is able to work in the difficult and challenging environment of the Emergency Department and is able to re-prioritise and respond to new and urgent situations.
- F. The PEMP is an expert at directing and co-ordinating medical, surgical and trauma resuscitations involving children.
- G. The PEMP is skilled at practical procedures especially those needed for resuscitation.
- H. The PEMP is able to interact with, co-ordinate, educate and supervise all members of the Emergency Department team.
- I. The PEMP is able to understand the unique interaction of the Emergency Department with every part of the hospital and its significant role in interacting with the external community.
- J. The PEMP is able to act as co-ordinator in the Emergency Department during a major incident.

### **Measurable outcomes**

To provide training in Paediatric Emergency Medicine, with graduates competent to practice as Tertiary Care Specialist having been adequately exposed to graduating complex problems in Paediatric Emergency Medicine under supervision, with progressive levels of independence and periodically evaluated.

The end result of the training programme envisaged and detailed below will provide for the needs of Paediatric Emergency Medicine Physician (PEMP) who is a Tertiary Care Specialist whose scope of practice would be expected to encompass:

### **C. Training period**

1. Initial training: Four years of training with pass in Part 1 fellowship of the National Postgraduate Medical College or its equivalent.
2. A post Part I full-time employment of 24 months (maximum of 36 months), supervised training in the Emergency Department of accredited institution.
  - a. Two month rotations in Trauma and Orthopaedic Surgery, Neuro-surgery, Cardiology, Intensive Care units, Pulmonology, Dentistry
  - b. Twelve months continuous posting in the Emergency Unit
    - i. First six months hands on management of emergency cases
    - ii. Second six months of leadership training and research towards award of fellowship

### **D. Research training**

With increasing need to ensure quality improvement (QI) and Performance improvement (PI) in clinical practice which is premised on research work, that is peer reviewed, published for reproduction and thus validation. This is the corner stone of evidenced based medicine.

Clinical research training (not excluding laboratory) of at least 6 months must be a part and parcel of this training programme to mentor research culture and competence in PEM practice.

### **E. Requirements for potential Training Institutions**

Accreditation will be by National postgraduate Medical College. In the first two years accreditation for Paediatric Emergency will be for a period of two years renewable for another two years for the same tenure. Accreditation should be aligned with the requirements of the Medical and Dental Council of Nigeria and the National University Commission.

- a. The Paediatric Emergency training accreditation will be performed by the Faculty of Paediatrics using guidelines approved by the Senate of the National Postgraduate Medical College.
- b. The centre must provide adequate experience in all fields of Paediatric Emergency Medicine including acute care. It is expected to provide all Training modules.

The number of activities must be sufficient to provide at least a minimum experience for a trainee. A group of related establishments can be considered a centre and each component considered as a unit contributing one or more modules. Training Units are department/ institutions that provide training in one or more aspects (Modules). They must provide adequate exposure in the defined area and **a teacher** who is deemed competent in these areas (Trauma and Orthopaedic Surgery, Surgery; Paediatric, ENT, Neuro, Cardiology, Intensive Care units, Pulmonology, Dentistry) The centre must have easy access and close relationships with other relevant specialities (Internal Medicine, Obstetrics and Gynaecology, Surgery, Family Medicine and Community Medicine and Public Health [especially Epidemiology and Biostatistics])

Demonstration of involvement of other care team's particularly specialised nurses, paediatric nutritionists, physiotherapists, social workers, psychiatrist and psychologists is essential for recognition.

The centre must provide evidence of on-going clinical research/audits and access to basic research.

The centre will be responsible for weekly clinical staff/seminar teaching and participation in regional/national meetings. Basic textbooks in Paediatric Emergency Medicine should be immediately available and there should be easy access to a comprehensive reference library either in paper or electronic format.

## **F. Requirements for Trainers in Paediatric Emergency Medicine**

Due to apparent lack of qualified personnel in the country, the training staff in a Centre should include at least three trainers. This will consist of the Training Program Director (TPD) who is employed specifically and practising in the Children Emergency Room or practicing Paediatric Emergency Medicine / Emergency Medicine (whichever that applies) for at least 5 years and have specialist accreditation/ registration. This could be modified to suit our humble beginning but with a caveat and signed agreement by management of institution of potential training centres to immediately send for training the TPD to a recognised training center world over. This assures step down transfer of knowledge. Two other trainers with experience In Paediatric Emergency of not less than five years from any of the Colleges in Nigeria or abroad or Fellowship in Paediatric Emergency from institutions recognized by the National Postgraduate Medical College.

The Training Director should meet the trainee at the beginning of the programme to define the educational contract for that trainee

Trainers should work out a training programme for the trainee in accordance with the trainee's own qualities and the available facilities of the institution. Regular review will be required to allow for flexibility and for early identification of problems or deficiencies.

The trainer should work with the Trainee to create a Personal Development Plan (PDP). Trainers are expected to provide appraisal and assessment of progress.

## **G. Requirements for Trainees**

In order to gain admission, prospective trainee must;

1. Possess a minimum of Part I of the Paediatric Fellowship of the National Postgraduate medical College of Nigeria.
2. Should have been under employment of any healthcare facility that remunerates the trainee.
3. Must sign a contract of agreement of tenure and availability for the period of training.
4. Certification in BLS, APLS ACLS and ATLS are required at different stages of training.

To gain the necessary depth of experience each trainee should be actively involved in the management care of a range of patients during the whole period of his/her speciality training. This should include the care of outpatients, inpatients (including emergency admissions) and community care where appropriate.

New pedagogic initiatives and blueprints to improve quality and effectiveness of the education in line with outcome-based education using the CanMEDS framework should be used. [19] The training should be customize for the local experience to meet international standards.

Competency based assessment, as an adjunct to knowledge assessment and portfolio completion, is an important aspect of evaluation.

CanMEDS consists of the following competencies

1. Medical expert: integration of all CanMED roles applying medical knowledge, clinical skills and professional attitudes
2. Communicator: effectively facilitates doctor-patient relationship and dynamic exchanges before, during and after medical encounter
3. Collaborator: effectively work within healthcare system to achieve optimal patient care
4. Manager/integral participant in health care organisations, allocating resources and contributing to health care system
5. Health advocate: responsibly use expertise and influence to advance the health of individual patients, communities or populations
6. Scholar: demonstrates lifelong commitment to reflective learning and to creation, dissemination, translation of medical knowledge
7. Professional: committed to the health and wellbeing of individuals and society through ethical practice, professional led regulation and high personal standards of behaviour.

### **i. Log-book**

The trainee should keep a written log-book of patients they have seen, procedures conducted, diagnosis and therapeutic interventions instigated and followed-up. This will constitute part of their portfolio.

The trainee will be required to keep his/her personal logbook or equivalent up to-date. The logbook must be endorsed by his/her tutor or authorised deputy as the skills are performed.

The trainee should attend and provide evidence of attendance at local, regional and national meetings. Attendance at International Meetings is considered essential for Tertiary Care training. It is recommended to give at least 2 - 3 presentations at these meetings.

Attendance at PEM update courses organised by the colleges is strongly encouraged.

### **ii. Competency assessment**

Competencies should be evaluated throughout the training period. There are a number of different tools for this, describing different aspects of training. Some of these are set out below with a recommendation for the number that should be completed during each year of training. Formal and informal reflection on these assessments is an important aspect of their success.

Assessment	Purpose	Method
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1	MiniCeX (Mini clinical examination)	Provides feedback on skills needed in clinical care	Trainer observes a trainee examining a patient and explaining the management plan to the parents
2	CBD (Case based discussion).	Assesses clinical reasoning or decision making	Trainee presents a more complex case to the trainer and has a discussion about the evidence or basis for diagnosis or treatment
3	DOPS (Directly observed procedural skills)	Assesses practical skill	Trainee undertakes a practical skill whilst being observed
4	LEADER	Focuses on leadership skills	A trainee is observed leading a team (e.g. during a resuscitation)
5	HAT (Handover assessment tool)	Evaluates handover skills	Handover episodes are supervised and discussed
6	DOC (Discussion of correspondence)	Assesses letter writing skills	Clinic letters or discharges are reviewed and discussed
7	MSF (Multi-source feedback)	Provides wider feedback on the performance of the trainee	Confidential comments from a wide range of colleagues, patients and the trainee are sought

#### iv. Competencies; Core competences

##### A. Generic competencies

1. History taking
2. Clinical examination
3. Therapeutics and safe prescribing
4. Time management and decision making
5. Decision making and clinical reasoning
6. The patient as central focus of care
7. Prioritisation of patient safety in clinical practice
8. Team working and patient safety
9. Principles of quality and safety improvement
10. Infection control
11. Managing long term conditions and promoting patient self-care
12. Relationships with patients and communication within a consultation
13. Breaking bad news
14. Complaints and medical error
15. Communication with colleagues and cooperation
16. Health promotion and public health
17. Principles of medical ethics and confidentiality
18. Valid consent
19. Legal framework for practice
20. Ethical research
21. Evidence and guidelines
22. Audit
23. Teaching and training
24. Personal behaviour

##### B. Clinical Competencies for the Paediatric Emergency Medicine Physician

###### 1. Cardiology

- a. Heart failure
- b. Arrhythmia
- c. Syncope
- d. Cardiac inflammation
- e. hypotension

## 2. Dermatology

- a. Life threatening allergies
- b. Eczema
- c. Bites and infestations
- d. Non blanching rash

## 3. Endocrinology and metabolic medicine

- a. DKA
- b. Hypoglycaemia
- c. Adrenal insufficiency
- d. Acid Base balance

## 4. Gastroenterology

- a. Acute abdominal pain
- b. Diarrhoea & Vomiting
- c. Severe Acute Malnutrition
- d. Surgical ; Appendicitis, GIT obstructions -intussusception, volvulus etc
- e. Gastro intestinal bleeding
- f. Acute liver failure
- g. Recurrent abdominal pain
- h. Non-surgical abdominal pains
- i. Constipation

## 5. Gynaecology and Obstetrics

- a. Ectopic
- b. STDs
- c. Septic abortion
- d. Urogenital malformation in ED

## 6. Haematology and Oncology

- a. Severe malaria
- b. Sickle cell
- c. Anaemia
- d. Purpura
- e. Disseminated intravascular Coagulopathy
- f. Leukaemia/ lymphoma
- g. Immunocompromised patient

## 7. Infection, Immunology and Allergy

- a. Sepsis, SIRS and Septic shock

- b. Febrile child
- c. vaccine preventable- DPT, TB, Yellow fever, Hepatitis
- d. Common exanthems
- e. Needle stick
- f. Allergic conditions and Anaphylaxis
- g. Kawasaki disease

#### 8. Neonatology

- a. Congenital heart disease
- b. Jaundice
- c. Sepsis
- d. Perinatal asphyxia

#### 9. Nephro-urology

- a. UTI
- b. Hypertension
- c. Acute scrotal pain

#### 10. Neurology

- a. Coma
- b. Meningitis
- c. Cavernous sinus thrombosis
- d. Seizures
- e. Headache
- f. Intra Cranial space occupying lesions

#### 11. Neurosurgery

- a. Blocked shunt
- b. Infected shunt

#### 12. Ophthalmology

- a. Trauma
- b. Conjunctivitis
- c. Chemical injury
- d. Bell's palsy
- e. Glaucoma
- f. Cataract
- g. retinoblastoma

#### 13. Orthopaedics

- a. Shoulder
- b. Elbow
- c. Wrist
- d. Hand
- e. Pelvis hip
- f. Knee
- g. Leg

- h. Ankle
- i. Foot
- j. Plastic surgery

14. Poisoning and accidents

- a. Burns
- b. Drowning

15. Major incident

- a. mass casualty
- b. disaster
- c. epidemics

16. Respiratory medicine with Ear, Nose and Throat

- a. Asthma
- b. Acute stridor
- c. Pneumothorax
- d. Bronchiolitis
- e. Pneumonia
- f. Pertussis
- g. Earache and discharge
- h. Traumatic ear conditions
- i. Epistaxis
- j. Nasal trauma
- k. Acute throat infections
- l. Airway obstruction
- m. Dental problems

17. Trauma (Management of the injured child)[20]

- a. Anticipates injury patterns in common trauma presentations in each age group.
- b. Demonstrates knowledge of the PED management of:
- c. The child with polytrauma and potential major trauma
- d. Bleeding disorders in trauma, (recognition and management of massive Haemorrhage)
- e. Chest trauma: perform and facilitate key chest procedures e.g. chest drain insertion
- f. Abdominal and pelvic trauma, including the application of pelvic binders
- g. Acute head and spinal injury, including spinal cord injury
- h. Acute drowning and immersion injury
- i. Acute burn injuries (including electrical burns), and subsequent complications
- j. All limb-threatening injuries, including open fractures, and been able to reduce
- k. Injuries compromising nerve or vascular supply
- l. All fractures and ligamentous injuries
- m. A dislocated joint, and is able to reduce the joint and manage the onward referral

- n. All lacerations and open wounds
- o. Rhabdomyolysis and compartment syndrome
- p. Crush injury
- q. Major burns
- r. Spinal injury

18. Child health [20]

- a. Child and Adolescent Mental Health; Performs a mental health assessment relevant to PED care. Risk-stratifies children attending the PED with acute mental health issues to identify those who require admission or urgent intervention
- b. Child Protection and children in special circumstances
- c. Physical abuse; Demonstrates an understanding of presentation patterns which suggest physical or psychological abuse, is able to stratify risk, and engages with allied professionals in accordance with national and local policies and guidance. Demonstrates an understanding of how societal issues, such as sex trafficking, involvement with gang culture and female genital mutilation (FGM) may impact on children presenting to the PED.
- d. Sexual abuse
- e. Self-harm
- f. Neglect

c) List of Paediatric Emergency Medicine procedures

1. Acute Life Support/Resuscitation procedures
  - a. Manual airway clearance manoeuvres
  - b. Heimlich manoeuvre
  - c. Airway insertion
  - d. Oxygen delivery techniques
  - e. Orotracheal and nasotracheal intubation
  - f. Mechanical ventilation
  - g. Use of Continuous Positive Airways Pressure
  - h. Replacement of tracheostomy tube
  - i. Cricothyrotomy and percutaneous trans-tracheal ventilation
  - j. Needle thoracentesis xi. Tube thoracotomy
  - k. Intraosseous line insertion
  - l. Direct current electrical cardioversion defibrillation
  - m. External cardiac pacing
  - n. Pericardiocentesis

- o. Apnoeic episodes in an infant

## 2. Dentistry

- a. Re-implantation of tooth
- b. Splinting of tooth
- c. Reduction of TMJ dislocation

## 3. ENT Procedures

- a. Control of epistaxis with cautery, anterior packing, posterior packing and balloon replacement
- b. Cerumen removal
- c. Incision and drainage of auricular haematoma
- d. Aural wick insertion.
- e. Foreign Body Removal i. Nose ii. Ear iii. In soft tissue iv. Eye v. Ring removal.

## 4. Gastrointestinal procedures

- a. Oro/nasogastric tube replacement
- b. Gastrostomy tube replacement
- c. Gastric lavage
- d. Hernia reduction
- e. Reduction of rectal prolapse

## 5. Genitourinary;

- a. Paraphimosis reduction
- b. Urethral catheterisation

## 6. Minor Surgical Procedures

- a. Infiltration of local anaesthetic
- b. Incision and drainage of abscesses
- c. Incision and drainage of paronychia
- d. Evacuation of subungual haematoma
- e. Wound exploration and irrigation
- f. Wound repair with glue, adhesive strips and sutures
- g. Fingernail/nailbed injuries
- h. Emergency management of amputation

## 7. Musculoskeletal Techniques

- a. Immobilisation techniques
- b. Application of Broad Arm Sling
- c. Application of Collar and Cuff
- d. Application of Thomas Splint
- e. Pelvic stabilisation techniques
- f. Spinal immobilization/log rolling

## 8. Fracture/dislocation reduction techniques

- a. Shoulder dislocation
- b. Elbow dislocation
- c. Phalangeal dislocation
- d. Supracondylar fracture with limb-threatening vascular compromise
- e. Patellar dislocation
- f. Ankle reduction,

## 9. Plaster techniques

- a. Back slabs
- b. Splints
- c. POP

## 10. Neurological Procedures

- a. Lumbar puncture

## 11. Obstetric and Gynaecological Procedures

- a. Normal delivery
- b. Gynaecological speculum examination

## 12. Ophthalmic Procedures

- a. Conjunctival irrigation
- b. Contact lens removal
- c. Eversion of eyelids
- d. Use of slit lamp

## 13. Pain relief and sedation

- a. Pain scoring
- b. Non-pharmacologic measures
- c. Pharmacologic approaches
- d. Local anaesthetics
- e. Regional nerve blocks
- f. Procedural sedation techniques

## H. Appraisal/Assessment

A guide to workplace-based assessment can be found here.

### iii. Participation in Audit project

The trainee should conduct at least one systematic style review of a topic and in addition prepare a detailed evidence based appraisal of a diagnostic test or a therapeutic intervention.

In order to provide a close personal monitoring of the trainee during his/her training, the number of trainees should be enough to provide service in the facility in the Emergency Unit as well as ensure supervision. The recommended ratio of three senior registrars and four registrars should be maintained to ensure effective rotation. The senior registrars will be in addition to the number doing regular rotation for pre-Part I training.

Appraisal consists of determining what is needed and what evidence is required to show that this has been achieved (log book).

Assessment evaluates progress against objectives. Trainee assessment should be provided in terms of:

1. Training and career ambitions
2. Training experience related to curriculum
3. Achievements related to current plan.

Reviews of progress should take place at 4 monthly intervals during the first year of training to appraise the individual.

Certification in BLS and APLS will be a requirement of the programme and prerequisite for **ALL** doctors in the Emergency Unit irrespective of status of training and must be renewed every two years.

An annual assessment should be undertaken, **online** from the National level (NPMCN and WACP) supervised by the Training programme director, to review competencies achieved and to allow progress within the teaching programme. The online format proposed, takes note of how vast the country is, the economic burden on trainees and poor state of our roads. Format is MCQ and True or false clinical scenario questions. Pooled from a pre-tested bank. (For now assessment can be confined to administration at the training institution until NPMCN deploys and online platform.)

Assessments should be detailed and contain statements of theoretical and practical experience accumulated by the trainee. It is expected that the trainee will also provide an account of the training received and problems encountered (portfolio).

The final assessment for award of Fellowship in PEM will consist of examination on standard clinical scenario questions on Acute Care Competences which will form the first part of the theory while the second part of the theory will be the general and clinical competences. This will be in form of slides and MCQ; the third part of the examination will be the simulated clinical scenarios and procedures in PASCE format.

Grading should be in accordance with the Faculty of Paediatrics Training Curricula

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