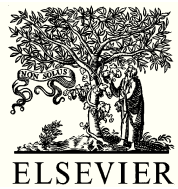
European Geriatric Medicine 2S (2011) S1–S23
Rev Esp Geriatr Gerontol. 2011;46(Espec Cong):1-23



Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

7th Congress of the EUGMS

# Oral presentation for clinical area

## *Comunicaciones orales área clínica*

CO-001

### Trends in emergency department (ED) usage by elderly patients in our hospital. Should we keep closing our eyes and do nothing?

M. Moreno[a], F. Bové[b], M. Partera[a], B. Gonzalez[a], C. Nogueras[a], R. Comet[a], A. Nogueras[a]
[a] *Geriatric Department Corporacio Sanitària Parc Tauli, Sabadell, Spain* ; [b] *Centre Atenció Primària Sant Félix, Spain*

*Objectives*.– To describe ED utilization by patients over the age of 75 years, compared to the younger patients. With a thorough knowledge of our experience and after review of literature, to propose a geriatric emergency care service delivery program to be implemented in our hospital.
*Methods*.– Medical literature review on ED utilization by elderly (Medline 1998–2011). Update on demographic data. Retrospective review of electronic charts of ED-visits from January to December 2008 at an urban teaching hospital (535 acute beds attending a population of 421.077, 6.2% aged over 75) over a 1-year period. Statistical analysis using SPSS version 17.
*Results*.– A total of 149.121 visits (91.671 patients) were analyzed of which 17.394 visits were of patients $>$ 75years (11.6%). Females were 59.37% in $>$ 75years (elderly) and 52.7% in $<$ 75years (younger). Triage stratification according to severity in elderly was 4–5 level (maximum severity) in 83.79% of visits (younger, 45.61%). Among elderly, 66.78% were attended in Medicine, 23.13% in traumatology, and 8.95% in surgery. Diagnostics (ICD-9) for elderly were injury and poisoning (20.7%); symptoms, signs, ill-defined conditions (18.8%); circulatory system (16%), respiratory (12.8%); musculoskeletal (8.6%). Among elderly visits, 25.8% were admitted vs 7.96% in younger. Among all admitted patients, 30.6% were elderly and 69% younger. Elderly admissions: Medicine 77.9%, traumatology 11.2% and Surgery 10.5%. 26.1% of elderly stayed in ED $>$ 24 hours (younger, 3.73%). Elderly follow a stable pattern of use over all year, and on holiday period (august) their visits increased. Rate of refrequentation is similar in both groups.
*Conclusions*.– ED was visited by 38% of the elderly in our area at least once during 2008. Of all ED-visits, 11% were elderly patients: in a more severe condition, longer stays in ED and more admissions (25.8%). The usage of ED by the elderly will continue to increase in the future. Focusing on the requirements of the elderly is essential to improve their care in ED.

CO-002

### Identification of older patients at risk of readmission and death after discharge from the emergency department: Comparison of two screening tools

C.E. Graf, S.V. Giannelli, F.R. Herrmann, J.P. Michel, D. Zekry, T. Chevalley
*Geneva University Hospitals and University of Geneva, Thonex, Switzerland*

Twenty per cent of admissions at the emergency department (ED) concern patients aged 65 years and older. After an ED-visit, readmission rates can reach 44% at 6 months. The Identification of Senior At Risk (ISAR) and the Triage Risk Stratification Tool (TRST) are the two most studied screening tools to detect patients at risk for readmission. However, they were developed for patients 65 years and older and their performances are not clear for patients over 75 years. This study aims to evaluate the performances of the ISAR and TRST to predict readmission after an ED-visit among patients over 75 years.
We performed a retrospective cohort study with systematic data collection at the Geneva University hospital between 2007 and 2009. Patients released home after an ED-visit were included (except nights and week-ends). Basic (BADL) and instrumental activities of daily living (IADL) scales and comorbidities (CIRS score) as well as readmission data were collected from the computed database of the hospital.
During this period, 345 patients were included (mean age ($\pm$ SD) 83.9 $\pm$ 5.7 years, 63% of females). Readmission rates reached 25%, 38%, 49% and 60% at 1, 3, 6 and 12 months, respectively. Sex (male), BADL, IADL and CIRS scores were significantly related to readmission. Patients with a positive ISAR ($\geq$ 2/6) and those with a positive TRST ($\geq$ 2/5) had respectively an hazard ratio (HR) [95% CI] for readmission of 2.79 [1.29–6.05] and 1.77 [0.94–3.33] at 1 month, 3.73 [1.90–7.34] and 1.99 [1.18–3.35] at 3 months, 3.30 [1.91–5.70] and 2.32 [1.44–3.73] at 6 months and 3.16 [1.97–5.03] and 2.67 [1.71–4.16] at 12 months. After adjustment for sex, BADL, IADL and CIRS, adjusted HR [95% CI] for ISAR and TRST were respectively 2.91 [1.29–6.59] and 1.89 [0.94–3.78] at 1 month, 3.70 [1.81–7.56] and 1.90 [1.06–3.38] at 3 months, 3.20 [1.78–5.73] and 2.27 [1.35–3.82] at 6 months and 3.00 [1.80–5.00] and 2.64 [1.63–4.27] at 12 months.
The two screening tools ISAR and TRST are both efficient to predict readmission after an ED-visit among patients over 75 years, but the

1878-7649/$ – see front matter
doi:10.1016/j.eurger.2011.06.003

ISAR tool is easier for clinical use and predicts significantly the readmission already at 1 month.

CO-003

**Does multi prognostic index (MPI) influence hospital costs of the acute geriatric inpatient?**

A. Greco[a], D. Sancarlo[a], P. Chiarelli[b], M. Mastroianno[b], L. Miscio[b], A. Pilotto[a]
[a] *Geriatric Unit, IRCCS "Casa Sollievo della Sofferenza"San Giovanni Rotondo, Italy* ; [b] *Economic Unit, IRCCS "Casa Sollievo della Sofferenza", Italy*

*Introduction*.– CMS-DRG classification does not provide an accurate estimate of resource consumption in elderly patients because it is related not only to the severity of the clinical disorder but also to the global impairment of the patients This, may stem from a combination of factors, which can be correctly appreciated by Multi Prognostic Index (MPI). Aim of the study was to evaluate if MPI may influence the hospital costs of the acute geriatric inpatient.
*Methods*.– Discharge abstracts (DA) of the elderly patients admitted to the Geriatric Unit of the IRCCS "Casa Sollievo della Sofferenza" in 2009 were collected and grouped with relative weight (RW) computation by the Centers for Medicare Service Diagnosis Related Groups (CMS-DRG) software. Activity-based costing data, with total in-hospital costs and CGA with MPI score, were also obtained for each subject. All these patients were divided in 2 subgroups according to a RW $< 1$ or $\geq 1$ and further stratified by MPI grade (1-to -3). Chi-square test and one-way analysis of variance were used to test the differences in MPI distribution and total costs (in €) between subgroups.
*Results*.– One thousand one hundred sixty four patients (mean age $78.3 \pm 6.8$, range 65–102) were included into the study. Mean length of stay was $7.9 \pm 6.1$ days. Group 1 (RW $< 1$, $n = 611$ subjects) and Group 2 (RW $\geq 1$, $n = 553$ subjects) were similar with respect to age and gender. MPI distribution was significantly different between the two RW groups (Group-1: MPI-1 = 349, MPI-2 = 186, MPI-3 = 76; Group-2: MPI-1 = 219, MPI-2 = 222 and MPI-3 = 112; $P < 0.001$). Costs grouped by MPI grade were also statistically different between the two RW groups (Group-1: MPI-1 = $2.292 \pm 250$, MPI-2 = $2.400 \pm 286$, MPI-3 = $2.868 \pm 294$; Group-2: MPI-1 = $3.273 \pm 245$, MPI2 = $3.326 \pm 328$, MPI3 = $2.5.367 \pm 321$; $P < 0.001$).
*Conclusions*.– The global impairment of elderly patients, evaluated by MPI grade, is able to influence hospital costs in both low and high weighted cases.

CO-004

**Frequency of colonization by multi-drug resistant organisms among patients hospitalized in a geriatric ward: A one year prospective cohort study**

D. Schoevaerdts, M. Frennet, J. Jamart, T.D. Huang, P. Bogaerts, Y. Glupczynski
*Centre Hospitalier Universitaire Mont-Godinne, Yvoir, Belgium*

*Introduction*.– The objectives are to determine prevalence, incidence and risk factors of asymptomatic carriage of extended-spectrum beta-lactamase producing Enterobacteriaceae (ESBLE), methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant *Enterococcus* (VRE) in elderly subjects admitted to hospital in a geriatric ward.
*Method*.– During one year, nasal, oropharyngeal, groin, axilla and rectal swabs were prospectively collected upon admission and at discharge for microbiological culture on selective chromogenic agar and broth enrichment. Identification and susceptibility testing of the target pathogens were performed according to conventional laboratory methods. Genotypic characterization of resistance determinants was performed by multiplex PCR assays.
*Results*.– Out of 473 admitted patients between 12.2009 and 12.2010, 337 were included in the study. The observed prevalence upon admission of ESBLE, MRSA and VRE carriage was 11.6% (Confidence Interval 95% (95%CI): 8.2–15.0%), 7.5% (95%CI: 4.6–10.4%) and 0.6% (95%CI: 0.1–2.1%), respectively. *Escherichia coli* (*E. coli*) was the most frequently isolated microorganism among ESBLE isolates (89%). The incidence density of ESBLE and MRSA carriage was respectively of 1.8 and 2.4 new cases/1000 patient-days. Using a logistic stepwise regression, the risk factors for ESBLE colonization on admission were: multiple contacts with the hospital within the previous year (Odds Ratio (OR): 2.5; 95%CI: 1.2–5.4; *P*: 0.017), chronic catheter use (OR: 3.2; 95%CI: 2.0–8.6; *P*: 0.020) and a high level of dependency measured by the Katz scale (OR: 0.9; 95%CI: 0.7–1.0; *P*: 0.06). For MRSA, the following risk factors were obtained: chronic wounds (OR: 3.5; CI95%: 1.4–9.0; *P:* 0.009), anti-acid use (OR: 3.0; 95%CI: 1.2–7.5; *P*: 0.017) and a high level of dependency (OR: 0.7; 95%CI: 0.5–0.9; *P*: 0.003). At the end of hospital stay, no difference was observed for length of stay, nosocomial infection rate or mortality rate among ESBLE or MRSA carriers.
*Conclusions*.– This study shows a high prevalence of asymptomatic colonization by ESBL–producing *E. coli* on admission in an acute geriatric ward. This rate is almost twice as high as the prevalence of MRSA carriage. VRE colonization remains low in our setting. A low functional status is a common risk factor for both ESBLE or MRSA colonization and highlights the need to reinforce infection control procedures.

CO-005

**Effective partnership between geriatricians and general practitioners (GPS) in nursing homes reduces emergency hospital admissions**

R. Lisk, K. Yeong, M. Bhaskar, B. Mike, D. Zahid
*Ashford & St. Peter's NHS Trust, Chertsey, United Kingdom*

*Background*.– Nursing home residents tend to be very frail older people with complex pathology who are very dependent, needing complex care needs. These residents will benefit from effective partnerships between primary and secondary care.
*Method*.– We looked at 1151 residents admitted from nursing homes at our Trust from April 2006 to March 2009 inclusive. We noted that 3 nursing homes had the highest number of multiple admissions ($\geq 4$).
Four interventions were carried out for a period of 3 months to reduce hospital admissions:

- Monthly Medical Advisory Meetings with GPs by a Consultant Geriatrician;
- Available for telephone advice on a daily basis;
- End of Life Care;
- Medihome – A healthcare company that can provide intravenous antibiotics and fluids in nursing homes.

Following the success of the initial project for the 3 nursing home from June to August 2010, the nursing home project was extended to 3 more nursing homes.
Part 2 of the project commenced in October 2010 to Jan 2011 and included 6 nursing homes (including the original 3 nursing homes).

*Results*.–

| Period | Average No. of Admissions from 3 Nursing Homes | Total emergency admissions | Admission rate per 1,000 admissions |
|---|---|---|---|
| June–Aug 08 | 25 | 3846 | 6.50 |
| June–Aug 09 | 24 | 4167 | 5.76 |
| Observed June–Aug 10 | 11 | 4251 | 2.59 |
| *Expected June–Aug 10* | *23* | *4251* | *5.41* |
| Part 2 | | | |
| Oct 08–Jan 09 | 69 | 7711 | 8.95 |
| Oct 09–Jan 10 | 68 | 8848 | 7.69 |
| Observed Oct 10–Jan 11 | 37 | 8742 | 4.35 |
| *Expected Oct 10–Jan 11* | *67* | *8742* | *7.66* |

Statistical analysis was using chi-square was performed.
In the initial project, there was a 52% reduction in emergency admissions ($\chi^2(2)$ 6.261, p 0.044). For part 2 of the project, there was a 43% reduction in emergency admissions ($\chi^2(2)$ 7.692, p 0.0048), arguably to an even greater extent than the initial project results.
*Conclusion*.– The results show that geriatrician working in partnership with GPs had a significant impact on emergency admissions from nursing homes in both parts of the nursing home project. Geriatricians working together with co-ordinated multi-disciplinary teams are well placed to manage these complex frail elderly care home residents and develop care plans for these residents.

CO-006

**Intermediate care in nursing home after hospital admission reduced the need for home services, but increased mortality. A randomized controlled trial with one year follow-up**

J.K. Herfjord[a], H. Erstad[b], T. Heggestad[b], A. Hylen Ranhoff[c]
[a] *Fylkesmannen i HordalandBergen, Norway ;* [b] *Haukeland Universitetssykehus, Norway ;* [c] *Kavli forskningssenter for aldring og demens, Norway*

*Introduction*.– The aim of intermediate care is to reduce demand for hospital beds, while providing adequate treatment and care at a lower cost. Typically the target population is elderly people. Storetveit nursing home has organized a 19-bed intermediate care unit staffed with a geriatrician and increased nursing staff. Elderly patients with acute illness are transferred 1–3 days after hospital admission for further treatment and care. The aim of this study was to evaluate whether treatment in this intermediate care unit was safe and beneficial, compared with usual care in hospital.
*Method*.– Four hundred patients over 70 years and living at home, admitted to hospital with acute medical illness or orthopedic non-surgical trauma were included and randomized to transfer to Storetveit nursing home (the intervention group) or usual care in hospital (the control group). The study population consisted of 376 patients (74% females, mean age 84 years) after 24 patients withdrew their consent or were lost to follow-up. Main outcomes were one-year mortality, hospital admissions, readmissions, days in nursing home and use of home care. Data were obtained from hospital and community patient registers.
*Results*.– After one year, 42 intervention patients and 32 controls were dead (22,1% vs 17,2%, $P = 0.29$). Among orthopedic patients 15 intervention patients and only 7 controls were dead (25.0% vs 10,3%, $P = 0.049$). For medical patients there was no difference in one-year mortality (25,6% vs 25,0%, $P = 0.99$). In the intervention group fewer patients used home services (68,4% vs 80,1%, $P = 0.0067$), and there was a trend towards less time in nursing homes (40 vs 55 days, $P = 0.09$). There were no difference in hospital admissions ($P = 0.411$) and readmissions ($P = 0.12$).
*Conclusions*.– This model of intermediate care resulted in less need for home care services and a trend toward less nursing home care, but gave concern about patient safety because more of the orthopedic patients died in the group who were transferred to intermediate care.

CO-007

**Primary care in Irish nursing homes revisited: A survey of the experiences of general practitioners caring for nursing home patients 2011**

L.E. Gleeson[a], S. Jennings[a], R. Gavin[a], D. Mcconaghy[b], D.R. Collins[a]
[a] *Adelaide & Meath Hospital Tallaght, Dublin, Ireland ;* [b] *Sallins Occupational Health Clinic, Sallins, Ireland*

*Introduction*.– The Irish Health Information and Quality Authority (HIQA) published their National Quality Standards for Residential Care Settings for Older People in 2009. We reported in 2006 results of the surveyed experiences of general practitioners (GPs) in Dublin caring for nursing home residents. This study sought to revisit these experiences following the publication of HIQA's standards.
*Methodology*.– An anonymous postal survey was distributed to 205 randomly selected GPs from the Irish College of General Practitioners membership throughout the country.
*Results*.– Hundred replies were received so far. 63% of respondents felt that NH residents required more contact time than other practice patients. 58% of all respondents reported NH consultations to be more complex than those of other practice patients. Only 60% of respondents felt they had adequate training in elderly medicine to care for this patient population, and only 59% reported adequate access to specialist geriatrician advice when needed. 80% reported no increase in access to specialist advice since the launch of HIQA national standards. 32% had witnessed substandard care in a nursing home, and of these 28% did not report this substandard care, representing similar figures to those obtained in the pre-HIQA study.
*Conclusion*.– Results of this survey found similar themes to those raised in 2006; that NH consultations are more time-consuming and more complex than other GP consultations, and a significant number of respondents still feel they lack adequate training and support to care for this population. In the experience of Irish GPs the publication of HIQA guidelines has not impacted yet on either availability of specialist support or standards of care.

CO-008

**Physicians and geriatric nurse practitioner co-management model–The recipe for success in a large hospital based geriatric practice**

D. Yasick, D. Raccio, W. Gray, B. Skudlarska
*Bridgeport Hospital, Woodbridge, United States*

*Introduction*.– In the USA, an advanced practice registered nurse (APRN) is a registered nurse with a Masters Degree who provides

preventive and health care services to individual of all ages. Since the inception of the APRN role in the mid-1960, APRN have been involved in all levels and setting of medical practice. By statue, the APRN can diagnose, treat, order diagnose tests and prescribe medications. With its roots in nursing care, the core philosophy of the field is individualized care and improved function. As government face fiscal crises and funding for public services is restricted, the APRN can provide an alternative care model, which can improve quality of care.

*Methods*.– A large Geriatric practice, consisting of 4 physicians and 3 APRN, based in an urban hospital in Bridgeport, Connecticut USA was surveyed to determine the proportion of services provided by APRN's vs. physicians. The practice provides consultation services in the hospital as well as an outpatient setting. The practice also provides geriatric primary care in assisted living facilities and home visits.

*Results*.– In a 12 month period 5458 patient visits were seen in this practice, physicians seeing 2674 visits (49%) and APRN seeing 2784 visits (51%). Physicians see the majority of initial visits 1296 of the 2168 initial visits vs. 872 visits seen by APRN. There were 1878 follow-up consultation visits, 838 by physicians and 1040 by APRN. Follow-up home visits were 860, 254 by physicians and 606 by APRN. And in the assisted living follow-ups visits were 512, 286 by physicians and 226 by APRN.

*Conclusion*.– APRN's provide a significant proportion of services in this geriatric practice. This practice model significantly contribution to a large number of patients being seen without compromising the quality of care. It is hypothesized that further study will show the involvement of APRN's in a practice setting will result in more face to face time with patients, increase focus on teaching and improved compliance.

CO-009

## Elder abuse: The role of the general practitioner

J. O'brien[a], C. Collins[b], A. Ni Riain[b], V. Long[b], D. O'neill[c]
[a] *University of LouisLouisville, United States ;* [b] *Irish College of General Practitioners, United States ;* [c] *Adelaide and Meath Hospital, United States*

Elder abuse is estimated to affect 2%–10% of those over 65. It robs the older adult of any quality of remaining life. The majority of care provided to older adults in the community is by their general practitioners.

In 2010, approximately 1/3 of general practitioners (800) in Ireland were surveyed regarding their experiences with elder abuse and neglect.

A response rate of 24% was achieved. Overall, 64.5% of general practitioners had encountered a case of elder abuse with 35.5% doing so within the past year. The most common forms of abuse encountered were psychological abuse in 70% of instances, followed by self-neglect, financial abuse and neglect, exploitation, physical abuse and sexual abuse. The most common method of detection was by the general practitioner followed by a report by a family member or neighbor. Detection most frequently occurred during a home visit–75.9%. Of those who had encountered elder abuse, 13.3% had been threatened by the suspected perpetrator or family member. Barriers to identification included concealment by the victim (61.4%) and the perpetrator (51%). Only 1/3 of general practitioners were aware of the existence of senior caseworkers. Over 70% of physicians felt that following detection the situation for the victim had improved.

The vast majority of general practitioners agree that elder abuse is an important issue for them to address.

CO-010

## Pain awareness and assessment in departments for geriatrics in Austria

K. Pils, P. Mrak, G. Pinter, P. Doviak, T. Frühwald, R. Fleischhackl, H. Herkner, R. Likar
*Austrian Society for Geriatrics and Gerontology, Wien, Austria*

*Introduction*.– Pain is common in old age. Most people are ment to suffer from chronic pain. To develop standards in pain assessment in Austrian geriatric department, we agreed to assess prevalence and degree of pain on a single day.

*Patients and methods*.– All 31 departments for Geriatrics were invited to participate. 17 departments agreed to complete a questionnaire for each patient at the ward – excluding those who were discharged this very day or those who came on "Pain day" or the day before. The dataset included personal data, geriatrics assessment and simple questions on pain and treatment. Additional the verbal rating scale, Visual analogue scale and Dolo plus were applied. The pain management of every patient was registered.

*Results*.– Five hundred and thirty-six patients were included, 87.8% women, 22.2% men, mean age $82.2 \pm 8$ years, Body Mass Index (BMI) $25.9 \pm 5.1$, Barthel Index $54.5 \pm 27.6$.

About two third agreed to have pain (67.7%), 386 patients (72%) focused pain on a specific region. When including patients without pain but with pain treatment the ratio of patient suffering from pain increases up to 471 (87.9%). About 10% did not received any pain medication although they described pain higher than 3 in the NRS.

Visual analogue scale showed reliable data in cognitive competent patients, but was not helpful in demented patients. Verbal rating scale correlates in all patients with Dolo puls.

*Discussion*.– Pain is often ment to be under recognised and under treated in older patients. Our data showed a high prevalence of pain, mainly caused by osteoarthritis, osteoporoses and fractures. The pain management was excellent in about 5% of the patients, two third claimed about pain, although they had analgesic treatment. In these patients the overall ratio of pain was moderate to low. It was mentioned very often, that patients prefer just some reduction of pain. They are afraid of negative side effects, like dizziness, fatigue or nausea. There should be done more research on adequate pain management in older patients. It seems not to be only a question of awareness but also on knowledge of side effects and drug interaction. Patients have to be more involved in their pain treatment.

CO-011

## Highlighting patterns of factors influencing the relationship between pain and quality of life among older adults–Findings from the snac study

L.W. Sandin Wranker[a,b], M. Rennemark[a], J. Berglund[a]
[a] *School of Health Science, Blekinge Institute of Technology, Karlskrona, Sweden;* [b] *Department of Health Sciences, division of Geriatric Medicine, Lund University, Sweden*

*Introduction*.– The influence of pain on Quality of Life may vary depending on several reasons, biological as well as social, psychological or even existential. Thus, to better understand individuals who suffer from pain, psychosocial and quality of life aspects should be taken into account. Consequently, the aim of this study was look for patterns of biological/psychological and social factors that alter the relationship between pain and Quality of life.

*Method*.– The SNAC (The Swedish National Study on Aging and Care) sample includes 1402 individuals aged 60–96 years out of whom 769 (55%) reported suffering from pain. This sample of older adults is being followed over time. Data were collected from physical examinations, patient records and a questionnaire. Age, gender, if living alone, KASAM, insomnia and pain were included as independent variables. The outcome variable, Quality of life, was estimated using the HRQL Medical Outcome Study-Short Form (SF 12).
*Results*.– All independent variables were related to Quality of Life in expected directions. Logistic regression analyses, showed that, multivariately, four factors influenced the quality of life among elders. Suffering from pain (OR 1.66), insomnia (OR 1.70), KASAM (OR 1.08) and age (OR 1.05) increased the odds of experienced low Quality of Life.
*Conclusion*.– The results clearly show that insomnia means high odds for a low quality of life. The next most influential factor leading to low quality of life is pain. Significantly but with low OR, also age and KASAM increase the risk of having a low Quality of Life. Thus, when understanding the relationship between pain and Quality of Life, sleeping problems and older age need to be considered.

CO-012

## Differences between patients with and without delirium in geriatric ward

M. Barceló, M.T. Comas, G. Fuster, R. Prats, M. Gelpi, D. Ruiz
*Hospital de Sant Pau, Barcelona, Spain*

*Objective*.– The aim of our study is to compare characteristics of patients with and without delirium during admission in a geriatric ward.
*Patients and methods*.– We analyzed all patients over 65 years admitted to a geriatric ward from February 2005 to September 2009. Age, sex, Charlson, previous Barthel, dementia, place of residence, length of hospital stay, admission diagnosis, complications, place of discharge and mortality were collected. Univariate analysis was performed using the statistical method ANOVA for quantitative variables and chi-square test for qualitative variables. Statistically significant variables were entered into a conditional logistic regression analysis.
*Results*.– We included 3164 patients with a mean age of 84.8 years (65–107), 60% women, mean Charlson was 2.19 and mean Barthel index 55.49. Mean length of hospital stay was 17.97 days and 18.6% were exitus during admission. Delirium was diagnosed in a 14.5% of patients.
Patients with delirium were older ($P < 0.001$), more frequently demented ($P < 0.001$) came mostly from home ($P = 0.018$) with more referrals to inpatient extended care facility ($P < 0.001$). Delirium was more frequent in patients admitted with urinary tract infection ($P < 0.001$), acute renal failure ($P = 0.002$), dehydration ($P = 0.017$), non-surgical fractures ($P = 0.007$), falls ($P = 0.006$) and was less frequent in those admitted for heart failure ($P < 0.001$) and arrhythmias ($P = 0.003$) in logistic regression analysis were statistically significant age ($P < 0.001$), dementia ($P = 0.001$), length of hospital stay ($P = 0.012$), living at home ($P = 0.004$), referral to a inpatient extended care facility ($P = 0.012$), diagnosis of UTI ($P < 0.001$), non-surgical fractures ($P = 0.025$) and in those without delirium heart failure ($P = 0.021$) and arrhythmia ($P = 0.031$).
*Conclusions*.– Patients at highest risk for delirium are older, demented, lived at home, hospitalized for urinary tract infection and non-surgical fractures. Have longer length of hospital stay and require more referrals to inpatient extended care facility.

CO-013

## Is there an association between delirium and plasma tryptophan and kynurenine levels in elderly hospitalized patients?

A. De Jonghe[a], B. Van Munster[a], H. Van Oosten[a], D. Fekkes[b], S. De Rooij[a]
[a] *Academic Medical Centre Amsterdam, Netherlands* ; [b] *Academic Medical Centre Rotterdam, Netherlands*

*Introduction*.– One of the hypotheses in the pathophysiology of delirium is a low plasma trypophan. The reduction in tryptophan might be caused by increased breakdown of tryptophan to kynurenine. It has been hypothesized that this is accompanied by an increased breakdown of serotonin and melatonin. An imbalance in both neurotransmitters could be responsible for the inattention and disturbances of the sleep-wake cycle seen in delirium. The aim of this study was to compare tryptophan and kynurenine in patients with and without delirium.
*Methods*.– In a prospective cohort study, patients with a hip fracture, aged 65 years and older were included. Delirium was diagnosed by the Confusion Assessment Method. Tryptophan and kynurenine were assayed in repeated blood samples. The association of tryptophan, kynurenine and kynurenine/tryptophan ratio with delirium state was analyzed with linear mixed models.
*Results*.– Four hundred and sixty-one blood samples of 71 delirious and 70 non-delirious patients were collected. Patients with delirium were significantly older (85 vs 83 years, $P = 0.03$) and they experienced pre-existing cognitive (47% vs 11%) and functional (8% vs 3%) impairment significantly more often than patients without delirium ($P < 0.001$). Adjusted for day of withdrawal, tryptophan, kynurenine and kynurenine/tryptophan ratio of samples taken 'before delirium', during delirium', and 'after delirium', and of samples taken of patients without delirium were overall not significantly different (table 1).
*Conclusion*.– No evidence could be found in serial blood samples from postoperative patients with and without delirium that changes in plasma tryptophan and kynurenine levels are associated with the development of delirium.

CO-014

## Vitamin B12 and folate intake, homocysteine levels and their association with cognitive functioning in Dutch elderly people

J. Van Wijngaarden[a], R. Dhonukshe-Rutten[a], A. Vaes[a], E. Brouwer[a], A. Enneman[b], K. Swart[c], L. De Groot[a]
[a] *Wageningen University, Wageningen, Netherlands* ; [b] *Erasmus MC, Netherlands* ; [c] *EMGO institute, VUmc, Netherlands*

*Introduction*.– Cognitive impairment is a well-known problem in the ageing population. Elevated plasma homocysteine levels have been reported as a possible risk factor for cognitive decline in community dwelling elderly people. Vitamin B12 and folate play an important role in homocysteine metabolism. Vitamin B12, folate and homocysteine levels are possibly associated with cognitive function. Our aim was to evaluate the cross-sectional association of vitamin B12 and folate intake and homocysteine levels with cognitive function in Dutch elderly, participating in the B-PROOF study. The B-PROOF study is a randomized, placebo controlled trial investigating the effect of vitamin B12 and folic acid supplementation on fracture risk in elderly people.
*Methods*.– *S*ubjects, aged $\geq$ 65 y; $N = 557$, 40% female, had a plasma homocysteine level between 12 μmol/L and 50 μmol/L, with a median of 14.3 μmol/L. Vitamin B12 and folate intake was measured with a validated Food Frequency Questionnaire. Cognitive functioning was assessed with the Mini-Mental State

Examination (MMSE) and six specific cognitive tests. The results of these tests were combined into four cognitive domains; Attention and Working Memory, Information Processing Speed, Executive Function and Episodic Memory, using compound Z-scores. Multiple Linear Regression analysis was performed to examine the association of vitamin B12 and folate intake and plasma homocysteine levels with cognitive domains.

*Results*.– We observed significantmodest inverse associations between plasma homocysteine levels and the cognitive domains Attention and Working Memory ($\beta = -0.02$, $P = 0.05$), Executive Function ($\beta = -0.02$, $P = 0.02$) and Information Processing Speed ($\beta = -0.45$, $P = 0.00$). When we adjusted for sex, age, education, smoking, alcohol intake and depression, the association remained significant only in the domain Information Processing Speed ($\beta = -0.023$, $P = 0.02$). We did not observe an association between folate or vitamin B12 intake and cognitive function ($P > 0.05$).

*Conclusions*.– We observed a modest inverse association of plasma homocysteine levels with cognitive function, especially within the cognitive domain Information Processing Speed. In our study no significant association was observed between vitamin B12 and folate intake and cognitive function.

CO-015

## The impact of frailty on cognitive performance in independent community dwelling older adults

A. Ní Mhaoláin, C.W. Fan, C. Cunningham, R. Romero-Ortuno, L. Cogan, R.A. Kenny, B. Lawlor
*TRIL (Technology Research for Independent Living) Clinic, Dublin, Ireland*

*Introduction*.– Frailty is an important clinical and public health problem in older adults characterized an increased risk of morbidity, disability and mortality. To date there remains limited information on the relationship between frailty status and subsequent change in cognitive function. Increasing frailty has been associated with incident Alzheimer's disease and mild cognitive impairment yet little work has been done to evaluate the specific domains of cognitive performance frailty relates to, nor whether it is an early indicator of poorer cognitive performance in those who have not yet developed established cognitive impairment. The objective of this study was to examine a detailed assessment of cognitive performance and its relationship to frailty in a cohort of independent community dwelling elderly.

*Methods*.– Cross-sectional design where 500 elders were assessed at the Technology Research for Independent Living (TRIL) Clinic in Dublin. (http://www.trilcentre.org/)Cognitive status was assessed in a variety of domains to include language, executive function, spatial ability, verbal and non-verbal memory. Frailty was measured using the Biological Syndrome Model.

*Results*.– Global cognitive performance was reduced within both pre-frail and frail elderly. ($\chi^2$ test, $P = <.001$) Frailty retained a significant association with poorer cognitive scores even when age, gender and education were controlled for. Impaired grip strength and reduced physical activity were the specific frailty criteria that inferred higher odds of reduced global cognitive performance. (OR = 2.11 CI 1.27, 3.52 $P = 0.004$, OR = 2.72 CI 1.43, 5.21 $P = .002$ respectively) Frailer elders performed poorly on neuropsychological tests of immediate and delayed word recall, executive functioning and praxis. The likelihood of having impaired executive functioning was increased fourfold if you were a pre-frail or frail elder. (OR = 4.31 CI 2.24, 8.72 $P = < .001$).

*Conclusion*.– Frailty even at the pre-frail stage is associated with poorer global cognitive performance and impaired executive functioning in a healthy non-demented elderly cohort. Any intervention for frail patients should include a cognitive evaluation and case management for a person targeting cognitive performance should consider coexisting frailty with an attempt to coordinate interventions to address both conditions.

CO-016

## Frailty syndrome and the risk of vascular dementia. The Italian longitudinal study on aging

F. Panza[a], V. Solfrizzi[b], V. Frisardi[b], D. Seripa[a], S. Maggi[c], A. Pilotto[d]
[a] *IRCCS Casa Sollievo della Sofferenza, San Giovanni Rotondo, Italy ;* [b] *University of Bari, Bari, Italy ;* [c] *National Center of Research (CNR), Padova, Italy ;* [d] *Azienda ULSS 16 Padova, S Antonio Hospital, Padova, Italy*

*Introduction*.– Frailty is a clinical syndrome generally associated with a greater risk for adverse outcomes such as falls, disability, institutionalization, and death. Cognition and dementia have already been considered as a component of frailty, but the role of frailty as possible determinant of dementia, Alzheimer's disease (AD), and vascular dementia (VaD) has been poorly investigated. We estimated the predictive role of frailty syndrome on incident dementia and its subtypes in a non demented Italian older population.

*Methods*.– We evaluated 2,581 individuals recruited from 5,632 subjects, aged 65–84 year old, from the Italian Longitudinal Study on Aging and with a 3.9 year median follow-up. A phenotype of frailty according to a modified measurement of Cardiovascular Health Study criteria was operationalized. Dementia, AD, and VaD were classified using current published criteria.

*Results*.– Over a 3.5 year follow-up, 65 of 2,581 (2.5%) older subjects developed overall dementia, 16 among 252 frail individuals (6.3%), out of which 9 affected by VaD (3.6%). In a proportional hazards model, frailty syndrome was associated with a significantly increased risk of overall dementia [adjusted adjusted hazard ratio (HR) 1.85, 95% confidence interval (CI) 1.01–3.40], and in particular of VaD (adjusted HR 2.68, CI 95% 1.16–7.17). The risk of AD or other types of dementia did not significantly change in frail individuals in comparison with subjects without frailty syndrome.

*Conclusion*.– In our large population-based sample, frailty syndrome was a short-term predictor of overall dementia and VaD.

CO-017

## First Irish experiences in DaTSCAN usage by a combined neurology and medicine for the elderly movement disorder service

A. Beirne, L. Tutty, N. Tubridy, S. O' Riordain, G. Hughes
*St Vincents University Hospital, Dublin, Ireland*

Single Photon Emission Computed Tomography (SPECT) imaging of the Dopamine Transporter (DaT) detects loss of striatal DaT binding in patients with degeneration in the nigrostriatal pathway, thus assessing its integrity. We undertook an audit to assess the way in which DaTSCAN is currently used in clinical practice in our institution and to determine its impact on patient management.

We retrospectively examined all DaTSCANs performed in our Radiology Department over a 20 month period. We reviewed request cards, clinical notes and results relating to each scan performed.

One hundred and eleven scans were performed in the period. The mean age of persons undergoing DaTSCAN was 65.6 years (range 29–91); 44 females (39.6%) and 67 males (60.4%) were

scanned. The majority of DaTSCANs were requested by Neurologists/Movement Disorder Specialists (83%). The indications for scan requests included confirming Parkinson's disease ($n = 64$), query Essential Tremor ($n = 31$), query Drug Induced Parkinsonism ($n = 8$), query Multi System Atrophy (n = 6), and query Lewy Body Dementia ($n = 2$). The majority of scans were requested in the age group 65–79 years. We noted that patients undergoing DaTSCANs with three or more typical symptoms and signs of Parkinson's disease (PD) were more likely to have an abnormal DaTSCAN indicating dopaminergic neuro-degeneration. Twenty four percent of patients underwent treatment change following their DaTSCAN. Second opinions were requested on four scans and this resulted in alteration of the report in 75% of cases.
SPECT scanning contributes significantly to patient management. The majority of scans were requested by movement disorder specialists and were requested in older people in whom disorders of dopaminergic deficiency are more likely to exist. Second opinions were requested in four cases, which resulted in report changes. Regular consensus meetings between radiologists and movement disorder specialists may be beneficial.

CO-018

**Electroencephalographic parameters during working memory activation can distinguish progressive from stable mild cognitive impairment**

G. Gold, P. Missoninier, M. Deiber, F. Herrmann, P. Giannakopoulos
*Geneva University Hospitals and Geneva University Medical School, Geneva, Switzerland*

Mild cognitive impairment (MCI) represents a heterogeneous population that includes individuals who remain cognitively stable (SMCI) and others whose deficits progress over time (PMCI). EEG is a widely available modality that may be particularly suited to the prediction of MCI progression.
*Aims*.– To examine whether memory-related EEG parameters may predict cognitive decline in MCI.
*Methods*.– Evaluation of EEG parameters during a working memory activation n-back task in 45 MCI cases that had a neuropsychological follow-up 1 year later.
*Results*.– Several measurements were able to distinguish MCI cases at baseline that went on to develop PMCI from those who remained cognitively stable. Reciever operating characteristic analysis revealed areas under the curve that ranged from 76% to 93% depending on the EEG parameter. Using Boolean combinations it was possible to correctly classify 90% of all MCI cases.
*Conclusion*.– It is possible to identify simple and promising EEG markers of rapid cognitive decline in MCI that can be used to predict individual prognosis with good accuracy.

CO-019

**NT-ProBNP is associated with complicated pulmonary embolism in emergency elderly patients**

L. Zerah[a], J. Boddaert[a], C. Chenevier-Gobeaux[b], F. Maziere[c], B. Riou[a], P. Ray[a]
[a] *Pitie-Salpetriere hospital, APHP, UPMC Paris, France ;* [b] *Cochin hospital, APHP, France ;* [c] *Saint Antoine APHP, France*

Incidence of pulmonary embolism (PE) increases with age, and PE represents almost 20% of acute respiratory failures in elderly patients admitted to emergency department (ED). Previous study suggested that cardiac biomarkers were predicators of adverse events related to pulmonary embolism, but data are scarce in elderly patients. The aim of our study was to determine variables associated with complicated PE in emergency elderly patients.
We conducted a prospective observational study in an ED over a 3-year period in patients aged 65 years and older. Main clinical and biological characteristics including brain natriuretic peptides (BNP and NT-proBNP) and troponin (cTnI), were determinate at admission in patients with confirmed PE. Complicated PE included one of the following: admission in ICU, thrombolysis, embolectomy, use of vasopressors, mechanical ventilation, and death.
Ninety-one patients aged $78 \pm 9$ years were included, in whom 30 (33%) with complicated PE (ICU admission $n = 27$, death $n = 8$, embolectomy $n = 1$, vasopressors $n = 1$). At admission, 70 patients (77%) presented with acute dyspnea, 22 (24%) with clinical signs of acute respiratory distress (24%), 11 (12%) with chest pain and one with hemoptysis. Diagnosis of PE was confirmed using spiral CT ($n = 74$), high-probability ventilation-perfusion scan ($n = 9$), and/or description of deep venous thrombosis by ultrasonography of the lower limbs ($n = 48$). In univariate analysis, patients with complicated PE presented with significantly higher respiratory rate, higher heart rate, lower pH, lower SaO2 and lower PaO2 than patients with stable PE. Complicated PE was associated with higher rate of elevated cTnI, and higher rate of NT-proBNP and BNP. In multivariate analysis, elevated NT-proBNP was associated with complicated PE (odds ratio, 95% CI: 22 [2.08–232.17], $P = 0.0024$).
At admission, elevated NT-proBNP but not cTnI was significantly associated with complicated PE in emergency elderly patients. The clinical implication of cardiac biomarkers in a risk stratification strategy requires further investigations for elderly patients.

CO-020

**Comprehensive geriatric assessment and hospital mortality among older adults with decompensated heart failure**

C. Rodriguez-Pascual, A. Vilches-Moraga, E. Paredes-Galan, A.I. Ferrero-Matínez, M. Torrente-Carballido, J.A. Lazarini-Diaz-Barriga, D. Perez-Soto
*Hosital Meixoeiro, Vigo, Spain*

*Purpose*.– To determine the influence of physical and cognitive function and other components of the comprehensive geriatric assessment (CGA) on in-hospital mortality of older adults admitted with acute heart failure (HF).
*Methods*.– Prospective study of 581 individuals aged 75 years or older admitted for decompensated HF to an acute geriatric unit (AGU) from October 2006 to September 2009. We recorded demographic indicators, clinical data and CGA including measurement of dependence in activities of daily living (ADL), mobility limitations, cognitive status, screening for depression, comorbidity and pharmacological prescriptions.
A Geriatric Assessment Score (GAS) was constructed using baseline individual scores on five domains: level of dependence on ADL, mobility, comorbidity, cognition and number of prescribed medications.
*Results*.– Mean age of patients was $85.8 \pm 5.8$ years, and 67% were women. Seventy five percent had preserved left ventricular ejection fraction, mean Charlson Comorbidity Index (CCI) was $3.97 \pm 3.01$. Forty five percent of patients showed cognitive impairment and 49% depression, 66% experienced mobility problems and 50% required assistance in one or more activities of daily living. In-hospital fatality was 8.2%. Variables associated with in-hospital mortality on multivariate analysis included advanced NYHA functional class III-IV, pulmonary oedema on chest radiography, renal dysfunction and the GAS.

*Conclusions*.– In our cohort of very elderly heart failure patients, an index incorporating comorbidities, total number of prescription drugs, cognitive, functional and mobility status predicts in-hospital mortality along with NYHA class, renal function and admission chest X-ray.

CO-021

**Nine hundred patients with heart failure admitted to the acute geriatrics units of eight hospitals**

R. Menéndez Colino[a], O. Nuñez Orrego[a], S. Quintanilla Clavijo[a], A.I. Ferrero Martinez[b], A. Del Pino[a], C. Mauleon Ladrero[a], C. Rodriguez Pascual[b]
[a] *Hospital La Paz, Madrid, Spain ;* [b] *Hospital Meixoeiro*

*Introduction*.– Chronic heart failure (HF) is a frequent syndrome among hospitalized older adults, and constitutes the main cause of hospital readmission and one of the major causes of quality of life deterioration and death.
*Objective*.– To describe characteristics and co-morbidity of HF-patients admitted to the acute-care units of Geriatric Departments (GD).
*Methods*.– Descriptive study of HF-patients over 75 years admitted to the acute-care units of the GD in 8 hospitals in Spain from November 2009 to May 2011. The following data were collected: age, sex, social condition, etiology and stage of HF, number of HF readmissions in the last year, Katz index, Lawton index, Reisberg's Global deterioration scale (GDS) and comorbidity (Charlson Index).
*Results*.– The sample included 925 patients: mean age was $86.37 \pm 5.33$ and 64.3% were female. The main cause of HF was hypertension in 43.6% of patients followed by coronary heart disease (21.1%). The 91.8% of patients were in NYHA functional class II-III. The global score means in assessment tools were: Lawton: $2.67 \pm 2.48$, GDS: $2.20 \pm 1.63$ and Charlson index $3.48 \pm 2.04$. Katz index was A in 26% of patients, B: 21.2%; C: 14.6%; D: 10.4%; E: 8.1%; F: 12%; G: 7.7%. The number of patients with a HF previous admission was 403 (47.2%).
*Conclusions*.– Patients with HF admitted to the acute-care units of GD are very old with high co- morbidity. Patients like these are not usually included in clinical trials. HF Disease management programmes for these patients must take account the management of comorbidity as well as HF.

CO-022

**Elderly and cardiogenic shock. Is age an important factor in long term survival?**

V.M. Hidalgo Olivares, M. Martinez Reig, A. Gutierrez Díez, R. Fuentes Manso, J.G. Córdoba Soriano, J.M. Jiménez Mazuecos
*CHUA, Albacete, Spain*

*Objectives*.– Cardiogenic shock (CS) complicates approximately 5 to 9 percent of acute myocardial infarction and it is the main cause of death in hospital. Revascularization is the only effective mean that has been clinically proven to improve outcomes in these circumstances. It is well known that age is a very important prognostic factor, but it has not been established its influence for a long term.
*Methods*.– We study a cohort of patients (P) admitted in our intensive care unit with myocardial infarction, cardiogenic shock and coronary revascularization $< 75$ years old (YP) and compared it with $> 75$ years old (EP). Arrhythmias and mechanical shock were excluded.
*Results*.– Prospective study of 97 consecutive P, 45% EP. There was statistically difference in gender (EP 57% male vs YP 81%, *P*: 0,014), diabetes mellitus (EP 21% vs 49%, *P*: 0,006) and smokers (EP 5% vs YP 40%, $P < 0.05$). No significant differences were found in the form of admission (SC at the beginning in 48% EP), existence of multi-vessel disease (EP 42%), intra aortic balloon pump use (EP 32%) or treatment with IIb/IIIa inhibitors (EP 33%). There were not any differences between groups in left ventricular ejection fraction and the existence of associated comorbidity. Coronary angioplasty was made in 95% of EP (multi-vessel in 18%, no differences). During hospitalization, 54.5% EP died versus 30.2% YP (*P*: 0.022). Long-term outcome at 5 years continued worsening in EP (73% died versus 39% YP, *P*: 0.007).
*Conclusions*.– Myocardial infarction complicated with cardiogenic shock in elderly patients is an entity with high mortality during hospitalization and prognosis dramatically getting worse at long term. Probably, we should have to select which of these patients may beneficiate of an invasive strategy and to do close monitoring of them in the follow-up.

CO-023

**Prognostic implications of atrial fibrillation in elderly patients undergoing primary coronary angioplasty after acute myocardial infarction**

M. Chung, D. Viliani, D. Vivas, C. Macaya, F. Alfonso, P. Gil
*Hospital Clinico San Carlos, Madrid, Spain*

*Introduction*.– Atrial Fibrillation (AF) is a common event in patients with acute myocardial infarction (AMI), and is associated with higher mortality and poor long-term prognosis. We evaluated the clinical in-hospital outcomes in elderly patients undergoing primary angioplasty after AMI with AF.
*Methods*.– We analyzed the data from patients aged 70 years and older with ST segment elevation myocardial infarction treated with primary angioplasty during the period between 2004 and 2008. All clinical, electrocardiographic, and angiographic data were collected. We recorded if the patient had previous AF, or developed a new one either transient or persistent after discharge, and the clinical implications and outcomes of these patients. The primary endpoints were combined outcomes of death and reinfarction, plus death, reinfarction, stroke and major bleeding all combined. Statistical analysis with SPSS15.0.
*Results*.– $N = 329$ patients. 66 patients had AF (20%): 20 had AF previously known (30%), 8 persistent (12%) and 38 transient (58%). All patients with AF had a significant higher Killip score ($P = 0.003$), especially those with persistent AF ($P = 0.017$) and transient AF ($P = 0.025$). We found no differences between groups with and without AF in the presence of hypertension, diabetes mellitus, peripheral vascular disease, hypercolesterolemia, previous AMI, chronic renal failure and the infarction localization. Patients with persistent AF, besides a greater Killip class, had more frequently hypertension and a lower left ventricular ejection fraction ($P = 0.011$), and greater in-hospital mortality and stroke ($P < 0.05$) than patients without AF. Overall, the AF group in-hospital outcomes showed a greater mortality and complications such as cardiogenic shock and major arrhythmias. On the multivariate analysis, persistent AF and a higher Killip class emerged as an independent predictor of death, reinfarction, stroke and major bleeding.
*Conclusions*.– In elderly patients with ST-segment elevation acute myocardial infarction undergoing primary angioplasty, AF is associated with a poor prognosis, especially those with persistent AF compared with previous or transient AF.

CO-024

## Guideline non-adherence for combination antithrombotic therapy in patients with heart failure: A study in five Dutch hospitals

A. Ahmed, I. Van Den Ingh, M. Fahimnia, T. Feuth, P. De Smet, K. Kramers
*Radboud University Medical Centre, Arnhem, Netherlands*

*Introduction.*– Recent studies in the Netherlands found that bleedings due to antithrombotic therapy were the most frequently occurring preventable causes of drug related unplanned hospital admissions. Furthermore, the combination of these therapies increased the bleeding risk. Patients with heart failure (HF) are a high-risk group, because of old age, multiple comorbidities and polypharmacy. The aim of this study is to evaluate the adherence to current guidelines, the Dutch national (CBO) guideline and the European Society of Cardiology (ESC) guidelines, in patients with HF on combination antithrombotic therapy.
*Method.*– Observational, retrospective, cross-sectional study was conducted in five HF clinics. We compared the prescribed indications and therapy duration with the recommendations of the CBO and ESC guidelines. Furthermore, a questionnaire was used to find out the reason of guideline deviation.
*Results.*– Among 2499 HF patients who used an antithrombotic agent, 248 patients were treated with combination antithrombotic therapy (Average age: 70.1 years; 62,9%: male). 38.7% used dual antiplatelet therapy, (i.e. acetyl salicylic acid (ASA) with clopidogrel), 55.6% was treated with an antiplatelet agent in combination with an oral anticoagulant (OAC) and 5.6% used triple therapy consisting of ASA-clopidogrel-OAC. In 66.1% and 39.5% of patients, no valid indication had been found for the combination therapy according to the CBO and the ESC guidelines, respectively. Furthermore, 34% of patients had three or more predisposing risk factors for haemorrhage. However, only 54,5% of total patients was treated with a proton pump inhibitor.
Interestingly, all participating cardiologists reported to use the ESC and not the national guideline. Their response rate to questionnaires about patients who, according to ESC guideline, did not have a valid indication for combination antithrombotic therapy was 22%. In 45,5% of those patients the cardiologist had intentionally deviated from the guideline, because of a perceived high risk for a thromboembolic event. In the remaining patients the deviation was unintentional.
*Conclusion.*– In many patients with HF who are treated with combinations of antithrombotic drugs, the current guidelines in the Netherlands are not followed. Careful and regular re-evaluation of therapy is needed to improve the safety and to reduce bleeding risks in these patients.

CO-025

## Adequacy between anticoagulant prescriptions and CHADS2 score recommendations in geriatric patients

M. Paccalin, N. Haida, M. Albouy-Llati, C. Baudemont, F. Bellarbre
*University hospital La Milétrie, Poitiers, France*

*Introduction.*– Atrial fibrillation (AF) is a major risk factor for stroke. Thromboprophylaxis with anticoagulant reduces the incidence of stroke and is warranted by the $CHADS_2$ recommendations when score $\geq 2$. But such therapy remains underutilized particularly among elderly patients. The aim of our study was to evaluate the adequacy between the prescriptions and the $CHADS_2$ recommendations in geriatric hospitalized patients with AF.
*Method.*– Retrospective study in the Geriatrics Department of the University hospital of Poitiers (France), of patients >75 ans with AF, hospitalized between July and December 2009. The description of the patients included epidemiological data, functional daily activities (score GIR), cognitive assessment, antithrombotic treatment, and evaluation of the $CHADS_2$ and $HEMORR_2HAGES$ scores.
*Results.*– Hundred and sixty-one hospitalizations were analyzed, mean age of the patients was $87{,}4 \pm 5.4$ years. Antithrombotic treatment was prescribed in 84% of cases. The overall conformity to $CHADS_2$ recommendations was 44%. Most of hospitalizations (88,9%) concerned patients with $CHADS_2$ score $\geq 2$. Non-conformity rate was up to 60% in this group with 5 significant variables: MMSE score $< 26$ (OR 3,17; IC95%, 1,23–8,17), high risk of bleeding (OR 2,88; IC95%, 1,28–6,47), dementia (OR 2,46; IC95%, 1,01–5,95), functional impairment (GIR score $\leq 4$) (OR 2,43; IC95%, 1,23–4,84) and history of fall (OR 2,42; IC95%, 1,13–5,17). Still, the variables explained only 19% of the non-conform prescriptions and no variable was significantly relevant on multivariate analysis.
*Conclusion.*– Our study show 56% of prescriptions that were non-conform to $CHADS_2$ recommendations, particularly in the elderly with a predictive embolic score $\geq 2$. Antithrombotic treatment seems to be all the less conform as patients appear to be more vunerable. Due to the new score $CHA_2DS_2$-VASc, physicians really have to discuss the benefit – risk balance at an individual level.

CO-026

## Difficult choices: Antithrombotic treatment for atrial fibrillation in frail geriatric patients

E. Topinkova[a], M. Novakova[b], M.K. Chamradova[a], M. Vlachova[a], P. Madlova[a]
[a] *First Faculty of Medicine, Charles University, Prague, Czech Republic ;*
[b] *Postacute Hospital Trebotov, Czech Republic*

*Background.*– The choice of risk reduction treatment strategies in atrial fibrillation (AF) in older persons are being extensively debated. Despite current guidelines recommend antithrombotic treatment (AT) there are major differences between guidelines and actual clinical care. Particularly in very elderly commorbid or frail patients the risk of major bleeding may exceed the expected benefit of AT on reducing cardioembolic stroke risk. The aim of the study was to assess the risk profile of older frail geriatric patients with non-valvular AF to weight the benefits and risks of AT. Current AT was evaluated against calculated stroke and bleeding risks using standardized scales.
*Methods.*– Medical charts of 592 frail post-acute care geriatric patients were analyzed retrospectively for the presence of AF. 136 (22.9%) cases were identified and after exclusion of valvular AF and palliative care patients total 119 finally analyzed. Type of AF, commorbidities, and treatment were recorded. Risk stratification scoring systems $CHADS_2$ and $CHA_2DS_2$-$VAS_c$ for the risk of stroke and $HEMORR_2HAGES$ and HASBLED for the risk of major bleeding were applied and descriptive statistics used.
*Results.*– Sample mean age was $83.0 \pm 7.5$ with 61.3% of female. One third (31.1%) received anticoagulants (AC), another half antiplatelet (AP) drugs. High means for $CHADS_2$ ($3.0 \pm 1.4$) and $CHA_2DS_2$-$VAS_c$ ($4.9 \pm 1.7$) reflected high stroke risk −2/3 of patients in high-risk category. Similarly the high risk of major bleeding was present in 70.6% and so were means of $HEMORR_2HAGES$ ($3.4 \pm 1.5$) and HASBLED ($2.51 \pm .2$). We did not confirm our hypothesis that patients with highest stroke risk and lowest bleeding risk receive AC. The differences in means of all used scales were non-significant for AC, AP, and no treatment. Empirical treatment thus does not reflect the risk/benefit in our sample. In the charts treatment was rarely justified by formal risk assessment. The $HEMORR_2HAGES$ scale seems preferable because it captures risk of falls/neuropsychiatric disease.

*Conclusions*.– In the frail commorbid elderly patients the estimation of risk/benefit is difficult and often risks are comparable. However systematic risk stratification using standardized scales in individual patients may better distinguish patients for safer anticoagulation and improve guidelines adherence.
*Supported by IGA-MH-CR NS-10029-4.*

CO-027

**Functional and clinical evolution of older patients with severe aortic stenosis after corevalve aortic valve implantation**

G. Mendieta[a], C. Pereyra[a], E. Sánchez[b], E. Gutiérrez[a], J. Elízaga[a], H. Bueno[a], M. Vidán[a], F. Fernández Avilés[a]
[a] *Hospital Gregorio Marañón, Madrid, Spain ;* [b] *Hospital Ramón y Cajal, Madrid, Spain*

Transcatheter aortic valve implantation (TAVI) is a therapeutic option in geriatric patients with severe symptomatic aortic stenosis excluded for surgery. Functional evolution after this procedure remains unknown.
*Objectives*.– To describe clinical and functional evolution of patients receiving TAVI.
*Design and Setting*.– Observational prospective study of patients $\geq$ 65 years old admitted for TAVI in a university hospital in Madrid. Baseline cardiologic symptoms, heart abnormalities and comorbidities were registered, and a comprehensive geriatric assessment was performed. Clinical and functional outcomes were evaluated in a clinical visit (1 month) and by phone interview (12 month after discharge). Symptoms evolution, mortality and readmission rates, autonomy for activities of daily living (ADL) and health status (SF-12 scale) were assessed. Functional decline was defined as a lower ADL score at follow-up than on admission.
*Results*.– Forty-two patients were included between January 2009 and April 2011, with age 82.9 (66-92) years, 59.5% were female. Median Charlson index was 3 (range 0–8), 30% had COPD and 19% renal failure. Main symptoms of aortic stenosis were dyspnea in 71.4% (30/42) and angor in 31% (13/42). Before TAVI 59.5% of the patients were independent for ADL and 11.9% were dependent for $\geq$ 3 ADL. Cognitive impairment (MMSE $<$ 22) was found in 16.7%. During admission 5 patients died (11.9%). Main complications were atrioventricular blockade needing permanent pacemaker (31%, 13/42) and infections in 16.6% (urinary infections, bacteraemia, respiratory infection or phlebitis).
Within the first month cumulated mortality was 11.9% (5/42) and any cause readmission rate was 37.8% (14/37). 56.7% (21/37) of the patients reported improvement of cardiac symptoms, and 44.4% a better health status. However (12/37) 33.3% presented functional decline and 2/37 (5.5%) were admitted to a nursing home. Functional decline was more frequent among those without cardiac symptoms improvement (42.9%) than among those that reported improvement (28.6%). So far, only 20 patients have finished 12-months follow-up. Cumulative death rate is 19.1% (8/42) and readmission rate 51.4% (19/37).
*Conclusion*.– In very old and comorbid patients, TAVI improves symptoms in more than half of the patients, but functionality or health perceptions do not improve in all. The study of factors that predict functional evolution is essential to better define TAVI indication.

CO-028

**Gait speed and health outcomes measures in community dweling elderly**

X. Rojano Luque, A. Salvà Casanovas
*Institut de l'Envelliment de la UAB. Institut d'Investigació Biomèdica Sant Pau, Barcelona, Spain*

*Objectives*.– To assess the relationship between gait speed and health outcomes in community dwelling older people.
*Methods*.– Cohort study with a 12 months follow-up. Participants randomly selected from census. We have analyzed those who finished the study (395/448).
*Assessments*.– Gait speed (GS)(m/s) walking a distance of 2,44m at usual pace (with inertia) categorization by quintiles; handgrip strength (HS) (kg) with an analogic dynamometer; basic activities of daily living (ADL) with Katz index, instrumental activities (IADL) with Lawton index; physical activity and hospitalization self-reported; falls with monthly questionnaire.
*Statistical analysis*.– Means: Kruskall Wallis; proportions: chi-square. Analysis stratified by age group (65–75; 75–84; $\geq$ 85).
*Results*.– GS decreased with age (1.03m/s $<$ 75y; 0.86m/s 75–84y; 0.65m/s $\geq$ 85y). Men were faster than women (1.08m/s vs 0.85). There is a slope in GS reduction, being bigger in the fastest quintile than in the lowest (−0.41m/s vs −0.8m/s).

| GS Quintile | Age* | % Women* | Gait speed* | Handgrip* | % Sedentary* | Body Mass Index (BMI) |
|---|---|---|---|---|---|---|
| Q1 | 71.3 | 28 | 1.3 | 30.5 | 5 | 28.8 |
| Q2 | 71.9 | 51 | 1.1 | 26.6 | 3 | 29.1 |
| Q3 | 73.6 | 58 | 1.0 | 22.6 | 16 | 29.7 |
| Q4 | 75.4 | 72 | 0.8 | 18.7 | 24 | 30.0 |
| Q5 | 79.2 | 85 | 0.5 | 15.0 | 42 | 30.4 |
| Total | 74.2 | 58 | 0.9 | 22.8 | 18 | 29.6 |

* $P < 0.001$

The differences in sex and physical acitivity are sustained over age, but there is no relationship with Body Mass Index (BMI). The relationship with handgrip strength disappeared in the oldest group.

| GS Quintile | Incidence Falls/year | % Felt previous year | % Hospitalized | % Aut. ADL* | % Aut. IADL* |
|---|---|---|---|---|---|
| Q1 | 0.20 | 21 | 14.8 | 91.6 | 34.9 |
| Q2 | 0.28 | 13 | 9.1 | 93.5 | 54.5 |
| Q3 | 0.59 | 35 | 11.4 | 92.5 | 45.0 |
| Q4 | 0.55 | 34 | 11.0 | 84.2 | 52.6 |
| Q5 | 0.53 | 22 | 12.8 | 64.6 | 22.8 |
| Total | 0.43 | 25 | 11.9 | 85.3 | 41.8 |

Aut. = Autonomous
* $P < 0.001$

Gait speed has no relationship on incidence of falls or hospitalization when stratifying by age. Relationship with autonomy is modified by age, disappearing the linearity in some age groups.
*Conclusions*.– There is a decreasing slope in gait speed with ageing. Some associations between gait speed and physical functions disappear or are modified once adjusted by age.

CO-029

**Six-month mortality in a cohort of elderly people hospitalized in medical wards via emergency department**

M. Dramé, R. Mahmoudi, L. Kanagaratnam, D. Jolly, F. Blanchard, J.L. Novella
*University Hospital of Reims Champagne-Ardenne, Faculty of Medicine, EA 3797, Reims, France*

*Background*.– Hospitalization following the occurrence of an acute medical problem, notwithstanding treatment, puts elderly people at risk for functional decline. However this risk seems to persist during post-hospital recovery despite stabilization of chronic diseases and/or treatment of acute pathologies. The objective of the present study was to identify factors predictive for six-month mortality in a frail elderly population after hospitalization via emergency department.
*Methods*.– A prospective cohort of elderly subjects of 75 or over was set up in nine French teaching hospitals. Data obtained from a Comprehensive Geriatric Assessment were used into a Cox model to predict mortality. Institutionalization and unplanned readmission have been introduced in the model as time-dependent variables (they were multiplied by log [time to death]).
*Results*.– The 1 306 subjects of the SAFES cohort were 85 ± 6 years and were mainly women (65%). Crude mortality rate after six months of follow-up was 24%. Factors found to be independently linked to six-month mortality were exclusively medical factors: dependency for the ADLs (HR = 1.67; CI95% = 1.12–2.48), malnutrition or risk thereof (HR=1.69; CI95%=1.02–2.81), delirium (HR=1.81; CI95%=1.25–2.63), and a high level of comorbidity (HR=1.58; CI95%=1.06–2.35). Presence of pressure sore was of borderline significance (HR=1.41; CI95%=0.99–2.00). In addition, unplanned readmission (HR=1.32; CI95%=1.22–1.42) and institutionalization (HR=1.14; CI95%=1.05–1.23) were time-dependent variables that influenced independently risk of death.
*Conclusion*.– The main factors predictive of six-month mortality identified in this study are modifiable by targeted interventions. Their early identification and management would make it possible to modify favorably frail elderly subjects' prognosis.

CO-030

## Relevance of inflammatory markers for weight loss, functionality and mortality in nursing home residents

R. Diekmann[a], K. Winning[a], V. Daniel[b], T. Bertsch[c], J. Bauer[d]
[a] *Institute for Biomedicine of AgingNurenberg, Germany ;* [b] *Institute of ImmunologyNurenberg, Germany ;* [c] *Institute of Clinical Chemistry and Laboratory MedicineNurenberg, Germany ;* [d] *Geriatric Center OldenburgNurenberg, Germany*

*Introduction/Purpose*.– Chronic low-grade inflammation has been regarded as a major etiologic factor for the deterioration of nutritional and functional status in older adults.
*Aim*.– To analyze in nursing home residents the association of inflammatory parameters at baseline with markers of nutritional status and functionality as well as with mortality after a follow-up of 12 months.
*Methods*.– High sensitivity IL-6 (hsIL-6), soluble IL-6 receptor (sIL-6R), neopterin and high sensitivity CRP (hsCRP) were analyzed at baseline ($t_0$). Parameters of nutritional status (weight, BMI, waist circumference (WC), calf circumference (CC), triceps skinfold (TSF)) and parameters of functionality (handgrip strength (HGS), Activities of Daily Living (ADL), Timed up and go test (TUG)) were measured at $t_0$ and after 12 months ($t_{12}$). Mortality of participants was recorded during the same period.
*Results*.– Fasting blood samples were taken from 185 nursing home residents (73% female; 85.5 ± 7.7 years, BMI 26.0 ± 5.2 kg/m$^2$). Parameters indicating higher fat mass were positively associated with inflammatory markers (Spearman's Rho: sIL-6R with BMI 0.154; $P < 0.05$, sIL-6R with TSF 0.268; $P < 0.05$, hsCRP with TSF 0.200; WC 0.158; and BMI 0.152; all $P < 0.05$). Weight loss was not associated with higher inflammatory markers (Comparison of 3 groups: weight loss/no change/weight gain; Kruskal-Wallis; $P > 0.05$). Inflammatory markers were negatively associated with functionality at baseline (hsIL-6 with ADL, −0.170; $P < 0.05$) and at follow-up (hsIL-6 and Neopterin with TUG, Mann-Whitney-U; $P = 0.003$, respectively $P = 0.017$). Higher inflammatory markers at baseline were associated with increased one-year mortality (Mann-Whitney-U-test; hsIL-6 $P = 0.002$, Neopterin $P = 0.027$, hsCRP = 0.035).
*Conclusion*.– Inflammatory processes do not appear to be of relevance for weight loss in nursing home residents, while higher fat mass may contribute to inflammation in this population.
As inflammatory parameters were associated with declining functionality and higher mortality, a growing burden of care may be expected if the trend towards a higher prevalence of obesity among nursing homes residents continues.

CO-031

## Predicting adverse drug reactions in hospitalized older patients: Application of the Gerontonet ADR risk score

M. O Connor, D. O Mahony
*Cork University Hospital, CORK, Ireland*

*Introduction*.– Adverse drug reactions (ADRs) are a global healthcare concern. They are associated with increased morbidity, mortality and healthcare utilization costs. Gerontonet ADR risk score is a recently published tool developed specifically to identify patients at increased risk of an ADR. The aim of this study was (i) to ascertain the prevalence of ADRs in older patients during their hospital admission and (ii) to evaluate the predictive value of the Gerontonet risk score.
*Methods*.– The study population was recruited prospectively from consecutive acute cases aged ≥ 65 years admitted over a four-month period. Baseline demographics, current diagnoses, comorbidities and medications were recorded. Laboratory and ECG data were also documented. Admission medications were screened for potentially inappropriate medications (PIMs) using Screening Tool of Older Persons' Prescriptions criteria (STOPP). The Gerontonet ADR risk score was calculated for all patients. Patients were reviewed on day 5 and day 10, where applicable. Diagnoses, medications and Gerontonet risk scores were also updated .ADR ascertainment was by medical notes and nursing notes review in addition to consultation with the patient and medical personnel. Statistical analyses were performed using PASW version 18.0. The accuracy of the Gerontonet risk score in predicting ADRs was measured by constructing receiver operating characteristic curves (ROC) and measuring the area under the curve (AUC).
*Results*.– Five hundred and thirteen patients were recruited (median age 77years) with a median (IQR) number of daily medications of 7 (5–10) each. Over half of patients (51%) had ≥ 1 PIM. 178 ADRs occurred in 135 patients (26%). The ADR group were older ($P < 0.001$), prescribed more medications ($P < 0.001$) and more likely to have renal impairment ($P = 0.003$) than the non ADR group. The ADR group had a longer mean (SD) hospital stay 12 (12) compared with the non-ADR group 7 (9) days ($P < 0.001$). The mean (+/-SD) Gerontonet ADR risk score was 4.43 (2.1) in the ADR group compared with 3.46 in the non-ADR group. Construction of the ROC demonstrated an AUC of 0.629 (95%CI, 0.582–0.629).
*Conclusion*.– One in four older patients had an ADR in hospital. The Gerontonet ADR risk score is poorly predictive of ADRs in this population.

CO-032

## Inappropriate prescribing in Irish nursing home residents

D. O Sullivan[a], D. O Mahony[b], C. Parsons[c], C. Hughes[c], S. Patterson[c], S. Byrne[a]
[a] *School of Pharmacy, University College Cork, Ireland ;* [b] *School of Medicine, University College Cork, Ireland ;* [c] *School of Pharmacy, Queen's University Belfast, Ireland*

*Introduction*.– Frail elderly individuals are particularly vulnerable to both potential inappropriate prescribing (PIP) and potential prescribing omissions (PPO). Both PIP and PPO have been reported to be a substantial cause of morbidity and mortality, and a major contributing factor to increased healthcare utilization in older individuals.
*Method*.– Fifteen publically-funded nursing homes/community hospitals in the greater Cork region of the Republic of Ireland were approached, fourteen agreed to participate in the study. Nursing home residents' aged $\geq$ 65 years of age were randomly selected and recruited. Exclusion criteria included terminally ill or respite patients. Instances of PIP and PPO were assessed in this population using a validated evidence-based, sets of explicit criteria known collectively as the "Screening Tool of Older Person's Prescriptions (STOPP)/Screening Tool to Alert doctors to Right Treatment (START)".
*Results*.– Seven hundred and thirty-two residents from 14 LTC facilities were reviewed of which 514 (70.2%) were female; the median age was 85, IQR 79–89. The total number of medicines prescribed was 8,325 (median 11, IQR 9–14; range 2–25). The mean Charlson Co-morbidity Index (CCI) score was 1.78 and a statistically significant positive correlation was reported using the Spearman rho correlation test between the CCI score and the number of medication prescribed (rs = 0.14 $P < 0.05$) and regular prescribed medications (rs = 0.19 $P < 0.05$). 70.8% of patients had at least one instance of PIP identified by STOPP (7.1% relating to "prn" (as required) medicines). The STOPP criteria identified 1280 instances of PIP relating to 1140 (13.7%) potentially inappropriate medicines. The START criteria identified a total of 614 instances of PPOs in a total of 57.1% of residents. A statistically significant positive correlation was found between age and PPO instance (rs = 0.105 $P < 0.05$).
*Conclusion*.– Potential inappropriate prescribing is highly prevalent in nursing home residents in Southern Ireland. Robust methods for the prevention and reduction of PIP in this population which are at an increased risk of ADEs are urgently needed.

CO-033

## Association between multi-dose drug dispensing and quality of drug treatment

C. Sjöberg[a], C. Edward[b], J. Fastbom[c], K. Johnell[c], S. Landahl[a], K. Narbro[d], S.M. Wallerstedt[a]
[a] *Sahlgrenska University Hospital, Mölndal, Sweden ;* [b] *Drug section, County of Kalmar, Sweden ;* [c] *Karolinska Institute, Sweden ;* [d] *Region Västra Götaland, Sweden*

*Introduction*.– In the elderly in Scandinavia, multi-dose drug dispensing (MDD) is a common alternative to ordinary prescriptions (OP). For patients on MDD, drugs are delivered in unit bags for each dose occasion. The prescribing procedure differs between MDD and OP.
*Objective*.– To investigate the association between MDD and quality of drug treatment.
Methods.– The participants consisted of all inhabitants in Region Västra Götaland, Sweden, alive at December 31st 2007, $\geq$ 65 years of age, $\geq$ 1 drug registered in the Swedish Prescribed Drug Register in 2005–2007, and $\geq$ 2 health care visits for $\geq$ 2 diagnoses within obstructive pulmonary disease, diabetes mellitus, and/or cardiovascular disease in 2005–2007.
For each patient, prescribed drugs at December 31st 2007 was estimated from prescribed and dispensed drugs October 1st to December 31st 2007 registered in the Swedish Prescribed Drug Register. Quality of drug treatment was evaluated according to five drug-specific quality indicators: *Ten or more drugs*, *Long-acting benzodiazepines*, *Drugs with anti-cholinergic action*, *Three or more psychotropics*, and *Drug combinations that should be avoided*. Logistic regression was performed to investigate the association between MDD and quality of drug treatment. The results were adjusted for age, sex, burden of disease (number of different three level ICD10 diagnoses), and residence at October 1st 2007 (nursing home or community dwelling).
*Results*.– A total of 24,146 patients were included in the analysis (mean age: 76.7; 50.8% female; 20.4% with MDD). The proportion of patients with poor quality in drug treatment was significantly greater for all quality indicators (all $P < 0.0001$); between 5.9% and 55.1% for patients with MDD, and between 2.6% and 19.1% for patients with OP. Unadjusted and adjusted odds ratios (95% confidence interval) for poor quality in drug treatment (patients with MDD vs. patients with OP) ranged from 1.47 (1.30–1.65) to 7.08 (6.30–7.96) and from 1.36 (1.18–1.57) to 5.48 (4.76–6.30), respectively.
*Conclusions*.– Patients with MDD have poorer quality in drug treatment than patients with OP, and this cannot be explained by differences in age, sex, burden of disease, or residency. Further research is needed to evaluate causative factors and if the findings also applies to other dose dispensing systems.

CO-034

## Information on old persons is lacking in the product information: An analysis of 33 recently approved drugs

E. Beers[a], P.A. Jansen[a], T.C. Egberts[a], H.G. Leufkens[b]
[a] *University Medical Center Utrecht, Netherlands ;* [b] *Utrecht University, Netherlands*

*Introduction*.– Health care professionals can find information about a medicine in the summaries of product characteristics (SmPCs) as well as in the European public assessment reports (EPARs). The SmPC, which is the physician's leaflet, contains the officially approved information; in the EPAR the main regulatory considerations and reasons to approve the product are summarized. Older persons are frequently excluded from registration studies for various reasons (e.g. for ethical reasons, for increasing internal study validity). In order to change this, the ICH E7 guideline on geriatrics has been introduced already in 1993 to enhance the inclusion of older persons in these studies. The aim of this study was to evaluate the availability of information on old persons in the EPARs and SmPCs of recently approved medicines within the EU according to the ICH E7 guideline.
*Method*.– We selected 33 SmPCs and EPARs of products with a new chemical entity and complete and independent applications of systemically administered drugs for a geriatric indication with a first European centralized marketing authorization between January 2008 and January 2011. For each SmPC and EPAR we evaluated whether the information described in the ICH E7 guideline (19 items divided in four categories) was available. For the statistical analysis we used descriptive statistics (frequencies) and McNemar's test (nonparametric method for significance in nominal data) in SPSS 18.0.
*Results*.– Table 1 shows the results of our analysis.Availability of information in the SmPCs and EPARs.

| | Systemic medicines ($n$ = 33) | | |
|---|---|---|---|
| | SmPC | EPAR | $P$-value |
| Definition of the population ($n$ = 4) | 26% | 84% | < 0.01 |
| Clinical experience ($n$ = 4) | 43% | 64% | < 0.01 |
| PK studies ($n$ = 8) | 78% | 89% | < 0.01 |
| Drug-drug interaction studies ($n$ = 3) | 77% | 96% | < 0.01 |
| Overall ($n$ = 19) | 59% | 84% | < 0.01 |

$n$ = number of ICH E7 items

*Conclusions*.– Our study shows that the information about using a medicine in old persons is reasonably well covered in the EPARs (overall in 84%), meaning that the ICH E7 aspects are adequately addressed in the dossier. However, the translation of these aspects into the SmPC is rather incomplete (overall 59%). This study underpins the perspective that more information to guide geriatric prescribing should be covered, especially in the SmPCs.

CO-035

## Incorporation of clinical parameters to the pharmacotherapeutics application for automatic detection of drugs potentially inappropriate/appropriate

J.P. Vilasoa Boo[a], C. Arroyo Conde[b], A. Barreiro Gonzalez[c], P. Iglesias Neiro[b], C. Gallastegui Otero[b], M. Caamaño Barreiro[b]
[a] *Complexo Hospitalario Universitario De Vigo-Residencia Geriatros Barreiro, Vigo, Spain ;* [b] *Complexo Hospitalario Universitario De Vigo, Spain ;* [c] *Residencia Geriatros Barreiro Vigo, Spain*

Objective.– Analyze the results of the integration of clinical data in the pharmacotherapeutical application of the Pharmacy Service, to produce an automatic interaction between clinical information and pharmacotherapeutical for the residents of an old people's home by detecting all prescriptions that meet the criteria Start/Stopp.
*Methods*.– Study for 4 months (January–April 2011) in an old people's home with 150 seats.
In the pharmacotherapeutical application we have incorporated 50 Yes/No data type (dementia, depression, diabetes...), which are completed initially from the medical histories and subsequently updated with medical orders.
Automatically the application crosses the clinical data of each patient with their active prescriptions, detecting those that meet the criteria Start-Stopp.
The incidents detected were analyzed and reported by the hospital pharmacist to the doctor, modifying those that may have clinical impact.
*Results*.– It has been assessed the pharmacotherapy of 175 patients, 130 (74.3%) presented some criteria of treatment potentially inappropriate, with a total of 295 incidents detected.
The criteria STOPP most frequently detected were neuroleptics as long-term hypnotics $n = 40$ (13.6%) and aspirin with no history of vascular disease $n = 23$ (7.8%).
The criteria START more frequent were statin in diabetes mellitus with cardiovascular risk $n = 32$ (10.8%) and statin therapy in patients with history of vascular disease $n = 24$ (8.1%).
104 Incidents (35.2%) were accepted by the physician, being the most widely accepted criteria: aspirin or clopidogrel in patients with a history of atherosclerotic disease (Start $n = 17$).
131 Incidents (44.4%) were rejected, being the criteria more frequent: statin in diabetes mellitus with cardiovascular risk (Start $n = 32$) due to the expectation of life and functional status of patients.
60 Incidents (20.4%) will be assessed according to consultation to the specialist and the progress of the patient.
*Conclusion*.– The integration of clinical parameters in pharmacotherapeutical application allows you to automate the detection of treatments potentially inappropriate, streamlining the process and easing their incorporation into daily clinical practice. The number of treatments potentially inappropriate detected with this method is very high, although it should be an individual assessment later to analyze the impact clinic in each patient.

CO-036

## General reduction in use of benzodiazepines–but high risk of use in the elderly

E. Holm[a], C. Torp-Pedersen[b]
[a] *Roskilde University Hospital, Roskilde, Denmark ;* [b] *Gentofte University Hospital, Gentofte, Denmark*

*Introduction & aim*.– Benzodiazepines are associated with serious adverse effect when used in the elderly. The aim of this study was todescribe the pattern of use of benzodiazepines and possible changes in Denmark in the period 1997–2008.
*Method*.– By using 3 national registers we were able to link on an individual-level basis drug prescription of commonly used benzodiazepines with age, sex, household income, and medical diagnoses. The associations between drug use and other factors were tested by using Poisson regression.
*Results*.– The benzodiazepines investigated covered $> 99\%$ of all prescriptions on benzodiazepines and benzodiazepine-like drugs in the period.
The population consisted of 4 614 807 individuals, who were above the age of 10 on the 1st of January 1997. Over time there was a significant reduction in the overall use of benzodiazepines from $1.12 \times 10^8$ daily defined doses (DDD) in 1997 to $7.56 \times 10^7$ DDD in 2008 ($P < 0,\ 0001$). The proportion of DDD of long acting benzodiazepines fell from 44% in 1997 to 27% in 2008 whereas the use of benzodiazepine like drugs (zopiclone and zolpidem) rose from 25% to 45%. The risk of getting any benzodiazepine rose with lower household income, increasing age and female sex ($P < 0,\ 0001$ for all associations). Hazard ratio for use of benzodiazepines in the 85+ year old was 2.3 (confidence interval 2.1–2.4, $P < 0.0001$) compared to the 35–44 year old.
Dementia was highly associated with benzodiazepine use (hazard ratio 2.6).
*Conclusion*.– Overall the use of benzodiazepines has successfully been reduced. This study indicates a need to focus on the old and on special groups of elderly (female, low income, demented patients), who still have a high risk of getting a prescription on a benzodiazepine.

CO-037

## Biological/clinical criteria for early diagnosis of dehydration in hospitalized geriatric patients

P. Betomvuko[a], M. De Saint Hubert[a], D. Schoevaerdts[a], J. Jamart[a], D. Olivier[b], S. Christian[a]
[a] *CHU Mont-Godinne, Montigny-le-tilleul, Belgium ;* [b] *Cliniques Universitaires Saint Luc, Belgium*

*Introduction*.– The aim was to test different clinical/biological criteria for dehydration (DH) against a standard diagnosis defined as a body weight gain of at least 3–5% during the first week.
*Methods*.– An expert panel selected a limited subset of relevant clinical/biological criteria for DH drawn from the literature (skinfold, dry mouth, calf consistency, SBP $< 90$ mmHg, orthostatic BP drop, orthostatic drowsiness, thirst, apathy or delirium, urea, creatinine, uric acid, proteins, haemoglobin). Using these criteria to make a clinical diagnosis (CD) of DH, expert clinicians assessed 112 consecutive patients admitted in an acute geriatric department over a 5 months period. Clinicians were asked to give yes/no answers for each criterion and global yes/no answer for diagnosis of DH with its estimated probability. Inter-rater reproducibility was performed. The principal investigator, unaware of the CD, carefully measured body weight at admission and at day 7. Biological parameters were assessed at baseline and at 7 days.

*Results*.– One hundred patients with complete data (mean age 83 ± 6 y), were considered for analyses.
DH was clinically diagnosed in 39 patients whereas a weight change defining DH was measured in 20, with concordance in 14. Inter rater reproducibility was poor for clinical criteria, good for biological criteria (Kappa 0.46 to 0.81), and better for estimated probability of DH (Spearman $r = 0.74$, $P = 0.02$).
Matched with the definition, CD of DH had 70% sensitivity (Se), 69% specificity (Sp), 90% negative predictive value. Individually, both clinical and biological criteria for CD had good Sp (65% to 90%) but poor Se (< 55%). Noteworthy: urea/creatinine ratio was not associated with DH diagnosis.
*Conclusion*.– Compared with the standard diagnosis (20% prevalence), DH was over-diagnosed by systematic clinical assessment (39%). The CD performance was good (70% Se, 69% Sp) with low probability for DH when the clinician excluded it. These results indicate that DH remains under-reported in frail older hospitalized adults, and that systematic clinical assessment with selected criteria at the least accurately excludes those not in poor hydration status. It is recommended that clinicians should train for systematic assessment of poor hydration in elderly at admission in acute settings.

CO-038

## Mild and moderate hyponatremia and functional impairments in geriatric patients

M. Gosch[a], B. Joosten-Gstrein[a], H.J. Heppner[b], M. Lechleitner[a]
[a] *Hospital Hochzirl, Zirl, Austria ;* [b] *Institut für Biomedizin des Alterns, Universität Erlangen-Nürnberg, Germany*

*Introduction*.– Hyponatremia is the most frequent found electrolyte disturbance. The prevalence ranges from 9.4% to 15% in hospital inpatients. Symptoms mostly depend on magnitude and rapidity of onset of hyponatremia. The Comprehensive Geriatric Assessment (CGA) is a common diagnostic tool to screen for functional disabilities in elderly patients.
*Objectives*.– To study whether geriatric patients with mild/moderate hyponatremia (< 132 mmol) reveal different outcomes in structured tests of the CGA compared to normonatremic patients.
*Design*.– Single-center, retrospective cross-sectional study.
*Patients and methods*.– Data were collected over two years at the Department for Geriatric Medicine of the hospital Hochzirl. We included all patients ($n = 2885$; 78% female; mean age 80.15) admitted consecutively to our department. Serum sodium levels lower than 132 mmol/L were defined as mild/moderate hyponatremia. Our standardized hospital admission procedure includes a CGA [including activities of daily living (ADL), Mini-Mental State Examination (MMSE), Clock Completion (CC) test, Geriatric Depression Score (GDS), Tinetti Mobility Test (TMT), the Timed Up&Go (TUG), the Mini Nutritional Assessment (MNA)]. The results obtained in hyponatremic patients were compared to and age- and sex-matched control group. Charlson Comorbidity Index (CCI) was comparable in both groups.
*Results*.– 11.6% of the overall study population was hyponatremic, 129 suffered from mild/ moderate hyponatremia (4.5%). This patients showed significantly worse results in the CGA, including ADL [mean 69.26 (25–100, SD 20.52) compared to 87.56 points (35–100, 13.08); $P < 0.0001$], MMSE [mean 26.05 (13–30, SD 3.64) to 27.31 points (14–30, SD 2.83); $P = 0.002$], CC test [mean 2.44 (0–7, SD 3.13) to 1.17 points (0–7, SD 2.52); $P < 0.0001$], GDS [mean 4.34 (0–12, SD 2.60) to 3.03 points (0–11, SD 1.95); $P < 0.0001$], TMT [mean 15.51 (1–28, SD 5.86) to 19.87 points (2–28, SD 4.23); $P < 0.0001$)], TUG [mean 53.73 (7–179, SD 43.15) to 15.68 seconds (4–46, SD 7.99); $P < 0.0001$], MNA [mean 19.07 (8–26, SD 3.52) to 20.69 points (13–26, SD 2.64); $P < 0.0001$].
*Conclusion*.– In our evaluation geriatric patients with mild to moderate hyponatremia reveal a significant worse outcome in all functional and cognitive tests of CGA compared to controls with normal sodium values. Serum sodium levels should therefore be considered when interpretating common tests of CGA.

CO-039

## Cohort for the study of falls (CEC-2 study): Arterial blood pressure, hypotensive drugs and orthostatism

B. Martínez-Luis[a], J. Ruíz-Fernández[b], C. Gálvez[a], L. Narvaiza[b], N. Gonzalo[b], E. Valldosera[b], A. Rodríguez-Molinero[c]
[a] *Consorci Sanitari del Garraf, Vilanova i la Geltrú, Spain ;* [b] *Fundació Privada Sant Antoni Abat, Vilanova i la Geltrú, Spain ;* [c] *Consorci Sanitari del Garraf/National University of Ireland Galway, Spain/Ireland*

*Objectives*.– The role of blood pressure (BP) changes in the occurrence of falls has not been sufficiently studied. In this study, we evaluated the possible association between the falls syndrome and BP levels, orthostatism and use of hypotensive drugs.
*Method*.– This prospective cohort study included 773 participants older than 64 years, community residents, from 16 different Spanish locations, who underwent 6-months follow-up. Participants were selected through probabilistic sampling stratified by sex, age and size of the residence location. In a baseline evaluation, BP was measured at rest, both in the sitting position and three minutes after standing, and all the drugs the subjects were using were collected. In a subsequent telephone follow-up every three-months, the number of falls was recorded. Measured control variables were cognition (Pfeiffer), functional performance (Katz), balance (Tinnetti) and limb-strength (scale 0–5). A statistical analysis evaluated possible associations between falls and the following variables: systolic BP, diastolic BP, mean BP, differential BP, orthostatism, quantitative BP decrement upon standing up, use of hypotensive drugs and use of specific hypotensive drugs (diuretics, beta-blockers, calcium antagonists, alpha-adrenergics, ACE-inhibitors and angiotensin II receptor antagonists-ARBs). The dependent variable i.e. falls, was evaluated quantitatively (number of falls) and dichotomously (presence or absence of falls). Finally, a multivariate analysis was carried out, introducing potentially confusing variables identified in the bivariate analysis: $P < 0.1$.
*Results*.– Out of a total of 667 patients whose data were complete, 126 (18.9%) suffered at least one fall during the follow-up period, 138 (19.4%) met orthostatism criteria and 447 (57.8%) were using a hypotensive drug (25.6% diuretics, 9.3% beta-blockers, 14.2% calcium antagonists, 9.6% alpha-adrenergics, 15.9% ACE-inhibitors and 17,2% ARBs). No association was found between the occurrence of falls and blood pressure values, orthostatism or use of hypotensive drugs. None of the evaluated confusing factors accounted for this lack of association.
*Conclusions*.– Blood pressure values, changes in these values upon changing position, and use of hypotensive drugs failed to predict the occurrence of falls in this representative sample of the Spanish elderly population.
*Projet funded by the CAALYX Project (IST-2005-045215–6TH framework program) and the Sociedad Española de Geriatría y Gerontología (VI Premio SEGG).*

CO-040

## Homocysteine in older adults: Effects on different aspects of physical functioning

K. Swart[a], N. Van Schoor[a], A. Enneman[b], J. Van Wijngaarden[c], M. Den Heijer[a], P. Lips[a]
[a] *VU University Medical Center, Amsterdam, Netherlands ;* [b] *Erasmus Medical Center, Netherlands ; c Wageningen University, Netherlands*

*Introduction*.– Growing evidence suggests that higher homocysteine levels are associated with lower physical functioning in older persons. However, it is also suggested that homocysteine levels rise with increasing fat free mass. Therefore, the current study aimed to examine homocysteine in relation to different aspects of physical functioning.
*Method*.– Data from the B-PROOF study (cross-sectional) the Longitudinal Aging Study Amsterdam (LASA) (cross-sectional and 3 year follow-up) were used. B-PROOF is a randomized controlled trial; LASA is an ongoing cohort study. The current study was performed in person aged $\geq$ 65 years ($N$ = 1025–1168 in B-PROOF and $N$ = 321–1255 in LASA, depending on outcome). Different aspects of physical functioning, including physical performance, muscle mass, grip strength, physical activity, functional limitations, and falling were regarded as outcomes. Gender and serum creatinine were investigated as effect modifiers.
*Results*.– In LASA, higher homocysteine levels were associated with lower muscle mass (Quartile 4: regression coefficient (B) = −1.17 (1.91–0.44)) and loss of muscle mass (Quartile 4: Odds ratio (OR) = 9.58 (1.47–62.28)), only in persons with serum creatinine levels below the median (classified as normal creatinine). Moreover, higher homocysteine was associated with decreased grip strength in men with normal creatinine (Quartile 3: B = −2.25 (4.51–0.00); Quartile 4: B = −3.52 (6.13–0.71)), and with loss of grip strength in women with normal creatinine (Quartile 4: OR = 4.29 (1.08−17.06)). Homocysteine was not associated with functional limitations, physical activity or falling. In B-PROOF, higher homocysteine levels were associated with decreased grip strength in women (Quartile 4: B = −1.37 (−2.74–0.02)). No associations with physical performance and muscle mass were observed. The interaction with serum creatinine was also non-significant.
*Conclusions*.– In both studies, higher homocysteine levels were associated with lower muscle strength. The results of other outcomes were less consistent, which might be explained by differences in the study populations' homocysteine range.

CO-041

## Vitamin D deficiency in elderly patients with hip fracture in Spain

J.M. Omonte Guzman, E. Marañon Fernandez,
Y. Gracia De San Roman, M.A. Garcia Alhambra, L. Alvarez Nebreda, M.T. Vidan Astiz, J.A. Serra Rexach
*Hospital General Universitario Gregorio Marañon, ALCORCON, Spain*

*Background and Objetive*.– Hypovitaminosis D is very frequent in the elderly, and especially among those with hip fracture. Our purpose was to determinate the prevalence of vitamin D deficiency among elderly patients admitted in our Hip Fracture Unit and to determine the factors associated with this condition.
*Patients and Methods*.– All 418 consecutive patients admitted in the Hip Fracture Unit between October 2009 and October 2010. Measurements included demographic data, functional status (Barthel index), ambulation (Functional Ambulation Classification), comorbidities (Charlson Index), prefracture mental and social status, nutritional parameters (Prealbumin, cholesterol, lymphocytes), levels of 25-hydroxyvitamin D, calcium and PTH. Medical and surgical complications during admission and length of hospital stay were also measured. The outcome measures were the prevalence of hypovitaminosis D (deficiency $<$ 20 ng/mL; insufficiency 21–29 ng/mL) and determine the factors associated with it by univariate and multivariate analysis.
*Results*.– We included 418 patients. Mean age was 84.3 $\pm$ 7.5 yr, mean Barthel index 76.5 $\pm$ 25.8. 77% of the patients had a Barthel index $>$ 60. Before the fracture, 323 patients (77%) walked independently (FAC scale of 4 or 5). Mean Charlson index was 3.1 $\pm$ 2.2. Only 41 patients (9.8%) were on osteoporosis medications. Mean 25-hydroxyvitamin D level was 14.08 ng/mL. 358 patients (85.6%) had vitamin D deficiency, and 39 patients (9.3%) had vitamin D insufficiency, and only 21 (5%) had normal levels ($>$ 30 ng/mL). 226 patients (54%) suffered at least one medical complication during hospitalization, being delirium the most common in 92 (22%). Length of stay was 11.2 $\pm$ 7.9 days. In the univariate analysis, age ($P$ = .015), prealbumin levels ($P$ = .002), Charlson index (p=.04) and Barthel index ($P$ = .035) were related with vitamin D deficiency. In multivariate analysis, age ($P$ = .03), Charlson index ($P$ = .039) and prealbumin levels ($P$ = .013), were independently associated with vitamin D deficiency.
*Conclusions*.– Vitamin D deficiency is almost universal in elderly hip fracture patients. Very few of them take any drug for osteoporosis, including vitamin D supplements, before hip fracture. Vitamin D deficiency is, in our sample, independently associated with advancing age, comorbidity and malnutrition. Efforts should be made to improve the use of osteoporosis medications.

CO-042

## 24 hour ambulatory blood pressure monitoring used in a falls clinic

S.S. Gren, I.B. Jacobsen
*Herlev University Hospital, Albertslund, Denmark*

*Introduction*.– Hypertension is a common condition in the elderly. Antihypertensive treatment may increase the risk of falls due to orthostatic hypotension or excessive blood pressure reduction. Ambulatory blood pressure monitoring (ABPM) is considered a valuable and useful test for the management of patients with hypertension. ABPM can disclose white coat hypertension, evaluate the effect of the antihypertensive treatment and assess the circadian rhythm of blood pressure.
*Method*.– Retrospective study of data from 110 consecutive patients (85 women, 25 men, mean age 80,4 years) examined with 24 hour ABPM between July 2009 and February 2011 as part of their evaluation in the Fall Unit. 11 patients had ABPM two times and 1 patient had the test performed three times.
ABPM was performed if the doctor in the Fall Unit suspected that changes in blood pressure (BP) might have impact on the symptoms. The medical records were consulted to elucidate which impact the results of the ABPM had on the treatment.
*Results*.– 87 (79,1%) were in antihypertensive treatment by the first visit at the fall Unit. Among those 28 (32,2%) were considered to have too low BP and the medication was reduced or stopped. 14 (16%) of the patients with known hypertension were poorly regulated, and their medical treatment was increased. 19 (17,3%) patients were suspected to have hypertension. Among those only 3 patients had hypertension. All together 42 (38,2%) patients had altered treatment as a result of the ABPM.
*Discussion*.– ABPM seems to be a valuable examination in the evaluation of patients consulting a Fall Unit. Both under- and over treated hypertension can be discovered.

CO-043

**Chair based exercise in frail older people: A systematic review**

A. Kevin[a], C. Louise[b], L. Phillipa[b], G. John[b], M. Tahir[c]
[a] *Nottinghamshire CityCare Partnership, Nottingham, United Kingdom ;* [b] *University of Nottingham, Nottingham, United Kingdom ;* [c] *Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom*

*Introduction*.– Frail older people are usually unable to undertake high intensity exercises with proven benefit. Consequently lower intensity chair based exercises (CBEs) are often provided despite uncertainty over their effectiveness. We undertook a systematic review to examine the effects of CBEs in frail older people.
*Method*.– A systematic search was performed for randomized and other controlled trials of CBE studies in populations who were frail and aged over 65 years published 1990-2010 in electronic databases (Medline, CINHAL, AMED, PsychINFO, Bandolier, Cochrane, DARE, Health Technology Assessment, NHS Economic Evaluation Database) supplemented by other sources (ProFane, conference proceedings). Quality of papers and reporting were performed by using the Jadad and PRISMA methods respectively.
*Results*.– The search identified 164 references: 42 duplicates were removed, and the papers/abstracts of the remaining 122 were reviewed, 116 of which were excluded leaving 6 for analysis. Number of participants in the 6 studies ranged from 20 to 82. Two studies showed no obvious benefit from CBE (Nicholson 1997, Thomas 2003). The others showed some evidence of benefit in the domains: Mobility and Postural Stability (Baum 2003, Hruda 2003,); Cardio-respiratory Fitness (Witham 2005); Mental Health (Hruda 2003, Van de Winckel 2004). No harmful effects were reported in any of the studies and compliance with CBEs was generally good in the populations studied. 26 different outcome measures were used, grouped in 3 domains: A) Mobility and Postural Stability (including timed up and go, timed walk, Berg balance, chair stand,, physiological profile, grip strength); B) Cardio-respiratory fitness (including respiratory fitness, heart rate, Guyatt chronic heart failure, accelerometry); C) Mental Health (including Beck's depression inventory, Amsterdam dementia screening, falls efficacy confidence measure). All 6 studies were of low methodological quality (Jadad score $\leq 2$, range 0–5).
*Conclusion*.– The quality of the evidence base for CBEs is low. Large well designed randomized controlled trials to test the effectiveness and cost-effectiveness of CBE are justified.

CO-044

**Investigation of the implementation of the Nintendo Wii-Fit in older fallers on balance and gait outcome measures: A retrospective evaluation**

V. Booth[a], L. Connell[b], T. Masud[a]
[a] *Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom ;* [b] *University of Nottingham, United Kingdom*

*Introduction*.– Falls are associated with significant patient-orientated and economic consequences. Nintendo Wii-Fit is a commercially available virtual reality system with the potential to increase exercise frequency, intensity and enjoyment in the rehabilitation of balance and gait in older adults. New interventions such as Nintendo Wii-Fit are being implemented into some falls prevention intervention regimes, despite little evidence of benefit.
*Method*.– As part of a continued research project, evaluation of the implementation of the Nintendo Wii-Fit into a specialist day-hospital rehabilitation unit was conducted. Data from 48 cases was retrospectively collected from medical notes of patients at completion of therapy. Ethical advice was sought by the hospitals Research and Development NHS Department.
*Results*.– Of the 48 patient samples, 52% ($n = 25$) were recurrent fallers. The Wii-Fit was used in 22% ($n = 7$) of these. The Berg Balance Score (BBS) and Timed Up and Go (TUG) were recorded in 50% ($n = 24$) of the sample. The Wii-Fit subgroup demonstrated higher mean pre (49.5) and post (53.3) BBS, with narrower mean ranges in the pre (45–53) and post (52–55), when compared to the non-Wii-included subgroup (mean pre = 36.5 and post = 43.1 BBS, range pre = 7–56 and post = 21–56 BBS). Faster pre (18.1 seconds) and post (14.6 seconds) TUG times were recorded in the Wii-Fit subgroup when compared to the non-Wii-included-subgroup (pre = 25.2 seconds, and post = 20 seconds). However, there was no statistical significance found between the mean differences in the Wii and non-Wii subgroups for the BBS and TUG measures. Wii-Fit was tolerated well and no adverse effects were noted.
*Conclusions*.– These data indicate that as part of the rehabilitation programme Wii-Fit tends to be used in patients with better balance level's and walking ability as shown by the higher pre-intervention BBS scores and faster TUG times. A positive effect from using the Wii-Fit in this patient population was suggested. Further research via randomisation is now required to investigate the effectiveness of Wii-Fit in older falls patients.

CO-045

**10 years falls related mortality among older people in England and Wales**

A. Michael[a], L. Doos[b]
[a] *Russells Hall Hospital, Dudley, United Kingdom ;* [b] *Keele University, Keele, United Kingdom*

*Introduction*.– Falls are a major age-related syndrome and a marker of general poor health and decline in physical function. Each year 1/3 of community dwelling elderly over the age of 65 years fall. Falls complications are the leading cause of death from injury in older people. It was estimated that 20% of those who fall die within 12 months.
*Aim*.– To study falls' related mortality among those aged 65 years and above in England and Wales.
*Methods*.– We used data on falls related mortality from Office of National Statistics (ONS) provided by the West Midland Public Health Observatory (WMPHO). We used the most recent available data for 10 years and this covered the period between 1999 and 2008. Falls related mortality was defined as the primary cause of death with ICD 10 code W00-W19. SPSS18 was used for statistical analysis.
*Results*.– In the 10-year study period, there were 25680 falls related death. 58.8% of the falls related mortality occurred in women, and 41.2% occurred in men ($P = 0.05$). The mortality rate due to falls for each year was between 0.21 and 0.29 per 1000 population. The mean age of falls related mortality in men was 80 years, compared to 84.3 years in women ($P = 0.0001$). The incidence of falls related mortality increases with the advance of age, with two thirds (67.5%) of those who died due to falls in England and Wales in 2008 aged 80 and above (Figure).
*Conclusion*.– Annually, falls are responsible for an average of 0.25 deaths per 1000 population in England and Wales.
Falls related mortality occur more in women than in men.
Mortality due to falls happens in men at a younger age compared to women.
The incidence of falls related mortality increases with the advance of age.

CO-046

**Associations between dietary intake, leisure time physical activity, body composition and physical function in Icelandic elderly**

O.G. Geirsdottir[a], A. Arnarsson[a], K. Briem[b], A. Ramel[a], P.V. Jonsson[c], I. Thorsdottir[a]

[a] *Unit for Nutrition Research, The national University Hospital of Iceland & Faculty of Food Science and Nutrition, University of Iceland, Reykjavik, Iceland ;* [b] *Department of Physical Therapy, University of Iceland, Iceland ;* [c] *University of Iceland, School of Medicine, Reykjavík, Iceland*

*Background*.– Age related changes in body composition and physical function are important factors in the development of disease and physical dependency. Dietary intake and physical activity (PA) can affect these changes. The aim of this study was to investigate the cross-sectional associations between dietary intake, leisure time PA, body composition and physical function among elderly Icelanders.
*Method*.– Participants ($N = 236$, $> 65$ years) were recruited in the Reykjavik area. Quadriceps strength was measured with a dynamometer, functional performance was measured with the timed up and go test for time (TUG) and the 6 minute walk for distance (6MWD). PA was assessed by self-reports as total minutes per week and calculated as total kilocalories per week based on participants weight and rate of energy expenditure (METs). Cognitive function was assessed using the Mini Mental State Examination (MMSE). All participants did three days weighed food record, two normal days and one at weekend. The food records were analyzed using Icelandic Food Database. Body composition was measured using DXA.
*Result*.– Participants who reported to eat less than 0.8 g protein/kg bodyweight had less favourable outcomes in functional tests than participants who reported higher intakes (quadriceps strength, $P = 0.003$; 6MWD, $P = 0.026$; TUG, $P = 0.002$). In a multivariate model, age ($B = -0.322$; $P < 0.001$) and MMSE ($B = 0.477$, $P = 0.027$) predicted lean mass; Quadriceps strength ($B = 4.171$, $P < 0.001$), PA ($B = 0.200$, $P < 0.042$) and number of medications take daily ($B = -4.454$; $P = 0.036$) predicted 6MWD. Quadriceps strength was predicted by age ($B = -7.253$; $P < 0.001$) and lean body mass ($B = 0.0022$; $P = 0.048$), PA did not reach significance ($P = 0.078$); TUG was predicted by age ($B = 0.149$, $P < 0.001$), quadriceps strength ($B = -0.179$, $P < 0.001$) and PA ($B = -0.000678$, $P = 0.045$).
*Conclusion*.– Our study underlines the importance of sufficient protein intake and leisure time physical activity in the maintenance of lean body mass, strength and physical outcomes in elderly. Higher cognitive function is positively associated with relevant outcomes whereas the number of medications takes daily is negatively associated.

CO-047

**Prevalence of deglutition disorders in an hospitalized geriatric population**

A. Forster[a], F. Herrmann[a], P. Morin[a], D. Ponard[b], F. Viret[a], A. Mendes[a], J.P. Michel[a]

[a] *Geneva University Hospitals/Hôpital des Trois ChêneThônex, Switzerland ;* [b] *Geneva University Hospitals Thônex, Switzerland*

*Introduction*.– In older population, dysphagia compromises deglutition efficacy, causing malnutrition or dehydration, and deglutition safety, increasing the risk of aspiration pneumonia. Precise data on the prevalence of dysphagia is however matter of debate and none consensual clinical screening test is available. The aims of the study were to measure the prevalence of deglutition disorders in a non-selected population of hospitalized elder patients, and to compare different screening methods.
*Method*.– A prospective observational study in the geriatric department of the Geneva University Hospitals involved 18 randomly selected wards. In each ward, all patients aged 75 years or over were asked to participate to the study.
Included patients were observed by two independent dieticians during the same meal (approximately 45 minutes) on a selected day during hospitalization. The nurse present at the time of meal was asked at the end of the meal if she had noted some dysphagia symptoms. Finally, the patients were questioned for difficulty with swallowing, dry mouth or hypersialosis. If one of these items was positive, the EAT-10 questionnaire, a dysphagia screening symptom instrument, was completed. The interrater reliability was assessed by the kappa statistics. The Study protocol was approved by the local ethics committee.
*Results*.– Between November 2010 and March 2011, 219 (69.9%) patients met inclusion criteria, 153 accepted to participate to the study and were finally included. They were 87 years old, range? 75–100?, 45 were men and 108 women. The prevalence of deglutition disorders assessed by the dieticians was 20.9%, 95% CI? 14.4–27.4?, assessed by nurses 5.9%, 95% CI? 2.1–9.7?, and assessed by the EAT-10 score (equal or above 3) amounted to 34.3%.
The interrater reliability measured by the kappa statistics between dieticians and nurses was 0.329 ($P < 0.0001$).
*Conclusion*.– Ecological observation during mealtime by dieticians was the best method for detecting dysphagia in elder hospitalized patients. Nurses are probably less efficient and may identify more severe deglutition disorders. The EAT-10 questionnaire seems not as effective as dieticians observation for screening of dysphagia in non selected hospitalized old patients.

CO-048

**Oropharyngeal dysphagia is a risk factor for readmission for pneumonia in the elderly**

M. Cabré Roure[a], C. Álvaro Rubio[a], L. Force Sanmartin[a], J. Almirall Pujol[a], E. Palomera Fanegas[b], M. Serra-Prat[b], P. Clavé Civit[a]

[a] *Hospital de Mataró, Mataró, Spain ;* [b] *Consorci Sanitari del Maresme, Spain*

*Introduction*.– Dysphagia is a high prevalent clinical condition in frail elderly and is believed to be a source of aspiration and pneumonia.
*Objective*.– To determine whether oropharyngeal dysphagia (OD) is associated with an increased risk of readmission for pneumonia in persons discharged from an acute geriatric unit (AGU).
*Methods*.– Prospective observational study. All patients over 70 years discharged from an AGU from June 2002 to December 2009 were classified according to the presence of OD and followed since death or December 2010. Main outcome measure was readmission for pneumonia. All hospital readmissions were recorded, as well as the diagnosis and days of hospitalization. Other study factors: age, sex, geriatric syndromes, cognitive status (Pfeiffer), functional status (Barthel Index), nutritional status (Mini Nutritional Assessment) and, Charlson comorbidity index.
*Results*.– Two thousand five hundred and sixty patients were recruited: 61.2% female, mean age 84.9 (6.2). OD was observed in 49.3% of cases. Patients with OD were older and had a higher prevalence of malnutrition, dependence, dementia, cerebrovascular disease, pressure ulcers, urinary and faecal incontinence and took more sedatives, antidepressants and neuroleptics compared with the group without OD. Incidence of readmission in patients

without OD was 3.92 readmissions/10 person-year 95% CI (3.70 to 4.15) while in the group with OD was 4.87 (4.56 to 5.19) with an attributable risk of 0.95 readmissions/10 person-years and a relative risk of 1.24. Incidence of readmission for pneumonia was 0.28 readmissions/10 person-year (0.22 to 0.34) in subjects without OD and 0.79 (0, 66 to 0.91) in patients with OD, with an attributable risk of 0.51 readmissions/10 person-years and a relative risk of 2.84. There were no differences in the incidence of readmissions for lower respiratory infection or heart failure between the group with OD and without OD.
*Conclusion*.– Elderly patients with OD have a three fold increase in the risk of readmission for pneumonia in comparison to patients without dysphagia. Approximately 10% patients discharged from an AGU are readmitted in the next year because of their dysphagia.

CO-049

**Usefulness of mini nutritional assessment–screening form in nutritional status assessment of elderly patients on hemodialysis**

S. Duque, R. Martins, C. Moura Pereira, I. Rodrigues
*Nephrocare Portugal - Barreiro, Amadora, Portugal*

*Introduction*.– Population ageing and medical improvement has determined an increasing prevalence of elderly patients on hemodialysis. Malnutrition is a medical problem of both elderly and hemodialysis patients and a negative prognostic factor of both groups individually. Therefore, association of these two conditions represents a higher risk of malnutrition. Subjective global assessment (SGA) has been considered a clinically adequate method for assessing nutritional status in dialysis patients. Mini nutritional assessment (MNA) is a nutritional status assessment tool validated to elderly people, however its utility in elderly patients on hemodialysis is still unknown.
*Method*.– MNA – screening form (MNA-SF) was performed to elderly patients (65 years old or more) undergoing routine hemodialysis treatment in an ambulatory clinic with a total of 190 patients. Two variants of MNA-SF were applied, using body mass index (BMI), calculated using dry weight, or calf perimeter (CP). SGA was also performed, assuming it as the gold-standard tool of dialysis patients' nutritional assessment. Patients on first three months of treatment were excluded.
*Results*.– One hundred elderly patients were enrolled, mean age 75,4 years (65,98), 59% male, median time in hemodialysis 56,8 months. MNA-SF median scores were $11.8 \pm 2.3$ and $11.4 \pm 2.8$ points using BMI or CF, respectively. According SGA 71% were classified as well-nourished (A), 27% mild/moderately undernourished (B) and 2% severely undernourished (C). Receiving Operating Curves were determined for malnutrition (considering malnutrition when SGA was A or B) and area under curve (AUC) was calculated. MNA-SF was a good predictor of malnutrition, with similar performance using BMI (AUC 0,79, IC 95% 0,69–0,89, $P < 0.001$) or CP (AUC 0,78, IC 95% 0,68–0,89, $P < 0.001$).
*Conclusions*.– MNA-SF is a simple assessment tool that can be reliably used in hemodialysis elderly patients, with similar performance of both variants of MNA-SF. However, validation MNA should be done using a more exact measure of malnutrition, such as the measurement of fat and lean mass by bioimpedance.

CO-050

**Comparison of tooth replacement strategies on the nutritional status of older patients: A randomised controlled clinical trial**

G. Mckenna, P.F. Allen, A. Flynn, D. O'mahony, M. Cronin, N. Woods
*University College Cork, Ireland*

*Introduction*.– Diet plays a key role in disease prevention in older age. Although nutritional state is influenced by various factors, dental status can have an important impact. Poor oral health and loss of teeth can have significant negative effects on dietary intake and nutritional status for older patients. Increasingly, patients are retaining some natural teeth into old age (partially dentate). Many receive removable partial dentures to replace all missing teeth despite their potential to increase the risk of further dental disease. Alternative, functionally-orientated treatments exist including the shortened dental arch (SDA). Instead of aiming to replace all missing teeth, this provides patients with 10 pairs of teeth that are easy to maintain whilst ensuring acceptable function and aesthetics. The aim of this study was to compare the impact of two different tooth replacement strategies on the nutritional status of partially dentate older patients. The study compared conventional treatment using removable partial dentures and functionally-orientated treatment based on the SDA.
*Method*.– Fifty partially dentate patients (mean age 68.8 years) completed a randomized controlled clinical trial. 26 patients were allocated to conventional treatment with removable partial dentures and 24 were allocated to functionally-orientated treatment with adhesive bridgework used to create 10 pairs of teeth. Nutritional status was assessed at baseline and 1 month after treatment using a range of haematological markers and the Mini Nutritional Assessment (MNA).
*Results*.– One month after treatment intervention, haematological measures did not illustrate a clear picture of improvement for either group. For the conventional group average levels of vitamin B12 ($P = 0.68$), albumin ($P = 0.20$) and cholesterol ($P = 0.50$) all increased. For the functionally-orientated group average levels of vitamin B12 ($P = 0.62$), albumin ($P = 0.16$) and vitamin D ($P = 0.37$) all increased. MNA scores improved for both treatment groups postoperatively. For the conventional group mean MNA score increased from 23.3 to 24.4 ($P = 0.03$). For the functionally-orientated group mean MNA score increased from 23.2 to 24.1 ($P = 0.03$).
*Conclusions*.– Haematological markers did not demonstrate any statistically significant improvements in nutritional status for either treatment group. However, MNA scores improved for both conventional and functionally-orientated groups after treatment intervention ($P = 0.03$).

CO-051

**Effect of whey and milk on the efficacy of resistance training among elderly people**

A. Arnarson[a], Ó.G. Geirsdóttir[a], K. Briem[b], A. Ramel[a], P.V. Jónsson[c], I. Thorsdóttir[a]
[a] *Unit for Nutrition Research, University of Iceland, Reykjavik, Iceland ;* [b] *University of Iceland, Iceland ;* [c] *Landspitali University Hospital, Iceland*

*Introduction*.– As a larger proportion of people reach very old age, age-related disability and associated increases in utilization of health care have become a critical concern. Therefore it has become important to establish therapies that are effective for preventing or decreasing age-related decrease in muscle mass (sarcopenia). Whey proteins are thought to be one of the best sources of protein available for elderly people. We hypothesized that whey protein supplementation would increase the efficacy of a strength training regimen in elderly people to a greater extent than milk and carbohydrate.
*Methods*.– Two hundred and thirty-six healthy elderly men and women (87 men, and 112 women, age $> 65$ years, mean

BMI = 28.9 kg/m$^2$) were recruited in Iceland and participated in a double-blind, randomized intervention involving a 12-week resistance exercise program. Subjects exercised for three days per week, and were assigned to one of three different isocaloric supplement drinks containing sweet whey, low-fat milk, and carbohydrates (reference), respectively. The drinks were ingested immediately after exercise. The whey and low-fat milk drinks contained approximately 20 g of protein. All data were obtained at baseline and endpoint. To calculate differences between groups we used a linear model (analysis of covariance), which adjusted for gender, age, and baseline values. 199 subjects were included in data analysis.

*Results*.– At endpoint, a significant increase in fat free mass (men, $1314 \pm 2282$ g, $P < 0.001$; women, $456 \pm 2023$ g, $P < 0.001$) and quadriceps strength (men, $55 \pm 59$ N, $P < 0.001$; women, $52 \pm 47$ kg, $P < 0.001$ N) was observed. However, according to analysis of covariance, no significant effects of supplement drinks were detected (quadriceps strength, $P = 0.188$; fat free mass, $P = 0.531$).

*Conclusions*.– Whey proteins don't seem to have any significant effects on the efficacy of a 12-week resistance among elderly people when compared to milk or carbohydrates. This suggests that the ingestion of proteins has little relevance among people that already follow a protein-rich diet, as was the case with most of our subjects.

CO-052

## The prevalence, management and follow-up of diabetes mellitus and its relationship to hypertension and obesity in persons aged 60 years and over living in a peri-urban area of South Africa

N. Kuven, B. Cassim
*University Of Kwazulu-Natal, Durban, South Africa*

*Aims*.– The purpose of this study was to determine the prevalence, management and follow-up of diabetes mellitus, hypertension, and obesity in a peri-urban South African community using self-reported data.

*Methods*.– In thisobservational analytical cross-sectional survey a questionnaire was administered to adults aged 60 years and over selected by random sampling using a skip method.

*Results*.– Of 1,010 participants selected, 1,007 participants were enrolled in the study (response rate 99.7%). The overall prevalence of DM was 20% with a peak prevalence of 24.7% in the 70–74 years age group. One hundred and eleven participants (55.2%) reporting DM were on treatment with 64 participants on a single agent and 47 on combination therapy. Hypertension was reported by 175 participants with self-reported diabetes (87.1%). Of these 51.4% were prescribed an ACE inhibitor. The BMI was calculated in 988 participants of whom 475 (48.1%) were obese. Women were more likely to be obese than men, 54.4% vs 26.7%. There was no correlation between DM and obesity. Participants, who reported DM, were more likely to have a blood sugar measured and blood pressure measured in the last three months (73.6% vs 45% and 76.6% vs 60.2% respectively), than those who did not. Quality of life was more likely to be rated as poor by participants with self-reported diabetes than those without.

*Conclusions*.– This study reports a high prevalence of self reported DM and hypertension and obesity in community living older persons and highlights their suboptimal management and follow-up.

This study was funded by the South Africa Netherlands research Programme on Alternatives in Development (**SANPAD**).

CO-053

## B-PROOF: Is arterial stiffening associated with homocysteine?

S. Van Dijk[a], A. Van Den Meiracker[a], K. Swart[b], Y. Smulders[b], F. Mattace-Raso[a], N. Van Der Velde[a], O. Behalf Of The B-Proof Group[c]
[a] *Erasmus MC, Rotterdam, Rotterdam, Netherlands ;* [b] *VU Medical Center Amsterdam, Netherlands ;* [c] *Erasmus MC, Rotterdam, VU Medical Center, Amsterdam, Wageningen University, Netherlands*

*Introduction*.– Recently, homocysteine alone has been shown to be a better predictor of cardiovascular mortality in very old persons than models based on classical risk factors. The pathophysiological pathway is however still under debate. Current view is that the combination of increased thrombogenicity, increased oxidative stress and over-activation of redox-sensitive inflammatory pathways, leads to impaired endothelial function, and finally atherogenesis.

*Methods*.– Baseline cross-sectional data of the B-PROOF study are used to determine associations between homocysteine level and different outcomes of vascular function and structure. A subgroup of the B-PROOF study was included ($n = 410$, 58% male, age $72.6 \pm 5.5$ yrs, mean homocysteine level $15.2 \pm 3.1$ μmol/L). We assessed carotid intima media thickness (cIMT), carotid distensibility, using ultrasonograpy, and aortic pulse wave velocity (PWV) and augmentation index (AIx), measured with applanation tonometry. Furthermore, office blood pressure measurements ($n = 410$) and 24-hour blood ambulatory pressure recordings ($n = 70$) were performed. Associations were tested using linear regression analysis and were adjusted for possible confounders including age, gender, mean arterial pressure and heart rate.

*Results*.– The baseline analysis of the B-PROOF trial showed that log homocysteine was associated with PWV [β 0.010 (95%CI 0.006; 0.014)] and with carotid IMT [β 0.0002 (95%CI 0.0001; 0.0004)]. This remained significant in the multivariate analysis for PWV [β 0.006 (95%CI 0.002; 0.011)]. However, the association with IMT did not remain significant after adjustment for confounders [β 0.001 (95%CI −0.001; 0.003)]. No significant association with homocysteine was found for AIx, distensibility or blood pressure levels.

*Conclusions*.– In older persons, homocysteine is associated with arterial stiffness, as measured with PWV. However, a subsequent question is whether lowering of homocysteine levels, indeed improves vascular function and structure. Currently, this trial is still in progress.

CO-054

## Prognostic factors associated with one-year functional decline of elderly patients undergoing cardiothoracic surgery; a prospective analysis

A. Govers[a], B. Buurman[a], P. Jue[b], D. Dongelmans[a], S. De Rooij[a]
[a] *Academic Medical Center, University of Amsterdam, The Netherlands ;* [b] *Rijnland Ziekenhuis, Leiderdorp, The Netherlands*

*Introduction*.– Considering the increasing life expectancy and the growing demand for cardiothoracic surgery in patients aged 65 years and over, the importance of selecting elderly patients undergoing cardiac surgery increases. Functional status becomes of more importance as a prognostic factor in hospital outcomes of elderly patients than age alone. The objective of our study was 1) to investigate baseline differences in functional and cognitive status in patients aged 65–79 years and 80 years and older and 2) explore which prognostic variables were independently associated with functional decline three and twelve months after cardiothoracic surgery.

*Method*.– A prospective cohort study in a tertiary university teaching hospital. Between December 2005 until September 2007 data were collected from 356 patients and their relatives, including one year follow-up. The majority underwent planned cardiothoracic surgery. Functional decline was defined as one point loss on the Modified Katz ADL index questionnaire at one year compared to baseline functioning. Baseline cognitive status was measured with the Informant Questionnaire on Cognitive Decline short form.
*Results*.– The mortality rate after one year was 8.7%, with 4.8% hospital mortality. The group aged 65–79 years consisted of 295 patients (64% men; age, 71.9 ± 4.1 years) and the octogenarians of 61 patients (56% men; age, 82.2 ± 2.4 years). One year after hospital discharge the younger patients demonstrated less functional decline compared to the octogenarians (38% vs 57%, $P < 0.01$). Cognitive impairment (OR 4.04; 95% CI 1.23 to 13.21), higher age (OR 1.07; 95% CI 1.01 to 1.12), female gender (OR 2.18; 95% CI 1.17 to 4.06), alcohol use (OR 0.41; 95% CI 0.24 to 0.70), type of cardiac procedure (OR 0.19; 95% CI 0.06 to 0.60), and serum creatinine (OR 1.02; 95% CI 1.01 to 1.03) were independently associated with functional decline one year after discharge.
*Conclusions*.– The outcomes for patients that have undergone cardiothoracic surgery are good, considering the survival rates and overall improvement of the functional status, although this improvement seems to be omitted in the eldest elderly. We suggest that baseline functional and cognitive status should play a more important role in the prognostification of hospital outcomes in elderly patients.

CO-055

**The national hip fracture database: A clinically led, web-based audit to promote quality improvement of hip fracture care in the United Kingdom (UK)**

C. Currie, R. Wakeman, M. Partridge, D. Marsh, F. Martin
*National Hip Fracture Database, London, United Kingdom*

*Introduction*.– Hip fracture is the commonest serious injury of older people, with c. 76,000 cases/year occurring in the UK. It is a major cause of mortality, morbidity and dependency. Hospital care costs are substantial, and together with subsequent social care costs amount to c. £3Bn(€3.44)/year. Quality of care is variable. The National Hip Fracture Database (NHFD), a collaboration between the British Geriatrics Society and the British Orthopaedic Association, was launched in 2007 to improve the care and secondary prevention of hip fracture, and was recognized as a centrally funded national clinical audit in 2009. All eligible hospitals in England, Wales and Northern Ireland are now registered with the NHFD, which since 2007 has accumulated casemix, care and outcomes data on 132,000 cases.
*Method*.– Participating hospitals upload case records in standard dataset format, and receive benchmarked feedback that enables clinicians and managers to monitor and improve the care they provide. Care is audited against six standards: admission to orthopaedic care within 4 hours; surgery within 48 hours; minimizing pressure ulcer incidence; routine access to orthogeriatric medical care; assessment and appropriate treatment to promote bone health; and falls assessment. Data from 53,443 cases submitted between 1st April 2010 and 31st March 2011 by 176 hospitals meeting the case threshold of 100 (or 100% submission rate in smaller hospitals) was compared with that from 36,556 cases submitted by 129 hospitals between 1st April 2009 and 31st March 2010.
*Results*.– Casemix in the two groups was near-identical. In terms of compliance with the six standards: 48% of cases were admitted to an orthopaedic ward within 4 hours (down from 55% in 09/10 group); 86% received surgery within 48 hours (up from 80%); 3.4% were reported as developing pressure ulcers (down from 6%); 36% were assessed preoperatively by an orthogeriatrician (up from 31%); 65% were discharged on bone protection medication (up from 57%); and 78% received a falls assessment before discharge (up from 63%).
*Conclusions*.– Clinical audit of hip fracture on a national scale is feasible, and year-on-year comparison shows improving compliance with 5 of the 6 care quality standards audited.

CO-056

**Results of a pilot national hip fracture database**

T. Coughlan[a], E. Ahern[b]
[a] *Adelaide and Meath Hospital, Dublin, Ireland ;* [b] *enny General Hospital, Ireland*

*Introduction*.– Hip fracture is the most devastating consequence of osteoporosis exerting huge demands in terms of social and economic costs. By 2031, in Ireland, these costs are estimated to treble, in the absence of a strategic approach to fragility fracture care. In other jurisdictions, establishing a NHFD was seen as the driving force behind improvements in standards of care, reducing length of stay and reducing morbidity and mortality.
*Method*.– With Industry funding a pilot Irish National Hip Fracture Database was developed modeled on successful versions used in England. The six standards of hip fracture care were used as bench marks for results.
*Results*.– Ten of the 16 trauma orthopaedic sites are entering data. 1,813 initial assessments have been completed. Average age of patients is 77 with 72% female. Between 20 and 40% of patients are seen and admitted from the ED within 4 hours. 60% of patients have operation delayed more than 48 hours with only 25% receiving formal orthogeriatric care. Mortality rates are low at 2%. We perform well in secondary prevention with 62% receiving bone protection and 50% receiving a falls assessment.
*Discussion*.– Hip fracture patients need improved standards of care. It is critical that a government led, properly funded and resourced National Hip Fracture Database is established. We believe that this is the most appropriate means of improving standards and monitoring quality, raising the political profile of fragility fractures and providing a network for much needed interdisciplinary research.

CO-057

**Assessment of the relationship between a high level of dependence and the incidence of perioperative complications in elderly patients admitted for hip fracture**

R. Gracia De San Roman
*Hospital General Universitario Gregorio Marañón, Madrid, Spain*

*Objective*.– To determine the association between a high level of dependence before hospital admission of elderly patients with a hip fracture and the incidence of complications during the perioperative period.
*Process*.– Longitudinal and analytical study of 581 patients consecutively admitted in the Gregorio Marañón hospital with a hip fracture between October 2009 and March 2009. Sociodemographic aspects, living conditions, social support, medical aspects and independence to perform activities of daily living before the fracture (Barthel index) were collected at admission moment.

The functional condition and the medical aspects. A list of medical and surgical complications was checked daily in every patient, by the orthogeriatrics specialist nurse.
*Data analysis*.– Descriptive analysis and chi-squared or t-test to evaluate association.
*Results*.– Patients with Barthel index $< 80$ before the fracture were older, had higher number of comorbidities and treatments and higher prevalence of stroke, heart failure, cognitive impairment and diabetes.
During their admission, more patients with a previous barthel $< 80$ suffered medical complications than patients with barthel $\geq 80$ (62.1% vs 52% respectively ($P < 0.001$). Those with barthel index $<$ 8o has higher rates of Delirium (29.9% vs 18.3%) Urinay Tract Infection (6.3% vs 2.5%) Heart Failure (10.3% vs 4.5%). The rate of patients with severe pain was higher in patients with barthel $\geq 80$. The incidence of surgical complications was similar in both groups.
*Conclusions*.– There is a significant association between patients with a higher level of pre-fracture dependence and the incidence of perioperative medical complications. This fact highlights a group of increased risk during admission. The observation of lower rates of severe pain in more dependent patients, who have also higher delirium incidence, suggests that pain is being undervalued and underlines the need of specific strategies of pain detection in these patients.

CO-058

## Blood loss and blood transfusion in the postperative period in hip fracture patients

A. Michael[a], A. Bindusri[b]
[a] *ussells Hall Hospital, Dudley, United Kingdom ;* [b] *Russells Hall Hospital, Dudley, United Kingdom*

*Introduction*.– Hip fracture is a major medical/surgical incident. Not infrequently, operative repair for hip fracture result in blood loss. Many older patients, the typical patients who sustain hip fracture, are on antiplatelet or anticoagulant medications and many have other comorbidities which compromise haemostasis.
*Aim*.– To study the incidence of operative/postoperative blood loss, as well as blood transfusion in hip fracture patients.
*Methods*.– Retrospective analysis of consecutive hip fracture patients admitted in a 6 months period to a UK teaching hospital. The patient notes and electronic records were reviewed. Patients' demographics, preoperative and postoperative haemoglobin and haemoglobin on discharge were studied as well as blood transfusion.
*Results*.– One hundred and eighty-three patients were admitted in the study period, the data of 6 patients were not completely available. 72.7% of the hip fracture patients were female and 27.3% male. The mean age of patients was 81.5 years. 90.7% of patients were discharged alive.
For the female patients, the mean haemoglobin on admission was 11.8 gm/L and the mean postoperative haemoglobin was 9.7 gm/L. On discharge the mean haemoglobin was 10.3; i.e. a drop of 1.5 gm/L compared to on admission.
For the male patients, the mean haemoglobin on admission was 12.9, and the postoperative mean haemoglobin was 10.7 gm/L. The mean haemoglobin on discharge was 10.8 representing a 2.1 gm/L drop relative to on admission.
31.7% of the patients required blood transfusion. The mean number of blood units needed was 2.4 units per patient (range 1–5 units).
*Conclusion*.– Both men and women lose about 2 gm/L of haemoglobin during the operative repair of hip fracture.
Nearly one third of patients undergoing operative repair of hip fracture require blood transfusion.
The above should be considered in the medical management of older people many of whom have diminished cardiac and kidney reserve and multiple comorbidities.

| | Men | Women |
|---|---|---|
| Mean Hb on admission gm/L | 11.8 | 12.9 |
| Mean postoperative Hb gm/L | 9.7 | 10.7 |
| Mean Hb on dicharge gm/L | 10.3 | 10.8 |

CO-059

## Vitamin D deficit and surgical delay as modifiable predictive factors of a bad functional outcome in hip fracture patients at discharge

R. Hoyos Gallego, A.I. Hormigo Sanchez, T. Alarcon Alarcon, J.I. Gonzalez Montalvo
*Hospital Universitario La Paz, Madrid, Spain*

*Introduction*.– Functional status of hip fracture patients after surgery could be improved if we would know the factors involved in the outcome of these patients, particularly the modifiable factors that can predict the probability of recovery their ambulation status.
*Method*.– Patients admitted to the Acute Orthogeriatric Unit with a hip fracture during two years were prospectively included. At admission demographic, clinical, functional and cognitive variables were collected. Patients who died at hospital and those who did not have authorization for weight bearing were excluded. The data were analyzed using the Statistical Package for the Social Sciences (SPSS/PC11). Logistic regression forward stepwise analysis was used between related variables associated in the bivariate analysis with a bad functional status at discharge defined as the need of more than one person light assistance for walking.
*Results*.– Two hundred and eighty-nine patients were included. The mean age was 84.97 (SD 7.19), 233 (86.6%) were women, 219 (75.8%) lived previously at home, previous mean Barthel Index was 77.77 (SD 22.82) and 128 (44.3%) had intracapsular fractures. One hundred ninety (65.7%) were in a high surgical risk (ASA Score III or IV) and 176 (60.9%) had a severe deficit of vitamine D (less than 11 ng/mL). The patients had a mean of 9.12 (SD 2.44) comorbidities. The mean delay to surgery was 3.40 (SD 2.11) days and the mean hospital stay was 11.12 days (SD 4.51).
The independent predictive variables for a bad functional status at discharge were:

| Variables | B | Sig | Exp (B) | 95% CI |
|---|---|---|---|---|
| Age | .046 | .034 | 1.047 | 1.004–1.093 |
| Previous Barthel Index | −.034 | .000 | .966 | .953–.980 |
| Living in Nursing Home | .739 | .037 | 2.094 | 1.046–4.190 |
| Vitamine D $<$ 11 ng/mL | .646 | .030 | 1.908 | 1.064–3.421 |
| Days untill surgery | .138 | .045 | 1.148 | 1.003–1.315 |

*Conclusions*.– Older age, worse previous functional status, living in a nursing home, a severe vitamine D deficit and delayed surgery were the predictive factors of bad functional status at discharge from the acute orthogeriatric ward in hip fracture patients.

CO-060

**Evaluating the Edmonton Frail Scale as a screening tool for postoperative complications in older patients undergoing elective hip and knee surgery**

A. Gordon[a], J. Woodard[b], R. Morris[c], D. Whynes[a], A. Attenborough[c], J. Mcintyre[c], T. Masud[a]
[a] *University of Nottingham, Nottingham, United Kingdom ;* [b] *Sherwood Forest Hospitals NHS Foundation Trust, Sutton-in-Ashfield, United Kingdom ;* [c] *Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom*

*Introduction*.– The Systematic Assessment of Older People in Elective Surgery (SCOPES) service aims to recruit older patients who are at high risk of postoperative complications following elective hip or knee replacement for preoperative Comprehensive Geriatric Assessment (CGA). We set out to evaluate the Edmonton Frail Scale (EFS) as a possible means of selecting patients for SCOPES. The EFS is an easy to use and well-validated frailty measure and the preoperative score has been shown to be predictive of the postoperative complication rate. It has not, however, been evaluated as a screening tool to select patients at high risk of postoperative complications in elective hip and knee surgery.
*Method*.– The EFS (scores 0–17, high scores indicating frailty) was collected as part of routine preoperative assessment of all patients over 70 presenting for elective hip or knee replacement over a 6-month period. Length of stay (LoS) for the same patients was collected from our elective orthopaedic database. A LoS $> 5$ days (the UK national average for elective hip and knee replacement) was used as a proxy measure of postoperative complications.
*Results*.– One hundred and ten patients were seen. Mean EFS score was 4.95 (SD3.13) and LoS was 8.38 (SD6.97). Correlation between length of stay and the EFS score was positive ($r = 0.425$; $P < 0.01$). Using threshold analysis an EFS $\leq 5$ had 70% sensitivity, 79% specificity, 81% positive predictive value (PPV) and 66% negative predictive value (NPV) for LoS $> 5$days (Youden's $J = 0.49$). Receiver operator curve (ROC) analysis of the EFS (LoS $> 5$ positive; $\leq 5$ negative) returned an area under ROC of $0.774 \pm 0.045$. Comparing this cut-off with a service seeing all patients over 70 years, SCOPES could have avoided seeing 37 patients with a normal LoS but would have missed 19 patients with a longer LoS over the 6 month study period.
*Discussion*.– The EFS was positively and significantly correlated with LoS in this population. Using an EFS cut-off of 5/17 provided satisfactory specificity, sensitivity and reasonable NPV and PPV for predicting a LoS $> 5$ days.

CO-061

**Geriatric outpatient assessment after hip fracture–An opportunity for secondary prevention**

M. Korpi[a], P. Jäntti[a], T. Luukkaala[b], E. Jämsen[a], A. Risku[a], M. Nuotio[a]
[a] *Seinäjoki Central Hospital, Seinäjoki, Finland ;* [b] *Pirkanmaa Hospital District and Tampere School of Health Sciences, University of Tampere, Finland*

*Introduction*.– An orthogeriatric programme was created to improve the care of hip fracture patients and to build up an intervention to prevent future falls. The aim here was to identify factors related to new falls in a comprehensive assessment of hip fracture patients at a geriatric outpatient clinic after the fracture.
*Method*.– In all, 451 patients aged 65 years or over and experiencing a hip fracture between September 2007 and November 2009 in a Finnish hospital district were enrolled into an orthogeriatric hip fracture cohort. Four to six months after the fracture, the surviving 364 patients were offered a comprehensive assessment at the geriatric outpatient clinic. Before the visit, a physiotherapisťs evaluation on mobility and need for further exercises was performed. New falls were recorded.
*Results*.– Of the survivors, 276 (76%) participated the assessment and of them 241 (87%) had a physiotherapist's assessment. New falls were reported in 58 (21%) cases. Compared to the non-fallers, the fallers were more likely to have difficulties in basic and instrumental activities of daily living (77% vs 58%; $P = 0.008$ and 88% vs 72%; $P = 0.016$, respectively), systolic and diastolic orthostatic hypotension (57% vs 31%; $P = 0.001$ and 41% vs 23%; $P = 0.009$, respectively), higher median number of prescribed medications (9 vs 8; $P = 0.031$) and longer median time in the Timed Up and Go test (30 s vs 22 s; $P = 0.005$). The fallers tended to score less in the Mini-Mental State Examination and the Short Form of the Mini Nutritional Assessment, but the difference between the groups was not statistically significant. Based on the physiotherapisťs assessment, 179 (74%) patients were in need of additional exercises.
*Conclusions*.– Falls are common in patients who have experienced a hip fracture. A comprehensive geriatric assessment, carried out in an outpatient setting and combined with a physiotherapist's evaluation and rehabilitation plan, identified multiple potentially modifiable risk factors and thus provides an opportunity for secondary prevention of future falls and fractures. Further follow-up is needed to show the effects of the intervention on the longer-term outcomes of this vulnerable patient group.

CO-062

**Osteoporosis treatments following hip fracture–Why do patients discontinue and how do we improve?**

D. Furmedge, I. Hopper, F. Dockery
*Guy's & St Thomas' NHS Foundation Trust, London, United Kingdom*

*Introduction*.– Prescription of, and adherence to osteoporosis medications is suboptimal despite clear guidance on their use in older age following a fragility fracture. Strategies to improve this have had mixed results. We wanted to look at: a) adherence rates with these medications; b) effectiveness of a reminder call and letter, on osteoporosis medication use in patients following a hip fracture.
*Method*.– Through telephone clinics 4 and 12 months following hip fracture, we established self-reported adherence rates with osteoporosis medications. For the cognitively impaired, carers or GP provided this information. For those who had discontinued the medications at 4 months, a letter was issued to GP, cc to patient, requesting prescription of appropriate osteoporosis medication.
*Results*.– Of 577 consecutive patients, 93% received assessment pre-discharge for bone health. By one year 132 (23%) had died and 15 (3%) were lost to follow-up, so were excluded, leaving 430 patients. Of those who were prescribed a new osteoporosis medication on discharge (215 of 428 pts), 146 (68%) were still taking it after 4 months, and 135 (63%) after 1 year. Reasons for discontinuing were largely due to side effects (9 (11%)) and lack of understanding of the need for, or disinterest in, taking it as long-term therapy (19 (24%)). GP/patient letter intervention was performed in 64 of 69 patients who had discontinued it by 4 months. By 12 months, a further 25 of this intervention group were now taking osteoporosis medications. i.e. a 40% benefit of the intervention.
*Conclusions*.– Almost a third of hip fracture patients report discontinuation of osteoporosis medications by 1 year. A telephone

clinic and letter intervention after 4 months contributed to this beneficially, but a gap remains. Greater patient education might help, given the large numbers who did not understand the need for, or wish to take, long-term therapy.

CO-063

## Effects of rehabilitative exercise training on activity parameters in patients with exacerbated copd at geriatric acute care units: A matched pairs analysis

E. Horn[a], T. Augustin[b], P. Mrak[c], A. Hierzer[a], C. König[b], W. Schippinger[a]
[a] *Albert Schweitzer Hospital, Geriatric Healthcare Centres Graz, Graz, Austria ;* [b] *Joanneum Research, Graz, Austria ;* [c] *QIGG-Association for Quality in Geriatrics and Gerontology, Graz, Austria*

*Introduction.*– Chronic obstructive pulmonary disease (COPD) is a major reason for morbidity and mortality in elderly. In the Austrian health care system geriatric acutely ill patients can be treated in units of acute geriatrics and rehabilitation (AG/R) in order to recover and improve patientś mobility and self-sufficiency. In this study we investigated the benefit of rehabilitative exercise training in elderly patients with exacerbated COPD compared with a non-COPD cohort.

*Method.*– An online benchmark and reporting system was developed (by QiGG and the Institute of Biomedicine and Health Sciences, Joanneum Research) for AG/R units to document their patients' characteristics and to measure quality related parameters in geriatric treatment. The data warehouse contains over 26000 cases since its roll out in 2008. In order to compare COPD patients with a non-COPD cohort, we performed a matched-pair analysis: Altogether, there were only 126 patients with COPD as admission diagnose. To find suitable controls for the analysis, patients were matched for the following criteria: age, gender, Barthel score (at admission = AA), Timed Get-Up and Go Test (AA), Tinetti score (AA). The aim of the analysis was to compare the patients' test results at admission to those at discharge. Statistical analysis was performed by applying paired t-tests ($P < 0.05$).

*Results.*– During hospital stay, the Barthel score has improved in both groups (COPD: $11.9 \pm 15.2$; controls: $12.1 \pm 14.1$). At discharge, we observed no significant difference between both groups (p=0.95). Similar results were found for the mean improvement in Timed Get-Up and Go Test (COPD −3.8; controls −5.2; $P = 0.3$) and the Tinetti score (COPD 3.2; controls 3.8; $P = 0.3$).

*Conclusions.*– Data of this study demonstrate that rehabilitative exercise training is an effective treatment in elderly COPD patients and benefits as assessed by the geriatric assessment instruments Barthel score, Timed Get-Up and Go Test and Tinetti score are statistically not different from those of a matched non-COPD cohort.

Our findings suggest that geriatric rehabilitative exercise training should be provided to elderly COPD patients as frequently as to patients suffering from other acute geriatric illness.