

# A Descriptive study of Malnutrition in Traumatic brain injury patients



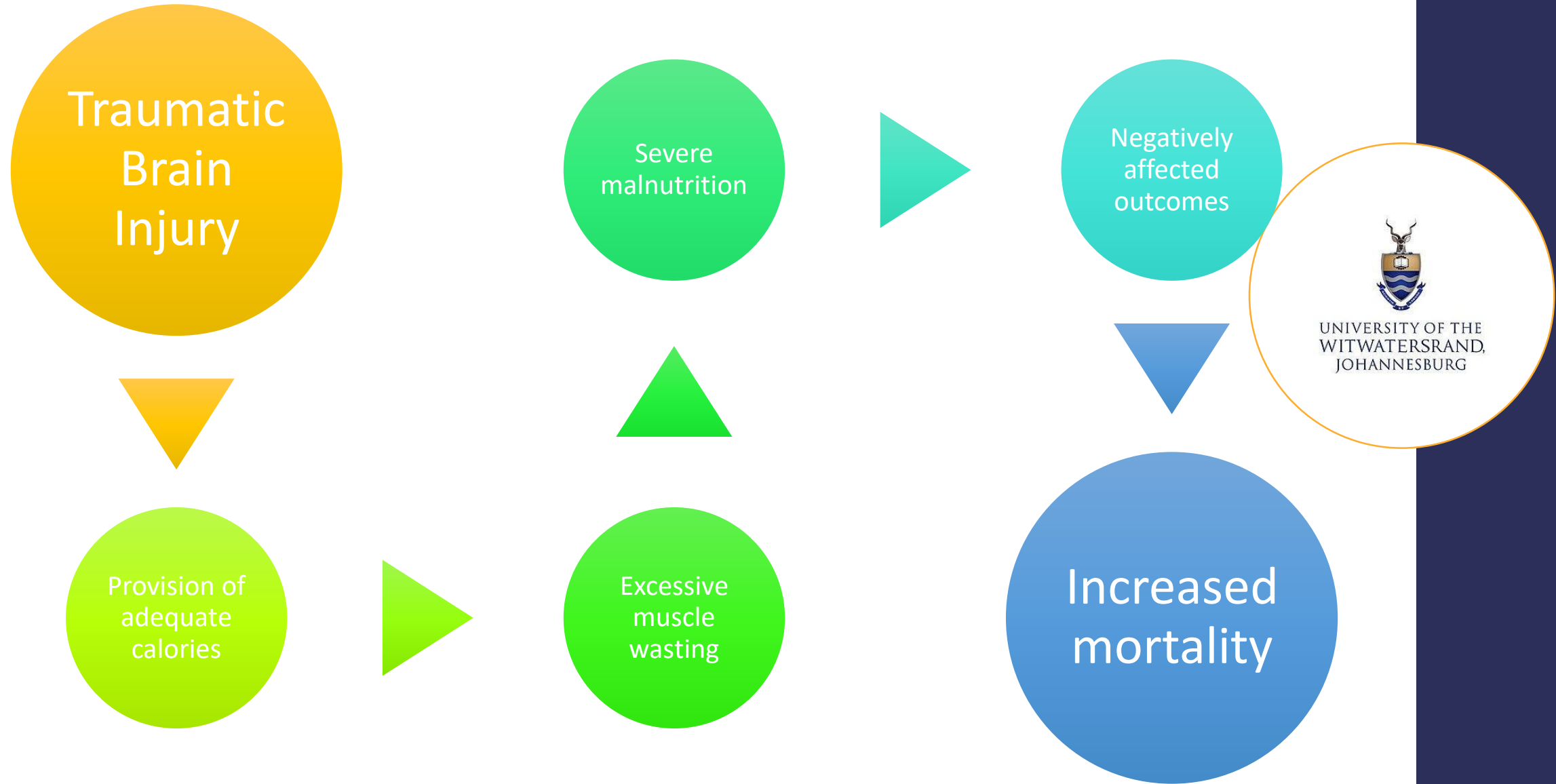
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Ford LM, Ouma JR

# Introduction



# Introduction

- **TBI**: injury caused by external forces to the head. Direct vs Indirect. Blunt vs Penetrating
- Overall *mortality* post-resus  $GCS \leq 8 = 23\%$
- **Secondary** brain injury
- 1991 incidence of **316** brain injuries / 100 000 people / year in South Africa
- Lower GCS & total serum protein & albumin levels = significant influence on development of clinical features of malnutrition
- Nutrition (WHO): intake of food, in relation to the body's dietary needs
- **Early nutrition**: feeding within 1<sup>st</sup> 5 – 7 days post injury



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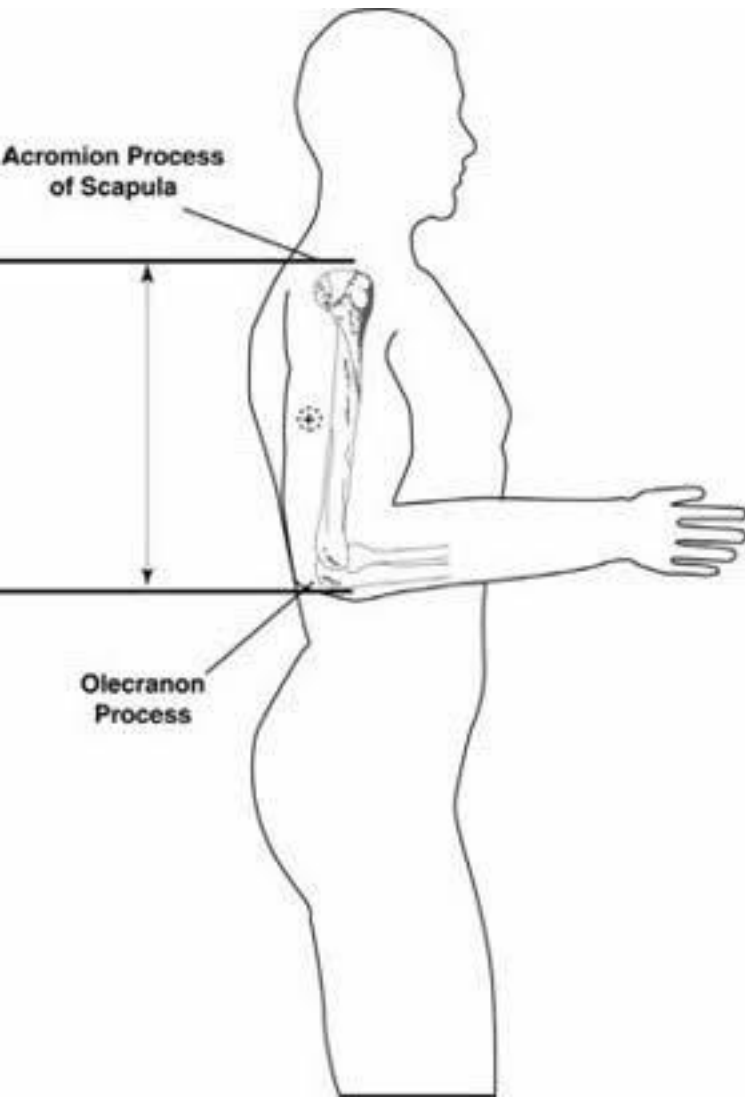
# Introduction

- **Malnutrition:** BMI < 18.5kg/m<sup>2</sup>
- MALNUTRITION: substantial socio-economic challenge
- Prevalence malnutrition **30 – 50%** in healthcare landscape
- Head injuries needs **≥ 140%** of normal metabolic expenditure
- Stroke victims risk of malnutrition higher at Day 10 than at admission
- TBI victims in ICU = 75% clinical markers of malnutrition at 3 weeks (Day 21)
- ESPEN guidelines calculation energy requirements = 25 – 30 Kcal/kg desirable weight/day



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# Introduction

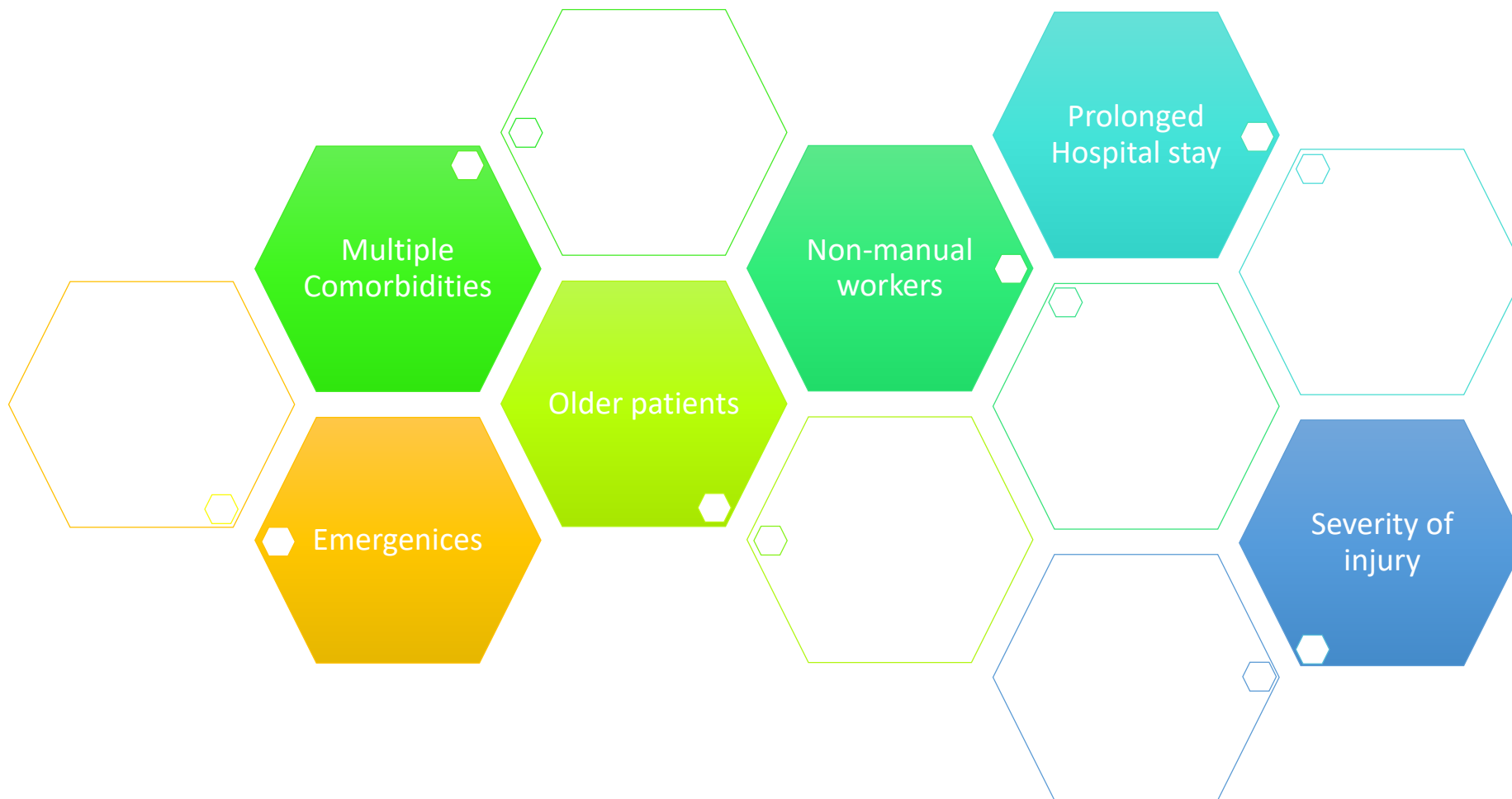


- BMI: Body mass index, objective indicator of generalized adiposity, anthropometric indicator for assessing nutritional status in adults
- **MUAC**: Mid-upper arm circumference
- PROBLEM: weighing & measuring bed ridden patients
- Strong correlation between MUAC & BMI for screening of undernourished adults



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# Risk Factors for Malnutrition



# What is the problem?

- Despite giving adequate nutritional support, TBI patients still waste away
- What factors contribute to or result in malnutrition in TBI patients admitted to CHBAH?



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# Classification of TBI

Modified Marshal CT grading system

Category of Diffuse Injury	Definition	Severity
I	No visible intracranial pathology	Mild
II	Cisterns present 0 – 5 cm midline shift Small, high or mixed density lesion < 25 cc	Moderate
III	Cisterns compressed or absent + I or II	Severe
IV	Midline shift > 5 mm + I, II or III	Severe
V	Any lesion surgical evacuated	Severe



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# Correlation BMI with MUAC

BMI Category	BMI (kg/m <sup>2</sup> )	MUAC cut-off (cm)
Severe Underweight	< 16	< 17
Underweight	< 18.5	< 22.5
Normal	18.5 – 24.9	22.5 - 27
Overweight	25.0 – 29.9	27.1 – 30.4
Obese	30.0 – 39.9	30.5 – 37
Morbidly obese	> 40	> 37



# Study Description

Prospective Longitudinal study

Objectives

Sample Size

Socio-demographic & clinical characteristics description

TBI characteristics on CTB

MUAC on day 1, 10, 21

Compare MUAC

Selective non-random sampling

All patients presenting to CHBAH with TBI



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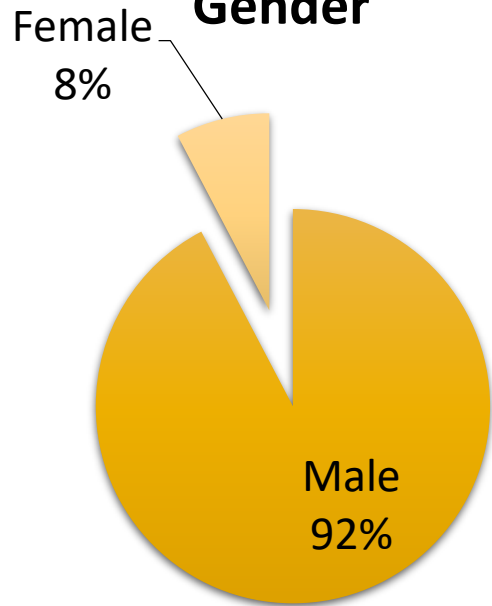
# Results

- Ongoing study
- **Provisional** results
- n = 13
- All African
- **ONLY** isolated TBI
- Average hospital stay **18.3 days**
- Feeds started on average on *day 1.6*
- Full feeds on day 3.6
- Average MUAC **25.8cm**, BMI of **27kg/m<sup>2</sup>** (overweight)
- **No** patients underweight or malnourished on admission
- 7 patients feeded parentally, & 8 orally
- Fresubin & FWD most used types of feeds
- 9 patients had multiple intracranial injuries

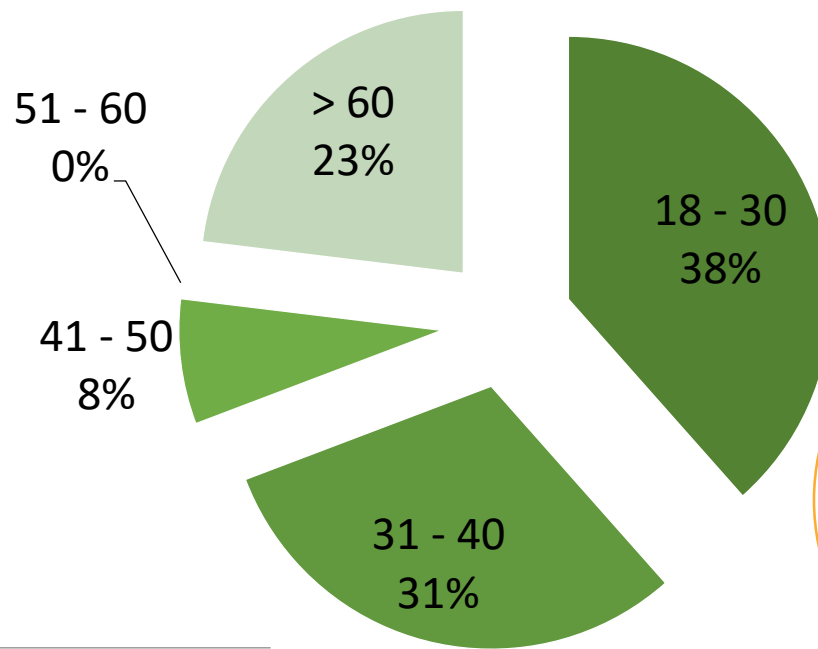


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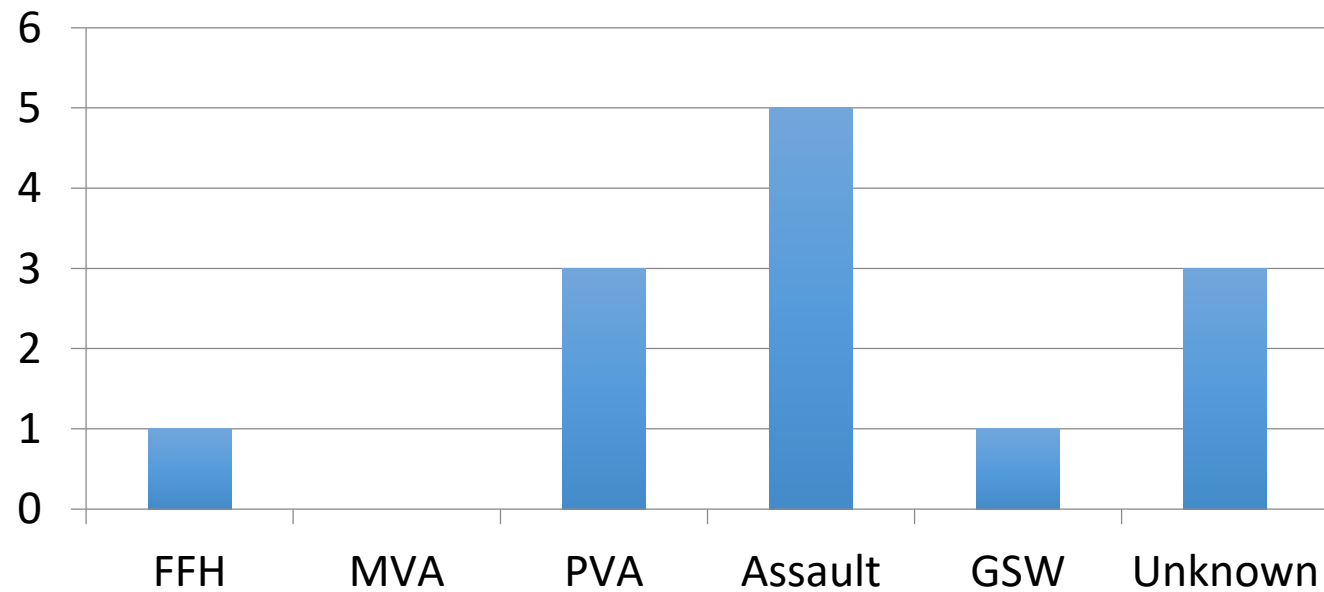
### Gender



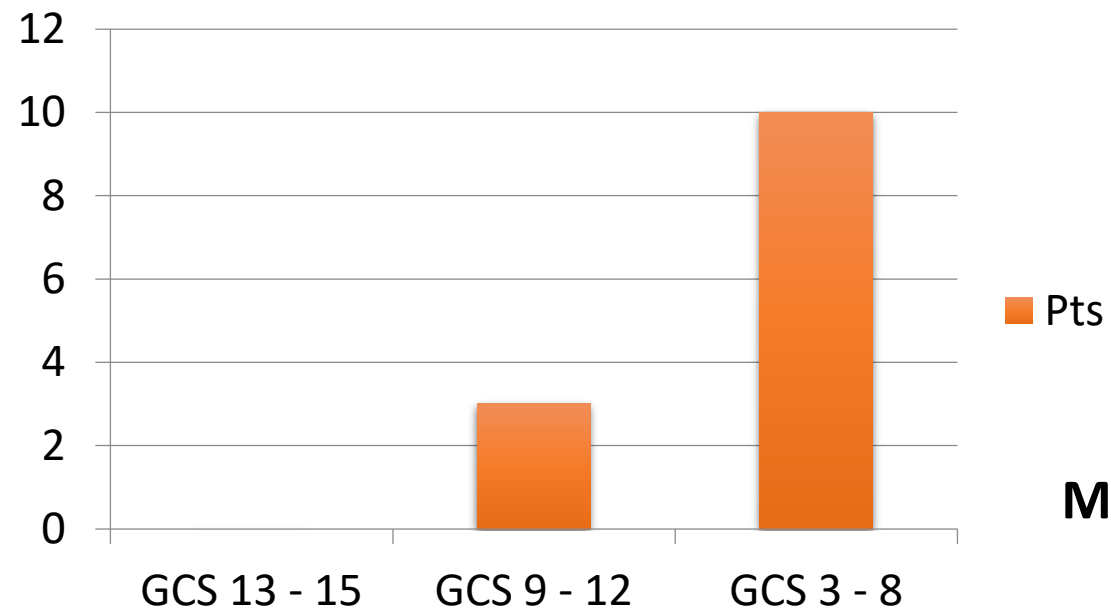
### Age



### Mechanism of Injury

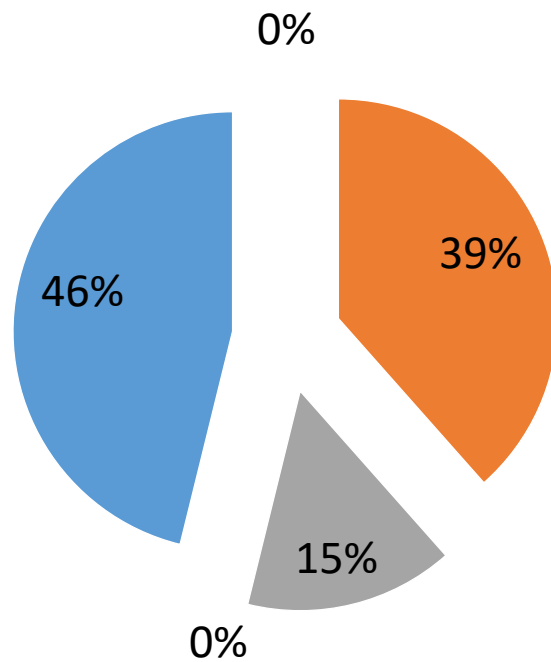


## Initial GCS



## Modified Marshall Grading

■ I ■ II ■ III ■ IV ■ V

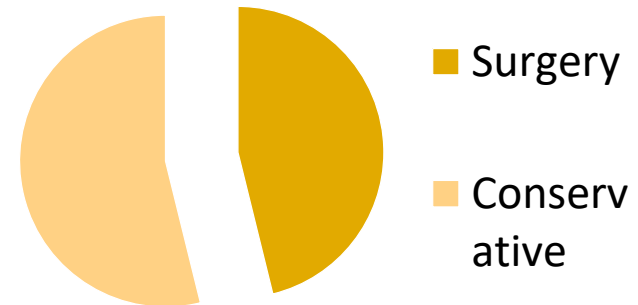


## Type of Injury

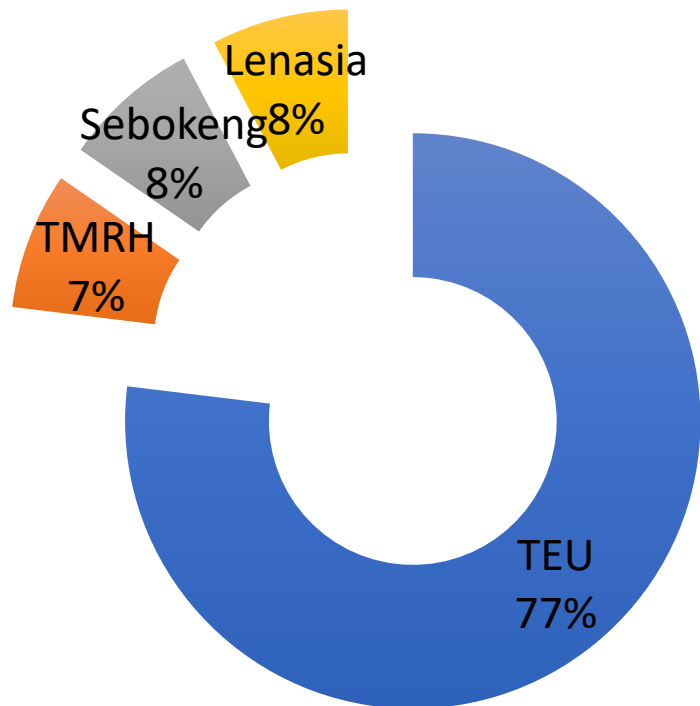


- SDH
- EDH
- ICH
- Cerebral Edema
- Contusions
- Skull fractures
- Pneumocephalus
- SAH

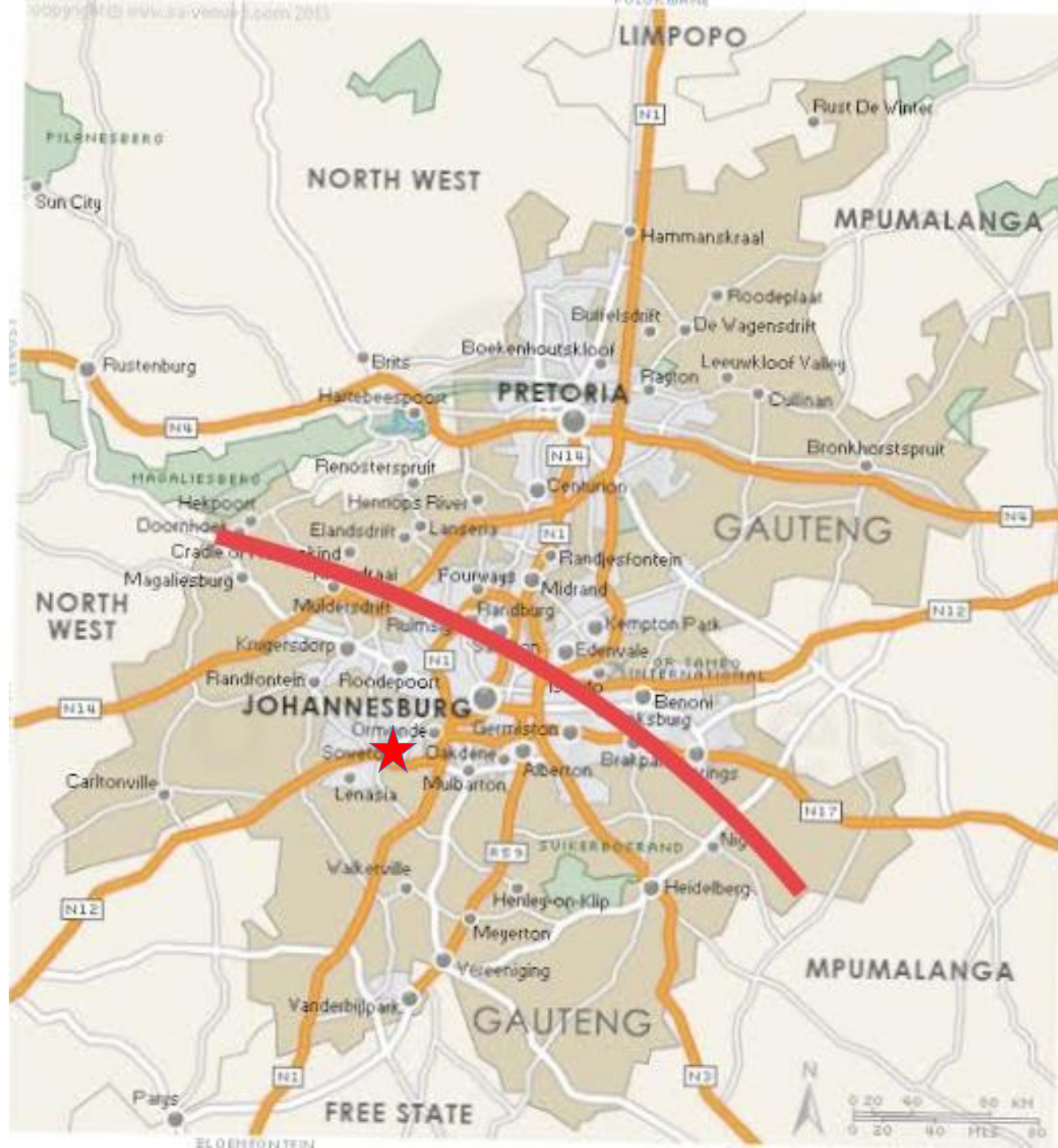
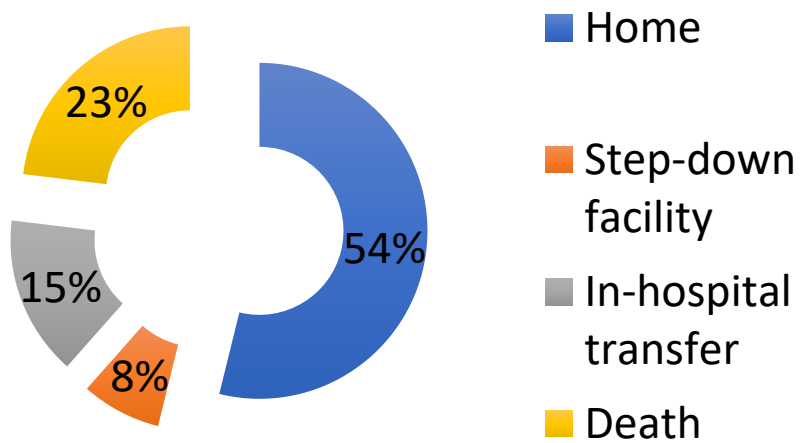
## Treatment



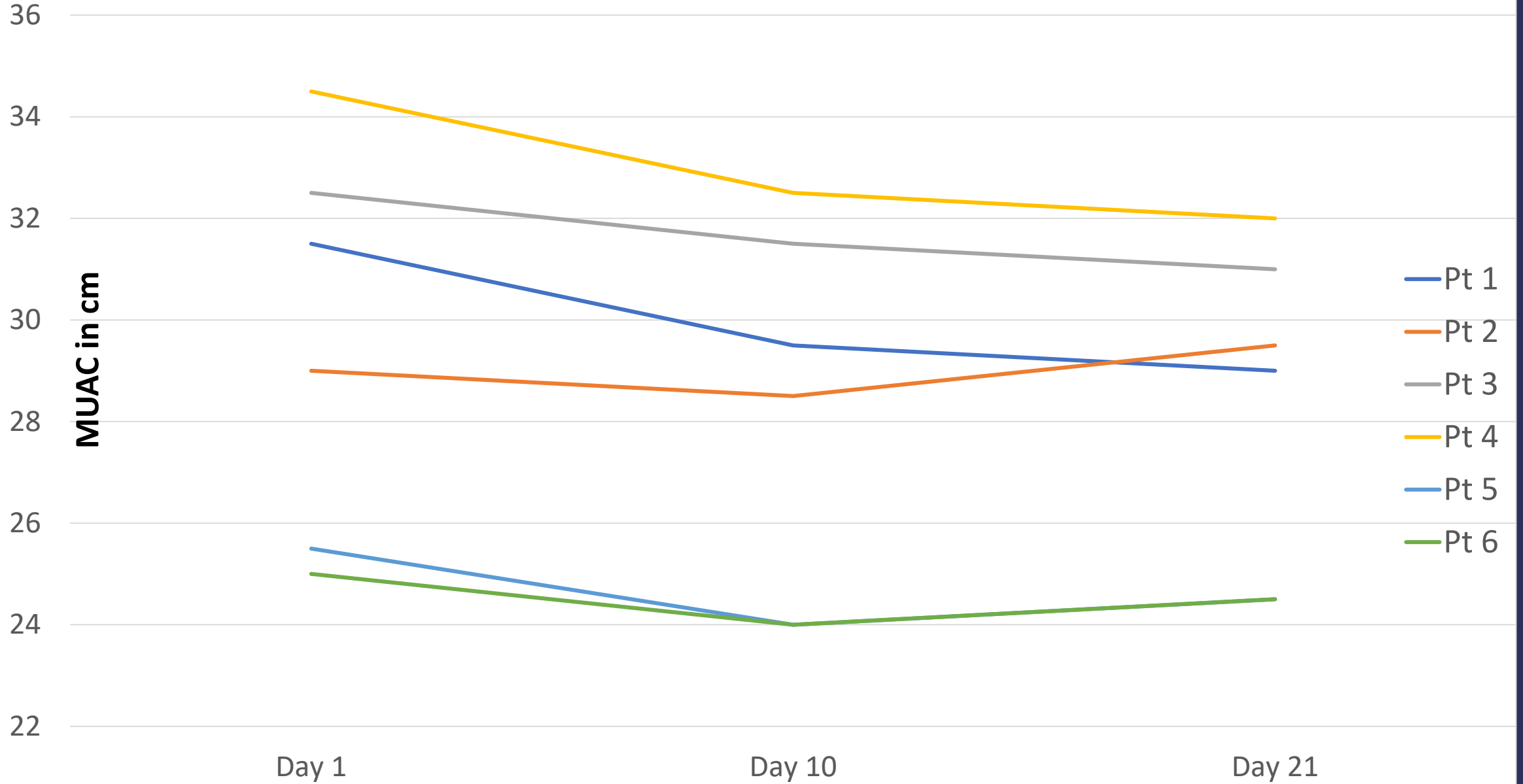
# Referrals



# Outcomes



# MUAC Trend





# Conclusion

- General downward trend in MUAC in 1<sup>st</sup> 10 days
- After day 10, in general patients on oral FWD started to gain weight again, compared to patients still on parenteral feeds, who continued to lose weight
- Patients classified as overweight, also continued to lose weight, possibly due to BME being calculated on ideal body weight & not actual body weight



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# Thank you

What do you call a  
walking, talking  
neurosurgical patient?

Pre-op.

