

# Grade V Subarachnoid Haemorrhage: A Single Centre Analysis of Patient Characteristics, Outcomes and Health Care Costs

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# Subarachnoid haemorrhage (SAH)



- Sub-class of stroke  $\approx 5\%$
- Incidence : 10.3 per 100,000 person years
- Hospital mortality : 29.2%
- Cost (1<sup>st</sup> year) : USD 41,000 - 65,900 (AUD 58,000 – 93,341)

Subarachnoid Hemorrhage Patients Admitted to Intensive Care in Australia and New Zealand:  
A Multicenter Cohort Analysis of In-Hospital Mortality Over 15 Years. [Andrew A. Udy et al](#)  
Critical Care Medicine 2017; 45: e138–e145

# Objectives: WFNS Grade-V SAH

- Demographics
- Length of stay ICU, Hospital
- Costs incurred in hospital
- Mortality: ICU, Hospital, 1Year
- Organ donation rates
- Functional outcomes

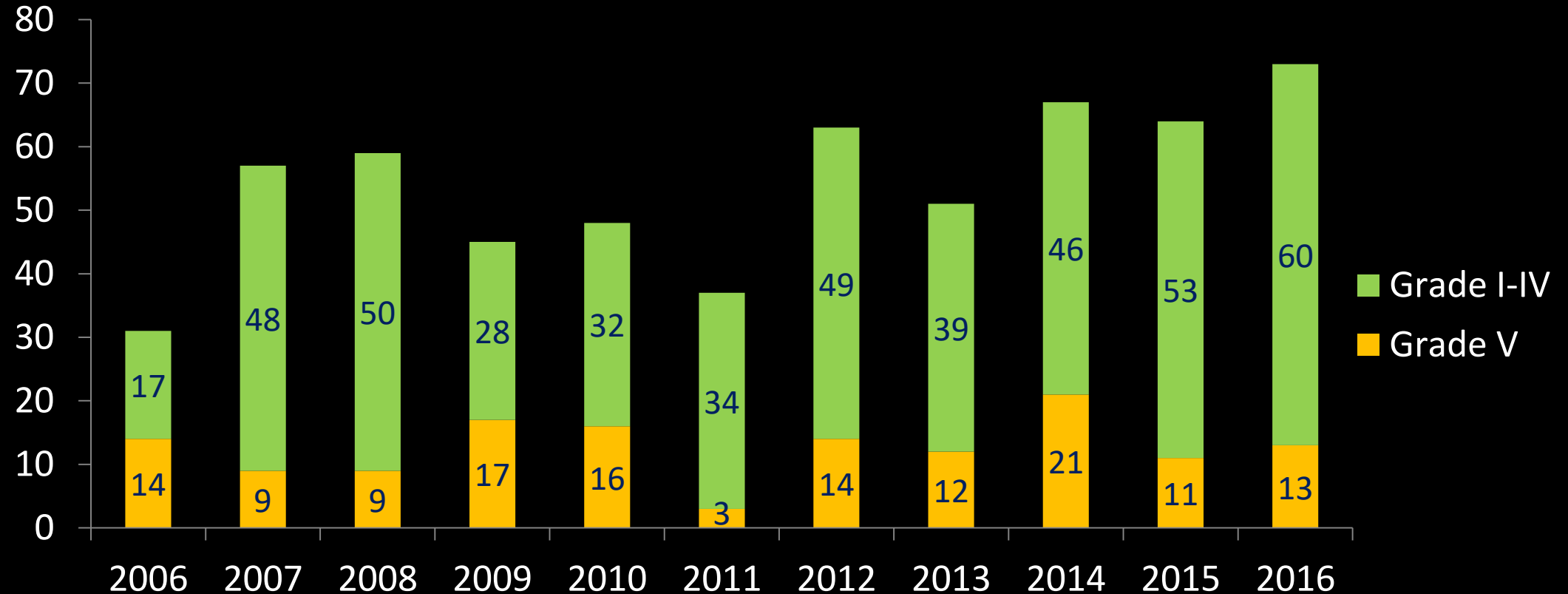
# Methods:

- ICU admissions with diagnosis of SAH , age  $\geq 16$
- 1 Jan 2006 to 31 Dec 2016
- WFNS Grade V = GCS  $\leq 6$
- Traumatic SAH excluded on CT scan review for Grade V
- Index admissions for given hospital episode only
- Databases: ANZICS APD, RAH, BIRU, BDM, Donate Life SA
- Comparisons made with Grade I-IV SAH (GCS  $> 6$ )

Ethics approval number: HREC/18/CALHN/229

Apache 3j diagnostic codes: 402, 1503

# Distribution of SAH 2006-2016:



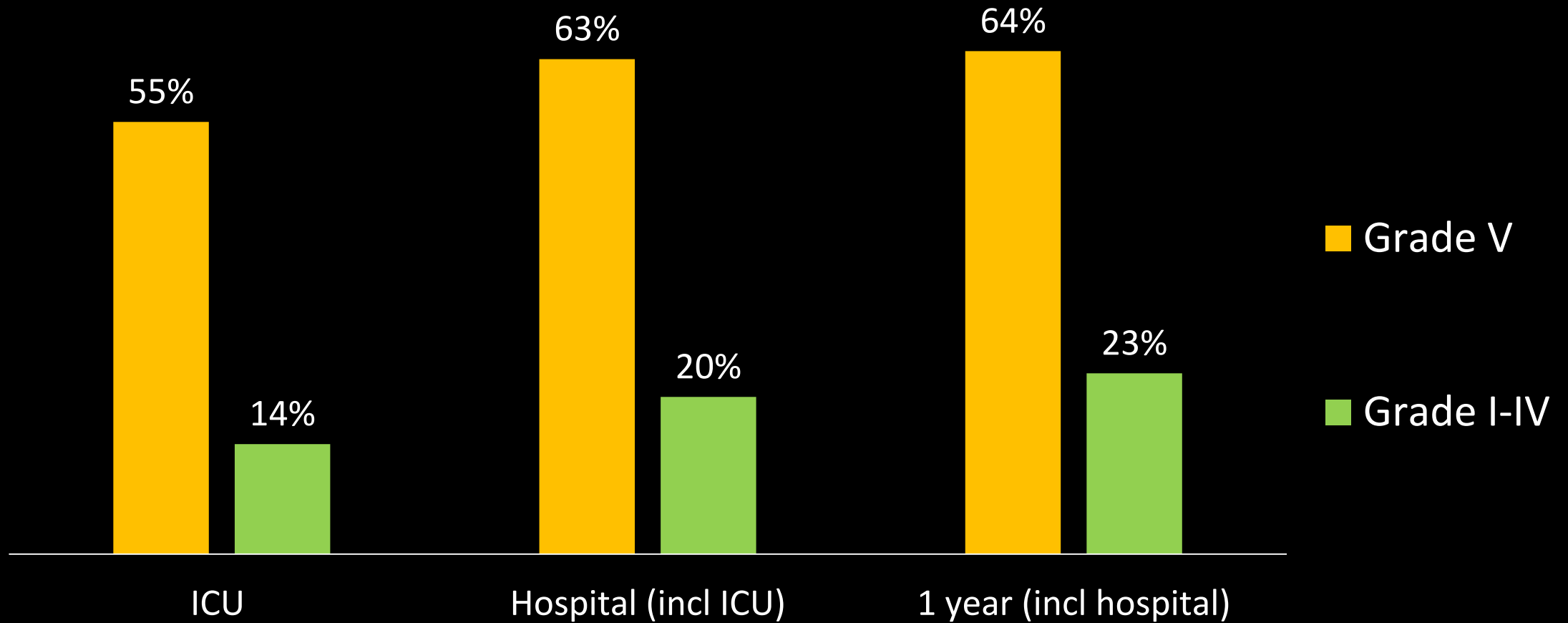
# Demographic Characteristics:

Characteristics	Grade V	Grade I-IV
Number (%) of Total=595	139 (23%)	456 (77%)
Males, N (%)	51 (37%)	187 (41%)
Age, Median [IQR]	56 [48,70]	58 [47,69]
Postsurgical admission, N (%)	14 (10%)	95 (21%)
Cardio-respiratory Arrest, N (%)	19 (14%)	10 (2%)
APACHE3 ROD: Median [IQR]	0.71 [0.54,0.83]	0.16 [0.07,0.33]

# Length of Stay, Costs:

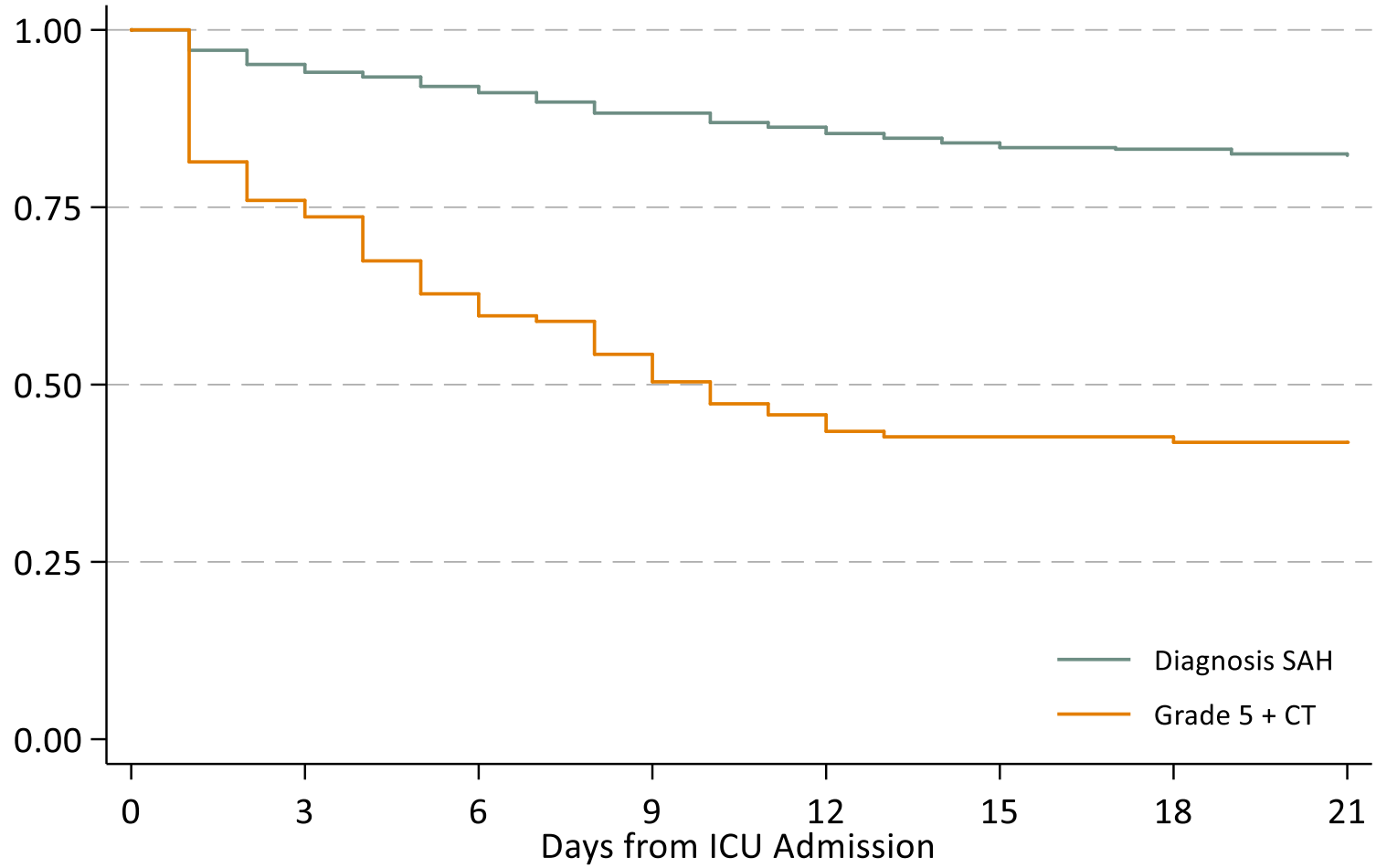
Characteristics	Grade V	Grade I-IV
Length of Stay (days) - ICU	5.47 [1.3, 11]	3.1 [1.7, 8.3]
Length of Stay (days) - Hospital	8.9 [1.8, 35]	17.7 [11, 28]
Total Hospital Costs (AUD)	\$41,824	\$42,278
Median [IQR]	[9,934 - 97,332]	[13,363 - 76,914]

# Mortality:



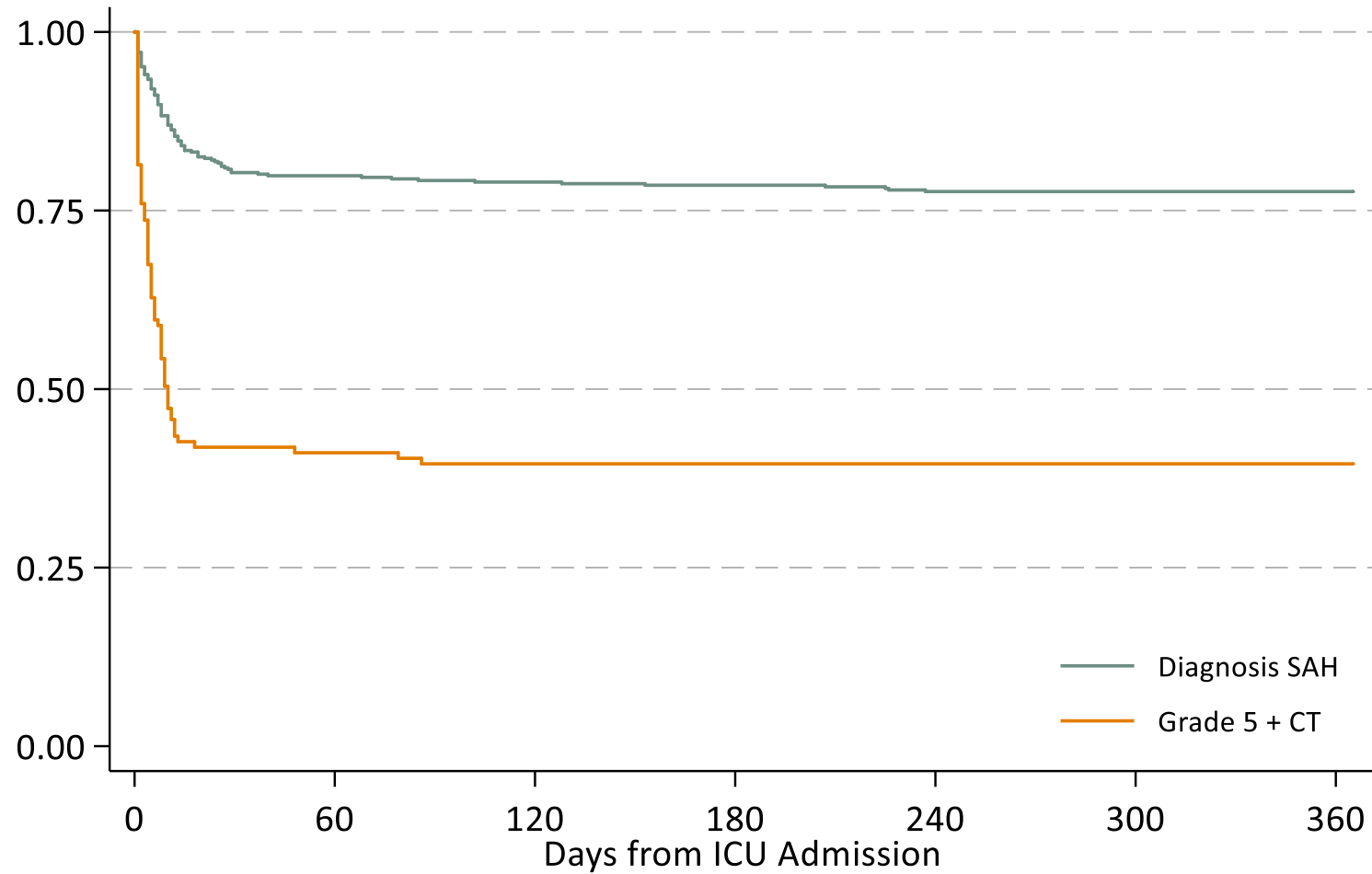


Survival Curves - SAH



Other SAH	452	430	416	399	390	380	376	373
Grade 5+CT	129	98	81	70	59	55	55	54

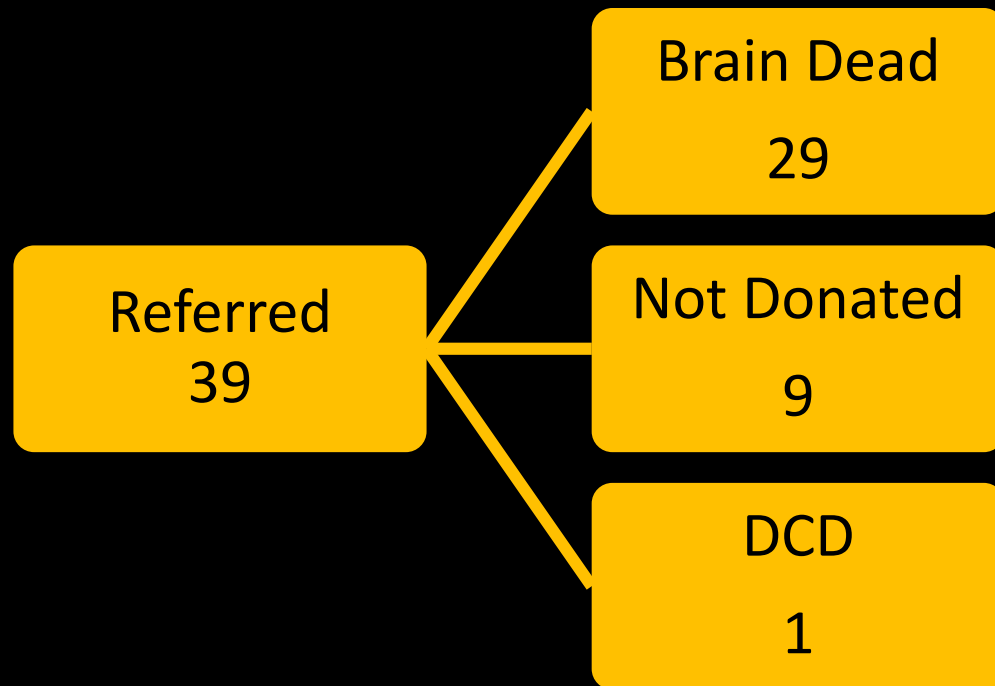
Survival Curves - SAH



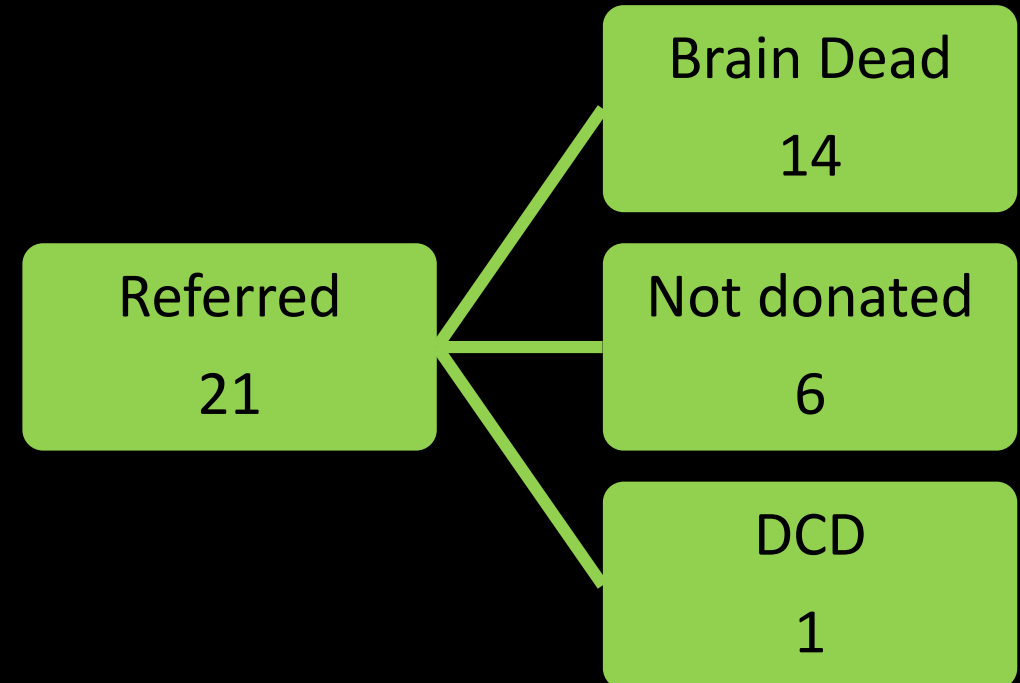
Other SAH	452	361	357	355	351	351	351
Grade 5+CT	129	53	51	51	51	51	51

# Organ Donation:

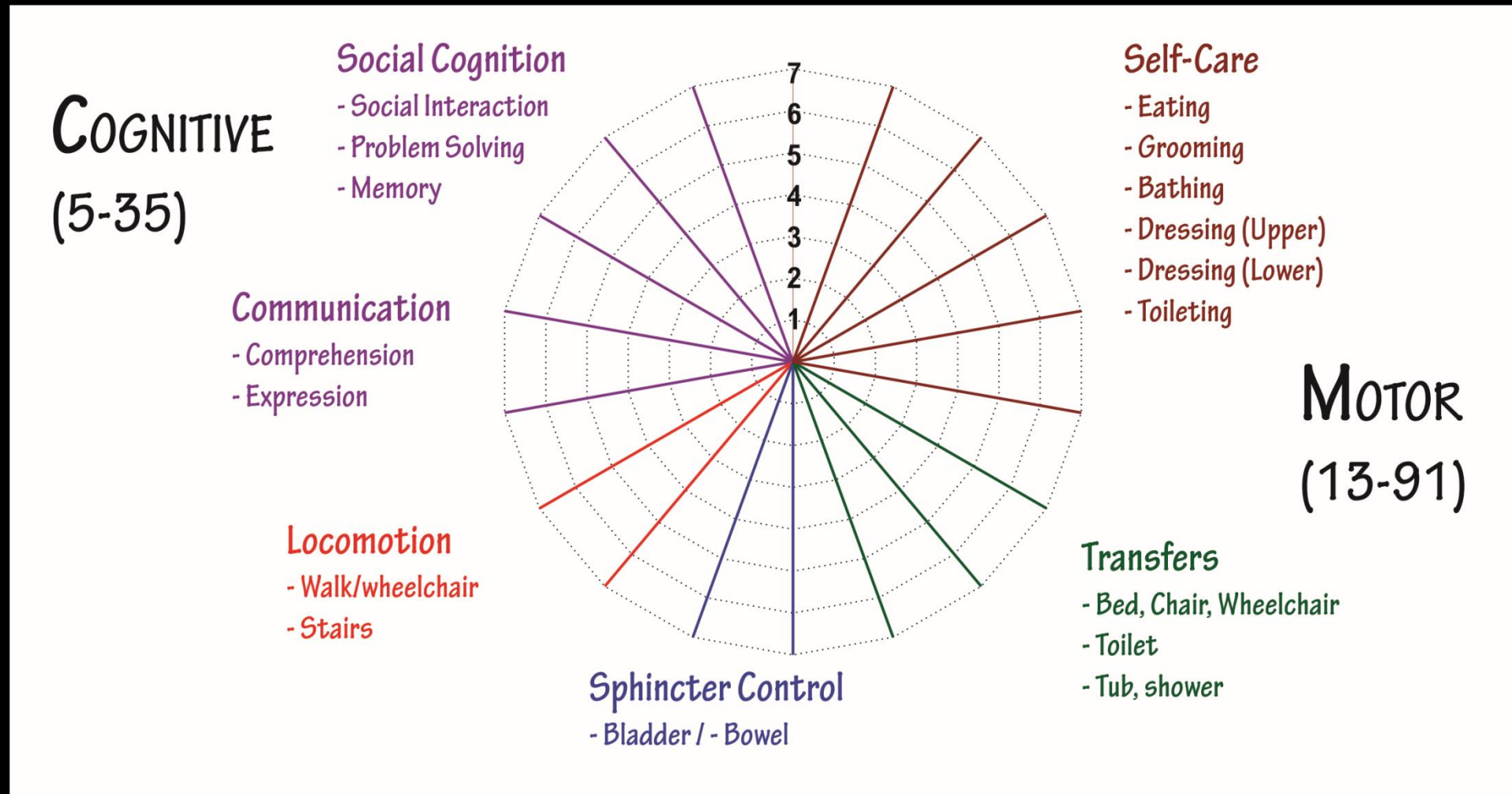
## Grade V



## Grade I - IV



# Functional Independence Measure (FIM) <sub>18-126</sub>



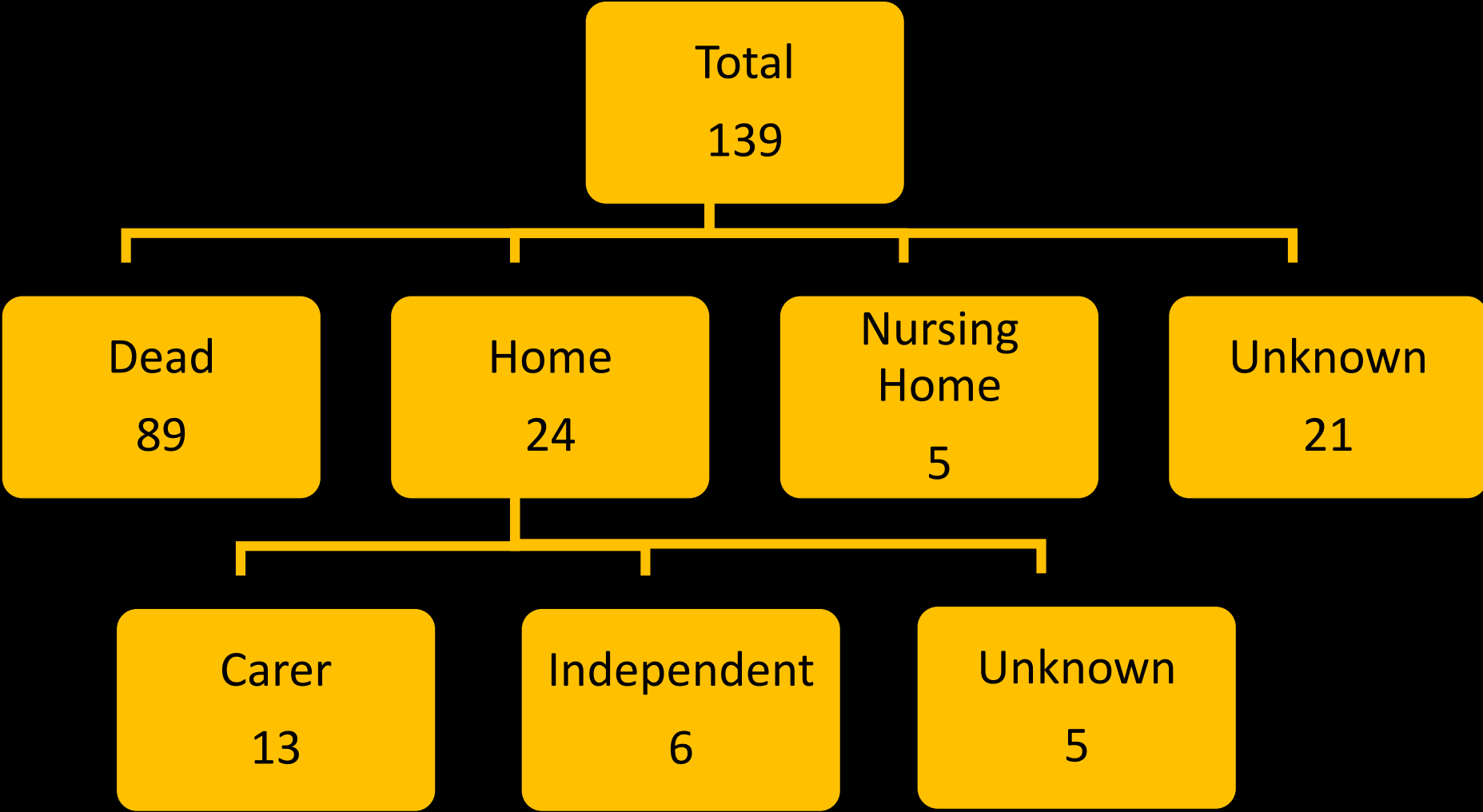
# Functional Outcomes: Grade V SAH

FIM, Median [IQR]	Admission	Discharge	FIM change
Motor	25 [13, 65]	74 [53, 83]	19 [9, 39]
Cognitive	20 [12, 24]	25 [19, 30]	5 [1, 11]
Total	44 [31, 91]	100 [80, 114]	25 [8, 51]

Adm/Dis FIM: > 80 – discharge to home (90%); <40 – discharge to Nursing home (70%)

FIM scores, FIM efficiency, and FIM discharge disposition following inpatient stroke rehabilitation. Kari. L Bottemiller et al. . Rehabilitation Nursing . Vol. 31, No.1 jan /Feb 2006

# Discharge Destination: Grade V SAH



## Strengths

- Only contemporary study
- In-hospital costs
- Wider societal benefit
- Discharge destination as outcome

## Limitations

- Retrospective
- Missing data
- CT confirmed Grade V not others
- No prediction model

# Conclusions: WFNS Grade V SAH

- 2/3 mortality at 1 year
- Most deaths in first 2 weeks in ICU
- In-hospital cost AUD 42,000/ person
- 22% organ donors - mostly brain dead
- 4% survived to independent living





Thank you

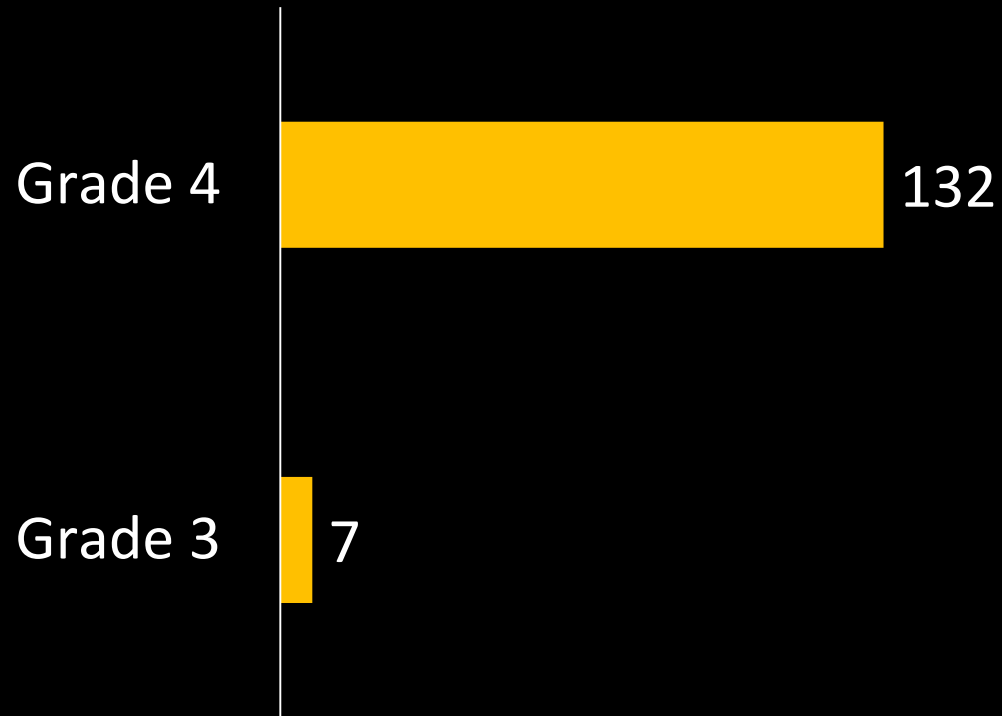
# Modified Fischer Grade for SAH

Grade	Initial CT scan finding
1	No blood visualized
2	A diffuse deposition or thin layer with all vertical layers of blood (interhemispheric fissure, insular cistern, ambient cistern) less than 1 mm thick
3	Localized clots and/or vertical layers of blood 1 mm or greater in thickness
4	Diffuse or no subarachnoid blood, but with intracerebral or intraventricular clots

Higher grade predicts increased risk of vasospasm and poor outcome

# CT Scan review: Grade V SAH

Modified Fisher Grade



WFNS Grade V SAH

