Title: The Groote Schuur Hospital Neurosurgical Intensive Care Unit: A 2 Year Review of Admission Characteristics

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Declaration

I, Sakina Mehboob Rashid, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signed by candidate

Signature:

Date: 24/01/2023

Dedication

To my late father who continues to be a source of inspiration

Acknowledgements

I would like to acknowledge and thank my supervisors - Professor Patrick Semple and Professor Ivan Joubert – for their assistance and guidance with the completion of this thesis. Their insight was invaluable.

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List Of Abbreviations

AEDH: acute extradural haematoma

aSAH: aneurysmal subarachnoid haemorrhage

ASDH: acute subdural haematoma

AVM: arteriovenous malformation

CSDH: chronic subdural haematoma

DBI: diffuse brain injury

DSA: digital subtraction angiography

EVD: external ventricular drain

GCS: Glasgow coma score

GSH: Groote Schuur Hospital

HREC: Human Research Ethics Committee

ICP: intracranial pressure

ICU: intensive care unit

IVH: intraventricular haemorrhage

NsICU: neurosurgical intensive care unit

SAJCC: South African Journal of Critical Care

SICH: spontaneous intracranial haemorrhage

SPSS: Statistical Package for the Social Sciences

TB: tuberculosis

TBI: traumatic brain injury

UCT: University of Cape Town

VPS: ventriculoperitoneal shunt

Chapter 1

Introduction

Neurosurgical Intensive Care Units (NsICU) provide a specialized and comprehensive service to critically ill patients. Apart from the use of expensive equipment and a high staff to patient ratio, the need for individualized patient care, as well as a multidisciplinary team with specialized training, emphasizes the resource intense nature of ICUs. Literature from developed countries indicates that the unit cost of in-patient days, in an ICU, can be up to 4.8 times higher than that of a general ward[1]. Just under 50% of this expenditure is attributable to nursing costs[1]. A financial analysis of a public sector hospital in South Africa demonstrated that the main cost driver of critical care was human resources at 55%[2]. In a resource constrained setting, admissions need to be triaged appropriately to avoid unnecessary expenditure.

At Groote Schuur Hospital (GSH), which is one of three tertiary level state hospitals in the Western Cape Province, the NsICU is a 6-bed unit headed by a specialist neurosurgeon with extensive experience in Neuro-Critical Care working in close collaboration with intensivists from the Division of Critical Care. GSH serves as the teaching hospital attached to the University of Cape Town and by extension the NsICU plays an important role in the training of neurosurgical registrars as well as critical care subspecialists.

It is anticipated that the admissions to the NsICU will not only reflect the specialized neurosurgical monitoring and advanced therapeutic services offered at GSH, but also the high volume of trauma that the facility currently manages. There is currently no detailed analysis of the demographics, diagnosis and management of patients admitted to the NsICU at GSH. It is the objective of this retrospective observational study to collect and describe this data.

Ethical Considerations

The research protocol was presented to and approved by the Surgical Departmental Research Committee (Protocol 2022/045). The Human Research Ethics Committee (HREC) of the University of Cape Town also provided clearance for the study (HREC Reference number: 297/2022). Institutional approval was also sought and granted from GSH. Patient records were deidentified for this retrospective observational study.

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Chapter 2

Publication Ready Format

The Groote Schuur Hospital Neurosurgical Intensive Care Unit: A 2 Year Review of Admission Characteristics

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Structured Abstract

Background: At Groote Schuur Hospital (GSH), the Neurosurgical Intensive Care Unit (NsICU) is a 6-bed unit headed by a specialist neurosurgeon with extensive experience in Neuro-Critical Care working in close collaboration with intensivists from the Division of Critical Care. There is currently no detailed analysis of the demographics, diagnosis and management of patients admitted to the NsICU at GSH.

Objectives: To provide a detailed descriptive analysis of the demographics, diagnosis and management of patients admitted to the NsICU at GSH from 1st January 2020 to 31st December 2021.

Methods: A retrospective descriptive analysis of patients who received treatment in the NsICU from 1st January 2020 to 31st December 2021.

Results: A total of 685 patients were admitted to the unit over a two-year period with a male preponderance (68.2%). The average age was 42.5 (±17.2) years. The most common neurosurgical diagnoses were traumatic brain injuries (39.6%), brain tumours (22.6%) and aneurysmal subarachnoid haemorrhages (9.9%). Emergency admissions comprised 76.6% of the total and 86.7% of admissions were admitted post operatively. Three hundred and seventy-two patients required mechanical ventilation (54.3%), 132 patients required both an intracranial pressure monitor (ICP) and brain tissue oxygenation monitor (19.3%), 86 had an external

ventricular drain placed (12.5%), 50 patients required placement of a tracheostomy (7.3%) and 16 patients had only an ICP monitor placed (2.3%). The average duration of stay was 5.5 (±1.3) days and ICU mortality over 2 years was 11.1%.

Conclusion: The NsICU at GSH manages predominantly male trauma patients and a significant number of admitted patients require specialized invasive intracranial monitoring.

Introduction

Groote Schuur Hospital (GSH), which is one of three tertiary level state hospitals in the Western Cape Province, has a six-bedded Neurosurgical Intensive Care Unit (NsICU) headed by a specialist neurosurgeon with extensive experience in Neuro-Critical Care working in close collaboration with intensivists from the Division of Critical Care.

GSH serves as the teaching hospital affiliated to the University of Cape Town (UCT) and by extension the NsICU plays an important role in the training of neurosurgical registrars as well as critical care subspecialists.

The demographics, diagnosis and management of patients admitted to the NsICU have not previously been described. It is anticipated that the admissions to the NsICU will not only reflect the specialized neurosurgical monitoring offered at GSH but also the high volume of trauma that the facility currently manages.

Methods

Study Design and Population

This is a retrospective descriptive analysis of patients who were admitted to the NsICU from 1st January 2020 to 31st December 2021. All patients admitted to the NsICU during the specified period were included in the study. There were no exclusion criteria.

Data Collection

The Human Research Ethics Committee (HREC) of the University of Cape Town (UCT) approved this study (HREC Reference number: 297/2022).

Data was extracted from the Neurocritical Care Unit Database (HREC UCT Ethics Number: R012/2015).

Demographic data recorded included age and sex. Admission variables included the neurosurgical diagnosis, source of referral, emergency versus elective admission and whether the patient was admitted postoperatively or required a neurosurgical intervention during their NsICU stay. Data points related to each patient's NsICU stay included the need for mechanical ventilation, external ventricular drain (EVD) placement, intracranial pressure (ICP) and brain tissue oxygenation monitor placement and whether the patient required a tracheostomy.

Discharge variables that were recorded included the duration of stay, mortality while in the NsICU and the discharge destination.

Data Management and Analysis

Data was entered into an Excel Spreadsheet. Statistical Package for the Social Sciences (SPSS) Version 23 was used for data analysis. All variables were analysed descriptively; continuous variables are presented in the form of means (± standard deviation) and categorical variables are presented as frequencies.

Results

Study Population

A total of 685 (2020: 336, 2021: 349) patients were admitted to the unit over a two-year period, the majority being male (68.2%) (Table 1) and the average age was 42.5 (±17.2) years. The most frequently admitted age groups were 41-50 years (21.0%), 31-40 years (20.0%) and 21-30 years (19.7%) (Table 1).

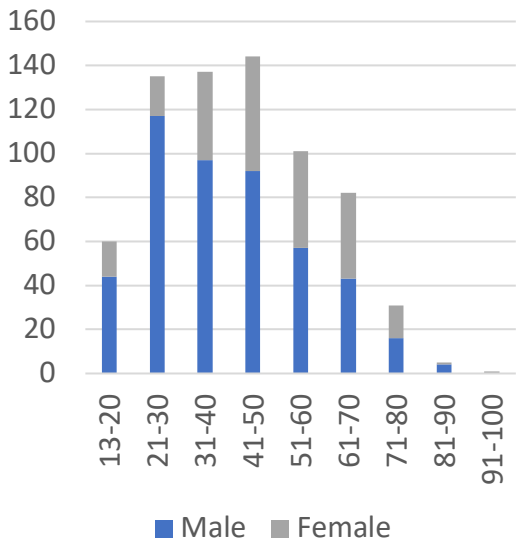

Table 1. Age and sex distribution of patients admitted between 2020 and 2021

Admission Characteristics

Most admissions were from the GSH trauma unit (n=243, 35.5%). Emergency admissions comprised 76.6% of all transfers into the unit and 86.7% of patients were admitted following a surgical intervention or were operated on during their NsICU stay. The most common neurosurgical diagnoses were traumatic brain injuries (TBIs) (n=271, 39.6%), brain tumours (n=156, 22.6%), and aneurysmal subarachnoid haemorrhages (aSAHs) (n=68, 9.9%).

	n	(%)
Source of referral		
GSH trauma unit	243	35.5
Neurosurgical ward	179	26.1
GSH medical casualty	151	22.0
Neurosurgical high care	78	11.4
Other	34	5.0
Admission diagnosis		
TBI	271	39.6
Brain tumor	155	22.6
aSAH	68	9.9
Hydrocephalus	38	5.5
Intracranial sepsis	35	5.1
Spinal surgery	30	4.4
CSDH	26	3.8
Ischaemic stroke	16	2.3
AVM	12	1.8
sICH	12	1.8
Other	21	3.1

Table 2. Admission characteristics: Source of referral and admission diagnosis. AVM: arteriovenous malformation, CSDH: chronic subdural haematoma, sICH: spontaenous intracranial haemorrhage

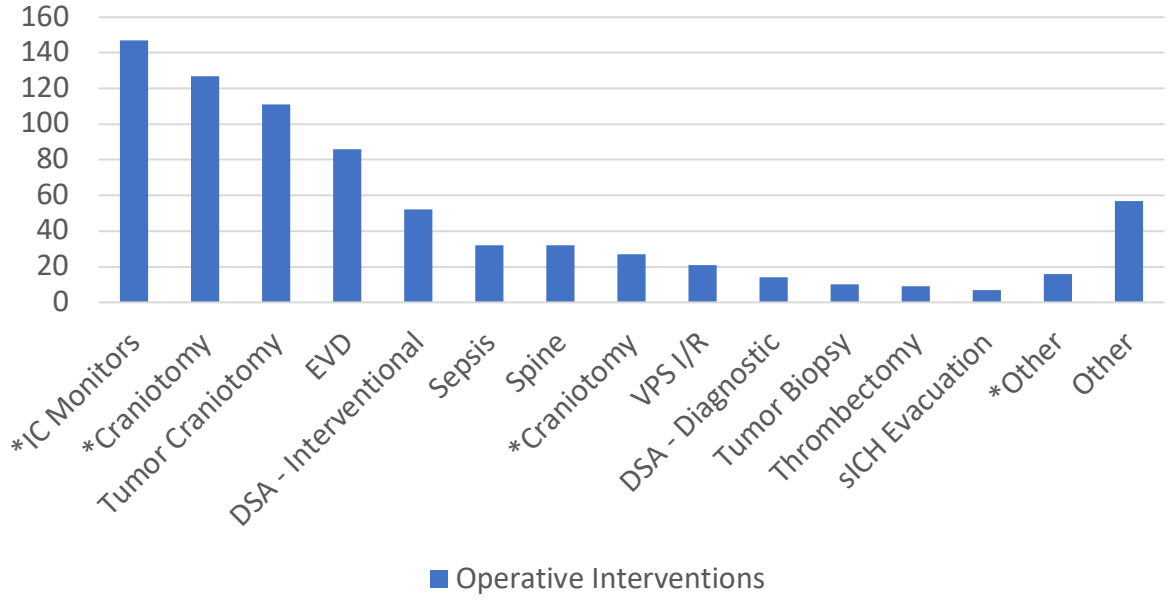

Table 3. Operative Interventions for NsICU Admissions, *Trauma. EVD: external ventricular drain, VPS I/R: ventriculoperitonetal shunt, index/revision, DSA: digital subtraction angiography, sICH: spontaneous intracranial haemorrhage

ICU Stay

Three hundred and seventy-two patients required mechanical ventilation (54.3%). One hundred and thirty-two (19.3%) patients required ICP and brain tissue oxygenation monitors, 86 (12.5%) had an EVD placed, 50 (7.3%) patients required placement of a tracheostomy and 16 (2.3%) patients had only an ICP monitor placed.

	n	(%)
Mechanical ventilation		
TBI	211	56.7
aSAH	34	9.1
Sepsis	29	7.8
Stroke	26	7.0
Brain tumor	24	6.5
Other	58	15.6
Total	372	100.0
ICP and brain oxygenation monitor placement		
DBI	53	40.2
ASDH and DBI	44	33.3
ICH – Trauma	15	11.4
AEDH and DBI	13	9.8
Other	7	5.3
Total	132	100.0
External ventricular drain		
aSAH/IVH	29	33.7
Intracranial sepsis	17	19.8
Tumor	14	16.3
TB meningitis with hydrocephalus	10	11.6
Trauma	4	4.7
Other	12	14.0
Total	86	100.0
Tracheostomy		
TBI	37	74.0
Intracranial Sepsis	3	6.0
Other	10	20
Total	50	100.0

Table 4. Neurosurgical diagnoses of patients who underwent ICP and brain oxygenation monitoring, required mechanical ventilation, placement of an EVD and tracheostomies. DBI: diffuse brain injury, ASDH: acute subdural haematoma, AEDH: acute extradural haematoma, IVH: intraventricular haemorrhage, TB: tuberculosis.

Discharge Variables

The average duration of stay was 5.5 (±1.3) days and the ICU mortality over 2 years was 11.1%. The most common discharge destination was the Neurosurgical Ward (n=344, 50.2%).

	n	(%)
Demised	80	11.7
Discharge destination		
Neurosurgical ward	344	50.2
Neurosurgical high care	222	32.4
Other	31	4.5

Table 5. Discharge Destination from the NsICU

Discussion

This is the first paper describing the demographics, diagnoses and management of admissions to a NsICU in South Africa. The most recent national audit of ICU resources in South Africa was conducted in 2009 which stated that there were 4719 ICU and high-care beds available in the private and public sector[1]. With a population of 57 million in South Africa at the time, this translated to around 1 bed for every 12,000 people. Only 25% of these beds were in the public sector which caters for 84% of the total population. The number of ICU beds available in South Africa was estimated to be between 3300 to 7000 in 2021[1]. It has never been described how many ICU beds are dedicated to neurosurgical services.

As a result of the divergent trajectories of development, General ICUs - which also cater for neurosurgical patients - and NsICUs around the world are structured differently. The concept and evolution of neurocritical care services has been described previously[2].

In most resource constrained settings and in countries where critical care is in its infancy, general-open ICUs are the norm[3,4,5]. Admissions are often a mix of different specialties and patients are managed by general physicians or anesthesiologists, with consultation as required or depending on availability from specialized consultant services. Patients with neurosurgical pathology are nursed on the same floor as patients with other pathologies. General monitoring is standard across all patients, however the provision of specialized neuromonitoring modalities

is limited. This model of care allows for greater cost effectiveness compared to running specialized ICU beds.

In high- and middle-income countries, there has been development of specialized combined neurological and neurosurgical ICUs. These are well resourced units with access to general and specialized forms of continuous neuromonitoring and therapeutics which accommodate both neurological and neurosurgical patients[6,7,8]. Patient care is overseen by a trained neuro-intensivist and nursing care is provided by specialist nursing staff. It has been repeatedly demonstrated that involvement of a neuro-intensivist in a closed neurological and neurosurgical ICU setting significantly reduces patient mortality rates with improvement in quality indicators[6,7]. A systemic review and meta-analysis published by Yang in 2019 also demonstrated improved patient outcomes in closed ICU systems[9].

At the opposite end of the spectrum from general ICUs, are dedicated NsICUs - often university affiliated and part of neurosurgical training programs[10,11,12]. The services are covered by dedicated neurosurgeons, neuro-intensivists and nursing staff with specific training in caring for neurocritical care patients. Apart from standard ICU services which include, but not limited to, continuous monitoring of vital signs, patient ventilation, inotropic support, and renal replacement therapy; specialized multimodality neuro-monitoring is often employed which includes continuous or intermittent recording of intracranial pressure (via an external ventricular drain or intracranial monitor), brain tissue oxygenation, brain temperature and electroencephalography.

The male preponderance in the study is likely a reflection of the trauma burden on the surgical services at GSH. An audit conducted in the trauma unit at GSH demonstrated that 72.5% of patients over the course of a year were male[13]. It also demonstrated consistently higher levels of weapon-related injury, intentional trauma, weekend injuries and substance use disorders in males[13]. Thirty five point five percent of admissions to the unit are from the GSH Trauma Centre. Referral institutions may not have after hours imaging facilities available resulting in transfers to the GSH Trauma Unit as per the Western Cape substructure referral guidelines.

Compared to other NsICUs around the world, the average age of our cohort was much lower; 42.5 years compared to 55.0, 56.4 and 59.2 years in Austria, the United States of America and South Korea respectively[14,15,16]. This may be a reflection of the high incidence of trauma in young males in South Africa. Only 8.2% of admissions to the NsICU were for patients over

the age of 60 years. Just over three quarters of patients admitted to the NsICU were emergency admissions, reflecting the burden of neurosurgical emergencies.

The three most common neurosurgical diagnoses in patients admitted to the unit were TBIs, brain tumours and aSAH. A review of neurosurgical and neurological ICUs in high-income countries demonstrated a different range of pathologies in their patient population with tumours and neurovascular conditions as the majority[14,17,18]. The contrast is likely due to a lower trauma burden in high income countries and a larger proportion of an elderly population resulting in a higher incidence of brain tumours and neurovascular conditions.

The NsICU at GSH offers continuous ICP and brain tissue oxygenation monitoring for TBI patients. Full time staff are trained to interpret changes in real-time data and to translate that into interventions aimed at potentially improving patient outcome. Of all patients who required mechanical ventilation 56.7% were admitted following a TBI. Of patients requiring tracheostomies 74.0% were TBI patients and 42.4% of operative interventions for NsICU patients were due to TBIs. A significant portion of the NsICU's resources are allocated to managing TBIs.

Patients with brain tumours comprised just over 20% of admissions. These patients are often admitted following elective surgery, or after presenting with acute neurological deterioration requiring emergent surgery, or a period of mechanical ventilation. One hundred and thirty-five surgical procedures for ICU admissions were either EVDs, craniotomies or biopsies for brain tumours (18.9%).

GSH is one of three tertiary hospitals in the Western Cape that offers neuro-endovascular intervention procedures. Over a two-year period 68 patients were admitted to the unit with aSAHs and 52 (76.5%) underwent therapeutic endovascular procedures. Patients admitted following a mechanical thrombectomy for an ischemic stroke are often only admitted for 24 hours or less for close observation. Admissions with a diagnosis of aSAH have a more variable length of stay prior to being transferred to the neurosurgical high care or ward.

In the NsICU, EVDs are placed almost exclusively for temporary cerebrospinal fluid diversion and only 4.7% of drains were placed in trauma patients, over the 2-year period. This contrasts with other NsICUs where institutional practice dictates that EVDs also be placed for patients with severe TBIs to facilitate ICP control and to measure ICP[19]. Due to the higher risk of

infections and haemorrhage with EVDs, placement of ICP monitors is preferred for TBI patients being admitted to the NsICU[20]. The risks of a malpositioned EVD in a TBI patient and the associated complications are also not insignificant.

Over the period of 24 months, 50 patients underwent placement of a tracheostomy to facilitate weaning off the ventilator. The neurosurgical diagnosis of 74.0% of tracheostomy patients was a TBI with poor neurological recovery.

The neurosurgical ward is the most common discharge destination for patients (n=344, 52.2%). A significant number of patients are also transferred to the neurosurgical high care unit (n=222, 32.4%) which is run by the same team. The decision regarding a patient's transfer out of the NsICU is influenced by the degree of neurological recovery and level of care required. Thirty-one patients were discharged to other wards and 80 demised while in ICU. The average duration of stay was 5.5 (±1.3) days and ICU mortality over 2 years was 11.1%.

The NsICU at GSH is an academic unit with a high volume of admissions reflecting the nature of neurosurgical services offered in the Division of Neurosurgery as well as the burden of trauma on the surgical service. A variety of neurosurgical conditions are managed in the unit; most commonly TBIs, brain tumours and aSAHs. Patients have the potential for rapid deterioration requiring adequately staffed units with personnel who recognize such situations and promptly institute corrective measures.

Conclusion

The results of this study have detailed the nature of admissions to the GSH NsICU over a two-year period. The NsICU manages predominantly male trauma patients and a significant number of patients requiring specialized neurosurgical monitoring. The results of this study will guide further research as well as assist in the planning of resource allocation for the improvement of neuro-critical care services in low- and middle-income countries.

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Appendix 1: Department of Surgery Research Committee Approval

UNIVERSITY OF CAPE TOWN

Department of Surgery
Departmental Research Committee
A/Prof Maritz Laubscher
Groote Schuur Hospital
Observatory 7925
South Africa
Tel (021) 404 5108
Email: maritz.laubscher@uct.ac.za

9 May 2022

Dr S Rashid

Department of Surgery
University of Cape Town

Dear Dr Rashid

RE: Project 2022/045

PROJECT TITLE: A Retrospective Descriptive Analysis Of Admissions To The Groote Schuur Hospital Neurosurgical Intensive Care Unit Over 2 Years

The above protocol has been reviewed by the Department of Surgery Research Committee. I am pleased to inform you that the committee approved the scientific merit of the study, and endorse the protocol for submission to the relevant ethics committee.

Although this letter serves as confirmation that the above protocol has successfully passed through the surgical DRC, respective ethics committees still require DRC chair signature before submission.

Please use the above project number in all future correspondence,

Yours sincerely

Signed by candidate

A/PROF MARITZ LAUBSCHER
CHAIR SURGICAL DRC

"OUR MISSION is to be an outstanding teaching and research university, educating for life and addressing the challenges facing our society."

Appendix 2: University of Cape Town's Human Research Ethics Committee approval

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room 45 E-52-E-Floor- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-submissions@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

23 May 2022

HREC REF: 297/2022

Prof P Semple
Division of Neurosurgery
D13, ICU NGSH
Email: patrick.semple@uct.ac.za
Student: Sakina.rashid@ymail.com

Dear Prof Semple

PROJECT TITLE : A RETROSPECTIVE DESCRIPTIVE ANALYSIS OF ADMISSIONS TO THE GROOTE SCHUUR HOSPITAL NEUROSURGICAL INTENSIVE CARE UNIT OVER 2 YEARS- (MMED CANDIDATE-DR SAKINA RASHID)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19. Please refer to guidance letter dated 02 February 2022 on our website:
http://www.health.uct.ac.za/fhs/research/humanethics/forms

Approval is granted for one year until the 30 May 2023.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Dr Sakina Rashid will also be involved in this study.

Please quote the HREC REF 297/2022 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

Signed by candidate

PROFESSOR M BLOCKMAN
CHAIRPERSON, FACULTY OF HEALTH SCIENCES HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637. Institutional Review Board (IRB) number: IRB00001938 NHREC-registration number: REC-210208-007
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2020), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

HREC/ref297 2022

Appendix 3: Groote Schuur Hospital institutional approval

Western Cape Government

GROOTE SCHUUR HOSPITAL

Enquiries: Dr Bernadette Eick
e-mail: GSHReserach.Request@westerncape.gov.za

PROFESSOR PATRICK SEMPLE
DIVISION OF NEUROSURGERY

E-mail: patrick.semple@uct.ac.za

Dear Professor Semple

RESEARCH PROJECT: A Retrospective Descriptive Analysis of Admissions to the Groote Schuur Hospital Neurosurgical Intensive Care Unit over two years (MMed Candidate: Dr Sakina Rashid)

Your recent letter to the hospital refers.

You are granted permission to proceed with your research, which is valid until **30 May 2023.**

Please note the following:

a) Your research may not interfere with normal patient care.
b) Hospital staff may not be asked to assist with the research.
c) Confidentiality must always be maintained.
d) No additional costs to the hospital should be incurred as indicated in your Annexure 2 i.e. Lab, consumables or stationery. **If access to TRACK Care/NHLS is required, kindly attach our letter of approval to the application form and approach Information Management to assist with data.**
e) **No patient folders may be removed from the premises or be inaccessible.**
f) Please provide the research assistant/field worker with a copy of this letter as verification of approval.
g) Should you at any time require photographs of your subjects, please obtain the necessary indemnity forms from our Public Relations Office (E45 OMB or ext. 2187/2188).
h) Should you require additional research time beyond the stipulated expiry date, please apply for an extension.
i) Please discuss the study with the HOD before commencing.
j) Please introduce yourself to the person in charge of an area before commencing.
k) On completion of your research, please forward any recommendations/findings that can be beneficial to use to take further action that may inform redevelopment of future policy / review guidelines.
l) If the researcher is not GSH staff member, a supernumerary contract is required before commencement of the research.
m) Please contact Michelle Riley (Patient Fees) at ext. 2276 to ascertain if there will be charges for conducting the Research and to obtain a quote or to discuss charges.
n) Kindly submit a copy of the publication or report to this office on completion of the research.
o) At no time should any posters encouraging patients to partake in research, be displayed within a clinical area.
p) Please adhere to ALL COVID-19 regulations and Groote Schuur Hospital policies.

I would like to wish you every success with the project.

Yours sincerely

Signed by candidate

DR BERNADETTE EICK
CHIEF OPERATIONAL OFFICER
Date: 21 June 2022
C.C. Mr. L. Naidoo, Prof. G. Fieggen, Dr. B. Jacobs, Mr. A. Mohamed

G46 Management Suite, Old Main Building,
Observatory 7925
Tel: +27 21 404 6288 fax: +27 21 404 6125

Private Bag X,
Observatory, 7935
www.westerncape.gov.za/health

Appendix 4: Author Guidelines of The Journal

Southern African Journal of Critical Care (SAJCC)

The SAJCC publishes peer reviewed articles pertaining to critical care medicine. It is an open access journal with a biannual publication schedule.

Electronic Link:
http://www.sajcc.org.za/index.php/SAJCC or https://www.ncbi.nlm.nih.gov/pmc/journals/.

Manuscript preparation

Preparing an article for anonymous review

To ensure a fair and unbiased review process, submissions may include an anonymized version of the manuscript.

Submitting a manuscript that needs additional blinding can slow down your review process, so please be sure to follow these simple guidelines as much as possible:

- An anonymous version should not contain any author, affiliation or particular institutional details that will enable identification.
- Please remove title page, acknowledgements, contact details, funding grants to a named person, and any running headers of author names.
- Mask self-citations by referring to your own work in third person.

General article format/layout

Submitted manuscripts that are not in the correct format specified in these guidelines will be returned to the author(s) for correction prior to being sent for review, which will delay publication.

General:

- Manuscripts must be written in UK English (this includes spelling).
- The manuscript must be in Microsoft Word or RTF document format. Text must be 1.5 line spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes). Pages and lines should be numbered consecutively.
- Please make your article concise, even if it is below the word limit.
- Qualifications, ***full*** affiliation (department, school/faculty, institution, city, country) and contact details of ALL authors must be provided in the manuscript and in the online submission process.
- Abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.
- Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160.
- Quotes should be placed in single quotation marks: i.e. The respondent stated: '...'
- Round brackets (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.
- Medical drugs should be referred to by their generic name although the trade name may be used in brackets in the text once if unique.

If you wish material to be in a box, simply indicate this in the text. You may use the table format –this is the *only* exception. Please DO NOT use fill, format lines and so on.

Preparation notes by article type

Research

Guideline word limit: 3 000 words (excluding abstract and bibliography)

Research articles describe the background, methods, results and conclusions of an original research study. The article should contain the following sections: introduction, methods, results, discussion and conclusion, and should include a structured abstract (see below). The title of the manuscript should concisely describe the study but should not include the outcome. The introduction should be concise – no more than three paragraphs – on the background to the research question, and must include references to other relevant published studies that clearly lay out the rationale for conducting the study. Some common reasons for conducting a study are: to fill a gap in the literature, a logical extension of previous work, or to answer an important question. If other papers related to the same study have been published previously, please make sure to refer to them specifically. At the end of the introduction clearly state the aim or objective of the study. The primary and secondary outcomes should be specified.

In the Methods section describe in sufficient detail so that others would be able to replicate the study should they need to. Sections of the methods that have been described in previous publications need only be referenced. The statistical methods should be described. Where appropriate, sample size calculations should be included to demonstrate that the study is not underpowered.

Results should describe the study sample as well as the findings from the study itself, but all interpretation of findings must be kept in the discussion section. The conclusion should briefly summarise the main message of the paper and provide recommendations for further study.

The discussion should be confined to an interpretation of your results with respect to your stated aim and if applicable, a comparison to the results of similar studies. The strengths and weaknesses of your study should be discussed.

The conclusion should be confined to an interpretation of the results of the study and a recommendation if applicable.

- May include up to 6 illustrations or tables.
- References should only include the most recent and relevant articles. A maximum of 30 references is advised.

Structured abstract

- This should be no more than 250 words, with the following headings:
    - **Background:** why the study is being done and how it relates to other published work.
    - **Objectives:** what the study intends to find out
    - **Methods:** must include study design, number of participants, description of the research tools/instruments, any specific analyses that were done on the data.
    - **Results:** first sentence must be brief population and sample description; outline the results according to the methods described. Primary outcomes must be described first, even if they are not the most significant findings of the study.
    - **Conclusion:** must be supported by the data, and be aligned with the conclusion in the main text.
    - Please ensure that the structured abstract is complete, accurate and clear and has been approved by all authors. It should be able to be intelligible to the reader without referral to the main body of the article.
    - Do not include any references in the abstracts.

Tables

- Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged.
- Embed/include each table in the manuscript Word file - do not provide separately as supplementary files.
- Number each table in Arabic numerals (Table 1, Table 2, etc.) consecutively as they are referred to in the text.
- Tables must be cell-based (i.e. not constructed with text boxes or tabs) and editable.
- Ensure each table has a concise title and column headings, and include units where necessary.
- Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

References

NB: *Only complete, correctly formatted reference lists in Vancouver style will be accepted. If reference manager software is used, the reference list and citations in text are to be unformatted to plain text before submitting.*

- Authors must verify references from original sources.
- Citations should be inserted in the text as superscript numbers between square brackets, e.g. These regulations are endorsed by the World Health Organization,[2] and others.[3,4-6]
- All references should be listed at the end of the article in numerical order of appearance in the Vancouver style (not alphabetical order).
- Approved abbreviations of journal titles must be used; see the List of Journals in Index Medicus.
- Names and initials of all authors should be given; if there are more than six authors, the first three names should be given followed by et al.

- Volume and issue numbers should be given.
- First and last page, in full, should be given e.g.: 1215-1217 **not** 1215-17.
- Wherever possible, references must be accompanied by a digital object identifier (DOI) link). Authors are encouraged to use the DOI lookup service offered by CrossRef:
    - On the Crossref homepage, paste the article title into the 'Metadata search' box.
    - Look for the correct, matching article in the list of results.
    - Click Actions > Cite
    - Alongside 'url =' copy the URL between { }.
    - Provide as follows, e.g.: https://doi.org/10.7196/07294.937.98x

Appendix 5: Supervisor Declaration

The journal publishing the paper is accredited by the department of higher education and training or it has been approved by the UCT Health Sciences Specialist Training Committee and:

- The candidate is the first author on the paper
- The candidate contributed the most to the paper
- The candidate developed the protocol and wrote the paper under supervision
- The candidate was involved in the analysis, presentation, and interpretation of results
- The other authors and their contributions to the paper are stated

Signed by candidate

Supervisor: Patrick Semple

Date: 18 April 2023

The journal publishing the paper is accredited by the department of higher education and training or it has been approved by the UCT Health Sciences Specialist Training Committee and:

- The candidate is the first author on the paper
- The candidate contributed the most to the paper
- The candidate developed the protocol and wrote the paper under supervision
- The candidate was involved in the analysis, presentation, and interpretation of results
- The other authors and their contributions to the paper are stated

Signed by candidate

Supervisor: Ivan Joubert

Date: 17 April 2023

Appendix 6: Supervisor Declaration

rshsak001:Thesis.pdf

ORIGINALITY REPORT

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