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Education and the Gerontological Imagination

Delirium is a predictor of mortality in elderly patients receiving non-invasive mechanical ventilation

A. Morandi et al.

<u>Aim:</u> to evaluate delirium and mortality in elderly patients receiving non-invasive ventilation in SICU.

<u>Methods:</u> Multidimensional assessment was obtained in (n=87) consecutive patients receiving non-invasive ventilation for hypercapnic respiratory failure due to acute exacerbation of chronic obstructive pulmonary disease (AECOPD).
In hospital mortality was evalued .

<u>Results:</u> patients had a mean age of 78$\pm$8.3 years, delirium occurred in 31 (35.6%), and dementia in 23 (26.4%). Mean comorbidity (Charlson Index) was 6.5 $\pm$ 1.7, severity of illness (APACHE II) 18.3 $\pm$5.7, and in hospital length of stay 7.1$\pm$6.9 days. In hospital mortality was of 24.1%. In the bivariate analysis high age (80+ years) (OR 2.8, 95% CI 1.02-7.92), low s-albumin (<3.5 g/dl) (OR 3.8, 95% CI 1.14-12.39), high comorbidity (Charlson Index >5) (OR 5.8, 95% CI 1.2-27.0), high number of drugs (9+) (OR 3.7, 95% CI 1.2-11.4), dementia (OR 6.7, 95% CI 2.3-19.6) and delirium during stay in the SICU (OR 7.8, 95% CI 2.6-23.5) were significantly associated with mortality, and marginally were APACHE II (score 20+) (OR 2.1, 95% CI 0.9-5.7) and the use of indwelling bladder catheter (OR 5.4, 95% CI 0.8-43.7).
After step-wise logistic regression, delirium and dementia were the only independent risk factors for in hospital mortality.

<u>Conclusion:</u> Delirium itself is a risk factor for mortality independently from other clinical indicators of severity in elderly patients receiving non-invasive ventilation.

Association between delirium and in-hospital mortality in 87 hospitalized elderly receiving non-invasive mechanical ventilation

	n/events	*Crude* RR (95% CI)	*Adjusted** RR (95% CI)
Dementia	23/12	6.7 (2.3-19.6)	3.4 (1.0-11.3)
Delirium	31/15	7.8 (2.6-23.5)	4.7 (1.4-15.9)

RR: Relative Risk. CI: Confidence Interval.
For dementia and delirium diagnoses see text.
*Confounders: gender, high age (80+ years), comorbidity (Charlson Index >5), APACHE II score (20+), number of drugs (9+), s-albumin (<3.5 g/dL), and indwelling bladder catheter.

Elderly demented patients in hospital

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Background: The aim of the study is to describe the characteristics of a population elderly patients admitted to geriatric wards.

Methods: Patients were stratified according to age in seven groups: <65, 65-69, 70-74, 75-79, 80-85, 86-90 and 90+. Rate of admission was directly, while LOS was inversely related to age. Over 90 patients those admitted were 56%; their LOS was 6.3+4.1 days.

All patients admitted to the geriatric ward received a multidimensional evaluation, including the assessment of potential important prognostic factors: demographics, number of chronic somatic diseases, Charlson Index, Apache II score, Apache II-APS subscore, number of currently administered drugs, serum albumin, cognitive status (Mini-Mental State Examination), depression (Geriatric Depression Scale) and functional status (BADL and IADL).

Results: Main reasons for admission were similar across age groups. Number of chronic diseases, comorbidities index, functional and mental status prior to hospitalization were significantly worse in the nonagenarians patients than in other age groups. Moreover, biological markers of in-hospital health status (i.e. serum albumin, Apache II-APS subscore) showed the greatest degree of impairment in demented patients.

Conclusions: demented patients account for more than 10% of hospital admission. Their physiology parameters and functional impairment show the greatest derangement with respect to the other groups of elderly patients. Hence the necessity to adopt adequate methods in order to prevent, as far as possible, the negative consequences of hospitalisation is warranted.

Age classes strata of 82.647 patients admitted to the Poliambulanza Hospital ER (in 2004-2005)

	n	%
< 65	65.320	79,0
65-69	3.897	4,7
70-74	3.751	4,5
75-79	3.551	4,3
80-84	3.398	4,1
85-89	1.624	2,0
> 90	1.106	1,3

Age classes strata of 13.059 patients admitted to wards via Poliambulanza Hospital ER (in 2004-2005)

% of admission.

age	tot	%tot*	M	F	LOS tot M (SD)	LOS M M (SD)	LOS F M (SD)	tot M	DRG M M	F M
< 65	7.561	11,6	2892	4669	4,7 (5,1)	5,8 (6,9)	4,1 (3,5)	0,96	1,33	0,74
65-69	883	22,7	542	341	8,1 (7,9)	8,3 (8,7)	7,7 (6,8)	1,82	1,88	1,72
70-74	1.004	26,8	554	450	7,7 (6,5)	7,9 (6,7)	7,5 (6,2)	1,62	1,73	1,47
75-79	1.121	31,6	540	581	7,5 (6,0)	7,4 (5,8)	7,6 (6,3)	1,57	1,63	1,52
80-84	1.170	34,4	506	664	7,8 (6,4)	8,0 (6,8)	7,7 (6,1)	1,58	1,68	1,50
85-89	701	43,2	242	459	7,1 (6,3)	7,9 (8.9)	6,8 (4,4)	1,50	1,61	1,44
> 90	619	56,0	167	452	6,3 (4,1)	6,7 (4,9)	6,2 (3,8)	1,34	1,42	1,32
Total	13.059	15,8	5443	7616	5,9 (5,9)	6,7 (7,1)	5,3 (4,7)	1,22	1,50	1,03

Age classes strata of 13.059 patients admitted via Poliambulanza Hospital ER (in 2004-2005) to medical wards (n= 6622) (Internal Medicine, Geriatrics, Cardiology, Neurology, ICU) or Surgical wards (n=6437) (General Surgery, Vascular Surgery, Orthopedics, Urology, Gynecology, Neurosurgery, ORL, Oculistics). In red severely demented patients (%). (~420/year).

		%	% tot	
Surgical wards (n=6437)				
< 65	4.854	75,4	64,2	
65-69	353	5,5	40,0	
70-74	340	5,3	33,9	
75-79	330	5,1	29,4	
80-84	291	4,5	24,9	
85-89	141	2,2	20,1	
> 90	128	2,0	20,7	
Medical wards (n=6622)				
< 65	2.707	40,9	35,8	(0)
65-69	530	8,0	60,0	(3)
70-74	664	10,0	66,1	(10)
75-79	791	11,9	70,6	(16)
80-84	879	13,3	75,1	(21)
85-89	560	8,5	79,9	(32)
> 90	491	7,4	79,3	(40)

Characteristics of 1250 hospitalized elderly patients according to age stratification.

	Total N=1250 N (%)/M+sd	<70 N=194 N (%)/M+sd	70-74 N=196 N (%)/M+sd	75-79 N=265 N (%)/M+sd	80-84 N=312 N (%)/M+sd	85-89 N=142 N (%)/M+sd	90+ N=141 N (%)/M+sd
Age	79.1+8.2	65.5+3.9	72.2+1.4	78.0+1.4	83.1+1.4	86.8+0.8	91.4+2.5
Gender (male)	405 (32.4)	94 (48.5)	67 (34.2)	87 (32.8)	83 (26.8)	38 (26.8)	35 (24.8)
Living alone	376 (30.2)	36 (18.7)	61 (31.6)	81 (31.3)	110 (35.4)	36 (25.5)	50 (35.0)
Geriatric Depression Scale-GDS*	5.2.+3.6	4.3.+3.6	4.8+3.6	5.8+3.7	5.4+3.4	5.2+3.7	5.3+3.6
Depressed (GDS 5+)	410 (40.4)	44 (28.4)	65 (36.1)	106 (46.5)	113 (44.3)	44 (41.5)	38 (41.3)
Mini Mental State Examination-MMSE	22.8+7.6	25.8+5.7	24.5+6.2	23.2+7.2	22.1+7.1	19.9+7.9	17.4+9.3
Dementia (MMSE <18)	263 (22.2)	19 (11.1)	23 (11.9)	46 (17.8)	70 (23.5)	47 (34.3)	58 (45.3)
IADL functions lost (2 wks pre adm.)	3.3+2.9	1.6+2.5	2.7+2.8	2.9+2.7	3.8+2.8	4.3+2.8	5.2+2.6
Barthel Index (2 wks before adm.)	83.2+24.4	92.9+17.0	88.4+19.7	86.0+22.1	81.1+24.1	75.8+27.6	69.4+30.4
Barthel Index (<85) (2 wks before adm.)	381 (30.5)	26 (13.4)	47 (24.1)	67 (25.4)	108 (34.5)	60 (42.3)	73 (51.8)
Barthel Index (on admission)	74.1+31.0	86.6+25.4	83.3+25.4	78.4+28.1	70.2+30.3	62.1+32.9	55.2+32.1
Funct. status change (before and on adm.)							
No change in Barthel index score	(70.3)	(84.0)	(82.6)	(71.9)	(64.2)	(58.5)	(56.7)
Change 5-25 points in Barthel index score	(14.5)	(8.8)	(9.2)	(14.8)	(16.6)	(18.3)	(20.6)
Change 30+ points Barthel index score	(15.2)	(7.2)	(8.2)	(13.3)	(19.2)	(23.2)	(22.7)
Barthel Index (on discharge)	76.3+29.9	89.3+23.2	84.9+24.1	79.7+27.9	73.5+28.8	66.1+32.2	56.9+34.4
Chronic diseases (n)	5.4+2.0	4.6+1.7	4.8+1.7	5.4+2.0	5.8+1.9	5.8+2.2	5.9+2.4
Charlson score	7.1+2.9	5.4+2.7	6.5+2.4	6.7+2.4	7.9+2.3	8.0+2.2	8.4+2.1
APACHE II score	8.3+4.8	6.2+3.4	7.1+4.4	8.4+4.9	8.8+4.4	9.8+6.1	9.8+4.9
Acute Physiology Score-APS	1.9+2.9	1.3+2.2	1.6+2.6	1.9+3.1	2.0+2.6	2.6+4.1	2.5+2.9
APS (4+)	253 (20.5)	24 (12.4)	35 (17.9)	49 (19.1)	68 (21.9)	34 (24.3)	43 (30.5)
Serum albumin	4.0+0.7	4.2+0.6	4.1+0.6	4.0+0.8	3.9+0.6	3.9+0.6	3.8+0.6
Serum albumin (< 3.5g/dl)	266 (21.5)	32 (16.7)	26 (13.4)	56 (21.5)	74 (23.7)	33 (23.4)	45 (32.4)
Drugs (n)	4.2+1.9	4.3+1.9	4.2+1.7	4.4+1.9	4.2+1.8	4.2+1.7	3.9+2.1
Major procedures (n)**	3.2+3.0	3.1+3.0	3.3+2.9	3.2+2.7	3.2+3.2	3.2+3.0	3.0+3.5
Length of stay (days)	6.9+3.3	6.8+3.6	6.3+2.8	7.2+3.5	7.2+3.4	7.0+3.3	6.4+3.0
In hospital mortality	55 (4.5)	3 (1.6)	9 (4.6)	8 (3.1)	10 (3.3)	18 (8.7)	13 (9.6)
Six months mortality	209 (16.7)	23 (11.9)	27 (13.8)	35 (13.2)	54 (17.3)	32 (22.5)	38 (27.0)
Six months hospital readmission (1+)	496 (41.5)	73 (38.0)	73 (38.8)	127 (49.5)	131 (43.5)	52 (42.0)	45 (35.2)

*On 1062 patients with MMSE>14; ** Major procedure considered are: endoscopy, CT or MRI, ultrasound (abdomen, heart, peripheral vascular); EMG, EEG.

Diagnosis and treatment of depression in elderly patients admitted to an ACE unit.

S.Boffelli et al

Aim of the study is to describe the characteristics of depression in patients admitted to an ACE Unit for acute somatic diseases.

Multidimensional assessment was obtained in all patients. Diagnosis of depressive disorder was performed following DSM IV criteria, through objective evaluation (clinical observation) and subjective report (GDS score). Pharmacological treatment at discharge was assessed.

Among the 383 patients consecutively admitted in a 4-months period, 83 were diagnosed as depressed. Patients were mainly female (n. 52/83, 62.6%, mean age 77.2±9.05 years), MMSE was 23.3±5.7, their GDS score was 6.4±3.4.

Fifty one patients were found to be affected by adjustment disorder with depressed mood, 13 by adjustment disorder with depressed mood and anxiety, 8 by depressive disorder due to a medical condition, 6 by major depression, 3 by dysthymic disorder, 2 by depressive disorder NOS in dementia.

Antidepressants prescribed were: SSRI (85.5%), SNRI (6.0%), tryciclic antidepressants (6.0%), atypical antidepressants (2.5%).

Results confirm that not only depressive symptoms, but also depressive disorders are highly represented in patients hospitalized for acute somatic diseases.

Heart failure in subjects with normal versus reduced left ventricular ejection fraction: clinical and echocardiographic characteristics and mortality.

T.Sabatini

Several studies have reported that a high proportion of patients with HF have normal left ventricular (LV) systolic function, and that they have a better prognosis compared with those with impaired LV systolic function.

We evaluated demographic, clinical characteristics, geriatric assessment and echocardiograms of 183 patients consecutively admitted in our ACE unit with NYHA III-IV HF. We considered systolic (SHF) versus diastolic (DHF) function according to a LVEF < or $\geq$ 50%.

Patients with DHF (70/183: 38%) are older (80.9 vs 77.7 years), more frequently female (72 vs 34%), more disabled (BI at admission 68.1 vs 78.5), and with a higher rate of cognitive impairment (MMSE 22.8 vs 24.7) than patients with SHF (113/183: 62%). Echocardiographic data show that patients with DHF have significantly smaller left ventricles (end diastolic dimension 48.5±7.5 vs 61.5±11.2 mm), lower LV masses (138.4±51.3 vs 184.8±48.5 gr/m2) and volumes (end diastolic 112.3±36.3 vs 177.8±64.8 ml); the stroke volume in patients with DHF is higher (78.6±25 vs 63.5±22.3 ml). Mortality at 6-month follow up was 30% and similar in the two groups, in particular 34/113 for the group with SHF and 21/70 for the group with DHF. In old patients admitted in an ACE unit for clinically relevant heart failure, the best predictor of mortality is the NYHA functional class rather than LV function.

Demographic, functional, mental and clinical characteristics of   study paricipants affected by heart disease, but no HF, compared with patients with DHF and SH, according to NYHA functional classes

	No HF N=308 (43.1) M(%)	DHF& NYHA I-II N=224 (31.4) M(%)	DHF& NYHA III-IV N=70 (9.7) M(%)	SHF& NYHA III-IV 113 (15.8) M(%)	p
Age (years)	79.0±7.6	78.6±7.6	80.9±7.0	77.7±8.5	0.22
Age (80+)	(42)	(44)	(61)	(38)	0.02
Gender female	(70)	(71)	(72)	(34)	0.01
Barthel Index (2 wks before)	88.5±18.5	89.5±19.8	86.4±21.8	88.0±20.5	ns
Barthel Index (on admiss)	81.9±24.4	84.3±25.0	68.1±36.1	78.5±29.5	0.03
IADL (2 wks before)	2.4±2.7	2.4±2.6	2.7±2.4	1.9±2.4	ns
Charlson Index (0-33)	6.2±1.8	7.5±1.8	7.4±1.7	6.8±1.7	ns
GIC (Class III-IV)	(21)	(16)	(64)	(66)	ns
Drugs (n)	4.2±1.9	4.8±1.7	5.3±2.2	5.6±1.8	ns
Hypertension	(68)	(81)	(68)	(65)	ns
Diabetes mellitus	(23)	(20)	(27)	(25)	ns
Serum Albumin g/dl	4.0±0.6	4.2±1.3	3.9±0.6	3.9±0.6	ns
APACHE II score (0-71)	8.0±3.6	7.5±3.5	11.9±6.8	10.1±5.5	0.05
APS score	1.8±2.1	1.9±2.3	3.9±3.7	2.6±3.2	0.04
MMSE	24.5±5.5	24.8±5.8	22.8±6.8	24.7±5.4	0.05
Dementia	(9)	(12)	(16)	(12)	ns
GDS	4.9±3.5	4.9±3.5	4.7±3.6	4.6±3.5	ns
LOS	6.4±3.1	6.1±2.7	8.1±5.3	7.6±3.9	0.12

Mortality at 6-month follow up was 30% and similar in the two groups, in particular 34/113 for the group with SHF and 21/70 for the group with DHF.
In old patients admitted in an ACE unit for clinically relevant heart failure, the best predictor of mortality is the NYHA functional class rather than LV function.

Systolic and Diastolic Heart Failure in the Community

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HEART FAILURE (HF) IS A highly prevalent syndrome with diverse etiologies that may be associated with reduced or preserved ejection fraction (EF). The pathophysiology of HF with reduced EF has been extensively studied and management strategies are well defined.[1] Conversely, while clinical series, epidemiological surveys, and clinical trials have improved our understanding of HF and preserved EF,[2,3] controversy remains on many key elements of this entity, including its prevalence, clinical characteristics, and outcome.[4] To this end, the prevalence and distribution of diastolic dysfunction among patients with HF and reduced or preserved EF has not, to the best of

Context The heart failure (HF) syndrome is heterogeneous. While it can be defined by ejection fraction (EF) and diastolic function, data on the characteristics of HF in the community are scarce, as most studies are retrospective, hospital-based, and rely on clinically indicated tests. Further, diastolic function is seldom systematically assessed based on standardized techniques.

Objective To prospectively measure EF, diastolic function, and brain natriuretic peptide (BNP) in community residents with HF.

Main Outcome Measures Echocardiographic measures of EF and diastolic function, measurement of blood levels of BNP, and 6-month mortality.

Design, Setting, and Participants Olmsted County residents with incident or prevalent HF (inpatients or outpatients) between September 10, 2003, and October 27, 2005, were prospectively recruited to undergo assessment of EF and diastolic function by echocardiography and measurement of BNP.

Results A total of 556 study participants underwent echocardiography at HF diagnosis. Preserved EF (≥50%) was present in 308 (55%) and was associated with older age, female sex, and no history of myocardial infarction (all $P<.001$). Isolated diastolic dysfunction (diastolic dysfunction with preserved EF) was present in 242 (44%) patients. For patients with reduced EF, moderate or severe diastolic dysfunction was more common than when EF was preserved (odds ratio, 1.67; 95% confidence interval [CI], 1.11-2.51; $P=.01$). Both low EF and diastolic dysfunction were independently related to higher levels of BNP. At 6 months, mortality was 16% for both preserved and reduced EF (age- and sex-adjusted hazard ratio, 0.85; 95% CI, 0.61-1.19; $P=.33$ for preserved vs reduced EF).

Conclusions In the community, more than half of patients with HF have preserved EF, and isolated diastolic dysfunction is present in more than 40% of cases. Ejection fraction and diastolic dysfunction are independently related to higher levels of BNP. Heart failure with preserved EF is associated with a high mortality rate, comparable to that of patients with reduced EF.

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Non Invasive Ventilation Tolerance in Acute Elderly Patients

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Introduction: Aim of the study is to evaluate the efficacy and tolerance to non invasive mechanical ventilation (NIV) in elderly patients affected by hypercapnic respiratory failure due to acute exacerbation of chronic obstructive pulmonary disease (AECOPD).

Methods: 127 elderly patients (age 78.3$\pm$9.2) suffering of hypercapnic respiratory failure due to AECOPD consecutively admitted to our SICU started ventilation. NIV was used in the first 48 hours; patients were weaned off as soon as possible, according to clinical improvement and arterial blood gas results. Patients were classified in Not Disabled and not Demented-NDD (20.9%), Disabled-D (51.3%) and Disabled and Demented-DD (27.8%)

Results: among the 127 patients ventilated, 115 (90,6%) tolerate the NIV. None developed severe complications depending to the NIV, exept facial skin lesions occurred in 14 patients. NIV was successful in 90/115 patients (78%), the other 25 (21.7%) failed to meet the criteria of improvement (clinical and gas results). Of these 4 (3.4%) were transferred in the ICU for invasive mechanical ventilation and 21 (18.3%) were considered end stage. All these 25 patients died in hospital. In elderly NDD patients mortality was 8.3% (n=2), in D patients was 25.9% (n=15) and in DD patients was 25% (n=8).

Conclusion: NIV can be used in elderly patients admitted with hypercapnic respiratory failure secondary to AECOPD. In a geriatric setting NIV may be implemented also in disabled and demented patients.

Table 1. Characteristics of 115 patients admitted to a sub-intensive care unit (SICU) for the elderly and undergone non-invasive ventilation (NIV) due to acute exacerbations of chronic obstructive pulmonary disease (AECOPD)

Age (years) [M (±SD)]	78.3 (9.2)
Gender (female) [n (%)]	64 (56)
History of heavy alcohol use [n (%)]	4 (3.5)
History of heavy tobacco use [n (%)]	48 (41.7)
Barthel Index (0–100) at admission [M (±SD)]	11.3 (20.7)
Barthel Index (0–100) at discharge [M (±SD)]	41.4 (35.3)
MMSE score (0–30) at discharge [M (±SD)]	20.7 (9.3)
Charlson Index (0–33) [M (±SD)]	2.1 (1.5)
APACHE II score (0–71) [M (±SD)]	18.8 (5.8)
APACHE-APS subscore (0–33) [M (±SD)]	12.7 (5.7)
pH (on admission) [M (±SD)]	7.26 (0.1)
PO_2 (mmHg) (on admission) [M (±SD)]	55.5 (21.5)
PCO_2 (mmHg) (on admission) [M (±SD)]	71.0 (20.0)
S-Albumin (g/dl) [M (±SD)]	3.3 (0.5)
Maximum number of drugs (n) [M (±SD)]	9.8 (2.3)
Indwelling bladder catheter [n (%)]	91 (79.1)
Length of stay in SICU (h) [M (±SD)]	58.8 (59.4)
Length of stay in hospital (days) [M (±SD)][a]	7.3 (4.7)
Not disabled and not demented [n (%)]	24 (20.9)
Disabled [n (%)]	59 (51.3)
Disabled and demented [n (%)]	32 (27.8)
Cumulative delirium [n (%)]	44 (38.3)
Mortality (in hospital) [n (%)]	25 (21.7)

[a]Only survivors were considered.

The Clinical Relevance of Preexisting Cognitive Impairment in Older Critically Ill Patients

M.Ferri

Aim of the study: to evaluate the role of IADLs impairment as a proxy of preexisting cognitive impairment in predicting negative outcomes in older critical patients.

Patients and Methods: 401 consecutive patients admitted to a Sub Intensive Care Unit. Premorbid cognitive impairment was detected as admitting diagnoses of dementia or by the assessment of IADLs impairment (IADL detect those functions essentially governed by cognitive status). In hospital mortality was obtained in all patients

Results: patients with preexisting 0-1, 2-5, and 5+ IADL functions lost developed delirium in 22.6, 42.4, and 50.6% of cases respectively, and the in-hospital mortality of the three groups of patients was 5.2, 13.1, and 19.8% respectively.

Conclusion: due to difficulties to an accurate mental status assessment at the moment of the admission in hospital (scanty information from family doctors, difficulties in detecting mental status) we believe that the easiest operative way to overcome the difficulties related to the direct detection of cognitive function in critical patients is to inquire relatives about the preexisting IADLs. They may be an useful proxy of premorbid mental status in critical ill elderly.

Examining a Construct of Geriatric Frailty With Sub-Phenotypes: The MacArthur Study of Successful Aging

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<u>Background</u>: We hypothesized that geriatric frailty consists of sub-phenotypes with different defining criteria. Our goal was to empirically examine frailty using criteria previously-selected by Cardiovascular Health Study (CHS) investigators, as well as other hypothesized criteria.

<u>Methods</u>: We used data from the MacArthur Study of Successful Aging, a cohort study of 1189 high-functioning Americans aged 70-79 years. Variables were: weight loss, exhaustion, low physical activity, slow gait, weak grip. We used principle components analysis to examine the factor structure of: 1) the CHS model; 2) the CHS model expanded to include cognitive function (using a previously-validated summary measure), anorexia, subjective weakness, inflammation (IL-6 and C-reactive protein), disability (Rosow-Breslau, Nagi, and Katz ADLs) and comorbidity.

<u>Results</u>: Analysis supports the existence of 2 sub-phenotypes in the CHS model: one consisting of slow gait, weak grip and low physical activity, and one consisting of exhaustion and weight loss. With the expanded set of potential criteria, PCA supported the existence of 4 sub-phenotypes distinct from disability: 1) exhaustion and subjective weakness; 2) inflammation; 3) slow gait, low cognitive function, weak grip and low physical activity; 4) weight loss and anorexia. Criteria were well-distributed across frail subjects using either the CHS or an expanded operational definition of frailty.

<u>Conclusions</u>: This study provides empiric support for the existence of sub-phenotypes of geriatric frailty.

Fried's Frailty Data (FRFRDATA): Prevalence of Frailty and the Association With Socioeconomic Status, Disability and Comorbidity from Database in Montreal

Chek Hooi Wong MBBS

<u>Introduction</u>: In 2001, Fried et al proposed 5 characteristics to identify frailty. They estimated the prevalence of frailty in a sample of older Americans, and examined the relationship between frailty, socioeconomic variables, disability and comorbidity. The objective of FrFrData is to replicate this work in a sample of elderly in Montreal.
<u>Methods</u>: 740 elderly aged > 74 years with baseline data from the Montreal Unmet Needs Study. Frailty characteristics were operationalized using self-reported measures. Individuals were classified as frail (> 3 characteristics), prefrail (1 or 2 characteristics) or non-frail (no characteristics). Associations of frailty with sociodemographic, disability and comorbidity were examined using the Cochran-Mantel-Haenszel test adjusted for age.
<u>Results</u>: Mean age was 79.6 years (SD 4.0), 67.8% were female, 4.9% ADL disability, 59.5% IADL disability and 66.1% had 2 or more comorbidities. Overall, 7.4% were classified as frail, 49.7% prefrail and 42.8% non-frail. For those classified as frail, 29.1% had ADL disability, 92.7% IADL disability and 81.8% had 2 or more comorbidities. Frailty was associated with being older, female, lower income, lower education, more comorbidities, ADL and IADL disability. Associated comorbidities include arthritis, cardiovascular risk factors, pulmonary problems and diabetes.
<u>Conclusions</u>: Prevalence of frailty was comparable to the study by Fried (7.4% vs 6.9%). There was consistency in associations which offer insight into possible etiologies for frailty. Frailty appears to overlap to a greater extent with IADL disability and comorbidity than with ADL disability.

Stress, Inflammation, and Metabolism: New Findings in Frailty Research

Jeremy D. Walston MD, Luigi Ferrucci MD PhD, Linda P. Fried MD

Frailty has been characterized as a state of increased vulnerability to adverse health outcomes in older adults. Alterations in multiple biological systems have been previously identified in frailty, including activation of inflammatory pathways and declines in hormones important in muscle mass maintenance. These alterations likely contribute to the increased risk for adverse outcomes observed in frailty. Building on this previous biologic discovery in frailty research, new hypotheses related to relevant biologic and molecular pathways and in some specific disease states continue to be tested and refined.

The goal of this symposium is to provide a framework for understanding how alterations in relevant biologic systems are hypothesized to contribute to frailty, and to provide important new data that supports the hypothesis that multiple biological alterations contribute to the frailty syndrome. Using a previously validated definition and screening tool for frailty, the organizer will provide a brief overview of the hypothesized biology of frailty, followed by presentations on the relationship between frailty and HPA axis activity, homocysteine metabolism and frailty, inflammatory gene expression and frailty, the complex relationships between frailty and obesity and diabetes, and frailty, allostatic load, and educational status. The discussant will provide a perspective on the integration of the alterations in multiple systems, and recommendations as to future directions of integrative modeling of the systems biology of frailty, as well as perspectives on potential clinical relevance and translation of these findings into clinical practice.

Physical Frailty and Cognition as Predictors of Change in Physical and IADL Functioning

Matthew J. Peterson MS, Carol Giuliani PhD

BACKGROUND: Cognitive performance measures may add to the predictive abilities of physical frailty models.

PURPOSE: To determine if cognitive performance enhances the ability of a physical frailty model to predict one year changes in physical functioning and IADL status.

METHODS: Retirement community residents volunteered for yearly tests of cognitive and physical functioning. The Gill physical frailty model (gait speed <0.60 m/s and the inability to rise from chair) was combined with a Trails B time of greater than 126 seconds (<25th percentile) to develop a frailty model that included cognition (frailty +cog model). Outcomes were one year changes in the SF-36 physical functioning score (SF-PF) and the Oars IADL questionnaire.

RESULTS: The mean age was 82.0 + 6.1 years, 68% were female, and averaged three diagnoses. At baseline 41% of the sample was physically frail, whereas 18% had frailty +cog. Physical frailty was a strong predictor of one-year change in SF-PF (P=0.003) and IADLs (P=0.0005). The frailty +cog model did not predict SF-PF (P=0.41), but did predict change in IADLs (P=0.0003). This was independent of individual Trails B scores, indicating that the frailty +cog model has construct validity beyond the individual effect of cognitive status.

CONCLUSIONS: Physical frailty is predictive of subsequent physical and IADL functioning. The utility of frailty +cog seems to depend on the outcome measure, as one year changes in IADL status were predicted by this model. Understanding the synergistic effects of physical frailty and poor cognitive performance may help us develop better indicators of future IADL status.
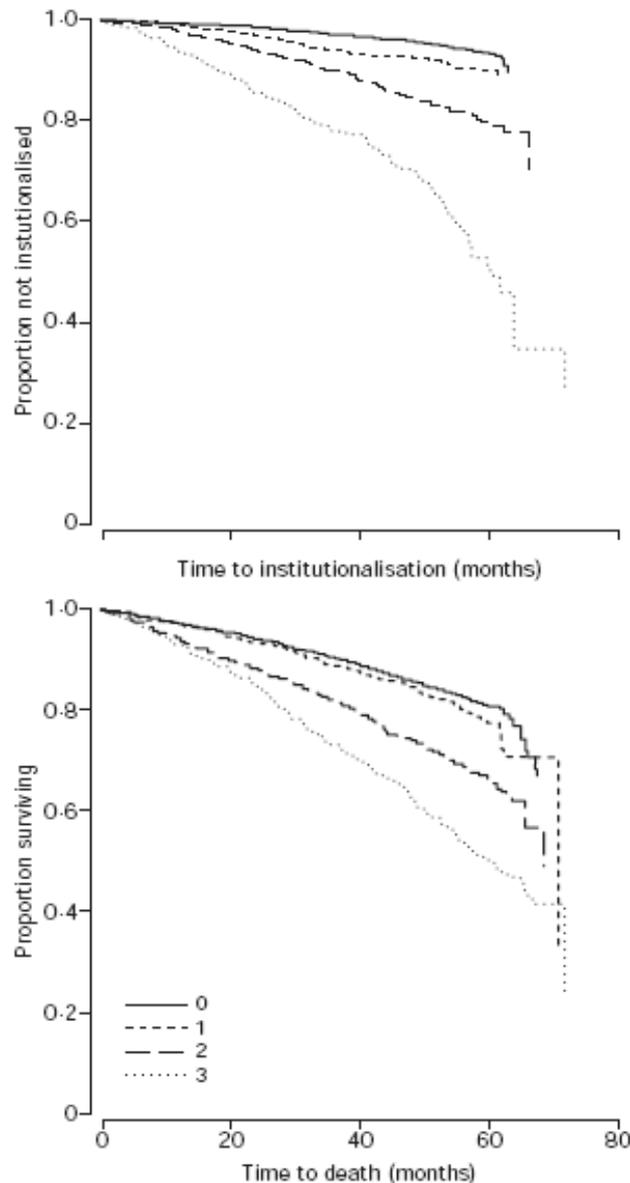
Time to institutionalisation (A) and death (B) on frailty scale, adjusted for age and sex

The frailty scale is based on the classification scheme of the geriatric status scale (GSS),[5] which was used to target patients in hospital eligible for a specialised geriatric intervention. Patients were classified at four levels, appropriate for people living in the community, representing fitness to frailty: (0) Those who walk without help, perform basic activities of daily living (eating, dressing, bathing, bed transfers),[3] are continent of bowel and bladder, and are not cognitively impaired; (1) bladder incontinence only; (2) one (two if incontinent) or more of needing assistance with mobility or activities of daily living, has CIND, or has bowel or bladder incontinence; and (3) two (three if incontinent) or more of totally dependent for transfers or one or more activities of daily life, incontinent of bowel and bladder, and diagnosis of dementia.[4]

Delirium and Functional Recovery in Disabled Elderly Subjects

Giuseppe Bellelli et al.

Aim of the study was to assess the relationship between duration of delirium and functional recovery in disabled elderly subjects. From June 2004 to January 2006, 116 patients aged >65 years were consecutively admitted to our Rehabilitation and Aged Care Unit (RACU) with delirium on admission. Of these, 12 died and 36 were hospitalized for severe clinical instability. The remaining 58 patients were included in this study. All of them received on admission a multidimensional assessment, including the Confusion Assessment Method. The Tinetti scale and the Trunk Control Test (TCT) were assessed on admission, at resolution of delirium and at discharge. Patients were divided in 3 groups according to the duration of delirium (<1 week, n=23, 1-2 weeks, n=20, (>2 weeks, n=15). To assess the mean functional recovery for each day of RACU admission without delirium, we created an index (Index of Functional Recovery After Delirium, IFRAD), estimating the score difference at Tinetti and TCT from resolution of delirium to discharge divided by the duration of RACU stay without delirium (days).

By comparing the IFRAD scores among the 3 groups, we observed that TCT recovery for each day without delirium was inversely correlated with duration of delirium, i.e. the lower the duration of delirium the higher the functional recovery. Our data support the notion that later delirium resolution is associated with poor functional recovery.

Apathy in Dementia

Angelo Bianchetti et al.

The role of apathy on dementia symptoms is uncertain, even recent data seem indicate that it represents a marker of more aggressive disease. To evaluate the role of apathy in the progression of dementia we carried out a multicentric longitudinal study (as a subgroup of the Italian Interdisciplinary Network on Alzheimer Disease - ITINAD) on 168 elderly outpatients (58% female, mean age 77.2±6.6 years) affected by mild dementia (Mini Mental State Examination –MMSE- score>18/30) with a 12 months follow up in 126 patients. Apathy (detected with the Neuropsychiatric Inventory -NPI-) was found in 53 patients (42%) both at baseline and follow-up examinations, while 28 (22%) had new onset apathy at follow-up and 41 (32%) showed no apathy neither at baseline nor at follow-up. Data analysis revealed that patients with apathy on both assessments had a significant worsening in MMSE score (21.4±2.8 at baseline vs. 19.1±4.6 at follow-up, p<0.001) and in the number of basic activities of daily living –BADL- lost (1.5±1.7 vs 2.3±1.9, p<0.008). Subjects with new onset apathy showed a significant cognitive decline (21.2±3.6 at baseline vs 17.5±4.8 at follow-up, p<0.009), with stability of BADLs and IADLs scores. The absence of apathy on both assessments was not associated with statistically rilevant decline in functional and cognitive parameters suggestive of a slower progression of dementia symptoms. Our data suggest that apathy should be considered an important marker of short term cognitive and functional decline in early stages of dementia.

Epidemiology of Aging: HDL-Cholesterol and Physical Performance: Results from the Aging and Longevity Study in the Sirente Geographic Area

Francesco Landi et al.

Aim. We evaluate the relationship of HDL-cholesterol with measures of physical performance (4-meter walking test, Short Physical Performance Battery), muscle strength (hand grip), and functional status (ADL-IADL) in older persons aged 80 years or older. **Methods.** Data are from baseline evaluation of the 359 participants in the prospective cohort study enrolling all the community-dwelling older people living in the Sirente geographic area (Italy). Physical disabilities were defined as the number of dependencies in ADLs and IADLs. Physical performance was assessed using the EPESE short physical performance battery score (SPPB, range 0-12), composed by 4-m walking test, balance test, chair stand test. Muscle strength was measured by hand grip strength. Adjusted analysis of covariance (ANCOVA) was used to examine the effect of different level of HDL-cholesterol tertiles on physical and functional performance.
Results. Participants with lower levels of HDL-cholesterol showed significantly worse results in all the physical function tests. Subjects in the first HDL-cholesterol tertile presented significantly lower adjusted mean results for the 4-m walking test (0.44 m/sec, SE 0.02) and the SPPB score (6.54, SE 0.32) compared to those in the third HDL-cholesterol tertile (0.54 m/sec, SE 0.02 and 7.31, SE 0.30, respectively; p for trend = 0.004). After adjustment for potential confounders (age, gender, living alone, alcohol abuse, physical activity, CHF, diabetes, stroke, OA, albumin, urea, C-reactive protein, LDL-chol) these associations were weaker for the hand grip strength, the ADLs and IADLs. **Conclusions.** Higher levels of HDL-cholesterol are associated with better functional performance among old-old subjects living in community.

Acute Care Unit of the Elderly: Understanding the Acutely Ill Older Adult.

Luis F Amador MD et al.

In response to a growing elderly population with multiple medical and social problems, hospital units dedicated to the acute care of the elderly (ACE) have been developed across the United States. Older adults are at higher risk of hospitalization and of developing hospital related functional losses and complications. The ACE unit provides patients with a home- like environment, patient-centered care, and interdisciplinary care. Care in the ACE unit has been shown to minimize functional losses in the older adult.

Despite what we know about minimizing functional losses, very little is known about psychological and social factors and the interplay of these factors with physical parameters in the hospitalized older patient. The purpose of this symposium is to present current research on the hospitalized older adult. The presentations will include areas such as emotional and psychological well-being in hospitalized older patients and how well-being affects coping and the ability to adapt to hospitalization. Perceptions of environmental attributes of an ACE unit will be assessed in the context of other measures of patient well-being. Social disposition factors will be discussed with respect to how they affect length of hospitalization. How to deploy the ACE concept for the hospitalized older adult including the use of technology will be discussed. In addition to patient care and geriatric/gerontological education, hospital care, including the ACE, presents many challenges for research. Understanding how physical, psychological, social and emotional factors interplay and affect hospitalization is paramount for the older adult population.

Hospice, Palliative, and End of Life Care: Suffering at the End of Life: Are Nursing Homes the Problem or Solution?

Sarah A. Forbes-Thompson PhD

Background: Quality of life (QOL) of nursing home (NH) residents is affected both by factors that are endogenous to the individual residents and by environmental factors, such as institutional policies and practices. While some NH assess QOL, few examine resident suffering or the role that institutions may play in causing or ameliorating suffering.

Methods: Data was obtained as part of a large, longitudinal study that examined and-of-life experiences in two nursing homes in the Kansas City area. Data was collected using a case study approach, incorporating observations, document review, and interviews with declining residents, family members and staff. Qualitative content analysis was used to analyze data. This analysis focused on the profound psychosocial and existential suffering that was experienced by many of the nursing home residents.

Results: The narratives of two residents who exemplified the suffering experiences of many of the residents in the larger study were selected for in-depth analysis and presentation. Through these narratives, specific examples of physical, psychosocial, and existential suffering are revealed. The experiences of these residents illuminate the profound roles that NH may have in causing or exacerbating resident suffering, as well as the steps that may readily be taken to relieve suffering.

Discussion: Suffering as an essential aspect of the human condition is explored within the context of nursing homes as systems of care for older adults. Attention to suffering is integral to quality of life, yet few nursing homes have integrated the diagnosis and relief of suffering into their routine work.

Hospital Elder Life Program

The Hospital Elder Life Program (HELP) is an innovative model of care, designed to prevent delirium and functional decline in hospitalized older persons.

The program provides skilled interdisciplinary staff and trained volunteers to carry out intervention protocols targeted toward six delirium risk factors: orientation, therapeutic activities, early mobilization, vision and hearing protocols, oral volume repletion, and sleep enhancement. The program is designed to be superimposed on existing hospital units, and does not require a separate, dedicated geriatric unit.

HELP has been demonstrated to be effective for prevention of delirium and functional decline. In addition, cost-effectiveness has been demonstrated for both acute hospital costs and for long-term nursing home costs. HELP is being implemented in over 60 hospitals worldwide.

Social Disposition Factors and Length of Stay in the ACE Unit

Older adults use more economic resources that younger adults for health care including hospital care. They account for a disproportional higher hospital admission and discharge rates. In addition, older adults are at risk for hospitalization related to complications and longer hospitalization due to the complexity of their medical illness.

Management of appropriate length of stay is critical in order to minimize unnecessary cost but also to minimize hospital acquired infections and to improve transition to home or another place of care. In this presentation, the factors that currently determine length of hospitalization will be discussed, including social and psychological factors that cause extended hospitalization. The Galveston Social Disposition Score (GSDS), a six-item, 0 to 12 point scale, will also be discussed.

Improving Care of Hospitalized Persons with Dementia
Donna M. Fick

Despite almost three decades of research in the field of delirium we still understand very little about preventing and managing delirium in persons with dementia (PWD) across the care continuum. Many factors are important in the examination of improved care for PWD in the acute care setting including increasing surgical interventions in older adults, innovations in assessment, transitions and communication in care across settings, increased interdisciplinary care, and the role of informal caregivers. We will present our data from a prospective study of acute care nurses knowledge of delirium superimposed on dementia and a retrospective analysis of claims data in persons with dementia to imagine a better future for PWD. These results will be discussed in the context of both the past and present acute care environment for PWD to imagine how acute care for persons with dementia will improve into 2010 and beyond.

The Association Between Failure to Resolve Delirium and Mortality Among Newly Admitted Post-Acute Facility Patients.

Dan Kiely et al.

Delirium is common among hospitalized elders and has been reported to be a risk factor for death. This study examined the not well-studied association between failure to resolve delirium and mortality in a post-acute care (PAC) population. Cam-defined delirium and subject characteristics were assessed at PAC admission and at four (2 weeks, 1, 3, and 6 months) follow-up (FU) assessments (n=457). Facility records and the National Death Index were used to determine death status over one year.

Nearly 40% (n=182) of subjects died during the FU period (range, 6-365 days). A Cox Proportional Hazards model with delirium status as a time-dependent covariate revealed that patients who failed to resolve their delirium were 3.65 [95%CI 2.36-5.67] times more likely to die over a 365-day period compared to patients who resolved their delirium, independent of age, gender, comorbidity and dementia (n=437). Delirium should be considered an independent risk factor for mortality.

Do Doctors Make a Difference?: Predictors of Early Re-Hospitalization Among Nursing Facility Subacute Rehabilitation Patients

Danuta Eva Bielicka M.D. et al.

Objective: Identify risk factors for early re-hospitalization from a skilled nursing facility subacute rehabilitation unit (SNFSR).

Methods: SNFSR patients admitted between January and June 2006 and subsequently re-hospitalized (R) within 5 days were identified (n=52). Control patients (C) (n = 48) were matched for age, gender and primary diagnosis. Functional status, number and type of medications, oxygen use, vital signs, admission day, time (days) until initial doctor assessment at SNFSR, and antecedent hospital length of stay were determined by structured chart review.

Results: R were 4 times (95% C.I. = 1.6212, 9.9305) more likely to be admitted over the weekend (X^2=9.5665;p=0.002). Physician orders were written on more days within a week of admission in C (4.2 ± 1.8) than R (2.9 ± 1.3) (p=0.0004), and 83% of C vs. 62% of R were seen within the first 2 days of admission (p=0.0044).

Conclusion: Patients needing early re-hospitalization were more likely to be admitted to SNFSR over the weekend and less likely to be seen by a physician within the first 2 days. Further study is needed to assess the impact of physician availability vs. facility staffing factors on early re-hospitalization.

Hospital Elder Life Program : Prevalence of Dysphagia in Hospitalized Elderly Patients With Delirium: A Pilot Study

Andrea G Matarazzo et al.

Purpose: To evaluate the prevalence of dysphagia in hospitalized elderly patients with diagnosis of delirium in a school-hospital in São Paulo (Brazil).
Patients and methods: Transversal pilot study developed between Jun-Sep/2005.
Inclusion criteria: Hospitalized elderly patients (65-years-aged or more, both genders, any race), who received the diagnosis of delirium by the Cognitive Assessment Method (CAM), in any division of the hospital.
The assessment conducted by the SLP consisted of clinical swallowing examination with food of varying consistencies. The observation of swallowing abnormalities (coughing, choking, wet "gurgly" voice, prolonged chewing or eating time, breathing changes, reluctance to consume particular food consistencies or to eat at all), and also stasis and cervical auscultation of laryngeal penetration noises were the criteria used to classify a patient as dysphagic.
Results: 18 patients were evaluated, but only 6 met criteria to be included in the study (4 women; 2 men; 75-90-years-aged, mean 81.8). Dysphagia was observed in five patients (83.33%): for solid food in 3 (60%), for liquid in one (16.6%), and for puréed form in one (16.6%). All the three patients who presented dysphagia for solid food seemed anxious and agitated during assessment, and the other two dysphagic patients were somnolent while being examined.
Conclusion: Dysphagia seems high prevalent in elderly hospitalized patients with delirium.

Hospital Outcomes of Older Chronically Critically Ill Patients

Patricia A. Higgins RN, PhD, et al.

Chronically critically ill (CCI) patients are an important and growing population and chronic critical illness is now acknowledged as an international public health concern. Chronic critical illness develops after a patient survives the life-threatening phase of critical illness but remains seriously ill and her/his recovery period requires extensive technological support. The purpose of this paper is to profile the hospital course of the older CCI patient, using the adult failure to thrive (FTT) framework to investigate illness-related and FTT factors and their relationships to patient outcomes. Adult failure to thrive syndrome is defined as low functional status associated with nutritional deficits, disturbed mood state, disrupted sleep, and social isolation. The sample (N=352) was drawn from a larger study in one tertiary medical center (NR 050005). Older CCI patients were defined as anyone > 65 years of age who required mechanical ventilation for > 3 days and had a length of stay (LOS) > 7 days. Age= 76 years (range 65-96), 57% female. Mortality rate=39%.

FTT data related to patients' functional status indicted that 86% (313) of the sample were living at home prior to hospitalization but 92% of the survivors were discharged to another institution (long-term acute care, rehabilitation, skilled nursing, or nursing home) and 20% required ventilator support at discharge.

Nursing Care of Older Adults, Physical Environments & Aging: Characteristics of Older Adults Admitted to the ICU

Colleen M. Casey BS, CCRN et al.

Older persons are hospitalized more frequently, and for longer, than other age groups. The increasing numbers of older ICU patients are physiologically and socially different from younger patients, making their ICU care complex. Little is known about these patients' pre-hospital living and functional characteristics. This study's purpose was to describe the characteristics of older patients admitted to three ICUs at an academic medical center in the Pacific Northwest.

A retrospective chart review was conducted for 136 patients aged 75 years and older admitted from September 1, 2005, to December 1, 2005. Baseline body mass index, living situation, functional status, functional aids, relationship of contact and support persons, admission diagnoses, and substance use were measured. Characteristics were analyzed using descriptive statistics, t-tests, and chi-square.

Mean age was 81.3 (5.0). The majority lived with their spouse (50%) or alone (30%), with 81% living at home, including 10% with in-home care. Patients had an average of 7 additional admission diagnoses and 64% reported using at least 2 ADL aids. While 63% were independent in all ADLs, 11% needed assistance or were dependent in all ADLs. Over 25% of patients were readmitted to the ICU during their hospital stay, with 9% readmitted a second time. Nearly 50% were discharged home (38% to SNF), with 80% of post-hospital support reported as family. This study provides preliminary evidence of the heterogeneity of older ICU patients. Further research on the effects of older patient characteristics on their hospitalization may lead to more effective care for this population.

Predictors Of Adverse Hospital Outcomes Following Intensive Care

Beverly L. Roberts PhD et al.

To evaluate the contribution of albumin, physical capacities and selected co-morbidities in predicting adverse outcomes and hospital length of stay, 142 women and 148 men hospitalized adults transferred from ICU (mean=63 years) were studied. 55.9% had low albumin (<3.5g/dL) with 67.0% also having anemia. Compared to subjects with normal albumin, those with low albumin were not significantly more likely to die (3.1% vs 4.9%) but were significantly more likely to fall (5.5% vs 14.8%), have an infection (23.8% vs 39.5%), and a pressure ulcer (3.1% vs 13.6%). When controlling for demographics, ADLs and physical capacity (muscle strength, gait and balance), low albumin was a significant predictor of falls (OR=4.50) but not of death (OR=.96). Low albumin was a significant predictor of hospital length of stay (â =.152) along with age, infection and pressure ulcers (â=-.11, .22, .26, respectively). Risk assessments for adverse outcomes following intensive care should incorporate albumin.