Journal Scan

- **Physical activity and fitness are associated with verbal memory, quality of life and depression among nursing home residents: preliminary data of a randomized controlled trial**

  Haritz Arrieta, Chloe Rezola-Pardo, Iñaki Echeverria, Miren Iturburu, Susana Maria Gil, Jose Javier Yanguas, Jon Irazusta and Ana Rodriguez-Larrad

  BMC Geriatrics BMC series – open, inclusive and trusted 2018 **18**:80

Background: Few studies have simultaneously examined changes in physical, cognitive and emotional performance throughout the aging process.

Methods: Baseline data from an ongoing experimental randomized study were analyzed. Physical activity, handgrip, the Senior Fitness Test, Trail Making Test A, Rey Auditory-Verbal Learning Test, Quality of Life-Alzheimer's Disease Scale (QoL-AD) and the Goldberg Depression Scale were used to assess study participants. Logistic regression models were applied. Trial registration: ACTRN12616001044415 (04/08/2016).

Results: The study enrolled 114 participants with a mean age of 84.9 (standard deviation 6.9) years from ten different nursing homes. After adjusting for age, gender and education level, upper limb muscle strength was found to be associated with Rey Auditory-Verbal Learning Test [EXP(B): 1.16, 95% confidence interval (CI): 1.04–1.30] and QoL-AD [EXP(B): 1.18, 95% CI: 1.06–1.31]. Similarly, the number of steps taken per day was negatively associated with the risk of depression according to the Goldberg Depression Scale [EXP(B): 1.14, 95% CI: 1.000–1.003]. Additional analyses suggest that the factors associated with these variables are different according to the need for using an assistive device for walking. In those participants who used it, upper limb muscle strength remained associated with Rey Auditory-Verbal Learning Test [EXP(B): 1.21, 95% CI: 1.01–1.44] and QoL-AD tests [EXP(B): 1.19, 95% CI: 1.02–1.40]. In those individuals who did not need an assistive device for walking, lower limb muscle strength was associated with Rey Auditory-Verbal Learning Test [EXP(B): 1.35, 95% CI: 1.07–1.69], time spent in light physical activity was associated with QoL-AD test [EXP(B): 1.13, 95% CI: 1.00–1.02], and the number of steps walked per day was negatively associated with the risk of depression according to the Goldberg Depression Scale [EXP(B): 1.27, 95% CI: 1.000–1.004].

Conclusions: Muscle strength and physical activity are factors positively associated with a better performance on the Rey Auditory-Verbal Learning Test, QoL-AD and Goldberg Depression Scale in older adults with mild to moderate cognitive impairment living in nursing homes. These associations appeared to differ according to the use of an assistive device for walking. Our findings support the need for the implementation of interventions directed to increase the strength and physical activity of individuals living in nursing homes to promote physical, cognitive and emotional benefits.

Trial registration: ACTRN12616001044415 (04/08/2016).

Keywords: Physical activity Exercise Cognition Quality of life Depression Older adults Nursing home

- **Implementation of grip strength measurement in medicine for older people wards as part of routine admission assessment: identifying facilitators and barriers using a theory-led intervention**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 79

Background: Low grip strength in older inpatients is associated with poor healthcare outcomes including longer length of stay and mortality. Measuring grip strength is simple and inexpensive. However, it is not routinely used in

clinical practice. We aimed to evaluate the implementation of grip strength measurement into routine clinical practice.

Methods: This implementation study was a mixed methods study based in five acute medical wards for older people in one UK hospital. Intervention design and implementation evaluation were based on Normalization Process Theory (NPT). A training program was developed and delivered to enable staff to measure grip strength and use a care plan for patients with low grip strength. Routine implementation and monitoring was assessed using the "implementation outcome variables" proposed by WHO: adoption, coverage, acceptability, fidelity, and costs analysis. Enablers and barriers of implementation were identified.

Results: One hundred fifty-five nursing staff were trained, 63% in just 3 weeks. Adoption and monthly coverage of grip strength measurement varied between 25 and 80% patients across wards. 81% of female patients and 75% of male patients assessed had low grip strength (< 27 kg for men and < 16 kg for women). Staff and patients found grip measurement easy, cheap and potentially beneficial in identifying high-risk patients. The total cost of implementation across five wards over 12 months was less than £2302. Using NPT, interviews identified enablers and barriers. Enablers included: highly motivated ward champions, managerial support, engagement strategies, shared commitment, and integration into staff and ward daily routines. Barriers included lack of managerial and staff support, and high turnover of staff, managers and champions.

Conclusions: Training a large number of nurses to routinely implement grip strength measurement of older patients was feasible, acceptable and inexpensive. Champions' motivation, managerial support, and shared staff commitment were important for the uptake and normalisation of grip strength measurement. A high percentage of older patients were identified to be at risk of poor healthcare outcomes and would benefit from nutritional and exercise interventions. Measuring grip strength in these patients could provide an opportunity to identify those with normal grip strength for fast tracking through admission to discharge thereby reducing length of stay.

Trial registration: Clinicaltrials.gov NCTO2447445. Registered May 18, 2015.

Keywords: Older Inpatients Grip strength Implementation Clinical practice Hospital

- **Performance of a brief geriatric evaluation compared to a comprehensive geriatric assessment for detection of geriatric syndromes in family medicine: a prospective diagnostic study**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 72

Background: Geriatric syndromes are rarely detected in family medicine. Within the AGE program (active geriatric evaluation), a brief assessment tool (BAT) designed for family physicians (FP) was developed and its diagnostic performance estimated by comparison to a comprehensive geriatric assessment.

Methods: This prospective diagnostic study was conducted in four primary care sites in Switzerland. Participants were aged at least 70 years and attending a routine appointment with their physician, without previous documented geriatric assessment. Participants were assessed by their family physicians using the BAT, and by a geriatriciant who performed a comprehensive geriatric assessment within the following two-month period (reference standard). Both the BAT and the full assessment targeted eight geriatric syndromes: cognitive impairment, mood impairment, urinary incontinence, visual impairment, hearing loss, undernutrition, osteoporosis and gait and balance impairment. Diagnostic accuracy of the BAT was estimated in terms of sensitivity, specificity, and predictive values; secondary outcomes were measures of feasibility, in terms of added consultation time and comprehensiveness in applying the BAT items.

Results: Prevalence of the geriatric syndromes in participants (N=85, 46 (54.1%) women, mean age 78 years (SD 6))ranged from 30.0% (malnutrition and cognitive impairment) to 71.0% (visual impairment), with a median number of 3 syndromes (IQR 2 to 4) per participant. Sensitivity of the BAT ranged from 25.0% for undernutrition (95%CI 9.8% - 46.7%) to 82.1% for hearing impairment (95%CI 66.5% - 92.5%), while specificity ranged from 45.8% for visual impairment (95%CI 25.6–67.2) to 87.7% for undernutrition (76.3% to 94.9%). Finally, most negative predictive values (NPV) were between 73.5% and 84.1%, excluding visual impairment with a NPV of 50.0%. Family physicians reported BAT use as per instructions for 76.7% of the syndromes assessed.

Conclusions: Although the BAT does not replace a comprehensive geriatric assessment, it is a useful and appropriate tool for the FP to screen elderly patients for most geriatric syndromes.

Trial registration: The study was registered on ClinicalTrials.gov on February 20, 2013 (NCT01816087).

Keywords: Brief geriatric evaluation Geriatric syndrome Diagnosis Family medicine

- **Health economic evaluations of non-pharmacological interventions for persons with dementia and their informal caregivers: a systematic review**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 69

Background: This systematic review aims to review the literature on trial-based economic evaluations of non-pharmacological interventions directly targeted at persons with dementia as well as persons with mild cognitive impairment and their respective caregivers.

Methods: A systematic literature research was conducted for the timeframe from 2010 to 2016 in the following databases: Centre for Reviews and Dissemination, EconLit, Embase, Cochrane Library, PsycINFO and PubMed. Study quality was assessed according to the Drummond criteria.

Results: In total sixteen publications were identified. Health economic evaluations indicated the cost-effectiveness of physical exercise interventions and occupational therapy. There was also evidence to suggest that psychological and behavioral therapies are cost-effective. Health economic studies investigating psychosocial interventions mainly targeted towards informal caregivers showed inconsistent results.

Conclusions: Due to the increasing prevalence of dementia non-pharmacological interventions and their health economic impact are of increasing importance for health care decision-makers and HTA agencies.

Keywords: Dementia Non-pharmacological interventions Economic evaluation Costs Cost-effectiveness.

- **Social factors and quality of life aspects on frailty syndrome in community-dwelling older adults: the VERISAÚDE study**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 66

Background: Frailty is a multidimensional clinical geriatric syndrome that may be reversed in its early stages. Most studies have paid attention to its physical or phenotypic boundaries, however, little is known about the social aspects surrounding this geriatric syndrome. The study examined the relationship between socio-demographic factors, social resources, quality of life and frailty in older adults.

Methods: This cross-sectional study included a representative sample ($n = 749$) of adults aged ≥65 years enrolled in forty-three senior centers located in North-West Spain. Socio-demographic data, social resources by the Older Americans Resources and Services Scale, quality of life by the World Health Organization's Quality of Life measure-brief version (WHOQOL-BREF), and frailty status diagnosed by the Frailty phenotype were measured.

Results: Female gender, age older than 75 years, single marital status, a poor quality of life, and low scores in the physical health domain of the WHOQOL-BREF were the main determinants of being non-robust. Together, these variables explained 24.4% of the variance. Age between 80 and 89 years, and a poor quality of life were the main determinants for non-robust men, whilst the physical health domain of the WHOQOL-BREF was the single main determinant for women.

Conclusions: Our study found evidence that physical frailty is associated with social determinants and several quality of life domains. More research on this understudied topic is needed to avoid healthcare expenditures and improve the quality of life of non-robust elders.

Keywords: Frailty Social resources Quality of life Elderly

- **Does sarcopenia predict change in mobility after hip fracture? a multicenter observational study with one-year follow-up**

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BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 65

Background: Patients with hip fracture frequently have sarcopenia and are at great risk of loss of mobility. We have investigated if sarcopenia predicts change in mobility after hip fracture.

Methods: This is a prospective, multicenter observational study with one-year follow-up. Patients with hip fracture who were community-living and capable of walking before the fracture were included at three hospitals in Norway (2011–2013). The primary outcome of the study was change in mobility, measured by the New Mobility Score (NMS). Sarcopenia was determined postoperatively by anthropometry, grip strength, and NMS.

Results: We included 282 participants and sarcopenia status was determined in 201, of whom 38% (77/201) had sarcopenia, 66% (128/194) had low muscle mass, 52% (116/222) had low grip strength and 8% (20/244) had low pre-fracture mobility (NMS < 5). Sarcopenia did not predict change in mobility (effect 0.2 points; 95% CI –0.5 to 0.9, $P = 0.6$), but it was associated with having lower mobility at one-year (NMS 5.8 (SD 2.3) vs. 6.8 (SD 2.2), $P = 0.003$), becoming a resident of a nursing home (odds ratio 3.2, 95% CI 0.9 to 12.4, $P = 0.048$), and the combined endpoint of becoming a resident of a skilled nursing home or death (odds ratio 3.6, 95% CI 1.2 to 12.2, $P = 0.02$).

Conclusions: Sarcopenia did not predict change in mobility in the year after hip fracture.

Keywords: Activities of daily living Hip fractures Independent living Mobility limitation Skilled nursing facilities Sarcopenia

- **Polypharmacy in the oldest old (≥80 years of age) patients in China: a cross-sectional study**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 64

Background: The oldest old generally have worse health and more comorbidities than the general population of older adults, and they are more likely to be exposed to polypharmacy. Reliable investigation of polypharmacy among the oldest old (≥80 years of age) in China are lacking. So this study aims to describe the polypharmacy status of oldest old patients ≥80 years of age and to assess the factors influencing medication compliance.

Methods: This was a cross-sectional study of 258 oldest old patients ≥ 80 years of age and hospitalized at a tertiary hospital in Beijing between December 1, 2014 and June 30, 2015. They completed three validated questionnaires to assess their pre-admission status (general demographics, medication knowledge, and medication adherence). Potentially inappropriate medications (PIM) use was evaluated by physicians.

Results: The majority of the patients (55.4%) took < 10 types of drugs. The numbers of drugs taken ranged from 8 to 60 drugs (median of 22.9). Patients taking 11–20 drugs accounted for 46.1% of the patients. Subjects with a history of adverse drug reactions accounted for 40.3%. The proportion of PIMs was 27.1%. Compliance was only 32.6% among the oldest old patients with polypharmacy. Age and medication classes were independently negatively associated with compliance, and medication knowledge was independently positively associated with compliance.

Conclusion: Oldest old patients (≥ 80 years of age) had a poor medication knowledge. Age, medication classes, and medication knowledge were independently associated with medication compliance.

Keywords: Oldest old Polypharmacy Non-adherence Medication knowledge

- **Inpatient falls in older adults: a cohort study of antihypertensive prescribing pre- and post-fall**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 58

Background: Falls are common during hospital admissions and may occur more frequently in patients who are taking antihypertensive medications, particularly in the context of normal to low blood pressure. The review and adjustment of these medications is an essential aspect of the post-fall assessment and should take place as soon as possible after the fall.

Our aim was to investigate whether appropriate post-fall adjustments of antihypertensive medications are routinely made in a large National Health Service (NHS) Trust.

Methods: Inpatient records over an eight-month period were captured from an electronic prescribing system to identify older adults (≥80

years old) with normal/low blood pressures (< 140 mmHg systolic) who had a documented inpatient fall as these patients were considered to be at high risk of further falls. Prescribed antihypertensive medication on admission was then compared with the post-fall (within 24 h after the fall) and discharge prescriptions.

Results: A total of 146 patients were included in the analysis. Of those, 120 patients (82%) were taking the same number of antihypertensive medications in the 24 h after the fall as they were before; only 19 patients (13%) had a reduction in the number of medications and seven patients (5%) had an increase in medications during that period. Only 9% of the antihypertensive classes assessed were either stopped or reduced in dose immediately post-fall. In addition, 11 new antihypertensives were prescribed at this time.

At discharge, half of the patients ($n = 73$) remained on the same number of antihypertensive medication as on admission, 51 patients (35%) were on fewer antihypertensives and 22 (15%) were on more. Additionally, no changes were made to individual antihypertensives in 49% of prescriptions; 34% were stopped or reduced in dose but 38 new agents were started by the time of discharge. Angiotensin converting enzyme inhibitors and angiotensin II receptor blockers (ACEi/ARB) were the class of medications most commonly stopped or reduced (51%).

Conclusions: Antihypertensive prescriptions are frequently unchanged after an inpatient fall. Routine medication review needs to be part of post-fall assessments in hospital to reduce the risk of further falls.

Keywords: Antihypertensive Medication review Postural hypotension

- **The theoretical and empirical basis of a BioPsychoSocial (BPS) risk screener for detection of older people's health related needs, planning of community programs, and targeted care interventions**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 49

  Background: This study introduces the conceptual basis and operational measure, of *BioPyschoSocial (BPS) health* and related risk to better understand how well older people are managing and to screen for risk status. The BPS Risk Screener is constructed to detect *vulnerability* at older ages, and seeks to measure dynamic processes that place equal emphasis on Psycho-emotional and Socio-interpersonal risks, as Bio-functional ones. We validate the proposed measure and describe its application to programming.

Methods: We undertook a quantitative cross-sectional, psychometric study with $n = 1325$ older Singaporeans, aged 60 and over. We adapted the EASYCare 2010 and Lubben Social Network Scale questionnaires to help determine the BPS domains using factor analysis from which we derive the BPS Risk Screener items. We then confirm its structure, and test the scoring system. The score is initially validated against self-reported general health then modelled against: number of falls; cognitive impairment; longstanding diseases; and further tested against service utilization (linked administrative data).

Results: Three B, P and S clusters are defined and identified and a BPS *managing score* ('doing' well, or 'some', 'many', and 'overwhelming problems') calculated such that the risk of problematic additive BPS effects, what we term health *'loads'*, are accounted for. Thirty-five items (factor loadings over 0.5) clustered into three distinct B, P, S domains and were found to be independently associated with self-reported health: B: 1.99 (1.64 to 2.41), P: 1.59 (1.28 to 1.98), S: 1.33 (1.10 to 1.60). The fit improved when combined into the managing score 2.33 (1.92 to 2.83, < 0.01). The score was associated with mounting risk for all outcomes.

Conclusions: BPS domain structures, and the novel scoring system capturing dynamic BPS additive effects, which can combine to engender vulnerability, are validated through this analysis. The resulting tool helps render clients' risk status and related intervention needs transparent. Given its explicit and empirically supported attention to P and S risks, which have the potential to be more malleable than B ones, especially in the older old, this tool is designed to be change sensitive.

Keywords: Interdisciplinary theory Successful ageing Risk stratification Measurement study Implementation science Integrated care delivery in the community

- **Delirium in older hospitalized patients—signs and actions: a retrospective patient record review**

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BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 43

Background: Delirium is common in older hospitalized patients, and is associated with negative consequences for the patients, next of kin, healthcare professionals and healthcare costs. It is important to understand its clinical features, as almost 40% of all cases in hospitals may be preventable. Yet, delirium in hospitalized patients is often unrecognized and untreated. Few studies describe thoroughly how delirium manifests itself in older hospitalized patients and what actions healthcare professionals take in relation to these signs. Therefore, the aim of this study was to describe signs of delirium in older hospitalized patients and action taken by healthcare professionals, as reported in patient records.

Methods: Patient records from patients aged ≥65 ($n = 286$) were retrospectively reviewed for signs of delirium, which was found in 78 patient records (27%). Additionally, these records were reviewed for action taken by healthcare professionals in relation to the patients' signs of delirium. The identified text was analyzed with qualitative content analysis in two steps.

Results: Healthcare professionals responded only in part to older hospitalized patients' needs of care in relation to their signs of delirium. The patients displayed various signs of delirium that led to a reduced ability to participate in their own care and to keep themselves free from harm. Healthcare professionals met these signs with a variation of actions and the care was adapted, deficient and beyond the usual care. A systematic and holistic perspective in the care of older hospitalized patients with signs of delirium was missing.

Conclusion: Improved knowledge about delirium in hospitals is needed in order to reduce human suffering, healthcare utilization and costs. It is important to enable older hospitalized patients with signs of delirium to participate in their own care and to protect them from harm. Delirium has to be seen as a preventable adverse event in all hospitals units. To improve the prevention and management of older hospitalized patients with signs of delirium, person-centered care and patient safety may be important issues.

Keywords: Signs of delirium Neurocognitive disorders Older hospitalized patients Person-centered care Patient safety Patient participation Action by healthcare professionals Qualitative content analysis

- **Diabetic kidney disease in the elderly: prevalence and clinical correlates**

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BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 38

Background: Diabetic kidney disease (DKD) is a major burden in elderly patients with type 2 diabetes (T2DM). Low estimated glomerular filtration rate (eGFR+, < 60 mL/min/1.73 m2) and albuminuria (Alb+) are essential for the diagnosis of DKD, but their association with clinical variables and quality of care may be influenced by ageing.

Methods: Here we investigated the association of clinical variables and quality of care measures with eGFR+ and Alb+ in 157,595 T2DM individuals participating to the Italian Association of Clinical Diabetologists (AMD) Annals Initiative, stratified by age.

Results: The prevalence of eGFR+ and Alb+ increased with ageing, although this increment was more pronounced for low eGFR. Irrespective of age, both the eGFR+ and Alb + groups had the worst risk factors profile when compared to subjects without renal disease, showing a higher prevalence of *out-of target* values of HbA1c, BMI, triglycerides, HDL-C, blood pressure and more complex cardiovascular (CVD) and anti-diabetic therapies, including a larger use of insulin

In all age groups, these associations differed according to the specific renal outcome examined: male sex and smoking were positively associated with Alb+ and negatively with eGFR+; age and anti-hypertensive therapies were more strongly associated with eGFR+, glucose control with Alb+, whereas BMI, and lipid-related variables with both abnormalities. All these associations were attenuated in the older (> 75 years) as compared to the younger groups (< 65 years; 65–75 years), and they were confirmed by multivariate analysis. Notably, Q-score values < 15, indicating a low quality of care, were strongly associated with Alb+ (OR 8.54; $P < 0.001$), but not with eGFR+.

Conclusions: In T2DM patients, the prevalence of both eGFR and Albuminuria increase with age. DKD is associated with poor cardiovascular risk profile and a lower quality of care, although these associations are influenced by the type of renal abnormality and by ageing. These data indicate that clinical surveillance of DKD

should not be underestimated in old T2DM patients.

Keywords: Diabetic kidney disease Elderly Type 2 diabetes Cardiovascular disease

- **Cost-effectiveness of comprehensive geriatric assessment at an ambulatory geriatric unit based on the Age-FIT trial**

  Martina Lundqvist, Jenny Alwin, Martin Henriksson, Magnus Husberg, Per Carlsson and Anne W. Ekdahl

  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 32

Background: Older people with multi-morbidity are increasingly challenging for today's healthcare, and novel, cost-effective healthcare solutions are needed. The aim of this study was to assess the cost-effectiveness of comprehensive geriatric assessment (CGA) at an ambulatory geriatric unit for people ≥75 years with multi-morbidity.

Method: The primary outcome was the incremental cost-effectiveness ratio (ICER) comparing costs and quality-adjusted life years (QALYs) of a CGA strategy with usual care in a Swedish setting. Outcomes were estimated over a lifelong time horizon using decision-analytic modelling based on data from the randomized AGe-FIT trial. The analysis employed a public health care sector perspective. Costs and QALYs were discounted by 3% per annum and are reported in 2016 euros.

Results: Compared with usual care CGA was associated with a per patient mean incremental cost of approximately 25,000 EUR and a gain of 0.54 QALYs resulting in an ICER of 46,000 EUR. The incremental costs were primarily caused by intervention costs and costs associated with increased survival, whereas the gain in QALYs was primarily a consequence of the fact that patients in the CGA group lived longer.

Conclusion: CGA in an ambulatory setting for older people with multi-morbidity results in a cost per QALY of 46,000 EUR compared with usual care, a figure generally considered reasonable in a Swedish healthcare context. A rather simple reorganisation of care for older people with multi-morbidity may therefore cost effectively contribute to meet the needs of this complex patient population.

Trial registration: The trial was retrospectively registered in clinicaltrial.gov, NCT01446757. September, 2011.

Keywords: Cost-effectiveness Quality-adjusted life years Comprehensive geriatric assessment Ambulatory care Multi-morbidity

- **Frail-VIG index: a concise frailty evaluation tool for rapid geriatric assessment**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 29

Background: Demographic changes have led to an increase in the number of elderly frail persons and, consequently, systematic geriatric assessment is more important than ever. Frailty Indexes (FI) may be particularly useful to discriminate between various degrees of frailty but are not routinely assessed due, at least in part, to the large number of deficits assessed (from 30 to 70). Therefore, we have developed a new, more concise FI for rapid geriatric assessment (RGA) — the Frail-VIG index ("VIG" is the Spanish/Catalan abbreviation for Comprehensive Geriatric Assessment), which contains 22 simple questions that assess 25 different deficits. Here we describe this FI and report its ability to predict mortality at 24 months.

Methods: Prospective, observational, longitudinal study of geriatric patients followed for 24 months or until death. The study participants were patients (n = 590) admitted to the Acute Geriatric Unit at the at the University Hospital of Vic (Barcelona) during the year 2014. Participants were classified into one of seven groups based on their Frail-VIG score (0–0.15; 0.16–0.25; 0.26–0.35; 0.36–0.45; 0.46–0.55; 0.56–0.65; and 0.66–1). Survival curves for these groups were compared using the log-rank test. ROC curves were used to assess the index's capacity to predict mortality at 24 months.

Results: Mean (standard deviation) patient age was 86.4 (5.6) years. The 24-month mortality rate was 57.3% for the whole sample. Significant between-group (deceased vs. living) differences (p < 0.05) were observed for most index variables. Survival curves for the seven Frail-VIG groups differed significantly (X^2 = 433.4, p < 0.001), with an area under the ROC curve (confidence interval) of 0.90 (0.88–0.92) at 12 months and 0.85 (0.82–0.88) at 24 months. Administration time for the Frail-VIG index ranged from 5 to 10 min.

Conclusions: The Frail-VIG index, which requires less time to administer than previously

validated FIs, presents a good discriminative capacity for the degree of frailty and a high predictive capacity for mortality in the present cohort. Although more research is needed to confirm the validity of this instrument in other populations and settings, the Frail-VIG may provide clinicians with a RGA method and also a reliable tool to assess frailty in routine practice.

Keywords: Frail elderly Frailty index Geriatric assessment Multimorbidity Mortality

- **Informal carers' perspectives on the delivery of acute hospital care for patients with dementia: a systematic review**

  Sarah Beardon, Kiran Patel, Bethan Davies and Helen Ward

  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 23

Background: Providing high quality acute hospital care for patients with dementia is an increasing challenge as the prevalence of the disease rises. Informal carers of people with dementia are a critical resource for improving inpatient care, due to their insights into patients' needs and preferences. We summarise informal carers' perspectives of acute hospital care to inform best practice service delivery.

Methods: We conducted a systematic search of bibliographic databases and sought relevant grey literature. We used thematic synthesis analysis to assimilate results of the studies and describe components of care that influence perceived quality.

Results: Twenty papers met the inclusion criteria. Findings identified four overarching components of care that influenced carer experience and their perceptions of care quality: 'Patient care', 'Staff interactions', 'Carer's situation' and 'Hospital environment'. Need for improvement was identified in staff training, provision of help with personal care needs, and dignified treatment of patients. Carers need to be informed, involved and supported during hospital admission in order to promote the most positive experience.

Conclusion: This review identifies common perspectives of informal carers of people with dementia in the acute hospital setting and highlights important areas to address to improve the experience of an admission for both carer and patient.

Keywords: Dementia Carers Hospital Experience Qualitative

- **Novel sensing technology in fall risk assessment in older adults: a systematic review**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 14

Background: Falls are a major health problem for older adults with significant physical and psychological consequences. A first step of successful fall prevention is to identify those at risk of falling. Recent advancement in sensing technology offers the possibility of objective, low-cost and easy-to-implement fall risk assessment. The objective of this systematic review is to assess the current state of sensing technology on providing objective fall risk assessment in older adults.

Methods: A systematic review was conducted in accordance to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement (PRISMA).

Results: Twenty-two studies out of 855 articles were systematically identified and included in this review. Pertinent methodological features (sensing technique, assessment activities, outcome variables, and fall discrimination/prediction models) were extracted from each article. Four major sensing technologies (inertial sensors, video/ depth camera, pressure sensing platform and laser sensing) were reported to provide accurate fall risk diagnostic in older adults. Steady state walking, static/dynamic balance, and functional mobility were used as the assessment activity. A diverse range of diagnostic accuracy across studies (47.9% - 100%) were reported, due to variation in measured kinematic/ kinetic parameters and modelling techniques.

Conclusions: A wide range of sensor technologies have been utilized in fall risk assessment in older adults. Overall, these devices have the potential to provide an accurate, inexpensive, and easy-to-implement fall risk assessment. However, the variation in measured parameters, assessment tools, sensor sites, movement tasks, and modelling techniques, precludes a firm conclusion on their ability to predict future falls. Future work is needed to determine a clinical meaningful and easy to interpret fall risk diagnosis utilizing sensing technology. Additionally, the gap between functional evaluation and user experience to technology should be addressed.

Keywords: Geriatric Older adults Fall risk Sensing technology

- **What works in falls prevention in Asia: a systematic review and meta-analysis of randomized controlled trials**

  Keith D. Hill, Plaiwan Suttanon, Sang-I Lin, William W.N. Tsang, Asmidawati Ashari, Tengku Aizan Abd Hamid, Kaela Farrier and Elissa Burton

  BMC Geriatrics BMC series – open, inclusive and trusted 2018 18 : 3

Background: There is strong research evidence for falls prevention among older people in the community setting, although most is from Western countries. Differences between countries (eg sunlight exposure, diet, environment, exercise preferences) may influence the success of implementing falls prevention approaches in Asian countries that have been shown to be effective elsewhere in the world. The aim of this review is to evaluate the scope and effectiveness of falls prevention randomized controlled trials (RCTs) from the Asian region.

Method: RCTs investigating falls prevention interventions conducted in Asian countries from (i) the most recent (2012) Cochrane community setting falls prevention review, and (ii) subsequent published RCTs meeting the same criteria were identified, classified and grouped according to the ProFANE intervention classification. Characteristics of included trials were extracted from both the Cochrane review and original publications. Where ≥2 studies investigated an intervention type in the Asian region, a meta-analysis was performed.

Results: Fifteen of 159 RCTs in the Cochrane review were conducted in the Asian region (9%), and a further 11 recent RCTs conducted in Asia were identified (total 26 Asian studies: median 160 participants, mean age : 75.1, female : 71.9%). Exercise (15 RCTs) and home assessment/ modification ($n = 2$) were the only single interventions with ≥2 RCTs. Intervention types with ≥1 effective RCT in reducing fall outcomes were exercise (6 effective), home modification (1 effective), and medication (vitamin D) (1 effective). One multiple and one multifactorial intervention also had positive falls outcomes. Meta-analysis of exercise interventions identified significant benefit (number of fallers: Odds Ratio 0.43 [0.34,0.53]; number of falls: 0.35 [0.21,0.57]; and number of fallers injured: 0.50 [0.35,0.71]); but multifactorial interventions did not reach significance (number of fallers OR = 0.57 [0.23,1.44]).

Conclusion: There is a small but growing research base of falls prevention RCTs from Asian countries, with exercise approaches being most researched and effective. For other interventions shown to be effective elsewhere, consideration of local issues is required to ensure that research and programs implemented in these countries are effective, and relevant to the local context, people, and health system. There is also a need for further high quality, appropriately powered falls prevention trials in Asian countries.

Keywords: Falls prevention Effectiveness Asia Elderly Community

- **Preoperative medication use and postoperative delirium: a systematic review**

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  BMC Geriatrics BMC series – open, inclusive and trusted 2017 **17**: 298

Background: Medications are frequently reported as both predisposing factors and inducers of delirium. This review evaluated the available evidence and determined the magnitude of risk of postoperative delirium associated with preoperative medication use.

Methods: A systematic search in Medline and EMBASE was conducted using MeSH terms and keywords for postoperative delirium and medication. Studies which included patients 18 years and older who underwent major surgery were included. The methodological quality of included studies was assessed independently by two authors using the Newcastle-Ottawa quality assessment scale for cohort studies.

Results: Twenty-nine studies; 25 prospective cohort, three retrospective cohort and one post hoc analysis of RCT data were included. Only four specifically aimed to assess medicines as an independent predictor of delirium, all other studies included medicines among a number of potential predictors of delirium. Of the studies specifically testing the association with a medication class, preoperative use of beta-blockers (OR = 2.06 [1.18–3.60]) in vascular surgery and benzodiazepines RR 2.10 (1.23–3.59) prior to orthopedic surgery were significant. However, evidence is from single studies only. Where medicines were included as one possible factor among many, hypnotics had a similar risk estimate to the benzodiazepine study, with one significant and one non-significant result. Nifedipine use prior to cardiac surgery was found to be significantly associated with delirium. The non-specific grouping of psychoactive medication use preoperatively was generally higher with an associated two-to-seven-fold higher risk of

postoperative delirium, while only two studies included narcotics without other agents, with one significant and one non-significant result.

Conclusions: There was a limited number of high quality studies in the literature quantifying the direct association between preoperative medication use and postsurgical delirium. More studies are required to evaluate the association of specific preoperative medications on the risk of postoperative delirium so that comprehensive guidelines for medicine use prior to surgery can be developed to aid delirium prevention.

Trial registration: This systematic review has been registered on PROSPERO International prospective register of systematic reviews (Registration number: CRD42016051245).

Keywords: Delirium Elderly Medication Risk factor Prevention Medication related problem Adverse drug event Medication safety.