



Long-Term Functional Outcome and Health-Related Quality of Life in ICH

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Health Outcomes in Cerebrovascular Disease Treatment Studies



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Background/Aim

Recovery in intracerebral hemorrhage (ICH) is prolonged (6-12 months) and unpredictable, resulting in challenges in estimating long-term functional outcomes and health-related quality of life (HRQoL) in the acute phase.

Aim: To evaluate functional outcomes, patient-generated HRQoL and patient disposition for ICH survivors.



Methods

A matched cohort analysis using a *modified* severity index¹ (mSI) score and clinical characteristic coefficients was performed to compare ICH survivors with patients who had WoLST.

Multivariable logistic regression (MLR) was used adjusting for *6 pre-specified variables*:

- Age
- Glasgow Coma Scale (GCS)
- deep ICH location
- ICH volume (mL)
- IVH volume (mL)
- ≥ 3 comorbidities (*renal failure, diabetes, hypertension, cardiovascular disease, hyperlipidemia and current tobacco use*)²

mRS and EuroQoL (EQ) visual analog scale (VAS) scores were compared by mSI coefficients at days 30, 180 and 365.

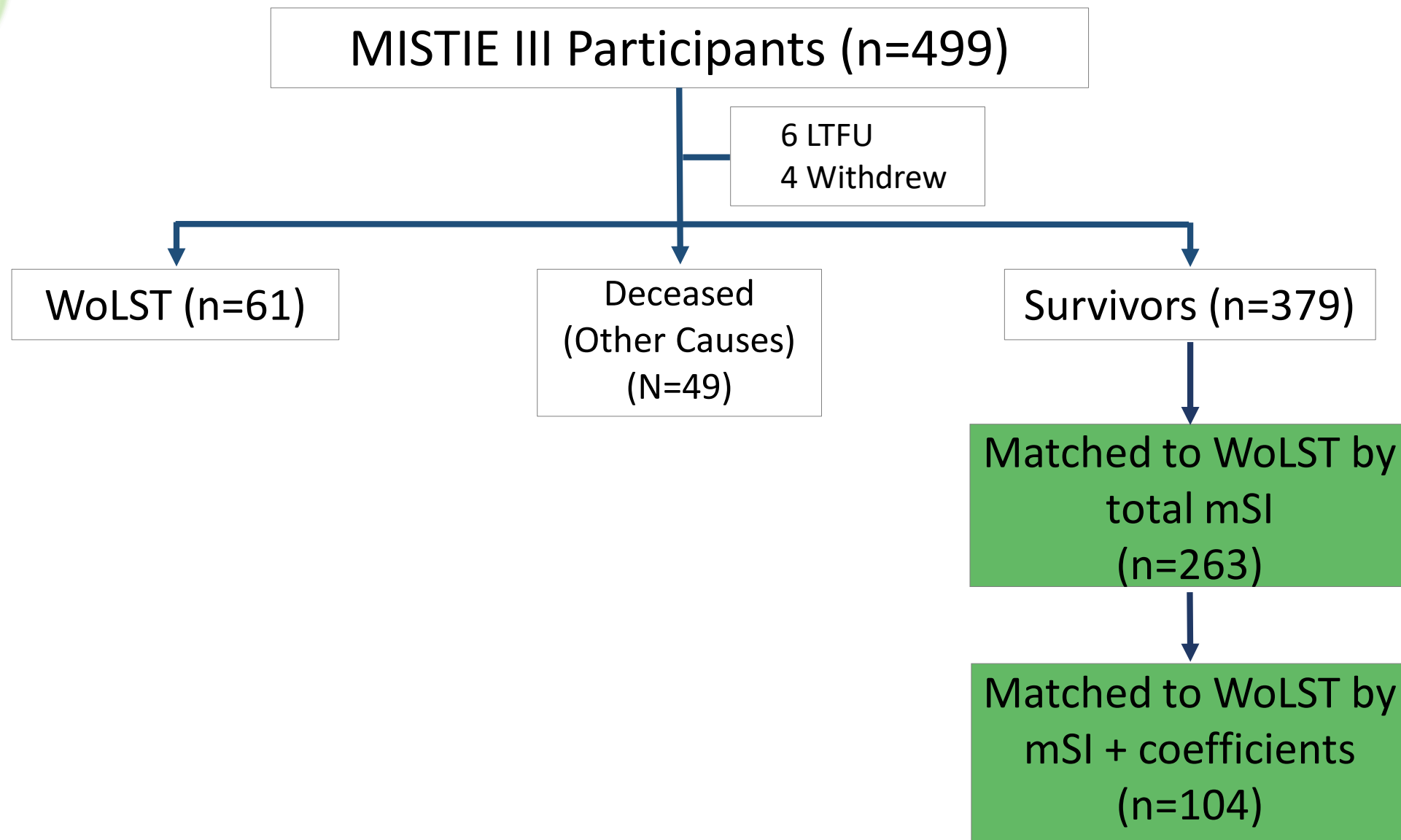
¹ Hanley DF, et al. Lancet 2019; 393: 1021–32. [supplemental appendix]; ² Hemphill et al., 2004



Functional Outcome



CONSORT Flow Diagram





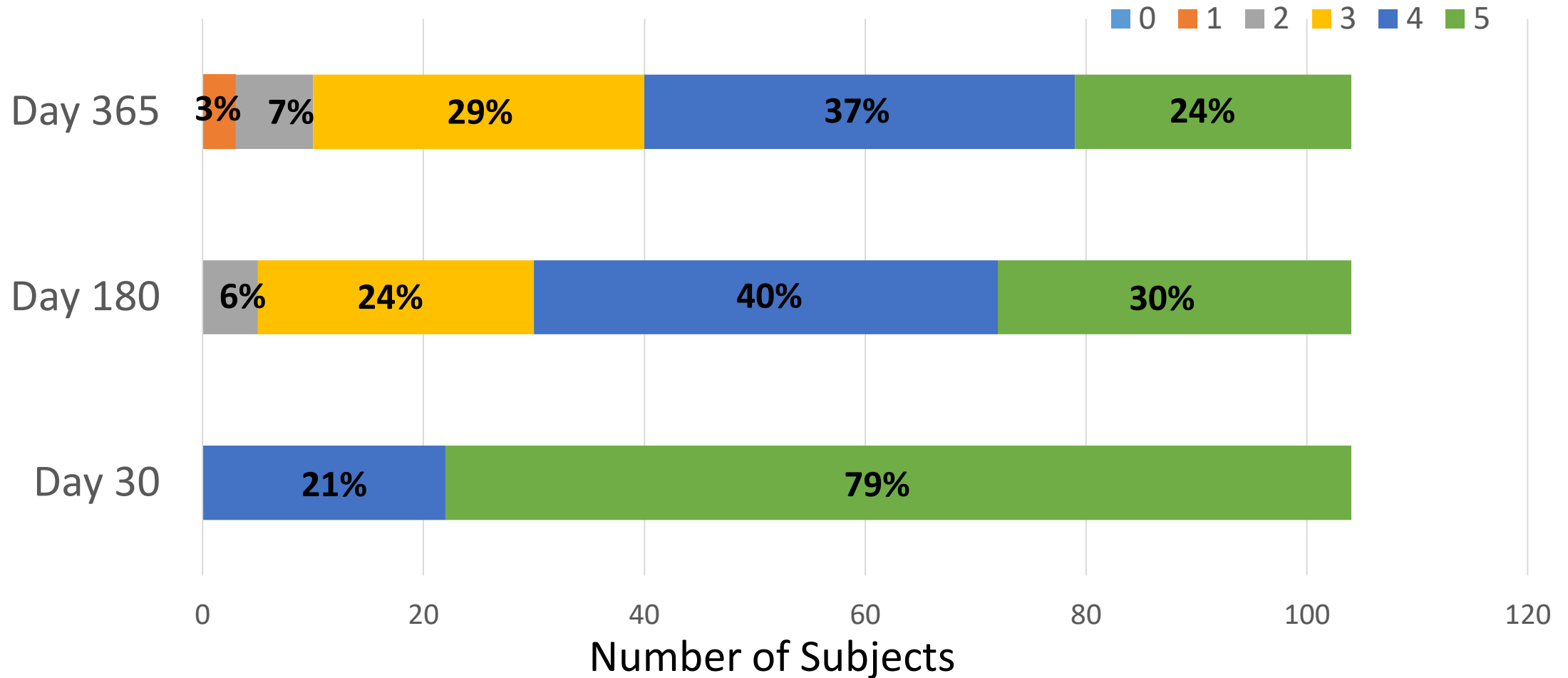
Clinical Characteristics for mSI Model

Disease Characteristics	WoLST (N=61)	Survivors (N=104)	P-value
Age at consent, years			
<56 years	9 (14.8%)	25 (24.0%)	0.357
56-66 years	15 (24.6%)	24 (23.1%)	
≥67 years	37 (60.7%)	55 (52.9%)	
GCS at randomization			
3-8 (severe)	23 (37.7%)	33 (31.7%)	0.735
9-12 (moderate)	27 (44.3%)	50 (48.1%)	
13-15 (mild)	11 (18.0%)	21 (20.2%)	
Stability ICH > 45 mL	50 (82.0%)	82 (78.9%)	0.629
Stability IVH > 0.4 mL	37 (60.7%)	60 (57.7%)	0.709
≥3 comorbidities	29 (47.5%)	31 (29.8%)	0.022
ICH location: deep	32 (52.5%)	59 (56.7%)	0.594



Results

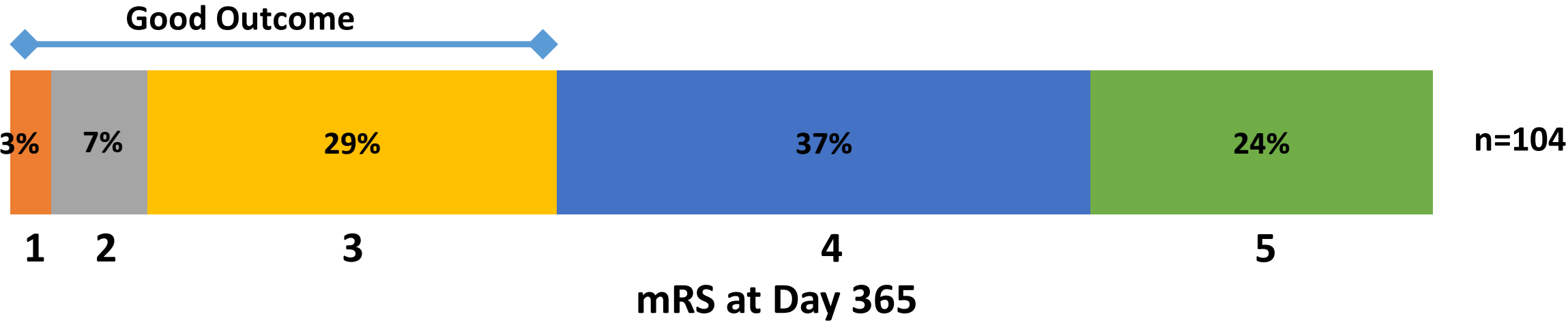
Matched Cohort Survivors by mRS Categories 0-5 by follow-up visit (n=104)





Results

Disposition at Day 365

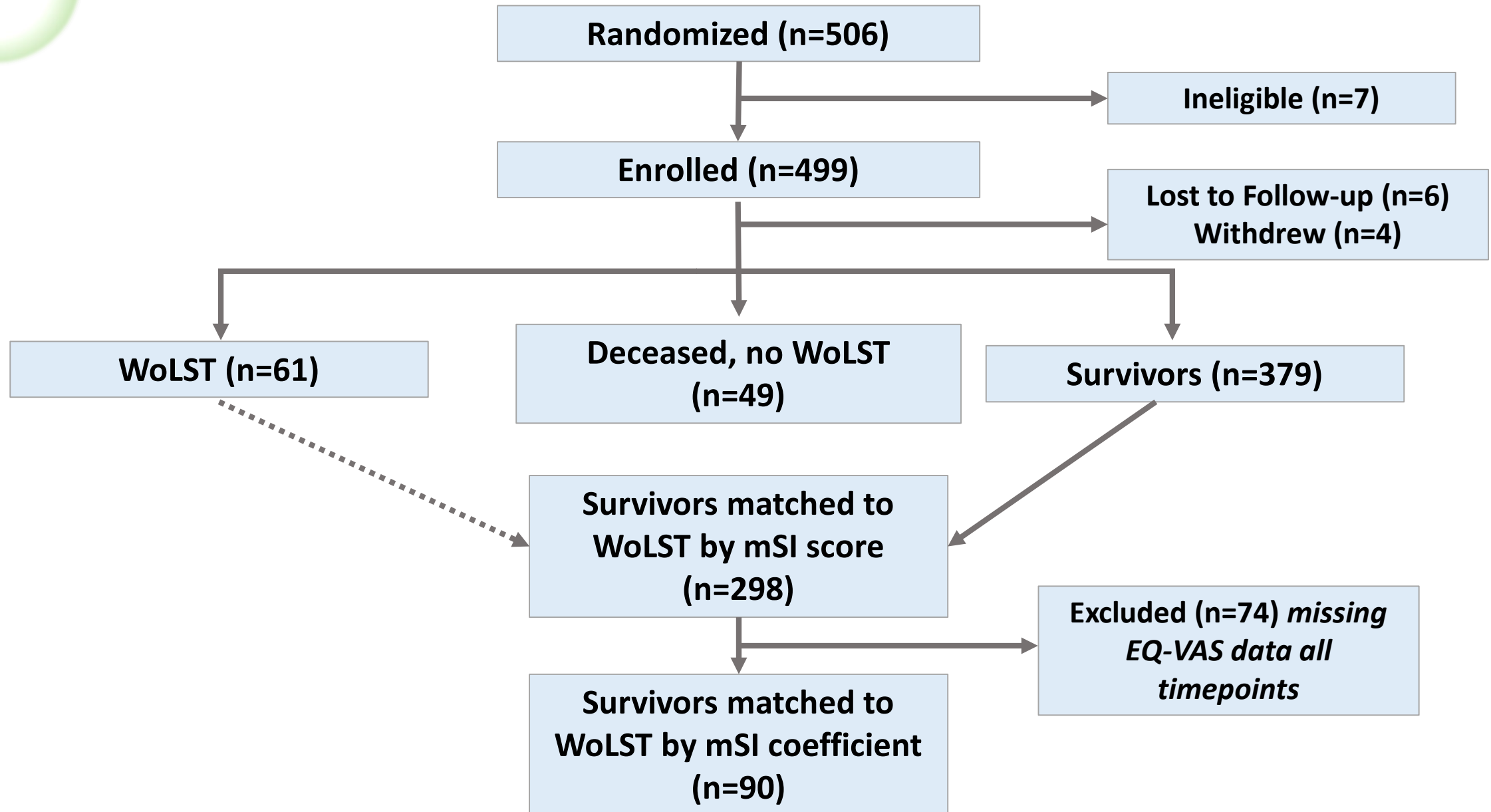




HRQoL and Patient Disposition



CONSORT Flow Diagram

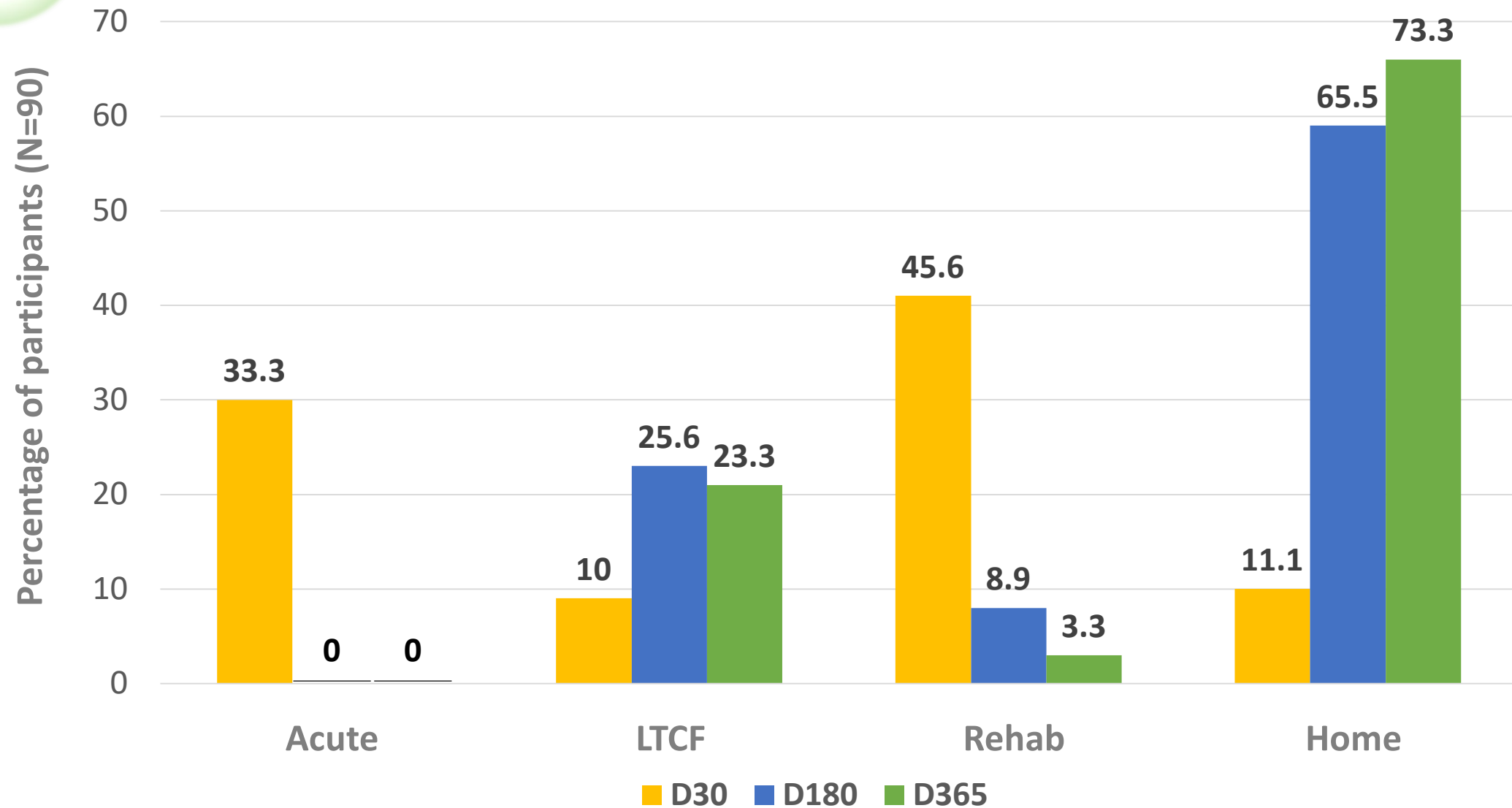


Baseline Characteristics

Disease Characteristics	Deceased, No WoLST (N=49)	WoLST (N=61)	Survivors (N=90)	p-value
Age at consent, years				
<56 years	10 (20.4%)	9 (14.8%)	18 (20.0%)	0.678
56-66 years	16 (32.6%)	15 (24.6%)	24 (26.7%)	
≥ 67 years	23 (46.9%)	37 (60.7%)	48 (53.3%)	
GCS at randomization				
3-8 (severe)	16 (32.6%)	23 (37.7%)	18 (20.0%)	0.099
9-12 (moderate)	25 (51.0%)	27 (44.3%)	46 (51.1%)	
13-15 (mild)	8 (16.3%)	11 (18.0%)	26 (28.9%)	
Stability ICH ≥ 45 mL	33 (67.3%)	50 (82.0%)	62 (68.9%)	0.136
Stability IVH ≥ 0.4 mL	32 (65.3%)	37 (60.7%)	52 (57.8%)	0.686
≥ 3 comorbidities	22 (44.9%)	29 (47.5%)	30 (33.3%)	0.168
ICH deep location	34 (69.4%)	32 (52.5%)	43 (47.8%)	0.047

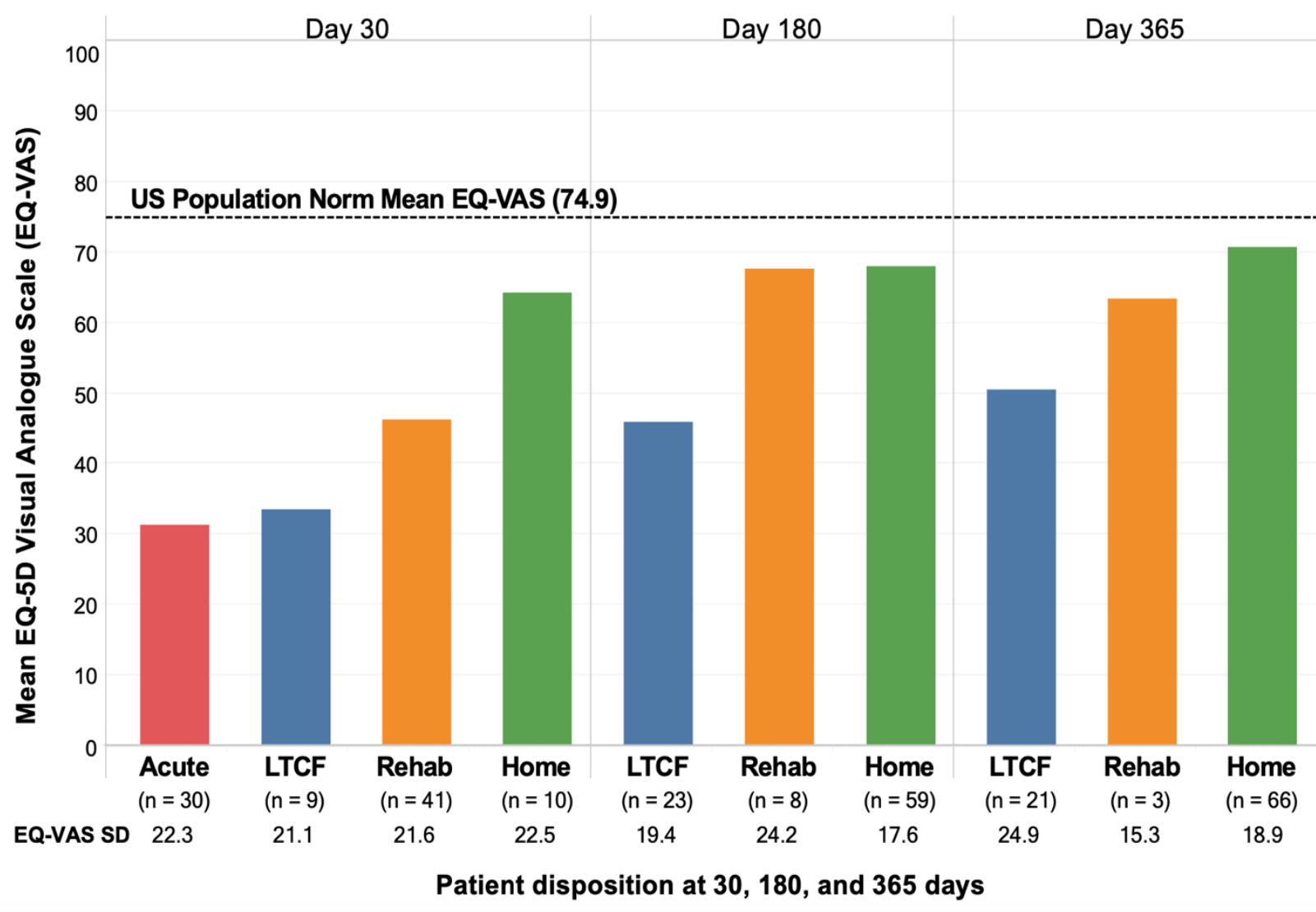


Survivor Disposition by Day 365



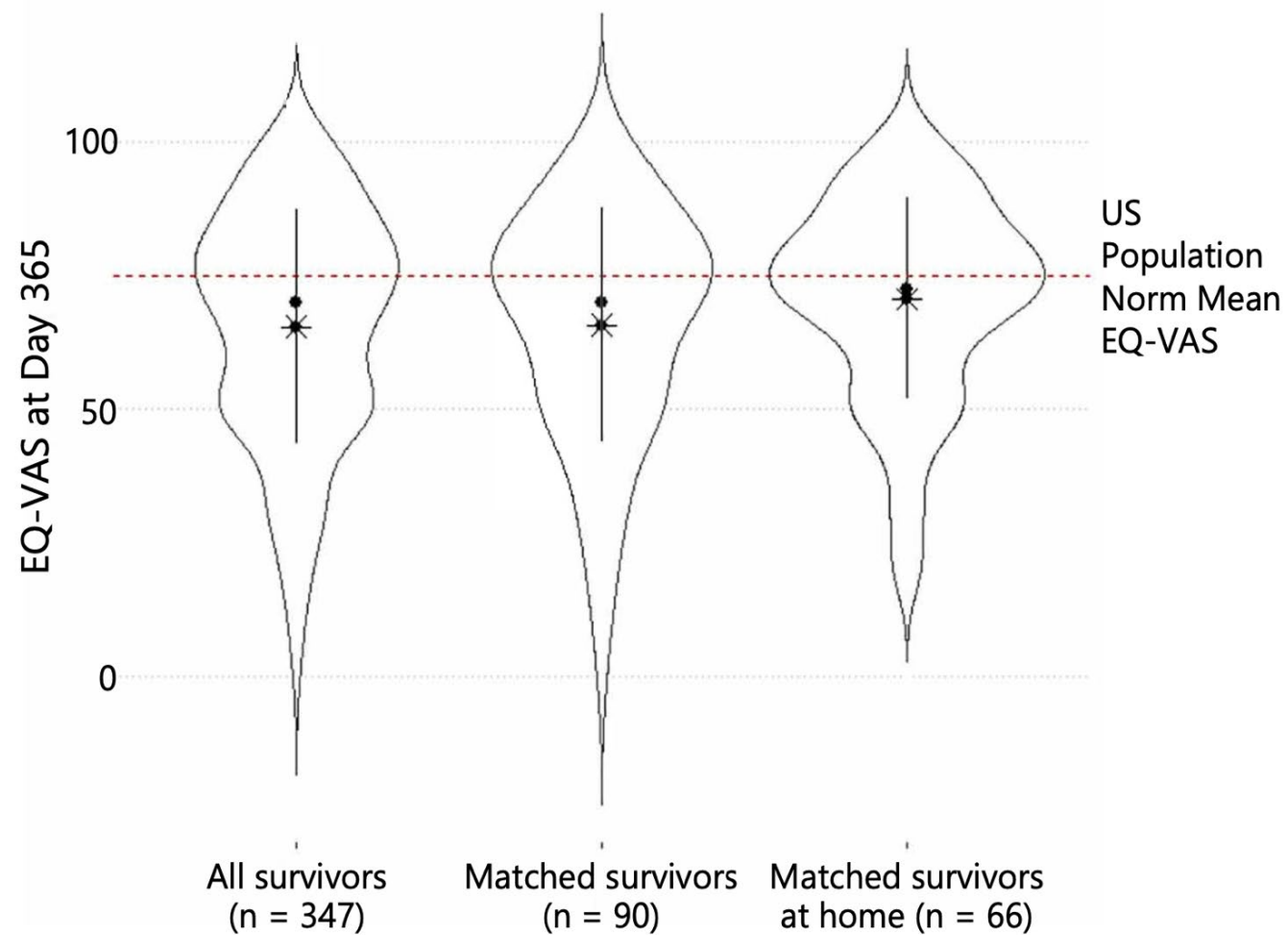


Disposition and EQ-VAS by Timepoint





EQ-VAS at Day 365



WoLST Decision-Making

Reason	Number (%) Citing Reason for WoLST
prior statement, brain death	1 (1.6%)
living will	2 (3.3%)
living will, dependent outcome anticipated	2 (3.3%)
living will, dependent outcome anticipated , prior statement	3 (4.9%)
dependent outcome anticipated	18 (29.5%)
dependent outcome anticipated , prior statement	15 (24.6%)
prior statement	11 (18.0%)
other	9 (14.8%)

How did “*dependent outcome anticipated*” influence decision-making for WoLST?

Reason	Number (%) Citing Reason for WoLST
dependent outcome anticipated	38 (62%)



Conclusion

ICH survivors, who were statistically comparable to ICH patients who had WoLST demonstrated improvement in functional outcome and HRQoL over time, and the majority returned home by 1 year.

To understand the recovery trajectory of patients with ICH, functional outcome and patient-reported HRQoL should be measured at 365 days or possibly 180 days in ICH treatment studies.



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