

*Delirium in the elderly ,DASU  
the SCGH experience*

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*Delirium: The Facts*

- ◆ Affects 14-56 % of hospitalized patients
- ◆ Up to 2/3 remain undiagnosed by treating physicians
- ◆ Mean duration of symptoms 7 days  
30% had persisting memory impairment at 6 months

Moran JA & Michael Dorevitch. Delirium in the hospitalised elderly. *The Australian Journal of Hospital Pharmacy* 2001;31:35-40.

## *Delirium: The Facts*

- ◆ Increased risk of hospital-acquired complications
- ◆ Increased length of stay
- ◆ Increased admission into supported facility due to cognitive and functional decline
- ◆ Overall mortality ~30%; 12-month mortality 35-40% and 5 year mortality 50%
- ◆ Costly

## *Delirium ,the facts*

- ◆ Delirium is preventable
- ◆ Methodologic quality of many studies is poor and literature is small
- ◆ Two important RCTs; Inouye 1999  
Marcantonio 2001

## *Delirium Units*

- ◆ Literature is very small
- ◆ No published audits or data to show clear benefits
- ◆ ??? Reduced mortality rate
  - ??? Decreased LOS
  - ??? Cost benefits

## *Delirium Units in WA*

- ◆ Supervised Care Unit in Fremantle Hospital, established in January 2002.  
Initial audit in 2002 showed 30% reduction in falls and cost benefits with savings of \$ 315,000.
- ◆ Delirium and Surveillance Unit ( DASU) at SCGH

## *What is DASU?*

- ◆ 10-bed Delirium and Surveillance Unit located within Ward C14 at SCGH
- ◆ Officially opened June 2004
- ◆ \$\$\$ - the driving force

Flaherty JH et al. A model for managing delirious older inpatients. JAGS 2003;51:1031-1035.

## *Key Elements of DASU*

- ◆ Secured environment
- ◆ Multidisciplinary
- ◆ Staff trained and committed to delirium care
- ◆ Patient-centred care based on comprehensive geriatric assessment principle
- ◆ Evidence based Pathways for clinical care
- ◆ Planning for discharge





### *DASU Inclusion Criteria*

- ♦ Patients over the age of 65 years
- ♦ Patients with delirium that is likely to be reversible but needs close monitoring and appropriate medical and nursing management and supervision
- ♦ Patients with acute delirium related to acute reversible medical and other risk factors.
- ♦ Patients at risk of absconding secondary to delirium or acute confusion states that are likely to improve with medical management.
- ♦ Patients with high falls risk that require close supervision and are poorly compliant because of delirium or confusion that is potentially reversible
- ♦ All patients will need to be reviewed and accepted by the geriatrician or trainee registrar responsible for management of patients within the unit

## *Comprehensive Care*

- ◆ Daily medical review with consultant review at least twice weekly
- ◆ Consultative psychogeriatric service
- ◆ Weekly multidisciplinary team meetings.
- ◆ Regular physiotherapy and occupational therapy review.
- ◆ Dietician input.

## *Guidelines and Protocols*

- ◆ Ward urinalysis protocol
- ◆ UTI investigation and management pathway
- ◆ Pharmacological management of behavioural disturbance
- ◆ Guidelines for prescribing analgesics
- ◆ Sleep Protocol
- ◆ Management of Acute Constipation in the Elderly
- ◆ Management of Acute Urinary Retention in the Elderly

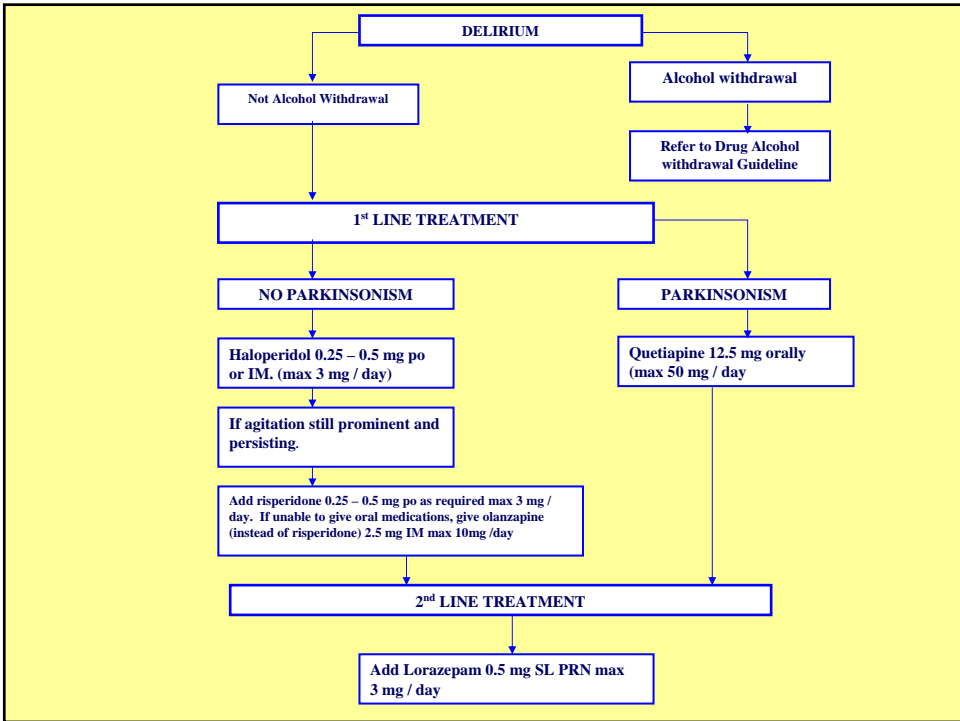
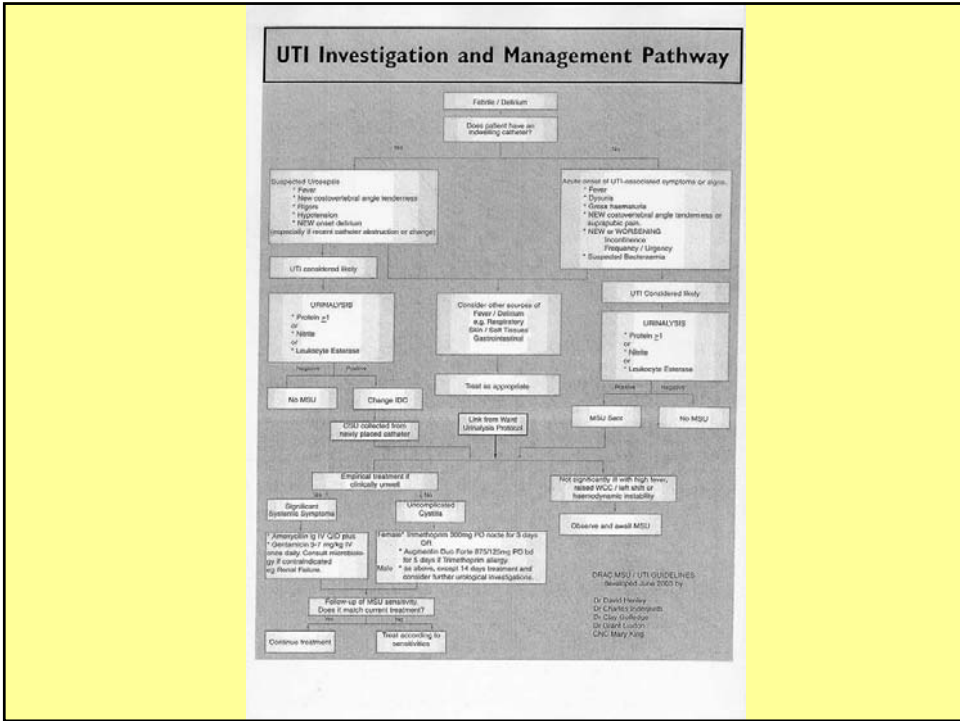
## *Validated Tools*

- ◆ Mini-Mental State Examination
- ◆ Geriatric Depression Scale
- ◆ Functional Independence Measure (FIM)
- ◆ Confusion Assessment Method (CAM)

## *CAM*

1. Acute onset and fluctuating course
2. Inattention
3. Disorganised thinking
4. Altered level of consciousness

Diagnosis if 1 and 2 and either 3 or 4

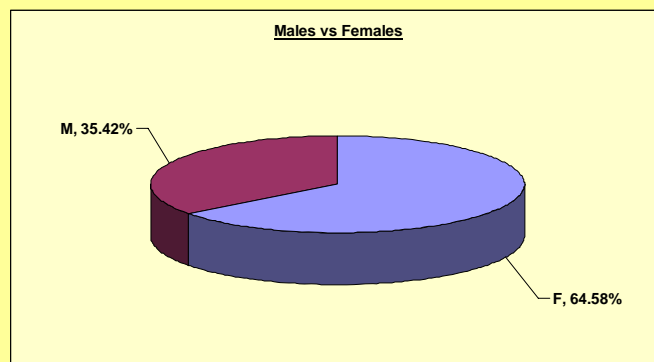


## *DASU: Initial Project*

- ◆ Provide a secure environment for the patients
- ◆ Provide comprehensive medical, nursing and multidisciplinary care to patients with delirium
- ◆ Improve patient outcome whilst being cost effective

### *DASU Audit (1st June 2004 – 30th June 2005)*

GENDER	Total	Total
F	64.58%	31
M	35.42%	17
Grand Total	100.00%	48

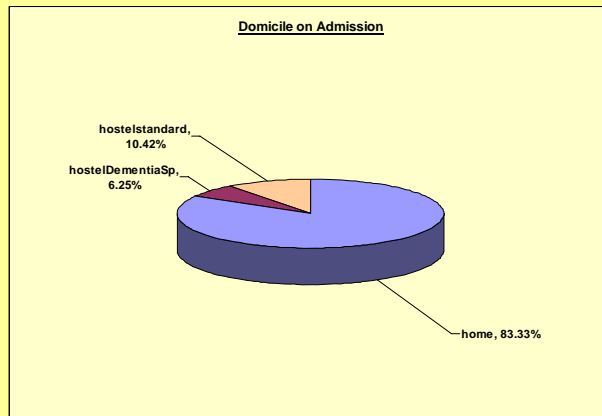


Average (Age)	85.17
Median	85.50
Minimum	66
Maximum	100
Total	48

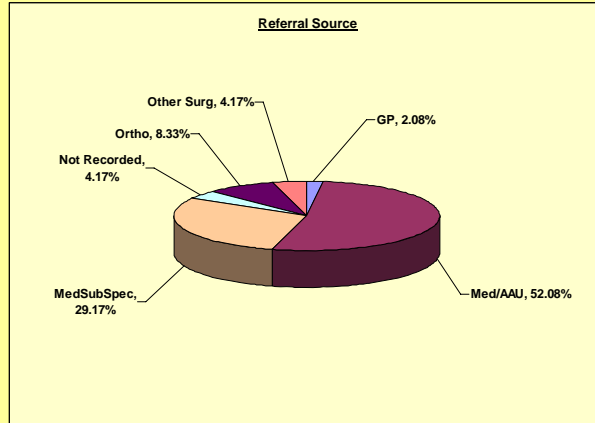
Average (Los - DASU)	25.48
Median	19.00
Minimum	3
Maximum	99
Total	48

Average (Los - Hospital)	36.27
Median	29.00
Minimum	4
Maximum	99
Total	48

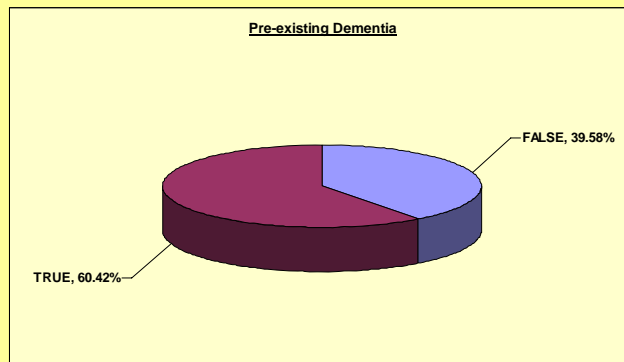
AdmAbode	Total	Total
home	83.33%	40
hostelDementiaSp	6.25%	3
hostelstandard	10.42%	5
Grand Total	100.00%	48



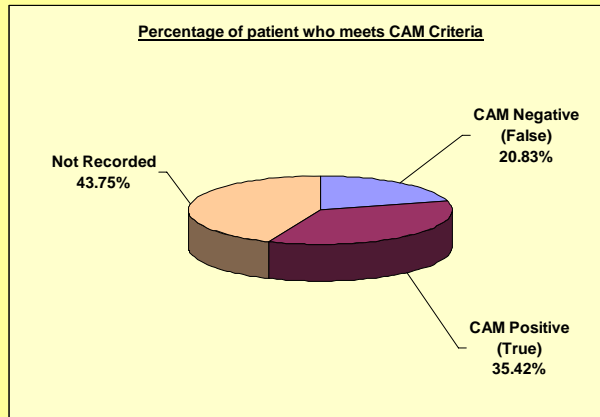
AdmSource	Total	Total
GP	2.08%	1
Med/AAU	52.08%	25
MedSubSpec	29.17%	14
Not Recorded	4.17%	2
Ortho	8.33%	4
Other Surg	4.17%	2
Grand Total	100.00%	48



AdmDementia	Total	Total
FALSE	39.58%	19
TRUE	60.42%	29
Grand Total	100.00%	48



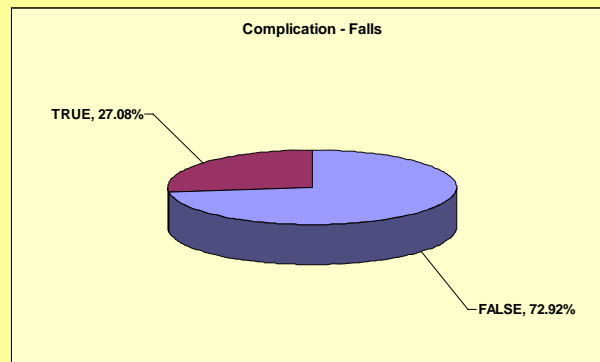
CAM Criteria	Calculate %	Total
CAM Negative (False)	20.83	10
CAM Positive (True)	35.42	17
Not Recorded	43.75	21
Grand Total	100.00	48



<b>Average (CAM +ve days)</b>	<b>8.94</b>
<b>Median</b>	<b>4.00</b>
<b>Minimum</b>	<b>1</b>
<b>Maximum</b>	<b>77</b>
<b>Total</b>	<b>17</b>

<b>Total Cases</b>	<b>48</b>
<b>Total Higher Care</b>	<b>8</b>
<b>% Higher Care</b>	<b>16.67</b>
<b>Total Deceased</b>	<b>4</b>
<b>% Deceased</b>	<b>8.33</b>

Complication - Fall	Total	Total
FALSE	72.92%	35
TRUE	27.08%	13
Grand Total	100.00%	48

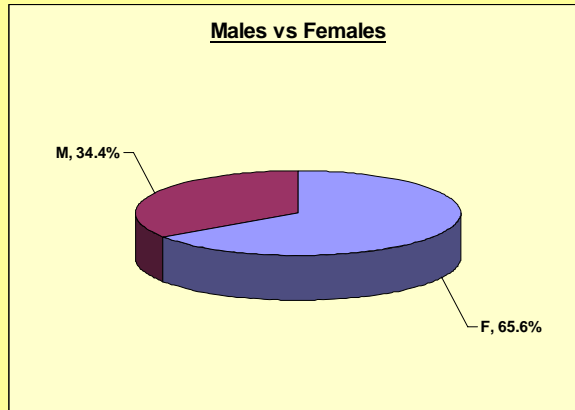


## *Changes in April 2006*

- ◆ No further use of physical restraints
- ◆ Education of all staff
- ◆ Change of protocol for pharmacological management of delirium : No benzodiazepines as first line treatment
- ◆ Better adherence to admission criteria to the unit

DASU Audit (1st May 2006 – 31st May 2007)

GENDER	Total	Total
F	65.6%	118
M	34.4%	62
<b>Grand Total</b>	<b>100.0%</b>	<b>180</b>

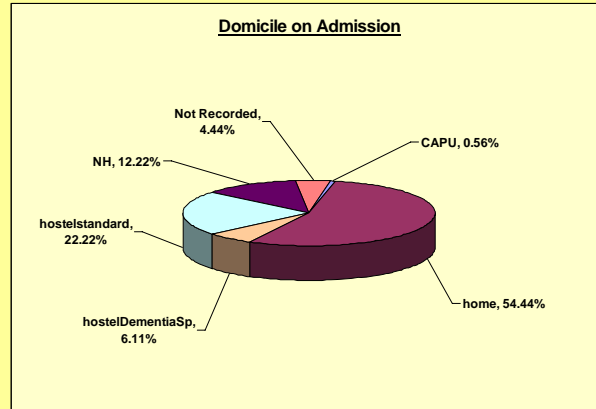


<b>Average (Age)</b>	<b>87.82</b>
<b>Median</b>	<b>88.00</b>
<b>Minimum</b>	<b>66</b>
<b>Maximum</b>	<b>103</b>
<b>Total</b>	<b>180</b>

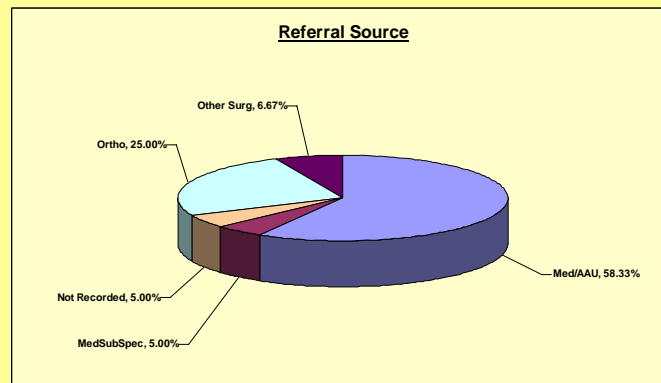
<b>Average (Los - DASU)</b>	<b>17.02</b>
<b>Median</b>	<b>12.00</b>
<b>Minimum</b>	<b>1</b>
<b>Maximum</b>	<b>53</b>
<b>Total</b>	<b>180</b>

<b>Average (Los - Hospital)</b>	<b>21.63</b>
<b>Median</b>	<b>16.00</b>
<b>Minimum</b>	<b>4</b>
<b>Maximum</b>	<b>74</b>
<b>Total</b>	<b>180</b>

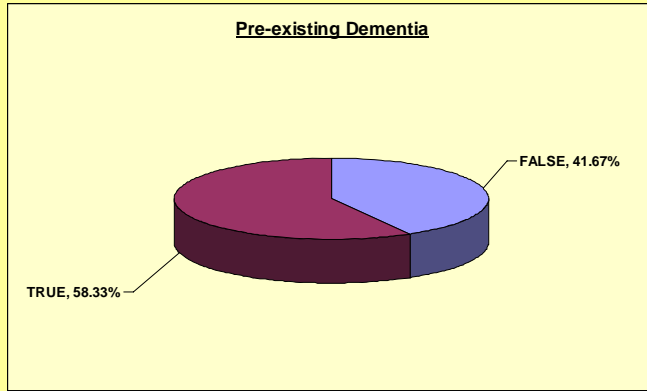
AdmAbode	Total	Total
CAPU	0.56%	1
home	54.44%	98
hostelDementiaSp	6.11%	11
hostelstandard	22.22%	40
NH	12.22%	22
Not Recorded	4.44%	8
<b>Grand Total</b>	<b>100.00%</b>	<b>180</b>



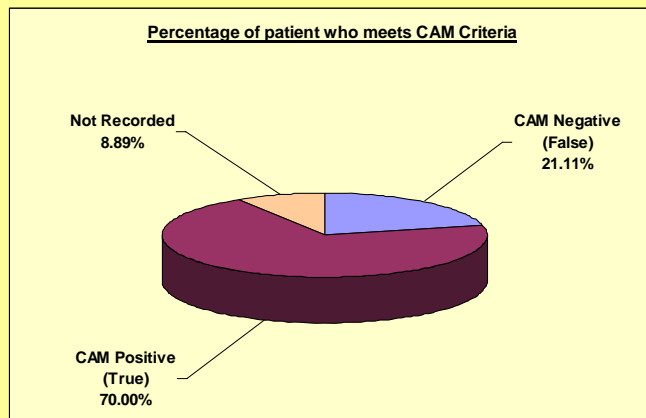
AdmSource	Total	Total
Med/AAU	58.33%	105
MedSubSpec	5.00%	9
Not Recorded	5.00%	9
Ortho	25.00%	45
Other Surg	6.67%	12
<b>Grand Total</b>	<b>100.00%</b>	<b>180</b>



AdmDementia	Total	Total
FALSE	41.67%	75
TRUE	58.33%	105
Grand Total	100.00%	180



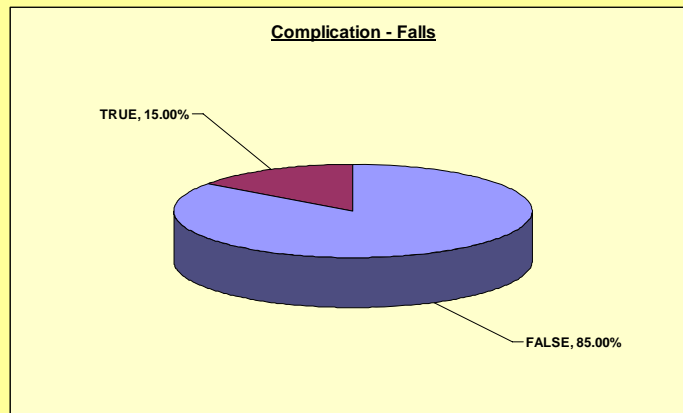
CAM Criteria	Calculate %	Total
CAM Negative (False)	21.11	38
CAM Positive (True)	70.00	126
Not Recorded	8.89	16
Grand Total	100.00	180



<b>Average (CAM +ve days)</b>	<b>7.03</b>
<b>Median</b>	<b>4.00</b>
<b>Minimum</b>	<b>1</b>
<b>Maximum</b>	<b>54</b>
<b>Total</b>	<b>126</b>

<b>Total Cases</b>	<b>180</b>
<b>Total Higher Care</b>	<b>31</b>
<b>% Higher Care</b>	<b>17.22</b>
<b>Total Deceased</b>	<b>6</b>
<b>% Deceased</b>	<b>3.33</b>

DchInSUCxFall	Total	Total
FALSE	85.00%	153
TRUE	15.00%	27
<b>Grand Total</b>	<b>100.00%</b>	<b>180</b>



<b>DASU Audit</b>	Baseline Date:	Baseline Date:
	<i>01/06/2004 to 30/05/2005</i>	<i>01/05/2006 to 31/05/2007</i>
<b>1. Total Admission</b>	48	180
<b>2. Gender</b>	Females = 31 (64.58%) Male = 17 (35.42%)	Females = 118 (65.60%) Male = 62 (34.40%)
<b>3. Age</b>	Average = 85.17 +/- 8.37	Average = 87.82 +/- 7.10
<b>4. DASU - Length of Stay (days)</b>	Average = 25.48 Median = 19.00 (3- 99)	Average = 17.02 Median = 12.00 (1-53)
<b>5. Hospital – Length of Stay (days)</b>	Average = 36.27 Median = 29.00 (4- 99)	Average = 21.63 Median = 16.00 ( 4-74)
<b>6. Domicile on Admission</b>	Home = 40 (83.33%) HostelDementiaSp = 3 (6.25%) HostelStandard = 5 (10.42%)	CACP = 1 (0.56%) Home = 98 (54.44%) HostelDementiaSp = 11 (6.11%) HostelStandard = 40 (22.22%) NH = 22 (12.22%) Not Recorded = 8 (4.44%)
<b>7. Referral Source</b>	GP = 1 (2.08%) Med/AAU = 25 (52.08%) MedSubSpec = 14 (29.17%) Not Recorded = 2 (4.17%) Ortho = 4 (8.33%) Other Surg = 2 (4.17%)	Med/AAU = 105 (58.33%) MedSubSpec = 9 (5.00%) Not Recorded = 9 (5.00%) Ortho = 45 (25.00%) Other Surg = 12 (6.67%)

<b>DASU Audit (Continue)</b>	Baseline Date:	Baseline Date:
	<i>01/06/2004 to 30/05/2005</i>	<i>01/05/2006 to 31/05/2007</i>
<b>8. Pre-existing Dementia</b>	True = 29 (60.42%) False = 19 (39.58%)	True = 105 (58.33%) False = 75 (41.67%)
<b>9. CAM Criteria</b>	CAM Positive = 17 (35.42%) CAM Negative = 10 (20.83%) Not Recorded = 21 (43.75%)	CAM Positive = 126 (70.00%) CAM Negative = 38 (21.11%) Not Recorded = 16 (8.89%)
<b>10. CAM Positive Days</b>	Average = 8.94 Median = 4.00 (1-77)	Average = 7.03 Median = 4.00 (1- 54)
<b>11. Discharge to Higher Care</b>	Total Higher Care = 8 (16.67%)	Total Higher Care = 31 (17.22%)
<b>12. Mortality</b>	Total Deceased = 4 (8.33%)	Total Deceased = 6 (3.33%)
<b>13. Complication (Falls)</b>	13 (27.08%)	27 (15.00%)

## *Estimated cost savings*

	Time Period 1		Time Period 2	
Occupied bed days	1223		3063	
Costs (\$)	Estimated	Actual	Estimated	Actual
24hr/day HSA	880,560		2,205,360	
12hr/day HSA	440,280		1,102,680	
12hr/day back to back HSA	220,140		551,340	
DASU COSTS		109,339		305,752
Rest of SCGH		2,686,829		11,623,473
Total costs		2,796,168		11,929,215
Estimated savings	110,801 – 771,221		245,598 – 1,899,618	

## *Conclusion*

- ◆ Dementia, is an important predisposing factor for the development of delirium
- ◆ Patients with delirium managed in a delirium unit appear to improve both cognitively and functionally although a significant proportion required relocation to higher levels of care
- ◆ Establishment of a Delirium Unit is likely to be cost effective
- ◆ Best model appears to be one where there is a dedicated consultant led unit with ongoing staff education.

## *Where are we at in 2009*

- ◆ Delirium liaison service
- ◆ New Data Base
- ◆ More emphasis on environmental modification and non pharmacological measures.
- ◆ Judicious use of pharmacological interventions