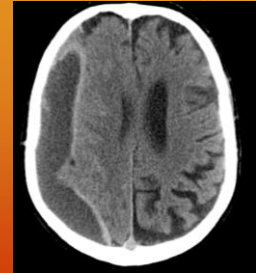


## Outcome of Subdural Hematoma Evacuation in Patients above 70 Years

Bethwel Raore MD  
Resident  
Emory University

## Case

88 yo Male with two day history of transient confusion.  
PMHx: Afib, HTN, pacemaker  
Meds: Coumadin, Sotolol  
Labs: Corrected INR 1.46  
Exam: Mild L pronator drift



## Assessing Neurological Status

### Markwalder Grading Scale

MGS score	Neurological status
0	Neurologically intact
1	Alert and oriented; mild symptoms such as headache; absent or mild neurological deficit, such as reflex asymmetry
2	Drowsy or disoriented with variable neurological deficit, such as hemiparesis
3	Stuporous but responding appropriately to noxious stimuli; severe focal signs such as hemiplegia
4	Comatose with absent motor responses to painful stimuli; decerebrate or decorticate posturing

Markwalder TM, Steinsiepe KF, Rohner M, Reichenbach W, Markwalder H. The course of chronic subdural hematomas after burr-hole craniotomy and closed-system drainage. *J Neurosurg.* 1981;55:390-396

## Assessing Functional Status

### Glasgow Outcome Scale

GOS Score	Functional Status
5	Resumption of normal life; there may be minor neurologic and/or psychological deficits
4	Able to work in a sheltered environment and travel by public transportation
3	Dependent for daily support by reason of mental or physical disability or both
2	Unresponsive for weeks or months or until death
1	Death

## Patient Demographics

Average age: 79.8 (range 70-94)	Pre-admission Residence	Home	41 (91%)
Patients Age 70-79	25 (56%)	Nursing Home	2 (4%)
Age 80-89	17 (38%)	Rehab Facility	1 (2%)
Age >90	3 (7%)	Unknown	1 (2%)
Male 33 (73%)	Female 12 (27%)	Discharge Location	Home 20 (44%)
Patient's Initial MGS score	Score 0-1	15 (36%)	Rehab Facility 13 (29%)
Score 2	16 (36%)	Nursing Home	3 (7%)
Score 3-4	13 (29%)	Hospice	6 (13%)
Craniotomy Patients	16 (35%)	Death	3 (7%)
Burr hole Patients	29 (65%)		
aSDH patients	9 (20%)	Study Period:	July 2010 to March 2012
cSDH patients	19 (42%)	Inclusion Criteria:	Age 70 and over
a/cSDH patients	17 (38%)	Statistics:	Mean
Patients on anticoagulation	Aspirin 14 (32%)		CI 95% with alpha set at 0.05
Coumadin	9 (20%)		two-tailed students T test
Multi-drug	5 (11%)		
Total	28 (60%)		
None	17 (38%)	Data Source:	EUH and Clinic chart with f/up period 3-6 weeks.
Patient Comorbidities	Type II DM	13 (29%)	
Stroke	4 (9%)		
Dementia	6 (13%)		
HTN	33 (73%)		
CAD	10 (22%)		
CHF	6 (13%)		
Atrial Fib	11 (24%)		

Change in neurological and functional status from admission to follow up

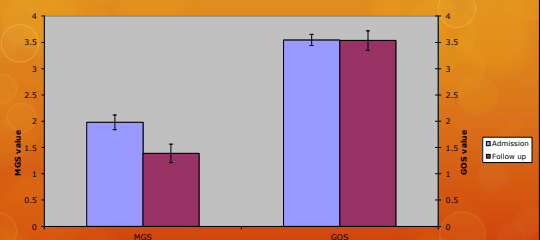


Figure 1. Change in neurological and functional status from admission to follow up. Admission and follow up MGS (mean 1.98, CI 95%: 0.28 vs. 1.39, CI 95%: 0.35;  $P=0.005$ ). Admission and follow up GOS (mean 3.55, CI 95%: 0.21 vs. 3.53, CI 95%: 0.37;  $P=0.96$ )

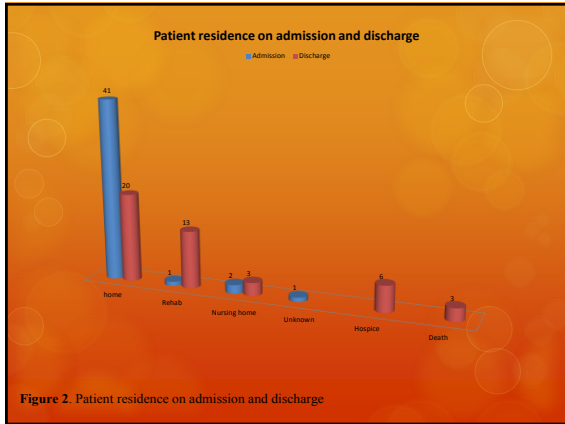


Figure 2. Patient residence on admission and discharge

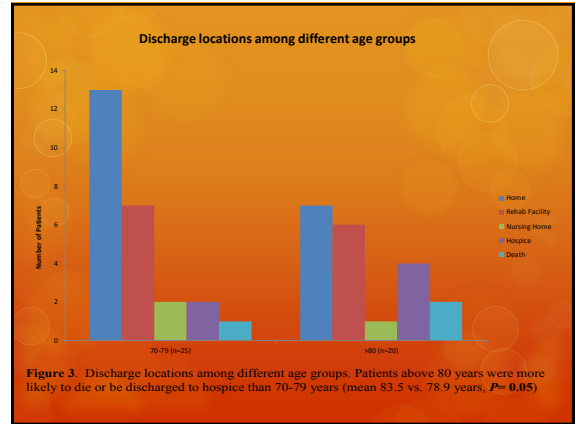


Figure 3. Discharge locations among different age groups. Patients above 80 years were more likely to die or be discharged to hospice than 70-79 years (mean 83.5 vs. 78.9 years,  $P=0.05$ )

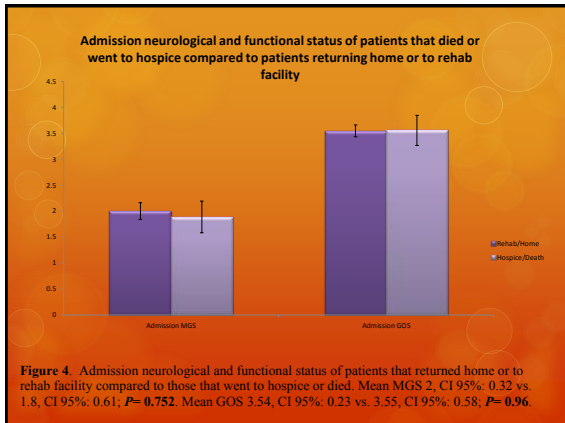


Figure 4. Admission neurological and functional status of patients that returned home or to rehab facility compared to those that went to hospice or died. Mean MGS 2, CI 95%: 0.32 vs. 1.8, CI 95%: 0.61;  $P=0.752$ . Mean GOS 3.54, CI 95%: 0.23 vs. 3.55, CI 95%: 0.58;  $P=0.96$ .

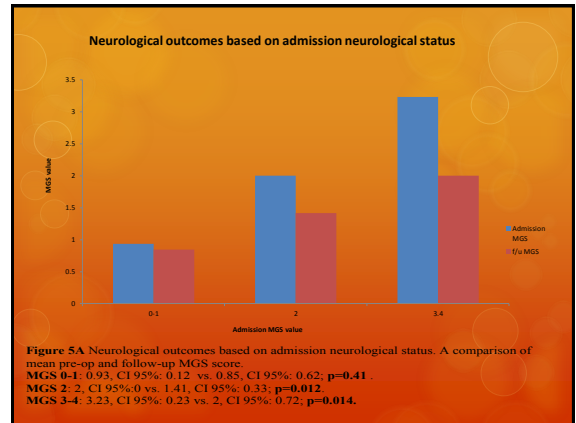


Figure 5A Neurological outcomes based on admission neurological status. A comparison of mean pre-op and follow-up MGS score. MGS 0-1: 0.93, CI 95%: 0.12 vs. 0.85, CI 95%: 0.62;  $p=0.41$ . MGS 2: 2, CI 95%: 0 vs. 1.41, CI 95%: 0.33;  $p=0.012$ . MGS 3-4: 3.23, CI 95%: 0.23 vs. 2, CI 95%: 0.72;  $p=0.014$ .

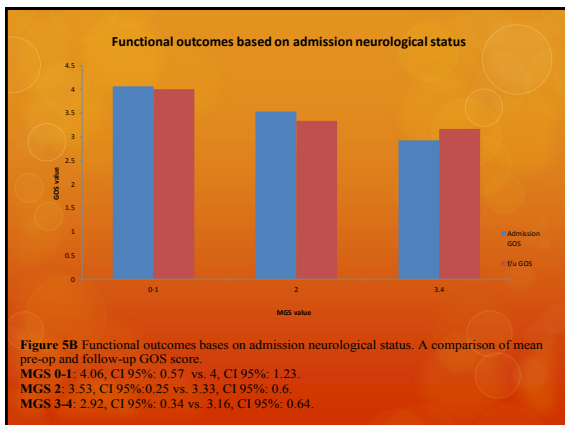


Figure 5B Functional outcomes based on admission neurological status. A comparison of mean pre-op and follow-up GOS score. MGS 0-1: 4.06, CI 95%: 0.57 vs. 4, CI 95%: 1.23. MGS 2: 3.53, CI 95%: 0.25 vs. 3.33, CI 95%: 0.6. MGS 3-4: 2.92, CI 95%: 0.34 vs. 3.16, CI 95%: 0.64.

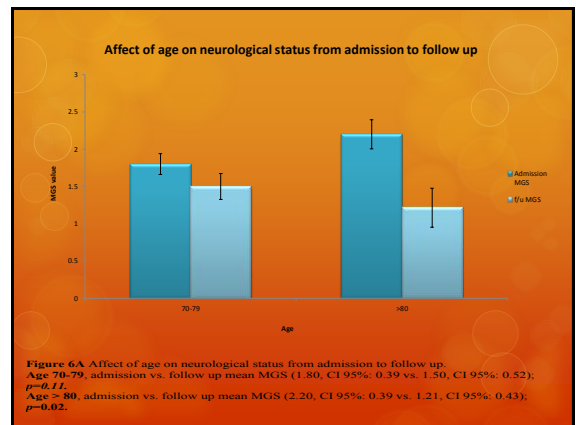
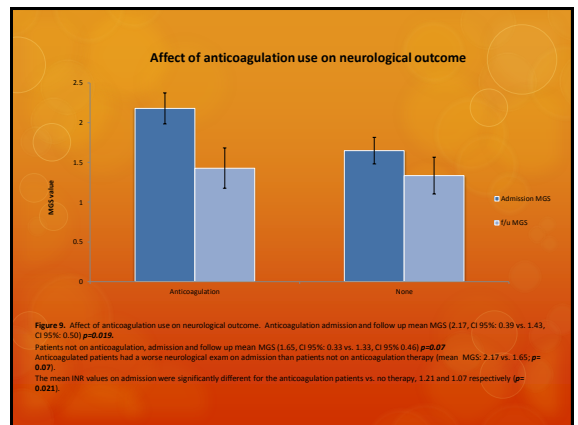
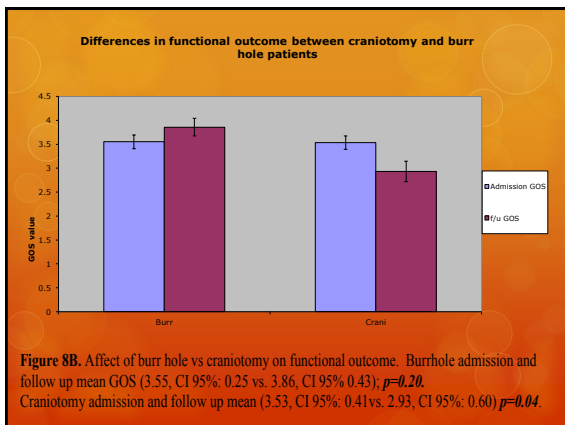
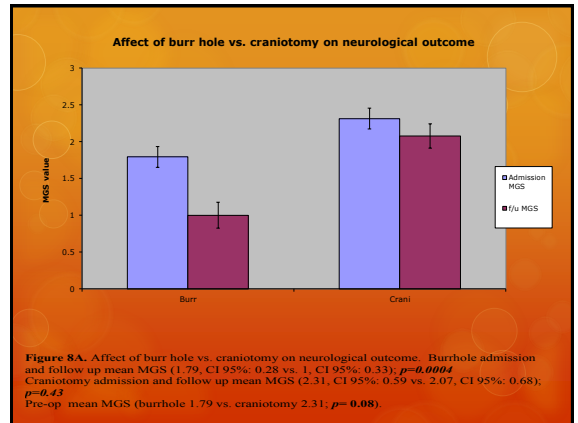
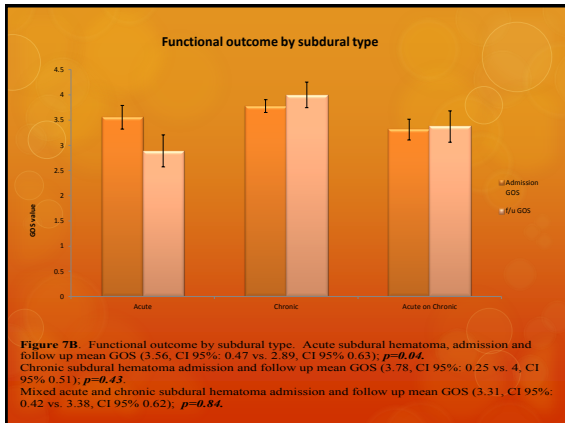
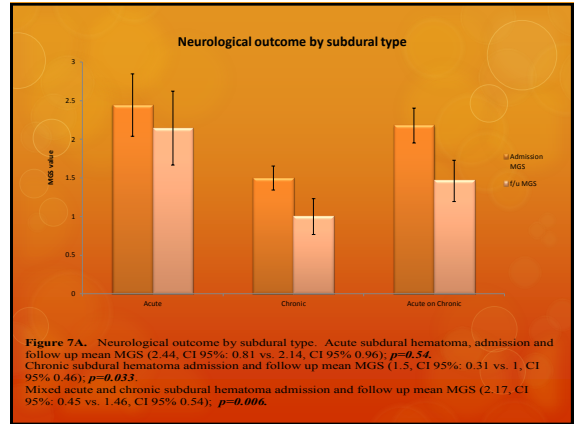
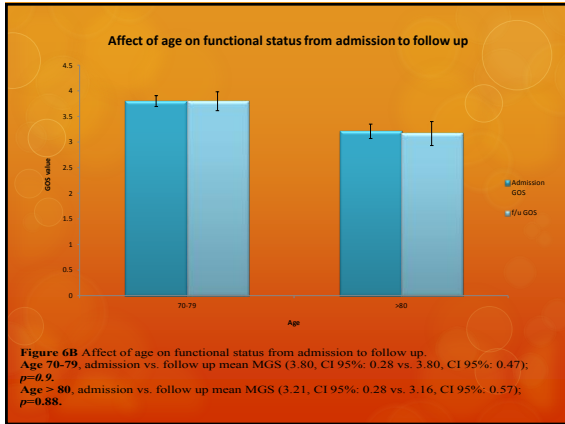
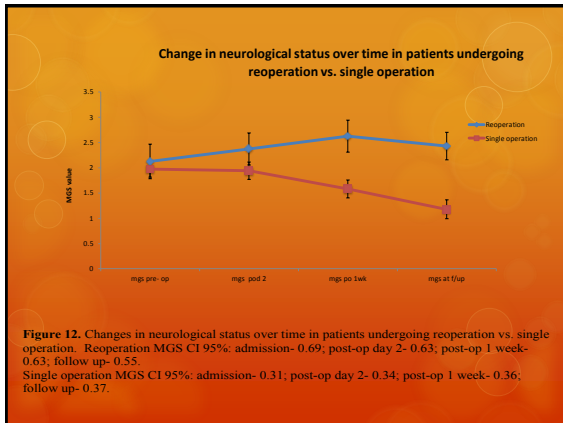
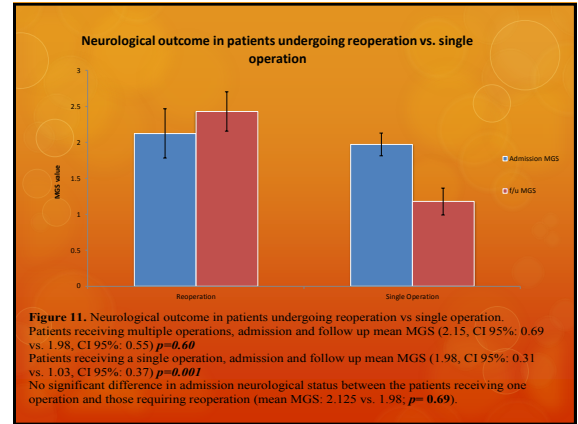
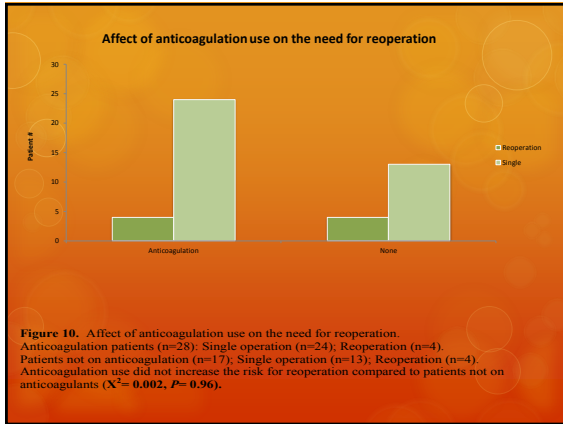


Figure 6A Affect of age on neurological status from admission to follow up. Age 70-79, admission vs. follow up mean MGS (1.80, CI 95%: 0.39 vs. 1.50, CI 95%: 0.52);  $p=0.11$ . Age > 80, admission vs. follow up mean MGS (2.20, CI 95%: 0.39 vs. 1.21, CI 95%: 0.43);  $p=0.02$ .





## Lessons:

- Improvement in neurological status without change in functional status
- Of the few that died or discharged to hospice more were >80yrs
- No relationship between admission neurological status to poor outcome
- Worse pre-op neurological status had significant improvement at f/up
- Older patients had significant improvement in neurological status
- Acute SDH showed worse functional status
- Burr hole drainage showed significant neurological status improvement
- Craniotomy patients had significantly worse functional status
- Anticoagulated patients showed significant improvement in neurological status
- Anticoagulation did not increase need for re-op
- Re-operation conferred worse neurological status

## Acknowledgment

Patrick Mulligan, BS