

# Neurosurgical speciality nursing training for neurosurgical facilities in West Africa: A pivotal, prospective single – Hospital study in Nigeria

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## Abstract

**Background:** The diversity of medical and surgical specialities unequivocally places a great demand for continuing subspecialisation within nursing services for safe and efficient patient care, especially in tertiary institutions. Although orthopaedic, psychiatric, obstetrics, intensive care and ophthalmic nursing are established, neurosurgical nursing is almost unknown in West Africa.

**Aim:** The aim of this study is to document the indigenous training of dedicated subspeciality nursing staff for neurosurgical facilities in West Africa using a simple, reproducible design.

**Study Design/Setting:** A prospective observational study of the effect of specialised neurosurgical nursing care on the volume and outcomes of patient care in a new neurosurgical unit in a tertiary hospital in Nigeria.

**Methods:** Twenty-six nurses (from nursing officer II to chief nursing officer cadres) were selected from various hospital units for training in neurosurgical nursing. None had previous exposure to neurosurgery, although they had between them 6 months to 30 years of nursing experience in tertiary institutions. They received structured training in neurosurgical patient care.

**Results:** Over 13 years, we established a fully dedicated neurosurgical facility with 30 speciality nurses and other in-house staff. The pre- and post-training tests showed significant gain in the knowledge of basic neurosciences and neurosurgical patient care. Yearly re-training showed similar results. The increase in numbers of in-patient admissions and operations, as well as reduction in mortality, underscored improved patient care.

**Conclusion:** Subspeciality training of dedicated nurses in neurosurgical care facilitates the rapid growth of new neurosurgical units, facilitates nursing expertise and improves outcomes of patient care when compared with the lack of neurosurgical training for nurses.

**Keywords:** Establishment, improved outcomes, neurosurgical facilities, neurosurgical nursing, neurosurgical patient care, West Africa

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## INTRODUCTION

Neurosurgery is a speciality which manages (operatively and non-operatively) disorders of the neuraxis.<sup>1,2</sup> The

burden of neurosurgical care in West Africa is immense and the specialists are few.<sup>3</sup> Tertiary institutions having neurosurgery also require sufficient numbers of highly

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skilled neuroscience specialists including nurses to provide safe and high-quality care.<sup>2</sup> In West Africa, the number of nursing specialities is few (compared with industrialised countries), and neuroscience nursing is almost unknown.<sup>4-6</sup>

This study highlights a 13-year experience at establishing a functioning neurosurgical facility commencing with neurosurgical speciality training for nurses at our teaching hospital facility.

## METHODS

This study was a prospective observational study from the commencement of Neurosurgery in Benin City, Nigeria in 2006 June until June 2019.

### Choosing the nursing team

Our goal was to train (and dedicate to neurosurgery) competent patient care-oriented nurses who also offer information services that promote healing and lead to healthier lifestyles.

We selected 26 nurses from the Accidents and Emergency Room, Intensive care, Orthopaedic Operating Room (OR), Paediatrics, Obstetrics, General Surgery, Ophthalmology and Renal units of the hospital, a 600-bed facility at that time. All were formally invited through the nursing services and hospital management with letters to participate in the training for neurosurgical nursing. They commenced a structured five-phased training detailed below.

They were ranked Chief Nursing Officer (1), Assistant Chief Nursing Officers (2), Principal Nursing Officers (4), Senior Nursing Officers (3), Nursing Officer I (6) and Nursing Officer II (10).

### Selection criteria

Each of the nurses was recruited on recommendation from two middle cadre nurses of high repute, known for dedication, compassion and patience with patients. Among the chosen nurses, some were asked to name one or two others fitting the same criteria.

They all had between 6 months and 30 years of service within nursing service; age did not affect selection though more were recruited in the junior ranks to avert conflicts of authority [Figure 1].

They had to be among those very few who willingly participated in the early morning neurosurgical rounds and took interest in the patients' treatment, though the speciality was quite new to them. This was a major prompt for their selection.

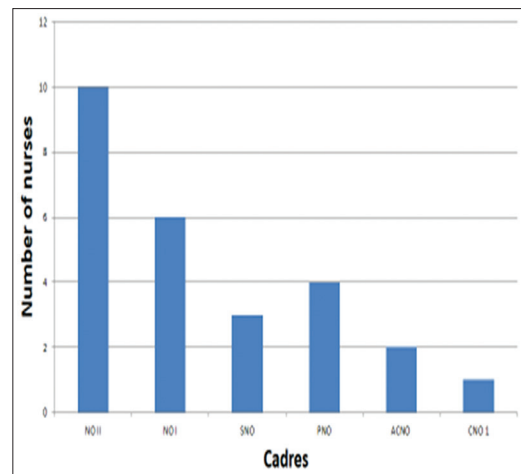


Figure 1: Selection of various nursing cadres

They had to be willing to participate in training for the new subspeciality, leave the present unit and to work in a physically demanding unit. Physical fitness was only considered if the individual complained of chronic back pain, aversion for/inability to stand for prolonged periods.

### Exclusion

Five nurses previously trained for orthopaedic, plastic, ENT, psychiatric and neonatal nursing were excluded from the study.

### Training

*Phase I: Prelude to training (passive learning for 9 months): June 2006 to February 2007*

This was targeted at kick-starting our fledgling unit despite several negative perceptions with respect to neurosurgery within the hospital community. During this period, neurosurgical patients were admitted in the various wards where future neurosurgical nurses worked (see above). They joined the early neurosurgical rounds in those wards and effected the treatment orders and called for the neurosurgeon's attention when necessary.

*Phase II: Introductory course in basic neurosciences and neurosurgical care: February to March 2007 [Appendices 1 and 2]*

This was a 4-week (10 hours daily) course which included the following:

- Daily ward rounds and bed-side teachings and demonstrations
- Neurosurgical OR participation
- Brain cut up/neuroanatomy dissection sessions
- Osteology of the skull and vertebrae
- Neurosurgical instrument demonstrations.

Classroom sessions with PowerPoint lectures and poster demonstrations:

Week 1: (a) Introduction to Basic Neurosciences.

Week 2: (a) Introduction to Clinical Neurosurgery

- (b) Ethics of the Specialized Nursing Surgical Practice
- (c) Skin Care, Prevention of Pressure Sores and Wound Care
- (d) Neurosurgical Workplace Ethics.

- Week 3: (a) Introduction to Clinical Neurology  
 (b) Paediatric Neurosurgical Peculiarities  
 (c) Neurosurgical Intensive Care.

- Week 4: (a) Neurosurgical Intensive Care Nursing  
 (b) Neurosurgical OR and Conduct of Operations  
 (c) Neuropsychiatry  
 (d) An Overview of Paediatric Surgical Nursing  
 (e) Professionalism and Nursing  
 (f) Holistic Care Nursing and Family Integration in Patient Care.

Five assessment tests:

- a. Pre-test on the 1<sup>st</sup> day to determine previous knowledge, especially from.

End of week 1, 2, 3 and 4 tests [Appendices 1 and 2].

The resource persons were invited from four teaching hospitals (including ours). They comprised a neurosurgeon, a neurologist, a surgical registrar (now a neurosurgeon), an anaesthesiologist, a plastic surgeon, three Chief Nursing officers (paediatric surgery, orthopaedics and the president of the National Association of Nigerian Nurses and Midwives) from our facility and three Chief Nursing Officers (Intensive Care, Neurosurgical OR and Spine Unit) from Ibadan and Enugu.

*Phase III: A 9-month post-introductory course ward, operating room and intensive care unit training: March to November 2007*

After the introductory course, the nurses remained in their previous wards for another period of nine months; there

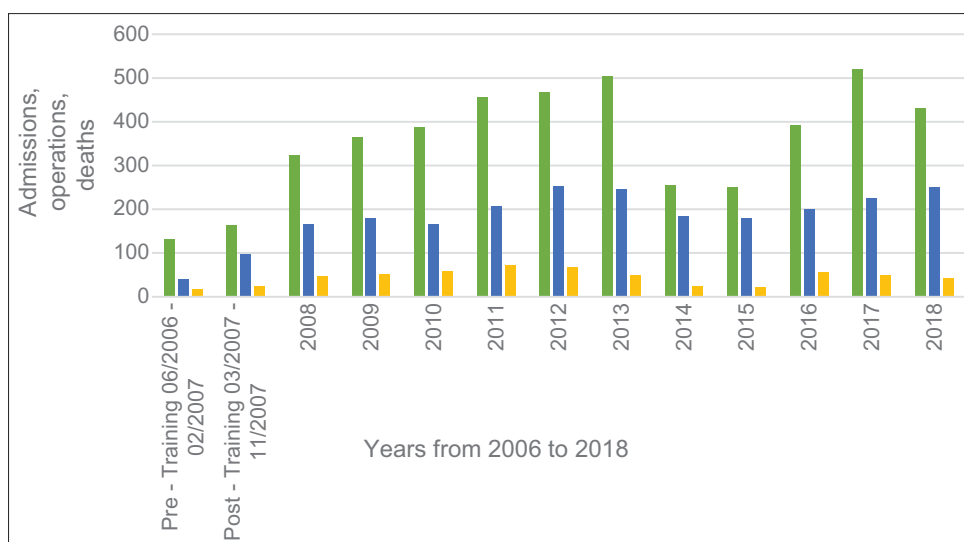
they influenced the treatment of the neurosurgical patients from experience gained from their training completing 18 months neurosurgical in-patient care experience, 9 months passively in Phase I and 9 months actively in Phase III, i.e., pre- and post-introductory course (Phase II), respectively. This was before the completion of a formal neurosurgical ward. The influence of the newly trained nurses on neurosurgical outcomes was compared to that obtained before training in those wards [Figure 2]. All the trained neurosurgical nurses were transferred to the new neurosurgical facility in December 2007, from which daily clinical exposure and active neurosurgical in-patient care participation commenced until the present date. Twenty-two of the nurses remained in the neurosurgical ward and three were deployed to the neurosurgical OR, and one to the intensive care unit (ICU).

*Phase IV: Continued (active) in-service and yearly re-training in the new neurosurgical ward: From December 2007*

This phase includes yearly re-training (classroom and bedside lectures for 4 weeks), holistic rounds and tests. This was to prepare them to take part in 2–3 weeks yearly neurosurgical missions abroad (Phase V).

After 24 months of participating in the neurosurgical ward, ICU and OR, tests administered at the end of a 4 week re-training to test proficiency in the following: Detecting changes in neurological status, preventing pressure ulcers, monitoring pre-, post- and non-operative neurosurgical patients, intra-operative conduct of neurosurgical procedures, bladder-care in the spine injured, implementing chart orders, etc.

Newly trained nurses are added yearly bringing the OR scrub nurses to 5 as well as replacing those who travelled



**Figure 2:** Influence of neurosurgical nursing training on in-patient volumes and outcomes

abroad and those who were deployed to teach at the post-basic nursing school. Seven additional nurses were trained.

#### *Phase V: Missions and conferences*

Yearly, six to seven members of the Neurosurgical team, including nurses (3 or 4), a neurosurgeon, a neurosurgical senior registrar and an anaesthesiologist are partly sponsored by the hospital to a 2–3-week Neuroscience Conference and/or Mission in other West African countries. These included participation in neurosurgical missions and overseas outreaches as well as networking and teamwork with neurosurgeons, neuroanaesthesiologists, neuroscience nurses, respiratory therapy nurses, biomedical engineers, et cetera from Ghana, Liberia, Vancouver, Atlanta and Baltimore. These were coordinated by the Korle Bu Neurosciences Foundation, a Canadian non-profit body with strong ties in Ghana.

#### **Interdisciplinary grand rounds and professional collaboration**

Daily rounds for comprised neurosurgeons, resident surgeons including fellows in training, neurosurgical nurses, occupational therapists (led by a neuro-occupational therapist who took the initiative to train further while a young therapist on our floor), physiotherapists (led by a PhD holder who also progressed to a master and doctorate degrees while on our floor) and students accompanying the various disciplines. These sessions were for collaborative patient care, mentoring, bedside staff education and professional growth.

Data was analysed using the SPSS 21.0. (IBM Corporation, New York, United States).

Ethical clearance was not required.

## **RESULTS**

Establishment of a functioning unit necessitated training 26 nurses for neurosurgical nursing none of whom had previous exposure to neurosurgery.

Since no neurosurgical facility existed at our institution in 31 years from inception until 2006, baseline parameters for the nurses' prior exposure to any form of neurosurgery or neuroscience were tested using a pre-introductory training multiple-choice questions test.

#### **Results of assessments tests**

In the pre-test, 23 of 26 (88.5%) participants scored above  $\geq 50\%$ , showing the effect of the initial nine months of passive learning (Phase I); subsequent end-of-week tests, on

weekly course outline in the four weeks of the introductory course (Phase II), showed similar results except in the multistation steeplechase type end-of-training examination to which they were unfamiliar and in which, only 15 of 26 (57.7%) participants scored  $\geq 50\%$ . However, after 2 years, 73% of the neurosurgical nurses scored  $\geq 50\%$ , while after 4 years, all 24 (100%) who took part scored  $\geq 50\%$  after 4 years - 2 were absent [Tables 1 and 2].

#### **In-patient admissions, operation volumes and mortality**

In-patient admission and operation volumes increased exponentially from 120 and 40, respectively, in the first 9 months (i.e., the pre-training period from June 2006 to February 2007) to 200 and 115 in the 9 months immediately post-training (i.e., from March 2007 to November 2007). However, mortality was little altered, but rather fell from 8% to 7.5%. From 2008 to 2013, admission and operation volumes increased from 335 and 170, respectively, to 505 and 240 (i.e., 51% and 41% rise in admissions and operations, respectively). Mortality fell from 3.6% to 2.4%. Admission and operation volumes fell from 2014 to 2016 due to the Ebola outbreak and incessant industrial actions by various unions [Figure 2].

## **DISCUSSION**

Worldwide, especially in the most industrialised countries, the number of nursing specialities is increasing rapidly; there are well over a hundred subspecialities of nursing and more frontiers of nursing are opening daily matching the emerging needs in health care.<sup>4-6</sup>

Nursing offers one of the most readily available career opportunities having an enviable range of earnings in the health sector in most countries, especially in Europe and the United States of America; this fact accounts for a steady draft of the young and experienced workforce among nurses from low socio-economic countries in pursuit of career satisfaction.<sup>4-6</sup> These include the neonatal nurse, nurse midwife, clinical nursing specialist, critical care nurse, dialysis nurse, nurse practitioners, health policy nurse, informatics nurse, nurse anaesthetist, nurse educator, nurse advocate and the nurse researcher; the others are pain management nurse, psychiatric nurse, trauma nurse, travel nurse, paediatric nurse, geriatric nurse, public health nurse and oncology nurse to mention only few.<sup>4-6</sup> While specialities such as ophthalmic nursing, cardiac care nursing, critical care nursing, otorhinolaryngologic nursing and orthopaedic nursing are known in hospitals in less technologically endowed countries, there is no neuroscience nursing in West Africa, if not in the whole of Sub-Sahara.

**Table 1: Results of assessment tests for all participants**

Serial number*	Pre-test: MCQ (%)	Week 1: MCQ (%)	Week 2: ESSAY (%)	Week 3: MCQ (%)	Week 4: Multi-station steeplechase (%)	After 2 years (%)	After 4 years (%)
1	52	64	54	58	46	65	57
2	62	31	48	38	46	40	41
3	52	42	55	46	34	65	49
4	60	70	59	52	50	40	58
5	64	87	70	82	68	60	73
6	70	89	62	66	65	60	68
7	70	64	59	70	49	65	61
8	94	91	84	64	46	80	77
9	70	76	61	64	50	75	65
10	52	88	68	64	46	85	70
11	76	70	68	82	59	65	69
12	76	86	76	88	68	70	78
13	70	82	60	82	57	60	68
14	40	61	58	58	30	60	53
15	84	94	69	82	74	65	77
16	56	76	74	70	38	60	64
17	62	70	60	76	54	60	64
18	70	81	48	72	29	60	58
19	62	67	72	94	54	60	69
20	54	88	88	64	38	60	68
21	52	82	58	100	74	70	77
22	16	50	64	76	33	60	57
23	44	79	62	70	69	65	69
24	64	68	57	64	35	55	56
25	62	51	56	64	50	50	55
26	94	67	63	70	54	50	61

\*Serial numbers 1 and 2: CNO, 3: ACNO, 4-7: PNO, 8-10: SNO, 11-16: NO I: nursing officer I, 17-26: NO II nursing officer II. MCQ: Multiple choice questions, Essays (long, written essays/theory questions), MCQ: Multiple choice questions, CNO: Chief nursing officer, ACNO: Assistant chief nursing officer, PNO: Principal nursing officer, SNO: Senior nursing officer, NO: Nursing officer

**Table 2: Result of examinations (introductory course) total number of students: 26**

	Examination scores						
	Pre-test: MCQ	Week 1: MCQ	Week 2: ESSAY	Week 3: MCQ	Week 4: Multi-station steeplechase	2 years	4 years
0-39%	1	1	0	1	7	0	0
40-49%	2	1	2	1	4	2	0
50-59%	6	2	8	3	8	3	7
60-69%	7	6	10	7	5	16	11
70-79%	7	6	4	7	2	3	6
≥80%	3	10	2	7	0	2	0

MCQ: Multiple choice questions, ESSAY: long, written essays/theory questions

At our facility, the initial challenges to establishing neurosurgery were quite unprecedented. For many nurses (at the inception of neurosurgery at our hospital), neurosurgical conditions were hopeless and surgeries on the brain and spinal cord were either unimaginable or taboo and, as such, deemed an unnecessary enterprise.<sup>7</sup> Furthermore, the unending demand exacted on OR, ward and ICU nurses, as well as all other staff, were considered unfair in the light of incommensurate remuneration. Treatment orders were new, poorly understood and as a result, patient outcomes were poorer than predicted. Training for nurses and interdisciplinary collaborations with allied professionals became necessary at the inception of neurosurgery.<sup>7</sup>

Nursing specialities in the United States earn between 60,000 USD and 200,000 USD, especially informatics nurse, nurse educator, nurse researcher, clinical nurse specialist,

nurse midwife, nurse practitioner, nurse anaesthesiologist et cetera in ascending order.<sup>4-6</sup> In West Africa where technology for various subspecialisations is suboptimal, earnings are far from encouraging given the physical and emotional demands of a speciality like neurosurgery; hence, it only attracts few nurses in low-resource settings.

Unlike in the past, when significant evidence affirmed that the society had not adequately invested in nursing education evidenced by their ill-equipment for research, the past decade has witnessed more and more nurses taking bold steps to acquire bachelor, master and, even doctoral degrees at home and abroad.<sup>8-10</sup> Furthermore, at a time when there appears to be no literature with a focus on nursing research in West Africa, there is a compelling need to reassess nursing education, especially in neuroscience in the country.<sup>8-10</sup> To actualise the gains of advancement in nursing and neurosciences, nurses and the neurosurgeons must team up

for the advanced educational and clinical experiences that are innate to academic neuroscience centres.<sup>11</sup>

Our study underscored the importance of career development and multilevel educational programs among nurses in neurosciences; however, acquisition of a recognised neuroscience certification (equivalent to Certified Neuroscience Registered Nurse) is also important.<sup>4,6,11</sup> This is not achievable without multidisciplinary collaborative commitment to excellence in patient care and advanced professional practice among neurosurgeons, their nurses and other allied staff on the neurosurgical floor.<sup>11</sup>

Creating a participative model to promote team collaboration and autonomous nursing practice is important for a neuroscience academic centre.<sup>11</sup> This includes the following: (a) unit-based clinical nurse specialists, critical care nurse practitioners, certified wound care nurses, discharge planners and educators who provide support, mentoring and ongoing bedside staff education and (b) shared governance structures with unit-based committees which offer opportunities for shared talents and professional growth.<sup>11</sup> In this study, we have designed a simple, reproducible curriculum that advances the neuroscience knowledge base of the registered nurse for improved patient care and also as a trusted leader and mentor on the neurosurgical floor. Over 13 years, this has fostered excellence and professional collaboration, in which the neurosurgeon and the residents are seen as the leaders in wards and ORs owned and run by the nurse. This model for growing together should serve to resolve an age-long conflict in the health sector.

The study demonstrates a steady rise in the number of admissions and operations (with unchanged or lower mortality) following the training of nurses for neurosurgery; this underscores the proficiency and resilience of the trained neuroscience nurse.<sup>11-13</sup>

Neuroscience nurses focus on stabilising and rehabilitating patients with neurological disorders; these include stroke, epilepsy, multiple sclerosis, Parkinson's disease, encephalitis, brain tumours, brain and spine injuries, congenital anomalies, etc.<sup>12,13</sup> In the nervous system, healing and rehabilitation may be prolonged, and hence, nurses interested in this field require sharp assessment skills and uncommon patience.<sup>12,13</sup>

The requirements for neuroscience nursing include an accredited (basic) nursing program, nursing licence, and a bachelor in nursing degree. Nurses with a bachelor degree have a broader range of opportunity as they can pursue supervisory roles as well as become clinical nurse

educators.<sup>12,13</sup> Six of our trained neurosurgical nurses later pursued careers as nurse educators in the perioperative nursing school of our institution and abroad. Sometimes, certification is not required, although a neuroscience certified nurse demonstrates competence, commitment and professionalism in the speciality.<sup>12</sup> The American Board of Neuroscience Nursing certification requires a current nursing licence and involvement in direct or indirect nursing care in the field of neuroscience for, at least, 2 years within the past 5 years.<sup>12</sup>

After training, our nurses were deployed to the neurosurgical unit, the general ICU to participate in the care of neurosurgical patients there and the neurosurgical OR as the neuroscience nurse can work in hospitals (stroke units, intensive care, paediatric nursing units, OR, neurosurgical floor and clinical education), outpatient clinics, rehabilitation facilities and elder care facilities.<sup>12,13</sup>

The salient contributions of our neurosurgical unit remain (as highlighted by E. Latunde Odeku, the pioneer of neurosurgery in West Africa, at the University College Hospital, Ibadan), broadening the scope of medical students as well as advanced training for resident doctors and nurses.<sup>14</sup> Unlike is required for an established medical faculty, far less resource is needed for a reasonable beginning in any sphere of medicine; with necessity, determined efforts and some opportunity much may be accomplished with limited resources.<sup>14-16</sup>

## CONCLUSION

Subspeciality training for nurses in neurosurgery will avert frequent unbeneficial deployment redeployment of nurses, whatever their speciality, in and out of neurosurgical units without prior training or previous exposure. On the other hand, training, and subsequently dedicating, nurses to neuroscience patient care makes for excellence in patient care as well increase professionalism.

## Limitations of the study

There was no previously known training of nurses in Nigeria, or probably West Africa, for neurosurgical speciality, and hence, there was no other instance to compare with besides a pre-test assessment of the nurses' prior knowledge.

## Acknowledgements

We appreciate the honest contributions of the Prof. Eugene Okpere, during whose tenure as Chief Medical Director, and whose goodwill, overcame obstacles to having a neurosurgical facility. We also acknowledge the immense sacrifice of all the resource persons and

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### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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### APPENDICES

#### Appendix 1



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**NEUROLOGICAL SURGERY TRAINING FOR NURSES: MAIDEN TRAINING FOR THE FIRST SET OF TWENTY-SIX (26) NEUROSURGICAL NURSES 5<sup>TH</sup> FEB. TO 3<sup>RD</sup> MAR 2007**

*YEARLY RE-TRAINING INCORPORATING NEWLY EMPLOYED NURSES.*

### COURSE OUTLINE

#### WEEK 1 (BASIC NEUROSCIENCES)

Mon. 05/02/07

NEUROEMBRYOLOGY

7.00-8.00: Ward Round

1300–1400: Introduction the Central Nervous System: Embryological development of the brain and spinal cord; the formation of the neural tube, closure and failure of closure of cranial and caudal neuropores and resultant abnormalities. The telencephalon, diencephalons, mesencephalon, metencephalon, myelencephalon, the cerebellum and the ventricular system (lateral and third ventricles, cerebral aqueduct and fourth ventricle)

Tue. 06/02/07 NEUROPHYSIOLOGY, NEUROHISTOLOGY AND NEUROBIOCHEMISTRY

7.00-8.00: Ward Round.

1300–1400: The nerve cell or neuron, myelin sheath and neuronal conduction; action potential; nerve fibre types. Nucleus, tracts. Synaptic transmission and neurotransmitters (acetylcholine, epinephrine, norepinephrine, dopamine, serotonin, glutamate, GABA etc.). Neuromuscular junction and motor unit. Denervation hypersensitivity. Wallerian degeneration. 1400–1500: Sense organs and receptors. Cutaneous sense organs, special senses. Reflexes. Cranial and peripheral nerves. Skull base foramina. Autonomic nervous system.

Wed. 07/02/07 GROSS ANATOMY

7.00-8.00: Ward Round

1300–1400: Osteology of the skull and vertebrae. Paraxial mesoderm, lateral plate mesoderm, neural crest ectoderm. Neurocranium (membranous (vault) and cartilaginous (base) ossification). Viscerocranium (skeleton of the face). 1<sup>st</sup> and 2<sup>nd</sup> pharyngeal arches. Sutures and fontanelles. Cranial bifidum, anaencephaly, craniosynostosis, microcephaly. Spina bifida, Klieppel-Feil syndrome. MMA and extradural haematoma. Vault, roof or skull cap (frontal, temporal, parietal and occipital bones. Floor or base. Foramina. Linear and depressed skull fractures. Fracture base of the skull. CSF rhinorrhoea and otorrhoea. Cervical, thoracic, lumbar and sacral vertebrae. Centrum or body, pedicle, lamina, spinous process. Atlas, axis. Radiculopathy, myelopathy. Laminectomy. *Dr. Azeez, AL.*

Thu. 08/02/07 GROSS ANATOMY

7.00-8.00: Ward Round

1300–1400: The brain and spinal cord - gross anatomy and internal structure. Neuroglia. Ascending and descending pathways. Control of posture and movement- cerebrum, cerebellum, basal ganglia and midbrain. Neuronal biochemistry. Dissection of the brain. *Lecture re-scheduled to week 2.*

1400-1500: EXAMS

Fri. 09/02/07: SCHOOL DAY OFF.





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YEARLY RE-TRAINING INCORPORATING NEWLY EMPLOYED NURSES.

### COURSE OUTLINE

#### WEEK 2 (CLINICAL NEUROSURGERY AND ETHICS OF SPECIALISED NURSING CARE)

Mon. 12/02/07

7.00-8.00: Ward Round:

13-1400: The brain and spinal cord - gross anatomy and internal structure. Neuroglia. Ascending and descending pathways. Control of posture and movement- cerebrum, cerebellum, basal ganglia and midbrain. Neuronal biochemistry. Dissection of the brain. *Re-scheduled lecture.*

1400-1500: Neurosurgical workplace ethics: Run, run, run, run.

Traditions: Everything you touch is a life. Be there, be prompt, be careful, and be precise.

Tue. 13/02/07

7.00-8.00: Ward Round.

1300-1400: Head injury I: Definition, aetiologies and aetiological factors. Epidemiology, mechanisms, types. 1<sup>o</sup> and 2<sup>o</sup> brain injuries. GCS: General overview of management. *Dr. Azeez, AL.*

Wed. 14/02/07

7.00-8.00: Ward Round.

1300-1400: Skin Care and Pressure ulcers: *Dr. Oludiran, O*

1400-1500: Head injury II: Sequelae: Raised intracranial pressure and herniation syndromes. Intracranial haematomas. Cerebral oedema, CSF fistulae, intracranial abscesses. Cranial nerve palsies. Post-traumatic epilepsy, hydrocephalus, headaches, psychosis, amnesia. Skull fractures (linear and depressed, open or closed). Carotico-cavernous fistula. GOS. *Re-scheduled lecture.*

Thu. 15/02/07

7.00-8.00: Ward Round.

1300-1400: Spinal cord injury I: Definition, aetiologies and aetiological factors. Epidemiology, mechanisms, types.

1400-1500: SCI II: Principles of management. Spinal Cord Injury protocol, complications and prognosis. *Re-scheduled lecture.*

Fri. 16/02/07

7.00-8.00: Ward Round

1300-1400: The Surgical sub-speciality ward: Nursing ethics at the workplace and demands of nursing care. *CNO Mene.* *Re-scheduled lecture.*

1400-1500: EXAMS



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CHIEF MEDICAL DIRECTOR:

CHAIRMAN, M AC:

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PROF. E. E. OKPERE  
*MBBS, FMCOG, FWACS, FICS, FRCOG.*  
PROF. O. OVIAWE  
*MBBS, FMCPaed, FWACP*

**NEUROLOGICAL SURGERY TRAINING FOR NURSES:** MAIDEN TRAINING FOR THE FIRST SET OF TWENTY-SIX (26) NEUROSURGICAL NURSES 5<sup>TH</sup> FEB. TO 3<sup>RD</sup> MAR 2007.

*YEARLY RE-TRAINING INCORPORATING NEWLY EMPLOYED NURSES.*

### **COURSE OUTLINE**

#### **WEEK 3 (CLINICAL NEUROLOGY, NEUROPSYCHIATRY and INTENSIVE CARE)**

Mon. 19/02/07 NEUROLOGY

7.00-8.00: Ward Round:

1300-1400: Neurology I: Differential diagnoses of intracranial space-occupying lesions. Cerebrovascular accidents and dementias. *Dr. Ogunrin, B.*

1400-1500: Neurology II: Meningo-encephalitis, transverse myelitis, Guillain-Barre syndrome.

Tue. 20/02/07

700-800: Ward Round

1300-1400: The Surgical sub-specialty ward: Nursing ethics at the workplace and demands of nursing care. *CNO Mene.*

Wed. 21/02/07 NEUROSURGERY

7.00-8.00: Ward Round

1300-1400: Congenital malformations of the CNS: Hydrocephalus, Spina bifida, Encephalocoele.

1400-1500: Intracranial infections: Meningitis, meningo-encephalitis, extradural, subdural, intracerebral and intraventricular abscesses

Thu. 22/02/07 NEUROPSYCHIATRY

7.00-8.00: Ward Round.

1300-1400: Psychiatric manifestations of intracranial lesions.

1400-1500: Understanding behavioural changes following CNS trauma, tumours and infections. *Dr. Akhigbe, K Rescheduled lecture*

Fri. 23/02/07 INTENSIVE CARE

7.00-8.00: Ward Round.

1300-1400: The Neurosurgical ICU: Patient monitoring. *Dr. Isab, IJ Rescheduled lecture*

1400-1500: EXAMS



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#### **COURSE OUTLINE**

##### **WEEK 4 (OPERATIVE NEUROSURGERY and INTENSIVE CARE)**

Mon. 26/02/07 INTENSIVE CARE.

7.00-8.00: Ward Round

1300-1400: The Neurosurgical ICU: The patient, the nurse, the instruments. *CNO Kumuyi.*

Tue. 27/02/07

7.00-8.00: Ward Round

8.00-9.00: The Neurosurgical OR: The tradition, the frenzy, and the conduct of operations. *CNO Oyerinde, M*

1300-1400: An Overview of Paediatric Surgical Nursing: The demands of the neurosurgical child. *CNO Egbuomwan*

Wed. 21/02/07 NEUROSURGERY AND INTENSIVE CARE

7.00-9.00: Ward Round

1300-1400: The Neurosurgical ICU II: Patient monitoring. *Dr. Isab, IJ*

1400-1500: Intracranial tumours

Thu. 22/02/07 NEUROPSYCHIATRY

7.00-8.00: Ward Round.

1300-1400: SCI Nursing: Holistic Care and Family Participation. *ACNO Aderibigbe, F*

1400-1500: Professionalism and Nursing: So much training and subspecialisation, but are we better? *CNO Osunde, N*

Fri. 23/02/07

7.00-8.00: Ward Round.

1300-1400: EXAMS

## Appendix 2



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### **COURSE OUTLINE**

#### **END OF WEEK I COURSE ASSESSMENT**

##### **ANSWER ALL QUESTIONS**

1. The following are true of the brain
  - a. It is an organ composed of smooth muscle and nerve fibres
  - b. It is the organ affected in stroke
  - c. Its blood supply is the abdominal aorta
  - d. Dementia only occurs in old age
  - e. The vagus nerve has parasympathetic function.
2. The spinal cord is affected in
  - a. Guillain–Barre syndrome
  - b. Hypertensive cerebrovascular accident
  - c. Traumatic quadriplegia
  - d. Brachial plexus injury
  - e. Diabetic coma.
3. A neuron
  - a. Is a nerve cell
  - b. May be ensheathed in myelin
  - c. Is composed of dendrites and a single axon
  - d. Is composed a dendrite and multiple axons
  - e. Is found in the brain but not in the spinal cord.
4. Cerebrospinal fluid:
  - a. Is produced in the ventricles
  - b. Its flow may be obstructed in hydrocephalus
  - c. Is infected in meningitis
  - d. Can be aspirated by lumbar puncture
  - e. Is faint yellow in colour.
5. Which of the following are true
  - a. Hydrocephalus is always congenital

- b. Cerebrospinal fluid is golden yellow and crystal clear
  - c. Lumbar puncture may cause death from sudden brain stem herniation in brain tumours
  - d. Lumbar puncture should be done to investigate and properly treat raised intracranial pressure
  - e. Meningitis may lead to brain abscess.
6. The following are true
- a. Mannitol is a polysaccharide
  - b. Mannitol is a thiazide diuretic
  - c. Mannitol should be given by slow intravenous infusion in cerebral oedema
  - d. Mannitol may be given intraoperatively in the presence of an acute extradural haematoma
  - e. Mannitol is not useful in raised intracranial pressure
7. Development of the central nervous system
- a. Is from the dural tube
  - b. Spina bifida results from failure of closure of the cephalic neuropores
  - c. Is from endodermal germ layer
  - d. Cerebral hemispheres are formed from myelencephalon
  - e. Two lateral ventricles drain the cerebral hemispheres.
8. Myelin sheath
- a. Is formed in the brain by Schwann cells
  - b. Oligodendroglia is synonym for unipolar neuron
  - c. Myelinated and unmyelinated axons have nodes of Ranvier
  - d. Wallerian degeneration refers to degeneration of myelin sheath
  - e. Is composed of lipid.
9. Which of the following is/are true?
- a. Cranial nerves arise from nuclei in the spinal cord
  - b. The vagus is cranial nerve IX
  - c. Cranial nerve is not involved in visual deterioration from a pituitary tumour
  - d. Exit through foramina at the skull base
  - e. Cranial nerves II, V and VII control eye movement.
10. Of Osteology of the skull and vertebrae
- a. The vault/roof of the skull forms from Viscerocranium
  - b. The anterior cranial fossa houses the frontal lobe
  - c. The sella lodges the pineal gland
  - d. CSF rhinorrhoea results from fracture of the base of the skull
  - e. The axis is the first cervical vertebra.

#### END OF WEEK 2 COURSE ASSESSMENT

1. Write short notes on the following: (a) Neuron (b) Synaptic transmission
2. List the twelve cranial nerves
3. Discuss briefly head injury and outline its nursing care.

#### END OF WEEK 3 COURSE ASSESSMENT

#### ANSWER ALL QUESTIONS

1. The following conditions may be treated medically and usually require no neurosurgical intervention
  - a. Guillain–Barre syndrome
  - b. Transverse myelitis
  - c. Stroke
  - d. Dementias
  - e. Intracranial tumours.
2. Cerebral oedema (brain swelling) may result from the following

- a. Meningo - encephalitis
  - b. Other systemic illness such as liver failure and uraemia
  - c. Diuretics
  - d. Cerebral malaria
  - e. Septicaemia.
3. Which is/are true of cerebrovascular accident
- a. Bleeding into the brain from head injury
  - b. Any form of mishap leading to unconscious
  - c. Any comatose state without an obvious cause
  - d. May occur in hypertensive patients
  - e. There may be no intracranial bleeding.
4. In the surgical child
- a. Excessive cry is a warning sign
  - b. Quietness is a warning sign
  - c. Blankets may reduce mortality
  - d. Raised intracranial pressure is easily detected by examining the head in teenagers
  - e. Require the same intravenous infusion set as the adults.
5. The anterior fontanelle
- a. May be predictive of dehydration
  - b. Bulges in gastroenteritis
  - c. May not bulge in raised intracranial pressure
  - d. May be patent in a 10-year-old with hydrocephalus
  - e. May help to determine whether a lumbar puncture should be withheld.
6. In the intensive care unit
- a. Only neurosurgical patients with severe traumatic brain injuries are admitted
  - b. Neurosurgical patients may be admitted after surgery
  - c. Glasgow coma score of 8 is an absolute indication for admission
  - d. Patients with hydrocephalus usually require ventilatory support post-operatively
  - e. One nurse monitors two patients.
7. Neurovital signs
- a. This usually refers to Glasgow coma score (GCS)
  - b. Includes GCS, full blood count and respiratory rate
  - c. Are monitored four hourly in the ICU, hence are not required for operations less than four hours
  - d. Are unnecessary when the patient needs to sleep
  - e. Intracranial pressure includes monitoring.
8. Hydrocephalus
- a. Occurs only in newborn and infants
  - b. Always refers to a large head
  - c. May be caused later in life by meningitis
  - d. May complicate stroke
  - e. Will always result in a bulging anterior fontanelle in a child.
9. Which of the following are true
- a. Urgent surgery saves lives in cerebrovascular accidents
  - b. Dementia refers to a psychiatric illness
  - c. Psychiatric illness is not a complication of traumatic brain injury
  - d. A computerised tomography scan may be necessary when unexplained behavioural changes are noticed.
  - e. Brain tumours may present as psychiatric illness.
10. Holistic care

- a. Family counselling may be necessary in traumatic quadriplegia
- b. Family participation is an essential part of neurosurgical care
- c. Religious counselling may aid recovery
- d. May include modification of home and environment
- e. Means preparing a patient to meet his Maker.

**END OF WEEK 4 COURSE ASSESSMENT (Multistation Steeplechase)**

**ANSWER ALL QUESTIONS (Marks for each questions written in brackets)**

1. Ventriculo-peritoneal shunt passer and catheter
  - a. Name this instrument. (2)
  - b. What is it used for? (1)
  - c. Which disease condition is associated with its use? (1)
2. Tendon or reflex hammer
  - a. Name this instrument. (1)
  - b. What action is it used for? (1)
  - c. Name two of these. (2)
3. Hudson brace, perforator and burr
  - a. Name these instruments. (3)
  - b. What are they used for? (1)
  - c. Name two disease conditions where they are used? (2)
4. The Intensive Care Unit Chart
  - a. Name three instruments you've seen where this chart is used. (3)
  - b. Name three types of patients nursed here. (3)
  - c. How often are recordings made in this chart? (1)
5. The fourth ventricle highlighted in a brain specimen
  - a. Name this ventricle. (1)
  - b. Name one disease condition associated with ventricles. (1)
  - c. Name four treatment modalities for the disease. (4)
6. The frontal lobe
  - a. Name this part of the brain.(1)
  - b. What does it develop from embryologically? (1)
  - c. Name four symptoms associated with disease here. (4)
7. Foam trough
  - a. What important device for neurosurgical management may be made from this? (1)
  - b. In which condition may it be used? (1)
  - c. What is its function? (1)
8. The skull with a probe in the optic canal
  - a. Which nerve passes through this opening? (1)
  - b. In which disease may the nerve be affected? (1)
  - c. How does the patient present? (1)
9. Bone wax
  - a. What is this? (1)
  - b. What is it used for? (1)
  - c. What else is used for this purpose in Neurosurgery? (1)
10. The Neurosurgical OR
  - a. Name three important instruments required for a successful craniotomy. (3)
  - b. List three rules of a neurosurgical theatre. (3)

Total Marks 48.