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## Neurology and Nervous System

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Discovering Thoughts, Inventing Future

VOLUME 14

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NEUROLOGY AND NERVOUS SYSTEM

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## Person with TBI, Key Health Team Member: Strategies toward Recovery

By Dr. Leilani Doty & Anonymous  
*University of Florida, United States*

*Abstract-* A Traumatic Brain Injury (TBI) may result in brief, moderate, or lifelong physical, emotional, cognitive, behavioral, social and employment difficulties, extended unconsciousness, permanent disabilities, or death. The annual TBI incidence in the United States of 1.7 million people or more and the estimated 5.3 million people with TBI dwelling in the U.S. contribute to TBI being a grave public health issue. While the physician is typically considered the point person directing the medical care for an acute TBI, the key member of the health team should be the person with the TBI along with a family support person. A comprehensive approach to recovery should include early referrals to many other types of health professionals such as neurologists and other physician specialists, physical therapists, psychologists, speech therapists, etc. for early intervention and avoiding delays in healing that may result from subtle problems, cognitive dysfunction, depression, or vision and other sensory system deficits.

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# Person with TBI, Key Health Team Member: Strategies toward Recovery

Dr. Leilani Doty<sup>o</sup> & Anonymous<sup>o</sup>

**Abstract-** A Traumatic Brain Injury (TBI) may result in brief, moderate, or lifelong physical, emotional, cognitive, behavioral, social and employment difficulties, extended unconsciousness, permanent disabilities, or death. The annual TBI incidence in the United States of 1.7 million people or more and the estimated 5.3 million people with TBI dwelling in the U.S. contribute to TBI being a grave public health issue. While the physician is typically considered the point person directing the medical care for an acute TBI, the key member of the health team should be the person with the TBI along with a family support person. A comprehensive approach to recovery should include early referrals to many other types of health professionals such as neurologists and other physician specialists, physical therapists, psychologists, speech therapists, etc. for early intervention and avoiding delays in healing that may result from subtle problems, cognitive dysfunction, depression, or vision and other sensory system deficits. Simple tools such as a *CarNotebook* holding various care and treatment details as well as pragmatic strategies such as memory and communication tips for the person with the TBI and the physician (or other health professionals) should help the family stay abreast of the multiple treatments, medicine changes, appointments, and changing needs over time. In addition, a network of health professionals, community programs and e-resources are important to address the many different challenges toward recovery.

A Traumatic Brain Injury (TBI) may range from a mild to a severe: bump, blow, jolt, or penetrating injury to the head that results in brain dysfunction. The impact of the TBI may range from a momentary mild brain dysfunction to a severe injury resulting in extended unconsciousness, permanent disabilities, or death. With 138 people in the United States dying daily from injuries that include TBI, the annual U.S. TBI incidence of 1.7 million people or more, and an estimated 5.3 million people with TBI dwelling in the U.S., TBI remains a grave public health issue.<sup>1-3</sup>

Results from TBI may lead to brief, moderate, or lifelong physical, emotional, cognitive, behavioral, social and employment difficulties. The person with TBI may be more at risk for other health problems such as seizures, depression, falls and fractures, habitual self-medication with alcohol, or other chemical abuses. Accessing appropriate healthcare and other services over the acute and long-term steps toward healing present unique challenges to the person with TBI and the family support system, especially with subtle injuries, such as mild cognitive changes in emotional communication (associated with right hemisphere injuries), or faulty judgment and decision-making (associated with frontal lobe injuries). Sometimes the embarrassment of the person with the TBI or

anosognosia (decreased or lack of self-awareness) interferes with seeking professional help. The limited training of health and social service providers may impede progressive healing, especially after the healing of obvious injuries, i.e. fractures and lacerations, and continuation of obtuse, neglected problems such as in sensory perception i.e., subtle difficulties in smell, hearing, or vision.<sup>4-8</sup>

Yet based on an intensive study of the literature published between 1998 and 2004, Gordon et al. (2006) in their "State of the Science Review" compelled researchers and clinicians to fill the extant gaps of TBI knowledge particularly related to the complexity and heterogeneity of: the population, the injuries, the treatments, rehabilitation protocols, recovery, and barriers to fulfilling, productive lifestyles.<sup>9,10</sup>

The purpose of this paper is to present an anecdotal model of strategies to guide others through "the dynamics of recovery from TBI".<sup>9,p.344</sup> The pragmatic strategies for the person with TBI, the family support person(s), and health and social service providers evolved from the post-TBI road to recovery and coping experiences of the second author, formerly a manager of a top fortune 20 company before sustaining a severe TBI seven years ago from a motor vehicle accident. Emphasis points to the importance of a comprehensive approach, being actively involved with the health team, having at least one family support person, attending to the complexity of obvious injuries versus elusive damage, creating unique interventions that respect individual differences, accessing diverse resources, and reintegrating into community life.<sup>9,10</sup>

## I. A COMPREHENSIVE APPROACH

Addressing a TBI should involve a comprehensive approach<sup>11</sup>. The person with the TBI, as soon as possible, as well as a family support person (spouse, adult child, partner, etc.) should actively join with the various health professionals in the care planning, decision-making, and development of a network of resources to deal with the many steps leading to recovery. The person with the TBI, family support person, and health providers should pay attention to the specifics and the follow-up of tests, treatments, appointments, and referrals to other services, educational resources, and programs.

### a) *Key Person on Health Team*

An important aspect of care and recovery is the relationship between the person with the TBI (the patient) and the physician. This relationship is especially critical initially because the physician is usually the first and ongoing point person to provide and guide medical care. As a result of the TBI, the patient is often in a state

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of turmoil due to the trauma, disrupted lifestyle, and several other related issues. For example, there may be trust issues because of a loss of sense of self. A severe cortical injury may lead to a complete loss of identity and cognitive dysfunctions such as the inability to communicate, make decisions, recognize family members, or remember information for more than one minute at a time. Struggles with pain may cloud thinking. Uncertainty or awkwardness with compensatory strategies or cognitive decline such as in executive functions may contribute to social withdrawal. Difficulty with Fear about the immediate, serious nature of the injury as well as long-term consequences and unknowns about future abilities to function build up stress.<sup>10</sup>

As essential as the physician and other health professionals are to treatments and healing, the patient, assisted by supporting family, should be empowered as much as possible to have a role as a key leader of the healing team.<sup>12</sup> In the medical evaluation, discussion of possible treatments, and design of the treatment plans, the patient is key and therefore should be involved whenever possible and appropriate in the discussion of clinical findings, needed tests, treatment choices, and care plan decisions.

The patient's success toward recovery depends greatly on the health team working with high levels of respect and professionalism that demonstrate to the patient and family support person(s) cultural sensitivity and competence, building of trust, fostering of hope during challenges and adaptations, ongoing clear communication, and honesty. Thus, the patient in partnership with others on the health team may become strongly invested in and regain a sense of control regarding therapy decisions.

#### *b) Caring for the Family Support Person<sup>13,14</sup>*

The family support person for someone who has had a TBI usually is a close family member, partner, or friend with deep emotional ties. Suddenly the family support person faces multiple responsibilities, not only survival-dependent medical decisions of the injured loved one, family matters such as paying bills, keeping up with the schedule of other family members, providing transportation, meals and other duties which the person with the TBI previously managed. Depending upon the nature of the TBI, the family support person may be on call 24/7 for the medical team in case of a sudden change in the patient's status. Additionally the family support person must balance the independent-dependent-interdependent functioning and changes of the person with the TBI

Not knowing the quality or the timeline of the recovery, difficulties communicating with the person who has the TBI as well as diverse health and social service providers may lead to overwhelming physical, emotional, and socioeconomic stress. Neglected caregiver stress may lead eventually to burnout with the

family support person feeling intensely overwhelmed and no longer able to keep up with the constant demands of care management. This downturn in support may set up risks for neglect or abuse of the person with the TBI.

Effective coping involves a focus on the problem and the steps (even small steps) towards recovery and learning to manage the stress of caregiving. Books, support groups, and experts such as psychologists, mental health counselors, clergy, and social workers can help the family support person learn coping strategies such as identifying help from community services, volunteers, or part-time, paid helpers to provide transportation, meals, homemaking tasks, etc.

Important to caregiver coping is learning how to take time for rest to refresh oneself, to follow a daily healthy lifestyle including good nutrition, adequate sleep, time for exercise and pleasant activities such as listening to music, watching a comedy, reading an enjoyable book, time with pleasant friends or alone time, and regular respite, brief periods of separation such as 10 minutes daily to refresh oneself or longer periods such as a weekend once a month or more often.

#### *c) Early Referral*

Not only do the patient, supportive family, and physician have to trust, respect, and communicate clearly with each other, but early on it is also essential to the recovery process to access a diverse network of health providers and resources to arrange a comprehensive approach to recovery to begin as soon as possible.<sup>15</sup> Sometimes TBI injuries involve impaired: memory, communication, thinking, vision, hearing, balance and movement, skilled hand movements, orientation to time or place, etc. These sometimes obscure disorders may lead to chronic stress, anxiety, and depression. Untreated stress, anxiety, and depression may magnify the impact of the brain dysfunctions directly related to the injuries from the TBI incident.

Healing should entail input from other health and social service experts. As soon as possible, referrals should be made to speech and hearing, physical therapists, occupational therapists, neuropsychologists, mental health counselors, neurologists, dentists, social workers, etc. for full evaluations and treatment recommendations.<sup>10,15,16</sup>

Delay in referrals may lead to high levels of frustration. For example, the patient who struggles with hearing, understanding, speaking, or other language issues may misinterpret complex directions. Memory problems may result in poor recall of important details of care. The patient with TBI to the right hemisphere may misunderstand or miss completely the emotion underlying the body language (kinesics) or speech of others; in addition, the patient may be unable to communicate emotion to others. These problems may

be masked and missed; if left untended, they may build frustration, anger, stress, anxiety and depression in the patient as well as the family support person and thus derail the progress toward recovery.

#### d) *A Care Notebook*

One of the first and most useful strategies is to start a Care Notebook, a tool to help manage sundry details. Similar to a journal, a Care Notebook is an important resource for the person with TBI as well as the family support person. A Care Notebook should be started as soon as possible after the traumatic event (even from the beginning moments when the person suffering with the TBI first receives medical attention) as it may help to record the details of what initially occurred. When appropriate, the Care Notebook should become the responsibility of the person with the TBI.

Keeping regular notes in this Care Notebook will help update both the person with TBI and the family about the different people, tests, treatments, and appointments that are involved in the daily care management and recovery process. The Care Notebook provides a place for a To-Do-List, with a check, date and special comments after completing a task; a record of health team members and their roles; a list of medicines and dosage; a schedule of therapies, etc. After the traumatic brain injury event, the focus of immediate (and early) care is likely to involve many emergency procedures. Once stabilized with emergency care, the patient and family can start to review and note the way to move forward and the overall approach with the health team. Moving forward may involve several steps and care goals. At this time keeping a record of vital information in the Care Notebook will help to keep the steps and people involved clear about the sequence of directions for moving forward. A review of previous notes can point out progress.

#### e) *Care Pages*

The Care Notebook should hold Care Pages of different formats. A Care Page identifying the persons who provide care should show the names, contact information, and assigned responsibilities of each health professional involved in medical evaluations, treatment, care management, and recovery for the person with TBI. [See an example of such a page (Figure 1. **Care Page Example #1**) at the end of this article.]

A different format for a Care Page that tracks medicines can keep the patient, family and health team updated, especially as dosage and frequency change and which medicines were tolerated well versus those with unpleasant side effects. [See an example of such a page (Figure 2. **Care Page Example #2**) at the end of this article]. The person with the TBI may not be able to participate fully in the early stages of healing; therefore, family and significant others may help by noting initially

on the care pages for medicines any valuable information such as comments about allergies and sensitivities to medicines (and foods). Changes in medicines during the course of healing, especially when the person is taking different medicines, are often challenging depending upon the complexity of injuries and individual differences. Sometimes when the person is taking several medicines, changing one medicine may affect how the other medicines work, such as the interaction leading to a stronger or weaker effect of a drug or side effects such as nausea, vomiting, or dizziness. Tapering off a former medicine and building up the dosage of the new medicine may lead to unexpected temporary inadequate levels of therapy or toxicity due to intolerance of the additional new medicine. Tolerance of a new medicine may fluctuate abruptly due to a sudden status change such as decreased kidney or liver function or an incipient infection. Thus, a Care Page for medicines can keep the patient, family and health team members updated and readily responsive to apply needed interventions.

#### f) *Memory Strategies*

Among the various cognitive dysfunctions that may follow a TBI, short-term memory difficulties may provide a major hindrance to adaptation and recovery. When a TBI disrupts memory function, stress from the medical setting amplifies the difficulty keeping track of cumbersome details, therapy appointments, the self-care schedule, and the names and contact information of staff.

The following pragmatic strategies may aid memory:

##### i. *For the person with TBI*

1. In addition to a Care Notebook, use a small, pocket-size or purse-size "memory notebook" with bound pages (not a loose leaf notebook) to write down important details, such as the daily schedule of health care and other tasks to do, appointments, people to phone, items to buy, etc., and check off what has been done. Keeping these details in a small notebook will serve as reminders about the schedule of tasks, etc. Then check off when tasks are done, visits completed, brief notes, etc. As an alternative, dictating into an iPod with a reminder alarm may help (iPhone and iPad apps convert speech to text, for example *Dragon*, speech to text).
2. As questions come up during the day, record the questions and answers which can be referred to later.
3. When thinking of a detail to tell someone, write it down (or dictate it) and then check it off when it is completed.
4. A calendar of the week's (or month's) activities on the refrigerator, bulletin board, and bathroom wall serve as ongoing reminders.

5. Express words of appreciation for reminders and help; remember the magic words "Please" and "Thank you".
6. Use Google to help with the word finding process.
7. Use yellow paper, post-it notes or different colored post-it notes for different topics. Or, try post-it notes, already installed on most computers, to make it easy to write down reminders daily on a to-do list.

There are also useful health and disability Apps, which may help. See the following list of suggestions:

- Apps for Windows Phone can be found at: <http://www.microsoft.com/windowsphone/en-us/apps/default.aspx>
- Apps for Apple devices such as iPod, iPad and iPhone can be found at the Apple App Store:
  - *iPod Touch*  
-<http://www.apple.com/ipodtouch/features/app-store.html>
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- ii. *For the physician and other health/social service professionals*
  1. Repeat simple details in simple sentences.
  2. Plan for enough time for the questions and concerns of the patient and family members to be addressed by different staff such as a nurse, social worker, health aide, physical therapist, occupational therapist, speech therapist, dentist, financial counselor, etc.
  3. Give information and directions orally, in written form, and on a tape or CD. As an alternative, give directions in pictures.
  4. Give simple choices such as one or two choices as a way to respect the patient and then remind the patient, for example, "As you just decided, we are going to start physical therapy first. Then medicine A to see how it works. What do you think of this plan?"
  5. Express words of appreciation for opinions and help from the patient and family; remember the magic words "Please" and "Thank you".

#### g) *Communication Strategies*

Critical to careful and safe healing is clear communication to and from: the patient, family support person, and health and social service providers. Any questions or doubts about a procedure, medicine or health staff should be acknowledged as being heard, evaluated, and followed-up. To facilitate communication, it may be useful:

##### i. *For the person with TBI*

1. Think about questions (and concerns) ahead of a medical visit or appointment, write them down, dictate them into an iPhone or other tech device. When staying in a hospital or rehab center, put the questions on the hospital bedside table so the incoming doctor or nurse will see and respond to the questions quickly.
2. Email a list of concerns and questions ahead of time to the doctor's office to allow the medical staff time to look up information and answers before the time of the medical appointment.
3. Write down words when speaking is difficult. Try to use hand gestures, point to pictures, or draw pictures to show what you want or are thinking.
4. Request help from a family member to explain your concerns to the medical staff.

##### ii. *For the physician and other health/social service professionals*

1. Listen carefully to words and watch body language such as facial expressions to learn about the obvious message and the subtle or hidden message.
2. Print instructions in large, bold, simple font, such as 16 point Arial.
3. Use pictured instructions such as pictures of exercises or a picture of a calendar highlighting the date of the next appointment with a clock pointing to the appointment time.
4. Ask simple questions that easily lead a patient to answer with a spoken "yes" (or nodding the head up and down or one eye blink) or a spoken "no" (or shaking the head side to side or two eye blinks). Alternatively, a patient may raise a finger or hand or leg to show yes or no answers.
5. If hand and finger skills function well, refer the patient to a speech therapist to teach about alternative communication using computer icons or Amerind (American Indian Sign Language, a language of gestures, [www.inquiry.net/outdoor/native/sign.htm](http://www.inquiry.net/outdoor/native/sign.htm)).
6. Show a group of simple smiley faces to ask about feelings, pain, or mood:



### h) Diverse Resources

Long periods of time may be necessary for healing; sometimes years pass before maximum medical improvement is achieved. When the recovery process has taken place and when the patient is ready to enjoy socialization, close friends may have moved on to different responsibilities, interests, and locations. As a result, the patient who has the TBI may feel disconnected or even isolated, despite the best efforts of family members. Working together, the patient, different health professionals, family members, and community resources such as support groups (offered by the Brain Injury Association) should help to address the challenges and set-backs the patient will encounter. Such an approach with the health team and reminders to the patient and family support person that the healing process is a long term process should help to address the hurdles and impatience that typically surface in the extensive, long-term work towards successful healing. In time and with guidance from a support network, the person with the TBI may find part-time employment, a different type of employment, volunteer work, or, as a motivational speaker or writer,

shares lessons learned during the recovery. A collaborative approach and creative thinking should develop steps toward optimal adaptation in a positive, fulfilling direction.

## II. SUMMARY

Each day, almost 140 people in the United States die from injuries that include TBI. Their recovery many take a few days, several years, and may result in lasting disabilities ([http://www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](http://www.cdc.gov/traumaticbraininjury/get_the_facts.html)). To optimize healing and rehabilitation, the patient should be respected as a key member of the health team and the patient-family-physician relationships should be strong. The person with TBI as well as the family support person, need help, support, and respite over the long-term course toward recovery. The early intervention of various health professionals with support from extended family, community programs and links to e-resources are essential to help in the long-term healing and adaptations necessary for the person with TBI to become as self-sufficient and re-integrated as fully as possible into family and community life.

Figure 1 : Care Page Example #1

This <b>Care Page</b> belongs to: _____ Date of TBI: Month/Day/Year: _____/_____/_____ Family contact: _____ Phone for contact: _____ Other info: _____		
Names – Health Team Role & Phone	Directions, Tests; Treatments	Date/Time Contact/Appt.
Dr.A. – general medicine	<b>Care Plan</b> 1. Dr. G.: surgery updates to patient/family-support person 2. Rehab: physical therapy, speech & swallow therapy...  <b>Goals:</b> walking; speaking...	
Dr B. – neurologist	Treatments:	
Dr.G. – surgeon	Surgery (staged) & post-op care	
Cal F. – head nurse	Care plan management ,daily Updates to patient & family	
Dan E. – nurse (medicine & IV)		
Ellen C. – night nurse		
Tim B. – social worker		
<b>Insurance Policy #XXX Agent &amp; Cell Phone</b>		
Alice S. _____		
Betty F. _____		

Figure 2 : Care Page Example #2

This **Care Page** belongs to: \_\_\_\_\_ Date of Birth: \_\_\_\_\_  
 Medical record ID #: \_\_\_\_\_ Weight: \_\_\_\_\_  
 Date of TBI: Month/Day/Year \_\_\_\_\_  
 Family contact: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Primary Care or referring Doctor \_\_\_\_\_  
 Resource Nurse: \_\_\_\_\_

**Medicines**  
 Allergies & Sensitivities: \_\_\_\_\_  
 Describe reactions & treatment: \_\_\_\_\_

Date: Month/Day/Year					
<b>Medicine Dose/Route</b> <b>Circle how often taken</b>					
Aspirin 325 mg. tablet by mouth 1Xdaily 2Xdaily 3Xdaily 4Xdaily bed time if needed					
Medicine XX 1Xdaily 2Xdaily 3Xdaily 4Xdaily bed time if needed					
Medicine YY 1Xdaily 2Xdaily 3Xdaily 4Xdaily bed time if needed					
Medicine ZZ 1Xdaily 2Xdaily 3Xdaily 4Xdaily bed time if needed					

Note: Other forms to use in a Care Notebook are available to edit for personal needs. See: Patient Care & Office Forms, click Chart Formats: [www.acponline.org/running\\_practice/practice\\_management/forms/matrix.htm](http://www.acponline.org/running_practice/practice_management/forms/matrix.htm),

REFERENCES RÉFÉRENCES REFERENCIAS

1. Brainline.org. Frequently Asked Questions (FAQs). [http://www.brainline.org/landing\\_pages/categories/rehabilitation\\_results.php](http://www.brainline.org/landing_pages/categories/rehabilitation_results.php).
2. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. Traumatic Brain Injury in the United States: Fact Sheet. [http://www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](http://www.cdc.gov/traumaticbraininjury/get_the_facts.html). (accessed 6/17/140)
3. Langlois JA, Rutland-Brown W, & Wald MM The epidemiology and impact of traumatic brain injury: A brief overview. J Head Trauma Rehabil. 2006 Sep-Oct;21(5):375-8.
4. Consensus conference. Rehabilitation of persons with traumatic brain injury. NIH Consensus Development Panel on Rehabilitation of Persons with Traumatic Brain Injury. JAMA. 1999 Sep 8;282(10):974-83.
5. Im B. The Continuum of rehabilitation for persons with traumatic brain injury. Exceptional Parent, WebMD, <http://www.webmd.com/brain/features/traumatic-brain-injury-rehabilitation>.
6. Office of the Director, National Institutes of Health. Rehabilitation of Persons with Traumatic Brain Injury October 26-28, 1998. National Institutes of Health, Bethesda, MD. <http://consensus.nih.gov/1998/1998traumaticbraininjury109program.pdf>.
7. Ragnarsson KT. Results of the NIH consensus conference on "rehabilitation of persons with traumatic brain injury". Restor Neurol Neurosci. 2002;20(3-4):103-8.
8. Ragnarsson KT. Traumatic brain injury research since the 1998 NIH Consensus Conference: Accomplishments and unmet goals. J Head Trauma Rehabil. 2006 Sep-Oct;21(5):379-87.
9. Gordon WA, Zafonte R, Cicerone K, Cantor J, Brown M, Lombard L, Goldsmith R, & Chandna T. Traumatic brain injury rehabilitation: State of the science. Am J Phys Med Rehabil 2006;85:343-82.
10. Cicerone KD, Mott T, Azulay J, & Friel JC. Community integration and satisfaction with functioning after intensive cognitive rehabilitation for traumatic brain injury. Arch Phys Med Rehabil. 2004 Jun;85(6):943-50.
11. Pačhalska M, Mańko G, Chantsoulis M, Knapik H, Mirski A, & Mirska N. The quality of life of persons

- with TBI in the process of a comprehensive rehabilitation program. *Med Sci Monit.* 2012 Jul;18(7):CR432-42.
12. Tomaszewski W & Mańko G. An evaluation of the strategic approach to the rehabilitation of traumatic brain injury (TBI) patients. *Med Sci Monit.* 2011 Sep;17(9):CR510-6.
  13. Luis CA. Stress Management for Caregivers. In Doty, L. (Ed.) (2012). *The Alzheimer's Disease Initiative Education Manual: Understanding & Dealing with Alzheimer's Disease & Related Disorders.* FL Dept. of Elder Affairs, Tallahassee, FL, pg 103-108. website:elderaffairs.state.fl.us/does/docs/adi\_manual\_2012\_final.pdf.
  14. Novack T & Bushnik T. Understanding TBI: Part 4 – The Impact of a recent TBI on family members and what they can do to help with recovery. <http://www.msktc.org/tbi/factsheets/Understanding-TBI/The-Impact-On-family-And-How-They-Can-Help>.
  15. Cifu DX, Kreutzer JS, Kolakowsky-Hayner SA, Marwitz JH, & Englander J. The relationship between therapy intensity and rehabilitative outcomes after traumatic brain injury: A multicenter analysis. *Arch Phys Med Rehabil* 2003;84:1441-8.
  16. Cicerone KD, Dahlberg C, Malec JF, Langenbahn DM, Felicetti T, Kneipp S, Ellmo W, Kalmar K, Giacino JT, Harley JP, Laatsch L, Morse PA, & Catanese J. Evidencebased cognitive rehabilitation: Updated review of the literature from 1998 through 2002. *Arch Phys Med Rehabil* 2005;86:1681-92.





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## Study of Neuron-Specific Enolase as Potential Biomarker for Assessing the Severity and Outcome in Patients with Cerebrovascular Accidents

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**Abstract- Background:** Stroke is the third cause of death and foremost cause of disability worldwide. Cerebrovascular accident or stroke is an emergency condition which require immediate procedure by a neurologist. Determination of extent of brain damage at the onset of the seizure is an appropriate action to determine therapy and prognosis. Increased serum neuron specific enolase can be expected to differentiating stroke types at the onset of the seizure.

**Aim:** The goal of present study was to measure diagnostic value of serum neuron specific enolase in various types of cerebrovascular accident as well as to evaluate the clinical performance of neuron specific enolase in early diagnosis of cerebrovascular accident.

**Keywords:** *cerebrovascular accident, ischemic stroke, hemorrhagic stroke, neuron specific enolase, brain damage.*

**GJMR-A Classification :** *NLMC Code: WL 102.5, WL 355*



*Strictly as per the compliance and regulations of:*



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# Study of Neuron–Specific Enolase as Potential Biomarker for Assessing the Severity and Outcome in Patients with Cerebrovascular Accidents

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& Dr. Andure Dhananjay V.<sup>¥</sup>

**Abstract- Background:** Stroke is the third cause of death and foremost cause of disability worldwide. Cerebrovascular accident or stroke is an emergency condition which require immediate procedure by a neurologist. Determination of extent of brain damage at the onset of the seizure is an appropriate action to determine therapy and prognosis. Increased serum neuron specific enolase can be expected to differentiating stroke types at the onset of the seizure.

**Aim:** The goal of present study was to measure diagnostic value of serum neuron specific enolase in various types of cerebrovascular accident as well as to evaluate the clinical performance of neuron specific enolase in early diagnosis of cerebrovascular accident.

**Methods:** A diagnostic case control study was conducted on 60 patients were admitted within 72 hours of onset of stroke in the department of neurology and department of medicine of PDVVPF's Medical College and hospital Ahmednagar and 60 healthy age and sex matched volunteers formed the control group. Serum neuron specific enolase level was estimated by commercially available quantitative enzyme linked immune sorbent assay (ELISA) kit which based on biotin double antibody sandwich technology.

**Statistical analysis used:** The student t test was used to compared patients and control. Receiver operating characteristic curve for neuron specific enolase was established to determined cut-off point. The sensitivity and specificity of neuron specific enolase for detection of cerebrovascular accident were analyzed.

**Results:** serum neuron specific enolase ( $p < 0.05$ ) concentrations was significantly higher in cerebrovascular accident than healthy controls. Sensitivity, specificity, positive predictive value and negative predictive value of neuron specific enolase for detection of cerebrovascular accident were 87.10%, 95.00%, 92.74% and 87.69%. The area under the receiver operating characteristic curve of neuron specific enolase in cerebrovascular accident was 0.84.

**Conclusion:** Present study shows that, assessment of serum neuron specific enolase level may be a useful Marker for severity in cerebrovascular accident like ischemic stroke and hemorrhagic stroke and it may be well correlated with neurological disability and short term functional outcomes.

**Keywords:** cerebrovascular accident, ischemic stroke, hemorrhagic stroke, neuron specific enolase, brain damage.

## I. INTRODUCTION

Stroke or cerebrovascular accident (CVA) is the third leading cause of death after cardiovascular disease and cancer (1). In fact it is a leading cause of morbidity and mortality in major industrial countries. Approximately 20 million people each year are suffer from stroke (2).

India will face enormous socio-economic burden to meet the cosis of rehabilitation of stroke victims. Because the population, it is now surviving through peak years (age 55-65years) of occurrence of stroke (3).

The two major mechanisms causing brain damage in stroke are ischemia and hemorrhage. The effects of ischemia are fairly rapid because the brain does not store glucose, the chief energy substrate and is incapable of anaerobic metabolism. Intracerebral hemorrhage originates from deep penetrating vessels and causes injury to brain tissue by disrupting connecting pathways and causing localized pressure injury.4

The diagnostic and management of CVA is limited by lack of rapid diagnostic assay for use in emergency setting. In recent years, neurobiochemical markers of brain damage have gained particular attention in the identification of stroke patients with an adverse neurological outcome. The serum Neuron – Specific Enolase (NSE) level is one of these markers which can provide early information about neuronal damage. 5

Neuron – specific Enolase (NSE; EC 4.2.1.11) is an acidic soluble protein which functions as glycolytic isoenzyme. It is a 78 kD gamma homodimer and represents the dominant enolase isoenzyme which found in the cytoplasm of neurons and cells with neuroendocrine differentiation. 6

The measurement of NSE concentration in serum and cerebrospinal fluid (CSF) following cerebral

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ischemia and traumatic head injury provides a reliable laboratory indicator of the degree of brain cell damage and may allow for early prediction of outcome. **7** An increased NSE concentration in blood has been reported in patients with small cell lung cancer, neuroblastoma and neurological disorders. **7, 8**

Thus, in view of above information and several risk of complication, it is worthwhile to study the various biomarkers in CVA. Very few studies have been reported from serum NSE testing and its application in Indian context. The initial aim of our study was to measure the serum NSE levels in various types of CVA within in 72 hours of admission. Furthermore, the remarkable intention of present research was to evaluate the clinical performance of NSE in early diagnosis of CVA and monitoring tool for early prediction of ischemic stroke.

## II. MATERIAL AND METHOD

The present diagnostic case-control study was conducted at department of Biochemistry in PDVVPF's Medical College Ahmednagar with all participants providing informed consent and utmost care was taken during experimental procedure according to the declaration of Helsinki 1975.

### a) Patients

Total 60 patients between age group 21 to 75 years admitted in the IPD wards of department of neurology and department of medicine were taken for the study. Data included history, clinical examination with laboratory investigation to exclude any other systemic or local disease that may affect the parameters examined in this study.

### b) Control subjects

60 healthy age and sex matched individuals who didn't have any evidence of CVA as per clinical examination were taken as control subjects.

### c) Inclusion criteria

Adult stroke (age > 21years) and within 72 hours of admission.

### d) Exclusion criteria

CNS infection, Stroke more than 72 hours, and Peripartum stroke. All selected patients also subjected to the following protocol,

- Detailed neurological examination using the national institutes of health stroke scale,
- Computerized Tomography (CT) scan within 12 hours of admission to exclude patients with stroke mimic.

Approximately 5 ml blood was collected by venipuncture from antecubital vein of the forearm of each subject in plain vacutainer (yucca diagnostic) under aseptic conditions within 72 hrs after admission and centrifuged for serum collection. Serum was stored at 20° C until assay was run to evaluate. All samples were thawed and analyzed in a single series.

## III. METHOD

1) Determination of serum NSE: Serum NSE was measured with commercially available quantitative enzyme linked immune sorbent assay (ELISA) kit which based on biotin double antibody sandwich technology. Add serum containing NSE to well that is pre-coated with NSE monoclonal antibody and then incubate. After incubation, add NSE antibodies labeled with biotin to unite with streptavidin- HRP, which forms the immune complex. Remove unbound enzymes after incubation and washing, then add chromomegnic reagent A and B. colour change blue to yellow with effect of acid which positively correlated with concentration of human NSE. **9, 10**

Statistical analysis: The statistical analysis was carried out by using the SYSTAT software package for window version 12. The students "t" test was applied for the statistical analysis and the results were expressed in mean ± Standard Deviation (mean ±SD). p values p < 0.05 for NSE were considered to be statistically significant. The Receiver Operating Characteristic (ROC) curve analysis and the area under the curve were performed for determination of diagnostic performance of serum NSE in the all patients included in the study. The optimum cutoff values for determination of serum NSE were selected from ROC analysis. This optimum cutoff was used to dichotomously classify positive or negative serum NSE level, and used for calculating of diagnostic sensitivity and specificity.

## IV. RESULTS

Baseline demographic and clinical characterization of the patients and healthy controls groups are given in table-1 there were no significant differences between the groups in age, gender.

Table 1 : Baseline characteristics of all subjects

Variables	Controls (n=60)	CVA	
		Ischemic stroke (n=32)	Hemorrhagic stroke (n= 28)
Age in years	40.1± 12.34	41.3±14.06	43.1± 13.01
Gender (Men/Women)	28/30	19/13	11/27
Systolic blood pressure (mmHg)	110 ± 15.03	119.15± 30.11	120.07 ± 35.16
Diastolic blood Pressure (mmHg)	75.62 ± 5.04	81.42± 14.28	79.53 ± 16.02
Cigarette Smokers (n)	-----	07	15
Tobacco Chewing(n)	-----	26	19
Atrial fibrillation (n)	07	06	04
DM (n)	9	12	8
Serum NSE ( ng/ml)	14.55± 12.41	43.63± 13.41*	45.63± 15.89*

Values were expressed in mean with Standard Deviation (mean±SD),

\*Statistically highly significant, (p<0.001)

n =numbers

As shown in table-1, Serum neuron specific enolase levels were increased significantly (p<0.05) in the ischemic stroke Group (43.63±13.41) and hemorrhagic stroke (45.63±15.89) as compared to controls group (14.55±12.64).

The performance of Serum NSE for diagnosis of ischemic stroke and hemorrhagic stroke is presented in

table- 2. Sensitivity, specificity, positive predictive value and negative predictive value were 84.38%, 95.00%, 90.00% and 91.94% respectively in Ischemic stroke. Similarly, in hemorrhagic stroke, Sensitivity, specificity, positive predictive value and negative predictive value were 89.29%, 95.00%, 89.29% and 95.00%.

Table 2 : Diagnostic performance of Serum NSE for detection of CVA

Types of CVA	Sensitivity (%)	Specificity (%)	Positive Predictive Value (%)	Negative Predictive Value (%)
Ischemic Stroke	84.38	95.00	90.00	91.94
Hemorrhagic stroke	89.29	95.00	89.29	95.00

Figure-2. shows a scatter plot distribution of the results of serum NSE in controls and CVA groups. The optimum diagnostic cut off point maximizing the

sensitivity and specificity was determined to be 40 ng/ml with a sensitivity of 87.10 % and specificity 95%, the area under curve for NSE was 0.84

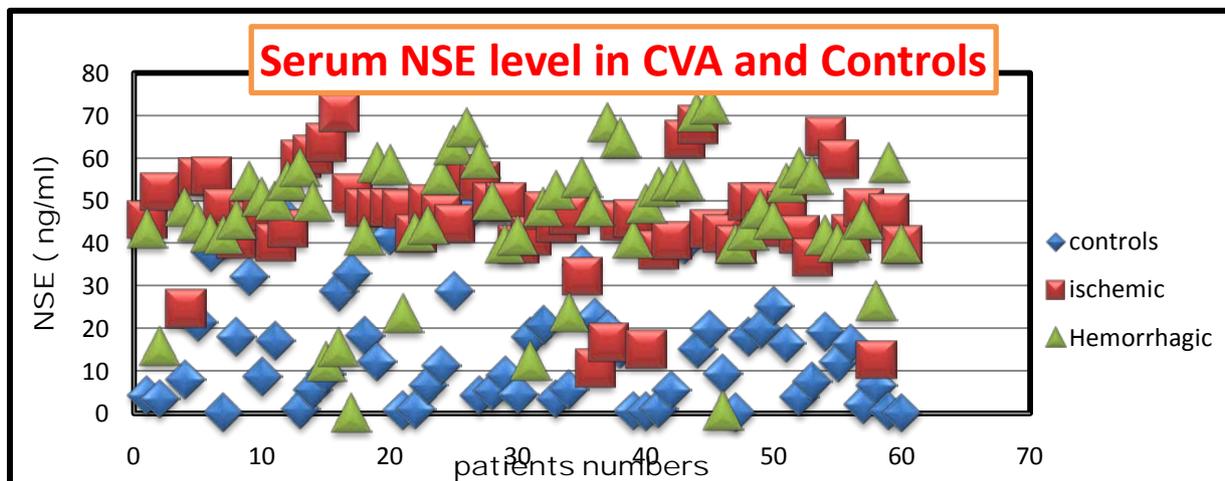


Figure 1 : Scatter plot distribution of the results of serum NSE in CVA and controls

## V. DISCUSSION

Stroke causes a vast amount of death and disability throughout the world. It is important to have sufficiently sensitive marker for brain damage that can be determined in blood instead of cerebrospinal fluid because blood samples can be taken more frequently and more independent of raised intracranial pressure than cerebrospinal samples. **11** Evaluation of enzyme level in Cerebrospinal fluid or serum has evoked keen interest as a simple, economical, reliable and easily available method for the evaluation of severity, course and prognosis and to some extent in the differential diagnosis of various types of CVA. Ischemia causes a cascade of event that eventually leads to neuronal damage and cell death. **12** NSE is the predominant enolase found in neural tissue, and the structural characteristics of this enolase allow for greater stability in high chloride concentrations compared with enolase in other organ system. **7**

In the current study, Serum neuron specific enolase levels were increased significantly ( $p < 0.05$ ) in the ischemic stroke group and hemorrhagic stroke as compared to controls group. Our results are strongly supported to previous reports. **5,11,13**, Increased NSE level in CVA may be due to cute CNS such as cerebral infarction, hypoxia, trauma and seizure the blood – brain barrier is altered and astroglial disintegration results in leakage of NSE into the serum and cerebrospinal fluid. **13**

Schaarschmidt H et. al. research where they have studied the NSE in relation to the severity CVA . They verified that, plasma NSE level is seen as a relevant parameter for assessing the prognosis of cerebral ischemia. Additionally it may prove to be a useful tool for monitoring space occupying brain infarctions and intracerebral hemorrhage and therefore may contribute to improved therapeutic management of severe cerebrovascular diseases. **11**

Numbers of researchers have focused on the study of NSE in various types of CVA. Aparna Pandey et al have showed that initial serum NSE level may be a useful marker for severity in acute ischemic stroke and it may be well correlated with neurological disability and short term functional outcomes. They also suggested that, serum NSE may be used as an indicator of outcome in cerebral infarction patients. **14**

Natheer H. Ravi and Karim M. Aantiyah have demonstrated that, salivary NSE alone or in combination with serum can be used as valuable diagnostic for measurement of neuronal damage in patients with stroke and stroke related diseases. According to them, in ischemic stroke, the integrity of blood- brain barrier is disrupted to various degrees in these patients and leakage of this enzyme outside the CNS can be seen in salivary secretion. **13** Takaaki kirino et al have

documented that, NSE as a reliable enzymatic indicator of axon injury, regeneration and in particular of target innervations and reinnervation. **6**

In cross- sectional comparative study, Diwi L Lukas et al have examined and compared serum NSE level in ischemic and hemorrhagic stroke patients according to lesion volume and also analyzed correlation between serum NSE level and lesion volume in CT scan as gold standard. According to them, serum NSE level in acute stroke patients (24-48 hours) after onset can be used to estimate the extent of brain damage (lesion volume) but it cannot be used to differentiate the type of stroke. **15**

In present study, furthermore diagnostic performance of Serum NSE for diagnosis of ischemic stroke and hemorrhagic stroke were analyzed. The optimum diagnostic cut off point maximizing the sensitivity and specificity was determined to be 40 ng/ml with a sensitivity of 87.10 % and specificity 95% the area under ROC curve for NSE was 0.84. Our results are completely conformity with Hill et al study. They found that in a single examination, NSE had sensitivity of 89%. They also suggested that, in the future the examination of neurobiochemical marker panel like serum NSE, Myelin basic protein, Protein S-100 B etc can be used not only to differentiate the type of stroke but also to differentiate the subtype of acute stroke. **16** In addition, Natheer H Rawi and Karim M Atiyah have accomplished the diagnostic performance of NSE in patients with ischemic stroke and stroke prone patients. According to their result, the area under the ROC curve for serum NSE was significantly higher (0.960) compared to salivary NSE (0.825). The optimum cut-off value for serum NSE showing the highest diagnostic accuracy (90%) was  $\geq 13.1 \mu\text{g/L}$ . This cut-off threshold showed optimum specificity (100%) and reasonable sensitivity (85%).

## VI. CONCLUSION

Our finding indicate that, serum NSE as brain biomarker in CVA had elevated compared to controls which provides insight into the pathophysiologic mechanism of brain injury. Serum NSE in CVA patients after onset (<72hours) may be used to estimate the extent of neuronal damage and can be reliable parameter for weigh up CVA.

## REFERENCES RÉFÉRENCES REFERENCIAS

1. Imad A J Thanoon, Hilmy AS, Abdul Jabbar, Dhia A Tana. Oxidative stress and C-reactive protein in patients with cerebrovasacular Accident (The role of Ginkgo biloba extract). SQU MED J 2012; 12(2):197-205.
2. World Health oraganisation. The world health report (2003) shaping the future Geneva world health oranisation 2003.

3. Jaspreet kaur, sarika Arova Bhawna singh, LC Thakur, J Gambhir, KM prabhu.(2011) role of oxidative stress in pathophysiology of Transient Ischeic Attack and stroke Int. J Biol Med. RPS 2011,2(3): 611-615.
4. Sid Shah MD. Pathophysiology for education and research in neurological emergencies. 1-15. Online 2012.
5. Anuradha Bharosay, Vivek Vikram Bharosay, Meena Varma, Kiran Saxena, Ajoy Sodani, Ravi Saxena. Correlation of Brain biomarker neuron specific enolase (NSE) with degree of disability and neurological worsening in cerebrovascular stroke. Ind J Clin Biochem. 2012; 27 (2): 186-190.
6. Takaaki Kirino, Milton W. Brightman, Wolfgang H. Oertel, Donald E. Schmechel, Paul J. Marangos. Neuron- specific enolase as index of neuronal regeneration and reinnervation. The journal of neuroscience.1983; 3 (5): 915-923.
7. Bonner JA, Sloan JA, Rowland KM, Kleen GG, Kugler JW, Mailliard JA et al. Significance of neuron specific enolase levels before and during therapy of small cell lung cancer. Clin Cancer Res. 2000; 6: 597-601.
8. Lima JE. Takayanagui OM, Garcia LV and Leite JP. Use of neuron – specific enolase for assessing the severity and outcome in patients with neurological disorders. Brazilian Journal of Medical and Biological Research. 2004; 37:19-26.
9. Pause E, Nustad K. Immunoradiometric assay for ag and gg-Enolase (Neuron Specific Enolase), with use of Monoclonal antibodies and Magnetizable Polymer particles, Clin. Chem. 1989; 35: 20-34.
10. Pause E, Risberg T. Establishment and Evaluation of a radioimmunoassay for neuron –specific enolase. Tumor Biol.1989; 10: 23-30.
11. Schaarschmidt H, Prange HW, Reiber H. Neuron-Specific enolase concentration in blood as a prognostic parameters in cerebrovascular diseases. Stroke. 1994; 25: 558-565.
12. Fisher M, Schaebitz W. An overview of acute stroke therapy. Past, present and future. Arch Intern Med. 2000; 160: 3196-206.
13. Natheer H. Al- Rawi, Karim M Atiyah. Salivary neuron specific enolase: an indicator for neuronal damage in patients with ischemic stroke and stroke- prone patients. Clin Chem Lab Med. 2009; 47: 1519-24.
14. Aparna Pandey, Amit Shirvastava, Kiran Saxena. Serum neuron specific enolase as predictor of neurological disability and short term outcome in ischemic stroke. Journal of Scientific and Innovative Research. 2013; 2(2): 227-234.
15. Dwi Lily Lukas, Endang Retnowati, Saiful Islam. Role of serum neuron specific enolase (NSE) to differentiate ischemic stroke from hemorrhagic stroke and its correlation with brain damage volume. Folia Medica Indonesiana. 2007; 43 (4): 230-234.
16. Hill MD, Jackowski D, Bayer N. Biochemical markers in acute ischemic stroke. Canadian Medical Association Journal. 2000; 162 (8): 1139-1140.

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## Cerebral Metastasis: Case Series Cerebrum as A Safe Haven

By Dr. Ashfaq ul Hassan, Ghulam Hassan, Dr. Pervez Shah, Dr. Masood Tanver,  
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*Abstract-* Cerebral metastasis may be a common manifestation of systemic diseases. Cerebral metastasis are reported in 15-25 percent of patients with Brain tumors. Parenchymal blood flow is an important regulator of metastasis and most of the metastatic lesions are found in the cerebrum .most brain metastasis arise by hematogenous dissemination followed by dessimination through CSF.

*Keywords:* metastasis, cerebral, cerebellum, MRI, disseminate, microinvasion.

*GJMR-A Classification :* NLMC Code: WS 342



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# Cerebral Metastasis: Case Series Cerebrum as A Safe Haven

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**Abstract-** Cerebral metastasis may be a common manifestation of systemic diseases. Cerebral metastasis are reported in 15-25 percent of patients with Brain tumors. Parenchymal blood flow is an important regulator of metastasis and most of the metastatic lesions are found in the cerebrum .most brain metastasis arise by hematogenous dissemination followed by dissemination through CSF.

**Keywords:** metastasis, cerebral, cerebellum, MRI, disseminate, microinvasion.

## I. INTRODUCTION

**M**eninges are the layers of connective tissue covering the brain and spinal cord The meninges consist of three membranous layers. Duramater: outer most, Arachnoid: middle layer: Piamater: inner most. Duramater is the thickest and toughest membrane covering the brain and consists of two layers. Endosteal layer: outer. Serves as internal periosteum, (endocranium). Meningeal layer: inner:

provides the protective membrane to brain. These two layers are fused to each other except where venous sinuses are enclosed between them.the cerebral metastatic lesions can be defin

Supratentorial and infratentorial. The supratentorial usually cause seizures, cognitive defects and headaches. The infratentorial lesions usually cause ataxia, Diplopia, dysarthria or brain herniation.

## II. TEXT

### a) Case 1

A 45 year old male presented in emergency Department with gradual onset headache ,. There was no past history of hypertension, diabetes, Sinusitis, pyrexia. The patient was able to move her extremities, Cranial nerves were normal on examination and Brain Stem Reflexes were normal. CT showed metastatic lesions in Occipital lobe

Symptom	Percentage of Patients / 30 patients
• Headache:	65
• Seizure:	12
• Ataxia:	5
• Weakness:	7
• Nausea/vomiting:	25
• Pappiledema:	8
• Visual changes:	6
• Others(Syncope,dizziness):	10

*Chart 1* : Showing Symptomatology Percentage of Presentation

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b) *Case 2*

A 45 year old woman presented with Breast Cancer and After several months with headache,

anorexia. Cranial nerves were normal on examination and Brain Stem Reflexes were normal. CT showed metastasis in occipital and frontal lobe.

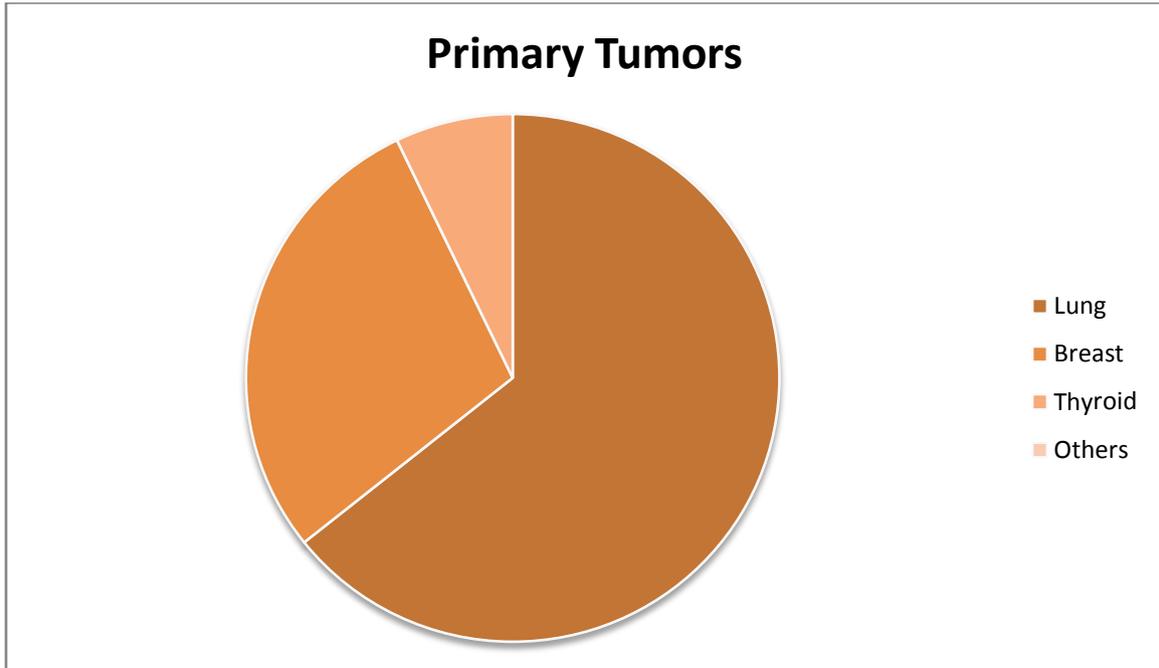


Chart 2 : Showing Primary Sites

c) *Case 3*

A 48 year old man with thyroid cancer with CT showed metastasis in occipital lobe.

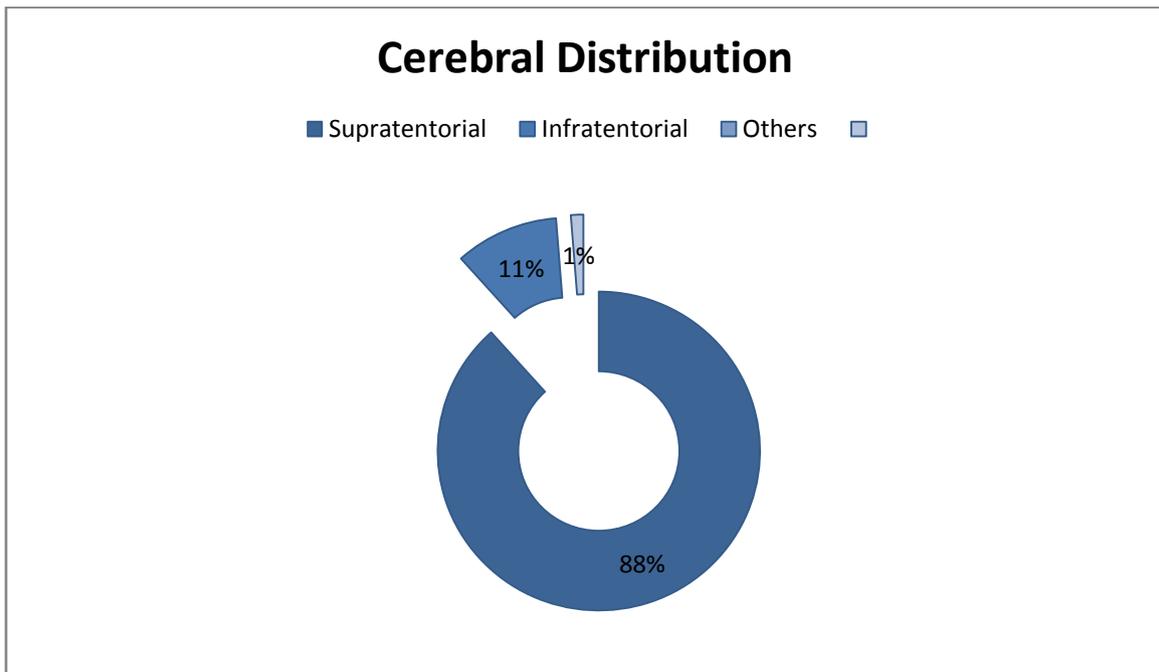


Chart 3 : Supratentorial Vs Infratentorial

### III. EPIDEMIOLOGY

Brain Metastasis are common tumors of Brain.<sup>1</sup> Any tumor can spread to the brain. But the most common tumors spreading to the brain have been noticed to be lung, breast, melanoma, renal cell carcinoma, lymphoma, leukemias, thyroid, colorectal, from unknown sources.<sup>2,3,4,4,6,7,8</sup>

The high rates of pulmonary disease spreading to Brain has been well documented. The tumor reaches the brain via hematogeneous route. The tumor cells circulate in blood, to the left side of the heart and are carried by way of the carotid vessels to the circle of Willis from where they metastasize to different parts depending upon the dynamics of blood flow. The zones where the blood flow is considerably reduced along with narrowing of vessel diameter causes aggregation of tumor cells in these areas and represents an embolic source of disease. The parts of brain effected are the cerebrum, cerebellum and the brain stem.

In addition to the blood flow the soil seed theory of a cancer proliferation from the site of lodgement of malignant cells away from a primary source where the tumor cells grow and disseminate is important in case of cerebral metastasis and here the mitotic activity of cells is very important for rates of growth. The big and large metastasis are due to rapid cell growth in contrast to smaller metastatic lesions. The micromechanisms involved follow a cascade of intravasation, dissemination, extravasation and colonization<sup>9,10,11</sup>

In a survey conducted from multiple hospitals from the state it was seen that most of the cases of metastasis were from lungs, others from breast in case of females and from thyroid. A large number of cases were from other cancers.

The patients usually present with headache, seizures, vomiting, alterations of mental status, visual alterations. however patients can be asymptomatic as well. Headache is the most common symptom in case of cerebral metastasis. In adults the lung cancer followed by breast cancer and melanoma are the most common sources of primary tumors. Interestingly in many cases the intracranial involvement may be the first presentation. The rates of dissemination of the tumors in pediatric age group are significantly lower than that found in adults. The main problem with the cerebral metastasis is that the tumour size is not of much significance as even small lesions can cause considerable neurological sequale. Sometimes the patients can also present with a haemorrhage inside the metastasis. This may produce a sudden headache, coma or a severe focal neurodeficit. Metastasis from melanomas, thyroid cancers and choriocarcinomas are particularly prone for hemorrhage. Usually in about one third of cases, patients with metastasis are diagnosed on routine investigations.

### IV. RADIOLOGY

At present MRI and CT remain to be the most cost effective and non invasive techniques for detection of cerebral metastasis. Contrast enhancement can add finer details in the form of disruption of Blood Brain Barrier.<sup>14</sup>

Typically the metastasis are well demarcated from the surrounding parenchyma. There may be peritumoral edema as well. The radiographic features differ and there is a lot of variability among these tumors. the metastasis may be solitary or multiple. Mostly the metastasis are multiple.

On Pre contrast imaging CT Scanning may show iso dense or hypodense lesions. there may be vasogenic edema. following administration of contrast media, the enhancement may be nodular, punctate or ring enhancing. the main site of primary is the lung, breast, melanoma, renal cell carcinoma<sup>15</sup>

The metastasis should be differentiated from primary brain tumors, cerebral abscesses, stroke, radiation necrosis, granulomatous brain lesions, demyelination and infarcts. The clinical implication in general is that the prognosis in a patient with cerebral metastasis is generally poor. Over the past few years whole brain radiotherapy has been considered as a standard treatment. Stereotactic radiotherapy has been introduced lately and is proving to be effective. surgery in the form of resecting is used for a selective group of patients.

### V. CONCLUSION

Brain metastasis are common following solid cancers. A look out for cerebral metastasis should be essentially carried out as the impact on survival remains serious. Early diagnosis and aggressive therapy can be beneficial for the patient.

### REFERENCES RÉFÉRENCES REFERENCIAS

1. Walker AE, Robbins M, Weinfeld FD. Epidemiology of brain tumors: the national survey of intracranial neoplasms. *Neurology* 1985;35:219-26.
2. Carcangiu ML, Zampi G, Pupia A, Castagnoli A, Rosai J. Papillary carcinoma of thyroid: A clinicopathological study of 241 cases treated at university of Florence, Italy. *Cancer*. 1985;5:805-28.
3. Dorairajan N, Pandiarajan R, Yuvaraja S. A descriptive study of papillary thyroid carcinoma in a teaching hospital in Chennai, India. *Asian J Surg*. 2002;25:300-3.
4. Hoie J, Stenwig AE, Kullmann G, Lindegaard M. Distant metastases in papillary thyroid cancer: A review of 91 patients. *Cancer*. 1988;61:1-6.
5. Patel JK, Didolkar MS, Pickren JW, Moore RH. Metastatic pattern of malignant melanoma. A study



of 216 autopsy cases. Am J Surg. 1978;135: 807-810.

6. Sampson JH, Carter JH Jr, Friedman AH, Seigler HF. Demographics, prognosis, and therapy in 702 patients with brain metastases from malignant melanoma. J Neurosurg. 1998;88: 11-20.
7. Floyd CE, Stirling CT, Cohn I Jr. Cancer of the colon, rectum and anus: review of 1,687 cases. Ann Surg 1966;163:829-37.
8. Patanaphan V, Salazar OM. Colorectal cancer: metastatic patterns and prognosis. Southern Med J 1993;86:38-41.
9. Stolp, H.B.; Dziegielewska, K.M. Review: Role of Developmental inflammation and blood-brain barrier dysfunction in neurodevelopmental and neurodegenerative diseases. Neuropathol. Appl. Neurobiol. 2009, 35, 132-146.
10. Brightman, M.W.; Reese, T.S. Junctions between intimately apposed cell membranes in the vertebrate brain. J. Cell Biol. 1969, 40, 648-677.

11. Oldendorf, W.H.; Cornford, M.E.; Brown, W.J. The large apparent work capability of the blood-brain barrier: A study of the mitochondrial content of capillary endothelial cells in brain and other tissues of the rat. Ann. Neurol. 1977, 1, 409-417.
12. The Blood-Brain Barrier, Biology and Research Protocols; Nag, S., Ed.; Humana Press: Totowa, NJ, USA, 2003; p. 572.
13. Ricci PE. Imaging of adult brain tumors. Neuroimaging Clin N Am 1999;9:651-69.
14. Geijer B, Holtas S. Diffusion-weighted imaging of brain metastases: their potential to be misinterpreted as focal ischaemic lesions. Neuroradiology 2002;44:568-73 Medline.
15. Hiwatashi A, Kinoshita T, Moritani T, et al. Hypointensity on diffusion-weighted MRI of the brain related to T2 shortening and susceptibility effects. AJR Am J Roentgenol 2003;181:1705-09 Medlin.

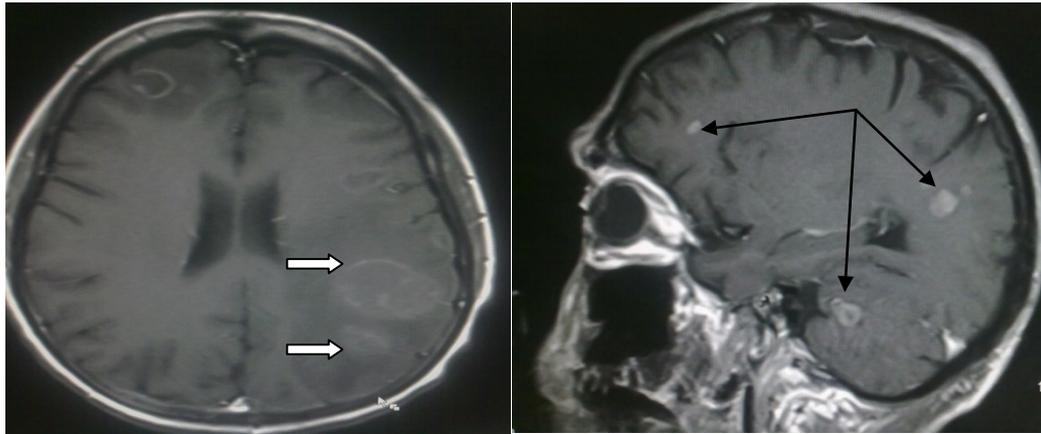


Figure 1 and 2 : Showing Intracerebral Metastasis and Supratentorial/Infratentorial metastasis

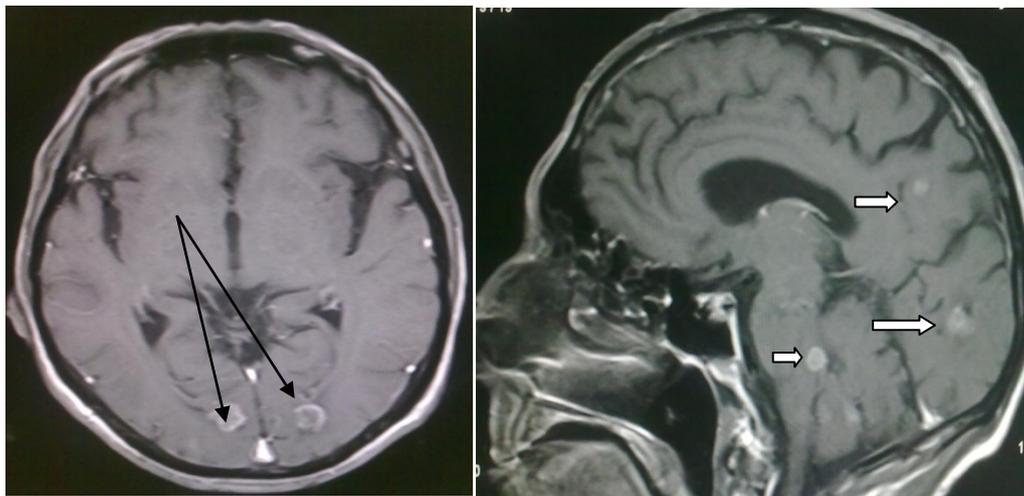


Figure 3 and 4 : Showing Multiple Intracerebral Metastasis and Supratentorial/Infratentorial metastasis



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## Outcomes of Care Among Patients Admitted to The Rehabilitation Unit of A Specialist Neuropsychiatric Hospital in Nigeria

By Adebowale T.O, Onofa L.U, Sowunmi O, Majekodunmi O.E, Latona O.O  
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**Abstract- Objective:** A large proportion of persons with serious and persistent mental disorders experience disability that interferes with their quality of life. This group of patients require rehabilitation services. Knowledge of the factors that are associated with good rehabilitation outcome can be used to optimize the structure of services to meet the needs of the patient population. This study was undertaken to assess the outcomes of care among patients admitted to the rehabilitation unit of a specialist neuropsychiatric hospital, Aro, Abeokuta, Nigeria.

**Methods:** We conducted a retrospective review of clinical records of all patients admitted to the rehabilitation unit of neuropsychiatric hospital Aro over eleven years period from September 2002 to august 2013. Data was collected using a semi-structured proforma and analysis was done using SPSS version 17.

**Keywords:** *rehabilitation, socio-demographics, clinical diagnoses, achieve discharge, activities of daily living.*

**GJMR-A Classification :** *NLMC Code: WM 102*



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# Outcomes of Care Among Patients Admitted to The Rehabilitation Unit of A Specialist Neuropsychiatric Hospital in Nigeria

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**Abstract- Objective:** A large proportion of persons with serious and persistent mental disorders experience disability that interferes with their quality of life. This group of patients require rehabilitation services. Knowledge of the factors that are associated with good rehabilitation outcome can be used to optimize the structure of services to meet the needs of the patient population. This study was undertaken to assess the outcomes of care among patients admitted to the rehabilitation unit of a specialist neuropsychiatric hospital, Aro, Abeokuta, Nigeria.

**Methods:** We conducted a retrospective review of clinical records of all patients admitted to the rehabilitation unit of neuropsychiatric hospital Aro over eleven years period from September 2002 to August 2013. Data was collected using a semi-structured proforma and analysis was done using SPSS version 17.

**Results:** The medical records of 56 patients were analyzed. The mean (SD) age of the sample was 54.6 (14.4) and 64% of them were male. The median duration of stay in the rehabilitation unit was 41.3 months. Among the patients, 26.8% completed rehabilitation programme and were discharged into the community. The factors identified by Cox proportional hazard regression analysis that significantly influenced achieving discharge among this cohort were high education, previous employment, good social and family support, good activities of daily living, younger age and vocational engagement.

**Conclusion:** In this sample of rehabilitation in-service patients, we conclude that good socio-demographic profiles and engagement in vocational activities were significantly associated with achieving discharge. In Nigeria and other developing countries, the need for the recognition of the role of rehabilitation in addressing the adverse consequences of mental disability is highly warranted.

**Keywords:** rehabilitation, socio-demographics, clinical diagnoses, achieve discharge, activities of daily living.

## I. INTRODUCTION

Mental disorders exert a high toll, accounting for 13% of the total global burden of disease. In Africa, neuropsychiatric disorders accounted for about 18% of years lived with Disability (YLD) in 2000.<sup>1</sup>

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The growing recognition that long term disability is experienced by a large proportion of persons with serious and persistent mental disorders has spurred the development of the field of psychiatric rehabilitation.<sup>2</sup>

Beyond persisting symptoms, social maladjustment in family and vocational roles interfere with the quality of life of an exceeding high number of those with psychiatric disorders.<sup>3</sup>

Psychiatric rehabilitation is a whole systems approach to recovery from mental illness that maximizes an individual's quality of life and social inclusion by encouraging their skills, promoting independence and autonomy in order to give them hope for the future and leads to successful community living through appropriate support.<sup>4</sup>

The unmet needs of the mentally disabled have pointed the way towards longer-term and more comprehensive in-patient rehabilitation services to help disabled individual to develop the emotional, social and intellectual skills needed to live, learn and work in the community with the least amount of professional support.<sup>5</sup>

Discharge from in-patient rehabilitation is a measure of good outcome because it marks an important stage in the individual's recovery. The person would have gained the skills needed for daily living, self medicating, engagement with community support to gain help and sense of identity.<sup>6</sup> Studies of schizophrenics and related psychotic disorders have found only limited evidence that socio-demographic, illness and treatment variables predict outcome.<sup>7, 8, 9, 10, 11</sup>

In a study, serious self harm, suicide attempt, high dose antipsychotics and antipsychotic poly-pharmacy predicted non-discharge from rehabilitation in-services.<sup>12</sup>

In psychiatric practice, some mentally ill patients spend their life in continuous hospitalization due to severe mental illness, substance dependence, homelessness and abandonment by the patient's relatives.<sup>13, 14</sup>

In developing countries like Nigeria, the issue of long-stay is intertwined with the history of orthodox psychiatric care. In the early 20<sup>th</sup> century, asylums were established in selected cities in the country by the colonial masters. These were to serve as places of

confinement for psychiatric infirm.<sup>15, 16</sup> when these asylums were converted to full-fledged psychiatric hospitals, most of the patients had remained in these facilities. Other sources of long stay patient is the vagrant psychotic patients and patients abandoned by their relatives.<sup>17, 18, 19</sup>

In view of the peculiar mental health situation in Nigeria, there have been strong recommendations for the establishment of rehabilitation centres to cater for this category of long-stay patients.<sup>20</sup>

The Neuropsychiatric hospital Aro, the foremost psychiatric hospital in Nigeria formally established Rehabilitation unit in 2002 and a transitional half-way home (Hope Villa) in 2009 for the effective rehabilitation and community re-integration of patients.

Since the service provision over a decade ago, no study had been undertaken on the outcome of the service. Knowledge of the factors that are associated with outcome can be used to guide treatment for individual patients. It can also be used at a service level to optimize the structure of services to meet the needs of the patient population.

This current study was therefore undertaken to evaluate the outcomes of care among patients admitted to the rehabilitation unit of Neuropsychiatric Hospital, Aro, Abeokuta, Nigeria.

## II. METHODS

*Site:* The study centre is Neuropsychiatric Hospital, Aro, Abeokuta, Ogun State, Nigeria. The population of Ogun State is 3.7 million and Abeokuta, the capital city has a population of 0.45 million (2006 National Census).

The Neuropsychiatric Hospital, Aro, started at the Lantoro annex which was a colonial local government prison until 13<sup>th</sup> April, 1944 when it was transformed into an asylum for the care of mentally ill soldiers repatriated from the Second World War. This asylum was converted to Neuropsychiatric Hospital (526 bed-space) Aro in 1954. Patients were admitted to the rehabilitation unit based on fulfillment of placement criteria. The rehabilitation unit utilizes a multi-disciplinary team approach to administer psycho-pharmacological, psychosocial, vocational and other structured interventions to patients in the unit. Patients had supervised vocational engagements both within and outside the hospital settings.

*Design:* This was a descriptive retrospective review of all patients admitted to the rehabilitation unit from inception, September, 2002 till August, 2013 (11 years period).

### a) Sample Size and Sampling Technique

With in the eleven (11) years period, there were sixty-two (62) admissions. However, case records of six (6) patients could not be traced, consequently a total of fifty-six (56) case records were analyzed.

*Data Collection:* Data was collected using a semi-structured proforma containing the following sections:

Socio-demographic variables, clinical diagnoses, physical co-morbidity, Rehabilitation activities and outcomes.

The psychiatric diagnoses were made according to ICD 10 diagnostic criteria

Activities of Daily Living (ADL) was rated good for patients who could take care of their personal hygiene without prompting; take care of their immediate environment; could prepare or vend for their meals without assistance and could take medications willingly without supervision.

*Data Analysis:* Data entering, cleaning and analysis was done using the statistical package for social sciences (SPSS) Version 17. Frequency tables and cross tabulations of relevant socio-demographic, clinical, rehabilitation and outcome variables were drawn up.

For survival analysis, the desired endpoint is achieving discharge from the rehabilitation unit, which means that this category achieved mental stability, completed rehabilitation and were re-integrated back into the community.

Survival data analysis was done using Kaplan-Meier method for censored data. This involved coding the outcome variables into 1 – discharge, which is the desired event and 0 – other outcomes which are the censored observations. The factors influencing discharge were evaluated using Cox' Proportional Hazard Regression. The factors in the model were socio-demographic variables, clinical diagnoses and rehabilitation variables.

Chi-square test was used to assess association between categorical variables and Independent student – t-test to compare the difference in the means of quantitative variables.

P – values of significance was set at  $P \leq 0.05$ .

### b) Ethics

Confidentiality of data was assured and approval for the study was obtained from the Ethical Committee of Neuropsychiatric Hospital, Aro.

## III. RESULTS

Of the 56 patients, 36 (64.3%) were males. The mean (SD) age of the patients was 54.6 (14.4) years. The socio-demographic characteristics of the patients shown in table I revealed that they were mostly Yoruba (73.2%), Single (67.9%), previously unemployed (73.2%), and that 36(64.3%) of the patients had primary school education and below. Social and family support was poor in 41(73.2%) of the patient while activities of daily living was also reportedly poor in 25 (44.6%) of the patients. Vocational engagements was reported in 35 (62.5%) of the patients.

Comparing patients who achieved discharge with the non-discharged group, the discharged group was found to be statistically more educated ( $\chi^2 = 21.888$ ,  $P = 0.001$ ), employed ( $\chi^2 = 36.842$ ;  $P = 0.001$ ) Younger ( $\chi^2 = 15.079$ ;  $P = 0.001$ ), married ( $\chi^2 = 9.212$ ;

$P = 0.027$ ); had good family support ( $\chi^2 = 41.837$ ;  $P = 0.001$ ), had good activities of daily living ( $\chi^2 = 22.347$ ;  $P = 0.001$ ), and engaged in vocational activities ( $\chi^2 = 9.184$ ;  $P = 0.002$ ) while the difference in gender, tribe, vagrant status (homeless) did not attain statistical significance.

The distribution of psychiatric diagnoses and co-morbid medical conditions among patients as shown in table II revealed that schizophrenia was the commonest (85.7%) diagnosis followed by bipolar affective disorder (8.9%). Among the physical co-morbid conditions, hypertension (23.2%) and epilepsy (12.5%) were the commonest. There was no significant difference in clinical diagnoses and medication used between the discharged and non-discharged group of patients. (Table III)

The distribution of vocational engagement among patients as shown in table IV revealed that barbing (8.9%), shoemaking (8.9%) and fashion designing (8.9%) were most represented and 15 (26.8%) patients were involved in paid sheltered work in the hospital.

Outcome measures as shown in table V revealed that 15 (26.8%) patients completed rehabilitation programme and were consequently discharged into the community. Improvement was reported in 43 (76.8%) patients and mortality was recorded in 12.5% of the cases while follow up care was good in 83.9% of the cases. The median duration of stay in the rehabilitation unit was 41.3 months with the discharged group staying lesser (10.1 months) while 43.9% of the patients were abandoned in the unit.

A survival function curve (complementary cumulative function) on vocational engagement and time to discharge from rehabilitation unit is illustrated in Figure 1. The cumulative probability of discharge was higher for patients with vocational engagements at all times.

The factors identified by Cox' proportional hazard regression analysis that significantly influenced time to discharge (increase or decrease) included: low education (HR 0.030, 95% CI, 0.002 – 0.287), unemployment (HR 0.409, 95% CI, 0.231-0.736), good social and family support (HR 3.352, 95% C.I., 0.897-12.553), Poor Activities of daily living (HR 0.02, 95% C.I., 0.001-0.290) and being lesser than 40 years old (HR 2.631, 95% C.I., 0.675-10.261), (Table V1).

#### IV. DISCUSSION

In our study, most of the patient were males, a finding that mirrors those of Joanna et al, but the patients in this sample were much older.<sup>12</sup> Socio-demographic variable predicting discharge were high education, previous employment, younger age, being married, having good social and family support, good

activities of daily living and engagement in vocational activities. These findings were in variance to some studies<sup>7,8,9</sup> that found only limited evidence that socio-demographic variables predict outcome. The non-discharged group had inferior socio-demographic profile which could be a reflection of the severity of illness that interfered with normal role performance.

The commonest diagnosis was Schizophrenia. This was similar to the findings amongst patients admitted to the rehabilitation service at the Royal College, Edinburgh hospital.<sup>12</sup> At anytime, about 1% of people with severe and enduring mental illness such as schizophrenia require in-patient psychiatric rehabilitation. Schizophrenia associated with major cognitive deficits independent of age of diagnosis may interfere with both education and employment.<sup>19</sup> The findings of the highest psychiatric co-morbidity with cardiovascular and neurological diseases gave credence to the previous studies that showed that these conditions were common in Nigeria.<sup>21,22</sup> Medical co-morbidity in psychiatric patients have been shown to increase the number of hospital admissions and the length of hospital stay with consequent increase in the overall cost of treatment.<sup>23</sup>

A high percentage of the patients were engaged in vocational activities. Engagement in vocational activities was predictive of discharge from Rehabilitation unit. Vocational engagement promote gains in related areas such as self-esteem and quality of life as work and employment are a step away from dependency and a step to integration in to society.

Despite the fact that many persons with serious mental disorders want to work, estimated rates of competitive employment among those with these conditions range from 10% to 20% hence most of the patients were placed on appropriate artisan skill training/re-training.<sup>24</sup> The hospital provided support to the patients by placing some of them on paid sheltered employment.

The discharged group of patients stayed lesser in the rehabilitation unit. The factors found to significantly prolong duration of stay in the rehabilitation unit were unemployment, low education, poor social support, poor activities of daily living and older age. These poor socio-demographic factors could be a reflection of the severity of mental illness that impact negatively on the functional domains of the sufferers.<sup>19</sup>

#### V. LIMITATIONS

All retrospective studies have certain limitations. Some patients' case records were missing. At the time of admission, there was no baseline rating of illness severity with any standard symptoms rating scale. It was therefore possible that some of the associations of non-discharge are as a result of more severe illness.

However, this effect was minimized as the two groups had similar clinical diagnoses. For some of the patients, their ages may not be exact. Although age is a potential variable determining the clinical profile and outcome of treatment, we did not match for this variable in the design stage. We however, evaluated the effect of age and other potential confounding variables in the multivariate Cox proportional hazard regression analysis.

## VI. CONCLUSION

In a sample of rehabilitation in-service patients, we conclude that good socio-demographic profiles and engagement in vocational activities were significantly associated with achieving discharge during the eleven year period we studied. In Nigeria and other developing countries, there is need for the recognition of the role of rehabilitation in addressing the adverse consequences of mental disability to the individual, community and the nation. Future research on the dynamics and econometrics of this rehabilitation psychiatry service is highly indicated.

## VII. ACKNOWLEDGEMENTS

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## REFERENCES RÉFÉRENCES REFERENCIAS

1. World Health Organization. Mental Health. New Understanding, New Hope, Geneva: World Health Report 2001.
2. Lieberman JA, Stroup TS, McEvoy JP. Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *N Engl. J. Med.* 2005; 353: 1209-1223.
3. Marshall M, Lewis S, Lockwood A. Association between duration of untreated psychosis and outcome in cohorts of first-episode patients: a systematic review. *Arch Gen Psychiatry* 2005; 62: 975-983.
4. Killapsy H, Harden C, Holloway F. What do mental health rehabilitation services do and what are they for? A national survey in England. *Journal of mental health* 2005, 14: 157-165.
5. Adair CE, Mc Dougall GM, Mitton CR. Continuity of care and health outcomes among persons with severe mental illness. *Psychiatric Serv*, 2005; 56: 1061-1069.
6. Strauss JS. Discussion: What does rehabilitation accomplish. *Schizophr Bull* 1986; 12: 720-723.
7. Wiersma D, Nienhuis FJ, Slooff CJ, Giel R. Natural course of Schizophrenic Disorders: A 15-year follow up of a Dutch incidence cohort. *Schizophr. Bull* 1988; 24: 75-85.
8. Wiersma D, Wanderling J, Dragomirecka E, Ganey K, Harrison G, AnDer Heiden W et al: Social disability in Schizophrenia: Its development and prediction over 15 years in incidence cohorts in Six European Centres. *Psychol med* 2000; 30: 1155-1167.
9. Harrison G, Hopper K, Craig T, Laska E, Siegel C, Wanderling J, et al. Recovery from psychotic illness: a 15 and 25- year international follow-up study. *Br. J. Psychiatry* 2001; 178: 506-517.
10. MacQueen GM, Young LT, Joffe RT. A review of psychosocial outcome in patients with bipolar disorder. *Acta Psychiatr. Scand* 2001; 103: 163-170.
11. Jablensky A, Sartorius N, Ernberg G, Anker M, Korten A, Cooper JE et al. Schizophrenia: manifestations, incidence and course in different cultures: a WHO 10-country study. *Psychol Med.* 1992; 20: 1-97.
12. Joanna B, Andrew W, Debbie AM, Fiona C, Stephen ML. The prediction of discharge from in-patient psychiatric rehabilitation: a case-control study. *BMC Psychiatry* 2011; 11: 149-162.
13. Rogers ES, Anthony W, Lyass A. The nature and dimensions of social support among individuals with severe mental illnesses. *Common Ment. Health J.* 2004; 40: 437-450.
14. Rosler W. Psychiatric rehabilitation today: An overview *World Psychiatry.* October 2006: 151-157.
15. Boroffka A. Psychiatric Care in Nigeria. *Psychopathologic Africaine* 1995-1996; XXVII; 1: 27-36.
16. Ekpo M, Oyiyege M, Ayeni F. Profile of long stay patients in Federal Psychiatric hospital, Calabar. In Association of Psychiatrists in Nigeria (ed). Book of procedure, Annual Conference of Association of Psychiatrists in Nigeria, November 2000 at Federal Psychiatric Hospital, Calabar, Nigeria: pp 116-121.
17. Anaele A. Bad Omen: Up, up goes population of crazy Nigerians; and few psychiatrists to treat them. In S. Nwosu (ed) Sunday Sun. The Sun publishing limited, Apapa, Lagos, Nigeria July 23, 2006: pp. 47.
18. Oshisada V. The upsurge of mental patients. In Debo Adesina (ed) Guardian. Guardian Newspaper Ltd, Isolo, Lagos, Nigeria. August 28, 2006: pp 34.
19. Onofa L, Fatiregun AA, Fawole OI, Adebowale T. Comparison of Clinical profiles and treatment outcomes between vagrant and non-vagrant mentally ill patients in a specialist neuropsychiatric hospital in Nigeria. *Afr J. Psychiatry* 2012; 15: 189-192.
20. Taiwo H, Ladapo O, Aina OF, Lawal RA, Adebisi OP, Olomu SO et al. Long Stay patients in a psychiatric hospital in Lagos, Nigeria. *Afr J Psychiatry* 2008; 11: 128-132.
21. Oshodi YO, Adeyemi JD, Oke DA, Seedats A. Psychiatric morbidity in hypertensives attending a cardiology out-patient clinic in West Africa. *Nigeria. J. Clin. Pract.* 2012; 15: 84-88.

22. Oshuntokun BO, Adelaja AO, Nottidge VA. Prevalence of epilepsy in Nigeria Africans; a community study. *Epilepsia*, 1987; 28: 272-279.
23. Lyketsos CG. Medical co-morbidity in Psychiatric inpatients: relation to clinical outcomes and hospital length of stay. *Psychosomatics* 2002; 43: 24-30.
24. Cook JA, Leff HS, Blyler CR. Results of a multisite randomized trial of supported employment interventions for individuals with severe mental illness. *Arch Gen Psychiatry* 2005; 62: 505-512.

*Table 1* : Socio-demographic Characteristics of Patients and their Rehabilitation Status

Variable	Rehabilitation Status of Patients		Total N = 56 (%)	Test Statistics (Chi-Square)	P – Value
	DISCHARGED N = 15 (%)	NON-DISCHARGED N = 41 (%)			
<b>Gender</b>					
Male	11 ( 73.3)	25 ( 61.0)	36( 64.3)	0.810	0.368
Female	4 (26.7)	16(39.0)	20 (35.7)		
<b>Age</b>					
20 – 39	12 (80.0)	4 (9.8)	16 (28.6)	15.079	0.001
40 – 59	3 (20.0)	18 (43.9)	21 (37.5)		
Over 60	-	19 (46.3)	19 (33.9)		
<b>Mean (SD)</b>			<b>54.6(14.4)</b>		
<b>Tribe</b>					
Yoruba	10 (66.7)	31 (75.6)	41 (73.2)	1.760	0.624
Ibo	4 (26.7)	8 (19.5)	12 (21.4)		
Others	1 (6.7)	2 (4.9)	3 (5.4)		
<b>Marital Status</b>					
Single	8 (53.3)	30 (73.1)	38 (67.9)	9.212	0.027
Married	5 (33.3)	2 (4.9)	7 (12.5)		
Divorced	2 (13.3)	6 (14.6)	8 (14.3)		
Widowed	-	2 (4.9)	2 (3.6)		
<b>Education</b>					
No Formal	3 (20.0)	21 (51.2)	24 (42.9)	21.882	0.001
Primary	1 (6.7)	11 (26.8)	12 (21.4)		
Secondary	1 (0.7)	7 (14.6)	7 (12.5)		
Tertiary	10 (66.7)	3 (7.3)	13 (23.2)		
<b>Previous Employment</b>					
Yes	9 (60.0)	6 (14.6)	15 (26.8)	36.842	0.001
No	6 (40.0)	35 (85.4)	41 (73.2)		
<b>Patients' Status</b>					
Vagrant				2.060	0.357
Non-Vagrant	3 (20.0) 12 (80.0)	8(19.5) 33 (80.5)	11 (19.7) 45 (80.4)		
<b>Social and Family Support</b>					
Poor				41.837	0.01
Good	5 (33.3) 10 (66.7)	36 (87.8) 5 (12.2)	41 (73.2) 15 (26.8)		
<b>Activities of Daily living</b>					
Poor	-	25 (61.0)	25 (44.6)	22.347	0.001
Good	15 (100.0)	16 (39.0)	31 (55.4)		
<b>Vocational Engagement</b>					
Yes	15 (100.)	20 (48.8)	35 (62.5)	9.184	0.002
No	-	21 (51.2)	21 (37.5)		

*Table 2 :* Distribution of Clinical Diagnoses and Co-morbid conditions among Patients N = 56

Variable	Frequency	Percentage (%)
<b>Psychiatric Diagnosis</b>		
Schizophrenia	48	85.7
Bipolar affective disorders	5	8.9
Alcohol/Substance use disorder	3	5.4
<b>Co-morbid Medical Conditions</b>		
Hypertension		
Epilepsy		
Arthritis	13	23.2
Infections	7	12.5
Cataract/Sight Problem	5	8.9
Diabetes mellitus	4	7.1
	3	5.4
	2	3.6

*Table 3 :* Clinical Variables among Discharged and Non-discharged Patients

Variable	DISCHARGED N = 15 (%)	NON-DISCHARGED N = 41 (%)	Total N = 56 (%)	P – Value
<b>Psychiatric Diagnosis</b>				
Schizophrenia	13 (86.7)	35 (85.4)	48 (85.7)	0.491
Bipolar affective disorder	1 (6.7)	4 (9.8)	5 (9.8)	0.226
<b>Co-morbid medical condition</b>				
Hypertension				
Epilepsy	3 (20.0)	10 (24.4)	10 (24.4)	0.523
	2 (13.3)	5 (12.2)	5 (12.2)	0.667
<b>Medication Use</b>				
Conventional antipsychotics	12(80.0)	32 (78.0)	32 (78.0)	0.867
Depot antipsychotics	4 (26.7)	11 (26.9)	11 (26.9)	0.988
Atypical antipsychotics	1 (6.7)	3 (7.3)	3 (7.3)	0.703
Mood Stabilizer	1 (6.7)	4 (9.8)	4 (9.8)	0.226
Antidepressants	1 (6.7)	2 (4.9)	2 (4.9)	0.448
Anti- cholinergic	6(40.0)	18 (43.9)	18 (43.9)	0.243
Report of Non- adherence	1 (6.7)	5 (12.2)	5 (12.2)	0.068

*Table 4 :* Distribution of Vocational Activities Engagement among Patients N = 56

Variable	Frequency	Percentage (%)
Barbing	5	8.9
Shoe making	5	8.9
Fashion designing	5	8.9
Hair dressing	4	7.1
Food and Catering	3	5.4
Retailing/Business	3	5.4
Vulcanizing	2	3.6
Computer programme	2	3.6
Paid sheltered work	15	26.8

Table 5 : Outcome Measures among the Patients N = 56

Variable	Frequency	Percentage
<b>Rehabilitation Status</b>		
Completed & Discharged	15	26.8
Not completed	41	73.2
Abandoned in the Unit	24	42.9
<b>Improvement Status</b>		
Improved	43	76.8
Worsened	10	17.9
Died	7	12.5
<b>Follow Up Care</b>		
Good	47	83.7
Poor	4	7.2
Absconded/Lost to follow up	5	8.9
Median Duration of Stay: 41.3 Months		

Survival Functions

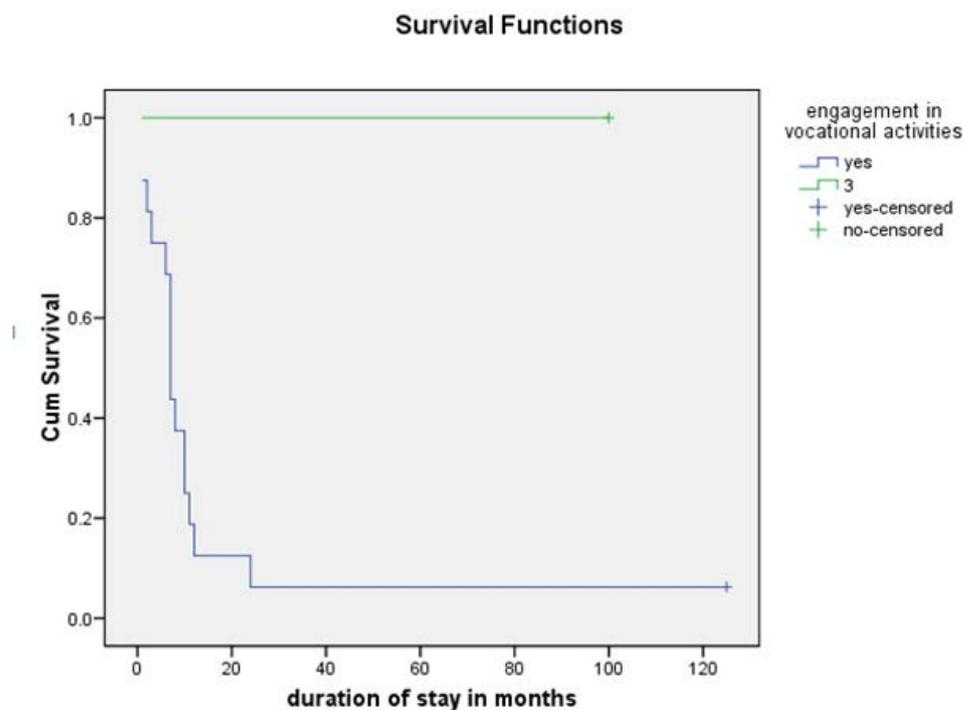


Figure 1 : Kaplan – Meier estimate of the survival function curves for discharged and Non-discharged patients in relation to their engagements in vocational activities

Table 6 : Variables affecting discharge using Cox Proportional Hazard Regression

Variables	Hazard Ratio (HR)	95% Confidence Interval (CI)
Low education	0.030	0.002 – 0.287
Unemployment	0.046	0.0231 – 0.736
Good Social Support	3.352	0.897 – 12.553
Poor Activities of daily living	0.02	0.001 – 0.290
Age < 40 years	2.631	0.675 – 10.261

# GLOBAL JOURNALS INC. (US) GUIDELINES HANDBOOK 2014

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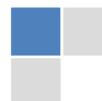
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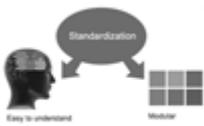
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It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

## Format

*Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.*

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than  $1.4 \times 10^{-3} \text{ m}^3$ , or 4 mm somewhat than  $4 \times 10^{-3} \text{ m}$ . Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

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*Abstract, used in Original Papers and Reviews:*

### Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

### Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art. A few tips for deciding as strategically as possible about keyword search:



- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

*Acknowledgements: Please make these as concise as possible.*

#### References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

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The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

#### Tables, Figures and Figure Legends

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*Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.*

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Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

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#### TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

**1. Choosing the topic:** In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

**2. Evaluators are human:** First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

**3. Think Like Evaluators:** If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

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**7. Use right software:** Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

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**22. Never start in last minute:** Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

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**26. Go for seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.



**27. Refresh your mind after intervals:** Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

**28. Make colleagues:** Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

**29. Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

**30. Think and then print:** When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

**31. Adding unnecessary information:** Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

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**33. Report concluded results:** Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

**34. After conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

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### Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

### Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.



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### **General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

- Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

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- Keep on paying attention on the research topic of the paper
- Use paragraphs to split each significant point (excluding for the abstract)
- Align the primary line of each section
- Present your points in sound order
- Use present tense to report well accepted
- Use past tense to describe specific results
- Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives
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Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.



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The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript-- must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

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- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

## Approach:

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- Center on shortening results - bound background information to a verdict or two, if completely necessary
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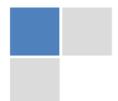
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- Explain the value (significance) of the study
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- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
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## Approach:

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- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
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- Leave out information that is immaterial to a third party.

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The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently. You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



## Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

### What to stay away from

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- Never confuse figures with tables - there is a difference.

### Approach

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- If you desire, you may place your figures and tables properly within the text of your results part.

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- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
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- All figure and table must be adequately complete that it could situate on its own, divide from text

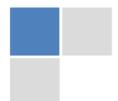
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- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
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- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

### Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
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<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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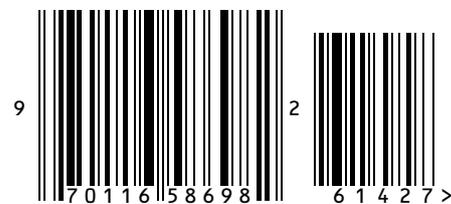


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