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Association between stairs in the home and instrumental activities of daily living among community-dwelling older adults

Tomioka K, Kurumatani N, Hosoi H.

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Affiliation: Nara Prefectural Health Research Center, Nara Medical University, Shijo-cho 840, Kashihara City, Nara, 634-8521, Japan.

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DOI 10.1186/s12877-018-0830-3 **PMID** 29898678

Abstract

BACKGROUND: There is insufficient evidence regarding the relationship of home environment with functional capacity among community-dwelling older people without disabilities. We conducted a population-based longitudinal cohort study and examined whether stairs in the home were associated with capability to perform instrumental activities of daily living (IADL) in community-dwelling high-functioning older adults.

METHODS: The target population was individuals aged 65 years or older living in two municipalities in Nara Prefecture in Japan. At the baseline survey, residents who were independent in IADL (n = 6722) were included as survey subjects. Subjects were divided into three groups according to their home type; one-storey residences, walk-up residences, or residences with an elevator. IADL was evaluated using the Tokyo Metropolitan Institute of Gerontology Index of Competence. Multiple logistic regression analyses stratified by gender were used to calculate the odds ratio (OR) and a 95% confidence interval (CI) for a decline in IADL, with one-storey residences as a reference. Age, studied area, marital status, working status, self-perceived economic status, body mass index, chronic diseases, smoking, drinking, eating habits, basic activities of daily living, cognitive functioning, depression, self-rated health, and social participation were used as covariates.

RESULTS: During the 3-year follow-up, 11.6% of the subjects showed a decline in IADL. After adjusting for covariates, women who lived in walk-up residences had a lower risk for IADL decline (adjusted OR = 0.72, 95% CI = 0.52-0.99), while living in a home with an elevator was not associated with IADL decline (adjusted OR = 0.94, 95% CI = 0.49-1.77). In contrast, there was no association between home type and IADL decline in men (walk-up residences, adjusted OR = 0.90, 95% CI = 0.71-1.14; residences with an elevator, adjusted OR = 0.82, 95% CI = 0.39-1.72).

CONCLUSIONS: The presence of stairs in the home was associated with prevention of IADL decline over a 3-year period in older women without disabilities. Although a barrier-free house is recommended for older people, our findings indicate that a home with stairs may maintain the capability to perform IADL among older adults without disabilities.

PDF Y Endnote Y

Combined effects of whole body vibration and unstable shoes on balance measures in older adults: A randomized clinical trial

Sobhani S, Sinaei E, Motealleh A, Hooshyar F, Kashkooli NS, Yoosefinejad AK.

Arch. Gerontol. Geriatr. 2018; 78: 30-37.



Affiliation: Department of Physical Therapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran; Rehabilitation Sciences Research Centre, Shiraz University of Medical Sciences, Shiraz, Iran. Electronic address: yoosefinejad@sums.ac.ir.

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Abstract

OBJECTIVE: The purpose of this study was to compare the efficacy of 4 weeks of whole body vibration training on balance in older adults who wore two different types of shoes: unstable (unstable group) versus standard shoes (stable group).

DESIGN: Randomized, single-blind clinical trial. **PARTICIPANTS:** Seventy eight eligible older adults were initially enrolled; 59 participants (mean age 69.7±5.3 years) completed the program.

INTERVENTION: Participants were randomized 1:1 to an intervention group that received whole body vibration with unstable shoes, and a control group that received whole body vibration with standard shoes.

OUTCOME MEASURES: The Fullerton Advanced Balance scale, preferred gait speed, maximum gait speed, and Fall Efficacy Scale were recorded at baseline, after the 4-week intervention, and 1 month after the end of the training program.

RESULTS: Both groups showed improvement in all outcome measures at 4 weeks ($p < 0.01$) with no significant between-group differences. In the unstable group, the gains were maintained at follow-up ($p < 0.01$) whereas the scores returned to baseline values in the stable group. At follow-up, significant between-group differences were found for Fullerton Advanced Balance scale ($p < 0.001$), preferred gait speed ($p = 0.007$) and maximum gait speed ($p = 0.007$), and all were in favor of the unstable group.

CONCLUSION: Combining whole body vibration with unstable shoes can be proposed as a beneficial method with relatively long-term effects to improve balance measures in older people.

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Falls in older patients with cancer undergoing surgery: prevalence and association with geriatric syndromes and levels of disability assessed in preoperative evaluation

Fahimnia S, Mirhedayati Roudsari H, Doucette J, Shahrokni A.

Curr. Gerontol. Geriatr. Res. 2018; 2018: e5713285.

Affiliation: Department of Geriatrics Service, Memorial Sloan Kettering Cancer Center, New York, NY, USA.

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Abstract

Falls are common among older adults. However, not much is known about the prevalence of falls among older patients with cancer. In 2015, older patients with cancer referred to Geriatrics service for preoperative evaluation were assessed for fall history, basic and instrumental activities of daily living (ADL and IADL), KPS, and use of assistive device. Of 806 patients, 215 (26.7%) patients reported fall. Incidence of last fall inside and outside home was 54.4% and 45.5%, respectively. Among

patients with no falls, 33.6% had KPS \leq 80 compared to 59.6% with one-time fall and 60.7% with multiple falls ($p < 0.001$). Among IADL, 8.5% of patients with no falls were unable to do shopping compared with 14.7% in one-time fall and 18.8% in multiple fallers ($p < 0.001$). In ADL items, the percentage of patients who were limited a lot in walking outside was 10.7% in no falls, 20.2% in one-time fall, and 27.1% in multiple fallers groups ($p < 0.001$). Only 17.8% of patients with no falls were using canes while 27.7% of patients with one-time fall and 38.8% with multiple falls were using canes ($p < 0.001$). Falls are prevalent among older patients with cancer. Fall history and number of falls are associated with functional status.

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Fatal falls in the elderly and the presence of proximal femur fractures

Schick S, Heinrich D, Graw M, Aranda R, Ferrari U, Peldschus S.

Int. J. Legal Med. 2018; ePub(ePub): ePub.

Affiliation: Institute of Legal Medicine, Ludwig-Maximilians-University (LMU) Munich, Nussbaumstrasse 26, 80336, Munich, Germany.

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Abstract

Fatal falls are frequent and seem to be an increasing problem in the elderly. Especially ground level falls (GLFs) and falls on or from stairs and steps (stairs falls) are worth examining for forensic classification and in order to improve the development of preventive measures. We retrospectively analyzed 261 fatal falls of elderly age 65 + years, which were autopsied at the Institute of Legal Medicine in Munich between 2008 and 2014. After careful screening, the sub-set of all 77 GLFs and 39 stairs falls were analyzed towards socio-demographic characteristics, fall circumstances, injuries, and circumstances of death. A subsequent analysis of GLF cases regarding the presence of proximal femur fractures (PFF) was performed. The injury pattern of the GLFs and the stairs falls clearly differ with a higher share of injuries to the lower extremities in the GLFs. However, the most severely injured body region was the head in both groups (62% of the stairs cases, 49% of the GLF cases). Alcohol as contributing to the fall was seen more frequently in the stairs falls. PFF were not seen in the stairs falls, but then in 18 GLF cases. Yet, for 17 among them (22% of 77), their hip fracture was the only serious injury leading to hospitalization and death. Only one GLF case was already found dead. This finding indicates a potential of avoiding up to 22% of the GLF fatalities by preventing hip fractures by optimized hip protectors or other measures, especially for the elderly aged 75 + years.

PDF Endnote

Medio-lateral stability during walking turns in older adults

Conradsson D, Paquette C, Franzén E.

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Affiliation: Function Area Occupational Therapy & Physiotherapy, Allied Health Professionals Function, Karolinska University Hospital, Stockholm, Sweden.

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Abstract

INTRODUCTION: Medio-lateral stability during walking turns relies on the interaction between precise weight shifts of the body and changes in base of support by regulating step width. Although older adults and clinical populations often slow down while turning in order to compensate for balance impairments, little is known about the influence of walking speed on stability during turning.

OBJECTIVE: To compare medio-lateral stability between walking turns and straight walking and to investigate whether walking speed affects medio-lateral stability during turning in healthy older adults.

METHODS: Nineteen older adults walked straight or walked and turned 180° to the right and left at their comfortable speed and at a slow pace. The walking direction was visually cued before they started to walk (preplanned) or while walking straight (unplanned). As a proxy for medio-lateral stability, we calculated the absolute difference between pelvis lateral displacement and the lateral edge of the base of support during straight walking and turning.

RESULTS: Overall, irrespective of turning condition, medio-lateral stability was enhanced during turning as the pelvis was further away from the boundary of the base of support resulting in a greater margin of stability compared to straight walking. Turning at a slow pace hampered medio-lateral stability as demonstrated by pelvis lateral displacement closer to the boundaries of the base of support resulting in reduced margins of stability. The reduction in stability was caused by a narrower step width during slow walking whereas pelvis lateral displacement was unaffected by turning speed.

CONCLUSION: In older adults, medio-lateral stability was augmented during turning compared to straight walking, whereas turning at a slow pace hampered medio-lateral stability. These findings provide insights into the postural strategies used by older adults in order to adapt to the postural challenges of turning and straight walking.

PDF Y Endnote Y

Sedative hypnotics and the risk of falls and fractures in the elderly

Andrade C.

J. Clin. Psychiatry 2018; 79(3): e12340.

Affiliation: Department of Psychopharmacology, National Institute of Mental Health and Neurosciences, Bangalore, India. candrade@psychiatrist.com.

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Abstract

Older age, poor sleep, and the use of the "Z" sedative hypnotic drugs (zopiclone, eszopiclone, zolpidem, and zaleplon) commonly go together. Each of these can increase the risk of falls and fractures through mechanisms related to cognitive and psychomotor impairment. A recent systematic review and meta-analysis examined the risk of falls and fractures associated with the use of the Z-drugs. The authors of that meta-analysis identified 14 relevant cohort and case-control studies. They found that Z-drugs increased the risk of falls in 2 out of 3 studies that provided information on this outcome; in the third, the increased risk narrowly missed statistical significance. Z-drugs increased the fracture risk in 9 of 10 studies (odds ratio [OR] = 1.63; 95% confidence interval

[CI], 1.42-1.87). In secondary analyses, the fracture risk associated with the use of Z-drugs was elevated in studies that included a control group diagnosed with insomnia (OR = 1.28; 95% CI, 1.08-1.53) as well as in studies of samples restricted to subjects aged > 65 years (OR = 1.70; 95% CI, 1.36-2.12). In 2 studies, zolpidem was associated with an increased risk of injuries. Whereas confounding by indication may explain a part of the risk of falls and fractures, there is reason to consider that Z-drugs augment the risk. Either way, the use of Z-drugs emerges as a clear marker for the risk of falls and fractures. Nonpharmacologic interventions for insomnia should therefore be considered as alternatives to the use of Z-drugs. Finally, patients prescribed Z-drugs and caregivers of these patients should be warned about the risk of falls and fractures and counseled about practical measures that can reduce the risk.

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Self-management tasks to improve mobility and reduce fall risk are not leading to lower research participation in older adults

Bongers KTJ, Schoon Y, Olde Rikkert MGM.

Arch. Gerontol. Geriatr. 2018; 78: 14-17.

Affiliation: Radboud University Medical Center, Department of Geriatric Medicine, Post Office Box 9101, NL, 6500 HB, Nijmegen, The Netherlands.

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Abstract

PURPOSE OF STUDY: The first aim is to evaluate, in a sub-study, the recruitment process of the Senior Step Study, which was an intervention study on the self-management of mobility and fall risk; the second aim is to explore the reasons mentioned by older people, from three different settings, for (not) participating.

METHODS: Subjects were community-dwelling older persons, residents of homes for the elderly, and older persons regularly visiting community centres. The effectiveness of different recruitment procedures was analysed for each setting separately. We also analysed reasons for accepting and declining participation between the settings.

RESULTS: The total inclusion rate was 27.9%. A personal initial approach (i.e., first contact was face-to-face or in a group meeting) did not improve the inclusion rate. More subjects consented to participate after an introductory meeting (which was planned after the first face-to-face contact) compared to persons not having one ($p < 0.01$). At different settings, subjects gave different reasons for participation. No differences were found in the reasons for refusing participation. Especially in homes for the elderly, people refused to participate because the research was too burdensome.

CONCLUSIONS: The inclusion rates in this study are comparable to other self-management studies with older people. An introductory meeting during which the study design and benefits of participating are explained and formal interim evaluations of the recruitment process may benefit recruitment. Recruiting older persons for self-management tasks is possible with the appropriate recruitment process, enabling more research on this increasingly important research topic.

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PDF Y Endnote Y**Strong relation between muscle mass determined by D3-creatine dilution, physical performance and incidence of falls and mobility limitations in a prospective cohort of older men**

Cawthon PM, Orwoll ES, Peters KE, Ensrud KE, Cauley JA, Kado DM, Stefanick ML, Shikany JM, Strotmeyer ES, Glynn NW, Caserotti P, Shankaran M, Hellerstein M, Cummings SR, Evans WJ. *J. Gerontol. A Biol. Sci. Med. Sci.* 2018; ePub(ePub): ePub.

Affiliation: Duke University, Durham NC, USA.

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Abstract

BACKGROUND: Direct assessment of skeletal muscle mass in older adults is clinically challenging. Relationships between lean mass and late-life outcomes have been inconsistent. The D3-creatine dilution method provides a direct assessment of muscle mass.

METHODS: Muscle mass was assessed by D3-creatine (D3Cr) dilution in 1,382 men (mean age, 84.2 yrs). Participants completed the Short Physical Performance Battery (SPPB); usual walking speed (6 meters); and DXA lean mass. Men self-reported mobility limitations (difficulty walking 2-3 blocks or climbing 10 steps); recurrent falls (2+); and serious injurious falls in the subsequent year. Across quartiles of D3Cr muscle mass/body mass, multivariate linear models calculated means for SPPB and gait speed; multivariate logistic models calculated odds ratios for incident mobility limitations or falls.

RESULTS: Compared to men in the highest quartile, those in the lowest quartile of D3Cr muscle mass/body mass had slower gait speed (Q1: 1.04 vs Q4: 1.17 m/s); lower SPPB (Q1: 8.4 vs Q4: 10.4 points); greater likelihood of incident serious injurious falls (OR Q1 vs Q4: 2.49, 95% CI: 1.37, 4.54); prevalent mobility limitation (OR Q1 vs Q4: 6.1, 95%CI: 3.7, 10.3) and incident mobility limitation (OR Q1 vs Q4: 2.15 95% CI: 1.42, 3.26); p for trend <.001 for all.

RESULTS for incident recurrent falls were in the similar direction (p=0.156). DXA lean mass had weaker associations with the outcomes.

CONCLUSIONS: Unlike DXA lean mass, low D3Cr muscle mass/body mass is strongly related to physical performance, mobility and incident injurious falls in older men.

PDF Y Endnote Y**The association between mediterranean diet and the risk of falls and physical function indices in older type 2 diabetic people varies by age**

Tepper S, Alter Sivashensky A, Rivkah Shahar D, Geva D, Cukierman-Yaffe T. *Nutrients* 2018; 10(6): e10060767.

Affiliation: The Center for Successful Aging with Diabetes, Endocrinology Institute, Sheba Medical Center, Ramat Gan 52621, Israel. tcukierm@gmail.com.

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Abstract

BACKGROUND AND AIMS: Diabetes and dysglycemia increase the risk of frailty and decreased physical abilities. Adherence to the Mediterranean Diet (MD) may reduce this risk. We hypothesized that adherence to the MD is associated with physical function in older type-2 diabetic patients and that the association is stratified by age.

METHODS AND RESULTS: We recruited type-2 diabetes patients aged >60 years at the Center for Successful Aging with Diabetes at Sheba Medical Center. Health status and demographic data were obtained from medical records. Food Frequency Questionnaire was used for nutritional assessment and calculation of MD score. Physical function indices were determined by a physiotherapist and included: Berg Balance test, Timed Get-Up-and-Go, 6-min walk (6 MW), 10-m walk (10 MW), Four Square Step Test, 30-s chair stand and Grip strength, and activities and instrumental activities of daily living. Among 117 participants (age 70.6 ± 6.5), high adherence to MD was associated with better score on functional tests (low vs. high MD adherence: 9.7% vs. 25%, ANOVA $p = 0.02$). A significant age by MD interaction was found: a higher adherence to MD was associated with a better 6 MW (low vs. high: 387 ± 35 m vs. 483 ± 26 m; $p = 0.001$) and higher 10 MW (low vs. high: 1.8 ± 0.16 m/s vs. 2.0 ± 0.13 m/s; $p = 0.02$) in participants aged >75 years. These associations remained significant after controlling for gender, age, BMI, and physical activity.

CONCLUSION: In the current study, we showed relationships between strength, physical performance, and MD among older diabetic patients. Future studies are needed to confirm this association and establish temporal relationships.

PDF Y Endnote Y

The effects of uniquely-processed titanium on balance and walking performance in healthy older adults

Black MJ, Lucero AA, Fink PW, Stoner L, Shultz SP, Lark SD, Rowlands DS.

J. Funct. Biomater. 2018; 9(2): ePub.

Affiliation: School of Sport, Exercise and Nutrition, Massey University, Wellington 6021, New Zealand. D.S.Rowlands@massey.ac.nz.

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Abstract

The increased risk of falls associated with advancing age has increased demand for methods to improve balance and mobility. The primary purpose of the study was to determine whether wearing Aqua Titan-treated stockings could improve balance and walking performance in an older population; secondary was to elucidate the mechanisms. In a randomized, double-blind crossover, 16 healthy older adults (age, 67.9 ± 4.2 years; BMI, 24.8 ± 3.1 kg/m²) performed two 4-day trials composed of baseline measures and fatiguing exercise on Day 1, with recovery measures at 14, 38 and 62 h post-exercise, wearing Aqua Titan and control stockings. Balance, walking performance, triceps surae stretch reflex, ankle range of motion and gastrocnemius muscle microvascular perfusion, blood flow and oxygen consumption were measured at baseline and during recovery. Aqua Titan had no effect on the microvascular parameters, but increased total ankle range of motion at 38 h (2.4° ; 95% CI $\pm 1.8^\circ$) and 62 h (2.7° ; $\pm 1.7^\circ$), contributed to by increases in dorsiflexion and plantar flexion. There was decreasing persistence in the medial-lateral center of pressure

movement at 38 h ($q = 0, -0.0635 \pm 0.0455$), compared to control stockings. Aqua Titan garments hold potential for improving balance and mobility in older adults in the days following a bout of fatiguing exercise. The proposed mechanisms associated with enhanced sensory feedback require further exploration.

PDF Y Endnote Y

Evaluation of the trauma triage accuracy in a Level 1 Australian trauma centre

Trinder MW, Wellman SW, Nasim S, Weber DG.

Emerg. Med. Australas. 2018; ePub(ePub): ePub.

Affiliation: Department of Trauma Surgery, Royal Perth Hospital, Perth, Western Australia, Australia.

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DOI 10.1111/1742-6723.13117 **PMID** 29888859

Abstract

OBJECTIVES: To assess the rate of undertriage of major trauma patients and to assess factors contributing to undertriage in a modern Australian Level 1 trauma centre.

METHODS: A retrospective case series of 600 consecutive major trauma (injury severity score [ISS] >15) patients admitted to Royal Perth Hospital (RPH) during 2015 was performed. Data were compiled via the prospectively maintained hospital trauma registry for all patients admitted with a major trauma during the study period.

RESULTS were analysed for patient demographics, mechanism and outcomes. The primary outcome of the study was to determine the rate of undertriage of major trauma at RPH by establishing whether or not the trauma team activation page was correctly sent at the time of patient arrival based on hospital criteria.

RESULTS: The average age of patients in the study population was 46.5 (± 21.5) years and the mean ISS was 24.7 (± 9.3). The most common mechanism of injury was falls, motor vehicle accidents and motorbike accidents. One hundred and sixty-nine patients (28%) did not have trauma team activation on arrival to the ED. Among these patients, 132 did not fulfil the RPH trauma activation criteria. The remaining 37 patients (6.1%) did meet the criteria and were considered undertriaged. Subgroup analysis showed a statistically significant difference in age between the patients who had trauma team activation (42.7 ± 19.5 years) and those who did not (55.9 ± 23.3 years).

CONCLUSION: In this cohort of major trauma, a 6.1% undertriage performance of the triage tool was observed. Sub-analysis of the data showed that elderly patients were more likely to be undertriaged.

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Incidence and risk factors of knee injuries associated with ipsilateral femoral shaft fractures: a multicentre retrospective analysis of 429 femoral shaft injuries

Byun SE, Shon HC, Park JH, Oh HK, Cho YH, Kim JW, Sim JA.

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Affiliation: Department of Orthopedic Surgery, Gil Medical Center, Gachon University College of Medicine, Incheon, Republic of Korea. Electronic address: sim_ja@daum.net.

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Abstract

A femoral shaft fracture is usually a high-energy injury and, thus, is likely to be accompanied by an injury of adjacent joints such as a knee ligament injury. However, these associated injuries are often neglected because of severe pain and deformity. The purpose of the current study is to evaluate the incidence, type and risk factors of ipsilateral knee injuries associated with femoral shaft fractures. A total of 429 femoral shaft fractures were included in this study from January 2010 to September 2015. There were 320 males and 109 females, with mean age of 40.7 years (range, 15-88). Exclusion criteria were skeletally immature patients and patients with metabolic bone disease such as osteoporosis, atypical femoral fractures, and pathologic fractures. The incidence and type of knee injury were identified, and the injury mechanisms, AO/OTA classification of the femoral shaft fractures, were analysed for assessment of risk factors for knee injuries combined with femoral shaft fractures. Knee injuries were found in 131 cases. Knee ligament injuries were identified in 87 cases. There were 20 posterior cruciate ligament injuries, 11 anterior cruciate ligament (ACL) injuries, 16 medial collateral ligament (MCL) injuries, 8 lateral collateral ligament (LCL) injuries, and 32 multi-ligament injuries. In 24 cases, ligament injuries were not detected before internal fixation of femoral shaft fractures. Average time of diagnosis for ligament injury after fixation in these neglected cases was about 10.6 weeks (range, 1-32). Fractures around the knee joint were identified in 69 cases; there were 32 patellar fractures, 14 distal femoral intra-articular fractures, 14 tibia plateau fractures, 3 proximal fibular fractures, and 6 combined fractures. Male sex, type C fracture of AO/OTA classification, and motor vehicle accidents were identified as risk factors for associated ipsilateral knee injuries in femoral shaft fractures. Knee injuries were identified in approximately 30% of femoral shaft fractures. About 30% of ligament injuries were not detected before internal fixation of femoral shaft fractures. Care should be taken since knee injuries can be accompanied by ipsilateral femoral shaft fractures.

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