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NEW HORIZONS

New horizons in falls prevention and management for older adults: a global initiative

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Abstract

Background: falls and fall-related injuries are common in older adults, have negative effects both on quality of life and functional independence and are associated with increased morbidity, mortality and health care costs. Current clinical approaches and advice from falls guidelines vary substantially between countries and settings, warranting a standardised approach. At the first World Congress on Falls and Postural Instability in Kuala Lumpur, Malaysia, in December 2019, a worldwide task force of experts in falls in older adults, committed to achieving a global consensus on updating clinical practice guidelines for falls prevention and management by incorporating current and emerging evidence in falls research. Moreover, the importance of taking a person-centred approach and including perspectives from patients, caregivers and other stakeholders was recognised as important components of this endeavour. Finally, the need to specifically include recent developments in e-health was acknowledged, as well as the importance of addressing differences between settings and including developing countries.
Methods: a steering committee was assembled and 10 working Groups were created to provide preliminary evidence-based recommendations. A cross-cutting theme on patient's perspective was also created. In addition, a worldwide multidisciplinary group of experts and stakeholders, to review the proposed recommendations and to participate in a Delphi process to achieve consensus for the final recommendations, was brought together.
Conclusion: in this New Horizons article, the global challenges in falls prevention are depicted, the goals of the worldwide task force are summarised and the conceptual framework for development of a global falls prevention and management guideline is presented.

Keywords: aged, guidelines, clinical practice, consensus, falls, injury, older adults, world

Key Points

- The world's population is ageing; falls and concomitant injuries, which increase in prevalence with age, are ubiquitous, making their prevention and management a critical global challenge.

- There is a considerable amount of literature on fall risk assessment and management, but guideline advice on management varies widely between countries and settings, warranting a standardised approach derived through a global expert consensus.
- A global task force has been assembled with the goal of updating existing clinical practice recommendations for falls prevention and management by including current and emerging advances in falls research and technology.
- There is a scarcity of falls management algorithms that take a person-centred approach and address the unique challenges and resources available in various settings, such as in developing countries.
- Recommendations need to incorporate the older person's beliefs and attitudes towards falls and their management when developing an agreed care plan with them.

Global challenges in falls prevention

> "The greatest glory in living is not in never falling, but in rising every time we fall"
>
> -Nelson Mandela
> (1918–2013)

Despite the developments in falls prevention over the past decades, falls in older adults are still on the rise [1]. This is only partly explained by an ageing population at least in developed countries. Other possible explanations include the increased prevalence of multimorbidity, polypharmacy and frailty in the older age categories. Therefore, falls and fall-related injuries are identified as a serious and growing health care problem because of the related increase in morbidity, disability, nursing home placement and mortality [1–3]. The accompanying societal and economic consequences are also substantial, as in developed countries ∼1% (0.85–1.5%) of health care costs are fall-related expenditure [4]. It is anticipated that the number of falls and concomitant injuries will also increase dramatically across developing countries as their populations age as part of the worldwide ageing demographic transition we are experiencing [5–11]. Fall risk varies by residential setting: ∼35% of community-dwelling people aged 65 years and over fall each year, compared with ∼50% of people living in long-term care settings [6]. Annual fall risk increases with age and frailty level, and also varies among countries.

For instance, one study from the South-East Asia region reported that 31% of Chinese older adults fell each year, compared with 20% of Japanese older adults [7]. A study in Latin America (including the Caribbean region) found that the proportion of older adults who fell each year ranged from 22% in Barbados to 34% in Chile [8]. These differences may be due in part to cultural and lifestyle differences [12]. Similarly, across the Western Europe region, there appears to be significant variability in fall prevalence, fall-related injuries and mortality from falls [9]. Globally, the mortality and morbidity associated with falls and fall-related injuries, and the burden imposed on healthcare systems are substantial despite the differences observed in fall prevalence between regions [10]. Irrespective of all these differences, research in older adults has confirmed that the risk for falls is substantially increased in people aged 65 years and over. However, there is lack of substantive epidemiological data in many regions of the developing world, which may reflect inadequate attention to this phenomenon or limited resources to collect data on falls.

During the last decade, several scientific advances have been published regarding falls prevention and management that can potentially enrich current falls guidelines, such as how low performance in some cognitive tasks can increase the risk of falls and fall-related injuries [11,13–16], new evidence concerning mechanisms of falls in long-term care facilities [17] and the potential role of e-health including wearable and implantable technology and virtual reality applications [18,19]. However, it is not apparent that these emerging advancements in science and technology can be easily implemented into practice or adapted in different countries with varying resources and population characteristics. There is also the need to obtain the perspective of older people on the acceptability of these novel approaches to falls prevention.

Clinical practice guidelines are evidence and/or consensus based recommendations used by clinicians and healthcare providers to direct care and ensure that the most appropriate course of action is taken to diagnose, treat and care for patients with a specific condition or disease [20]. Although several clinical practice guidelines for falls prevention have been published [21–27], little is known on the level of agreement between the recommendations contained within each of the guidelines used across the globe.

Challenges to be addressed in creating a harmonised global clinical practice guideline include reconciling the different recommendations of the multiple existing guidelines. For instance, while there is general agreement on the value of multifactorial risk assessment in high-risk patients, details differ on the optimal content, setting and frequency of this assessment, as well as on the definition of 'high risk' [28]. As an example, recommendations on medications (which increase falls risk as a side effect) vary from simply deprescribing sedatives and other psychotropic drugs to performing a comprehensive medication review [29]. Similarly, physical exercise is one of the most effective interventions to prevent and reduce falls [30] but older adults around the world may have different attitudes to exercise and preferences for different types of exercise. There is also a need to consider the impact of different systems for the delivery of healthcare found across the world and different cultural characteristics.

Successfully implementing effective fall prevention interventions in individuals with higher risk in the community is also challenging [31,32]; some recent pragmatic trials have failed to show a significant reduction in falls, possibly due to a lack of adherence, fidelity to interventions or rigorousness

in applying the protocols developed in previous successful multifactorial assessment and intervention trials [33,34].

Another major challenge is how to reduce fall rates in individuals defined as being at 'low or moderate risk' of falls, from a population-based perspective. This group still experiences a significant number of falls and fall-related injuries [28,35]. Currently there is no consensus on strategies for reducing their risk.

Lastly, the perspectives of people with a history of falls and associated injuries have not been consistently incorporated in clinical practice guidelines. Current fall prevention and management strategies generally do not adopt a personalised approach that incorporates individual preferences (goals and wishes) as well as individual aspects such as gender, frailty level, multimorbidity and motivation, among other characteristics [36,37].

To assimilate these and other developments, an updated set of international recommendations for fall prevention and management incorporated into a worldwide falls guideline is warranted. These guidelines should be based on both research evidence and a structured expert consensus, with global representation of not only researchers but other stakeholders including health practitioners from a variety of disciplines who see patients with falls as well as older persons who have experienced falls and have a fear of falling [38].

Main goal and conceptual framework of the global task force on falls prevention

The main goal of the Global Falls Guideline Task Force is to achieve a set of evidence- and consensus-based falls prevention and management recommendations to provide guidance to medical, nursing and allied healthcare professionals treating older people who fall. The older person is at the centre of these efforts and the main target practitioner groups for these guidelines include physicians, nurses, physiotherapists, occupational therapists, pharmacists and other healthcare professionals caring for older adults with falls. To achieve this goal, we have assembled a worldwide multidisciplinary group of experts from across the globe. Although there may be complementary approaches to reducing fall risk at a population level that do not involve patient-level interventions (such as public health messages/mass media campaigns, modification of the built environment and cities planning to encourage exercise, making exercise programs ubiquitous and available at low or no cost and reducing environmental hazards), these are beyond our scope and will not be addressed in the anticipated consensus guideline. Nevertheless, we aim to provide a set of core recommendations that apply to all older adults to reduce their risk of falling, with a set of targeted recommendations for older adults considered at higher risk or belonging to specific clinical groups. We have created Working Groups to address these core and targeted recommendations.

Our framework includes four core elements:

i) **Overall recommendations:** to reduce the risk of falling for older adults.
ii) **Assessment:** to identify appropriate and individualised assessment tools, which can measure the risk of falls.
iii) **Risk stratification:** to assess individual's unique and modifiable fall risk factors by applying a person-centred approach.
iv) **Interventions:** to evaluate available and feasible interventions for reducing fall risk.

Recognising that falls are just one of many health challenges that clinicians must consider when treating older people, we also aim to create an assessment and management algorithm that gives guidance on conducting a practical fall risk assessment in older adults presenting with a fall or for another reason.

We envisage that this algorithm will be adaptable to cater for the different needs of individuals with varying characteristics and residing in diverse settings and countries with variable resource availability. By taking a person-centred approach in the algorithm, healthcare professionals will be able to optimise and tailor care on an individualised level. This approach, termed the P4 approach [39] incorporates the following:

1. **Personalisation:** customising diagnosis and management of fall risk.
2. **Prediction:** utilisation of available information to determine an individual's risk of falls and fall-related injuries.
3. **Prevention:** utilisation of identified fall risks factors to develop individualised fall prevention plans.
4. **Participation:** data and strategies are fully shared with the older person, allowing them active involvement in treatment choices, thereby resulting in improved adherence (shared decision-making).

As a key part of this algorithm, we will foster the incorporation of digital technology (such as e-health including artificial intelligence and web apps) in fall risk screening, assessment and management. This will include, where available, data obtained from wearables and other technologies, thereby also facilitating and supporting the proposed person-centred approach. Finally, we aim to develop and provide educational materials and digital training tools for clinicians, healthcare workers and older adults who experience falls and their caregivers.

Process, timelines and consensus building activities

The current endeavour is a collaboration with experts from 35 countries (leaders per country can be seen in Appendix 1, Supplementary data are available in Age and Ageing online) to develop a comprehensive evidence- and consensus-based falls prevention and management recommendations for falls prevention and management. This Global Falls Guidelines Task Force will adhere to a 34-month timeline, as described in the following section. We have created three groups with different responsibilities and expertise to develop these recommendations. All members of the three groups have

provided explicit consent to participate and a detailed ad-hoc disclosure form that will be available in our global guidelines.

1. **Steering committee:** this committee is composed of 21 experts in the field who are responsible for establishing the strategy for the global guideline development. They meet bi-monthly virtually to review progress, outline challenges, develop solutions and ensure that the milestones proposed are achieved.
2. **Working groups and a cross-cutting theme:** besides the initial preparative Working Group that reviewed existing guidelines preceding the first task force meeting, 10 Working Groups were created to develop evidence-based reviews that will inform the recommendations in each area. These groups include 15 members of the Steering Committee, methodology experts of each category and clinicians and researchers specialised in each of the designated areas. In addition, a cross-cutting theme of the experiences and perspectives of older persons with falls and their families will be used to inform the deliberations of the Working Groups.
3. **Worldwide experts:** the third group consists of a worldwide stakeholder review committee of experts with representation from recognised scientific and academic societies in the field for each of the 35 countries involved, so far. Each country has two leaders that have assembled local groups of experts that will provide feedback to the 'preliminary recommendations' drafted by the Working Groups through a modified Delphi process. The country expert leaders will also vote alongside the steering committee members, and Working Group's leaders on the 'revised recommendations', and ultimately endorse the 'final recommendations' and guideline/s on behalf of their respective societies.

The Global Falls Guideline Task Force was initiated in July of 2019 when 14 experts were invited to address the possibility of this initiative and broadly discussed the logistics of creating a world guideline on falls prevention and management. The first step of the process was to conduct a preliminary literature search for existing falls prevention and management clinical practice guidelines, which was shared among the experts to identify potential gaps and opportunities for building on these clinical practice guidelines.

The first face-to-face meeting of the steering committee took place on 4 December 2019 at the Inaugural World Congress on Falls and Postural Stability 2019 (Kuala Lumpur, Malaysia) that was jointly organised by the British Geriatrics Society, the Malaysian Society of Geriatric Medicine, under auspices of the Malaysian Convention Bureau. Fourteen international experts discussed the preliminary results of a Systematic Review (Prospero registration # 173597) of current clinical practice falls guidelines. During this meeting, it was agreed that a global guideline must include perspectives from developing countries, update existing guidance by incorporating the last decade of scientific advances in falls prevention and management and explore the adaptability of the guideline to different countries with differing resources and realities. As a result, 10 Working Groups were created to provide updated evidence- and expert-based recommendations on specific areas, and to address the existing gaps in our current knowledge on falls prevention and management. A cross-cutting team on perspectives from patients and other stakeholders was also formed to address these issues across the 10 Working Groups. The Working Groups' topics and research questions along with the leaders of each Working Group and their respective countries are detailed in Table 1. For each Working Group the main gaps, as identified by the task force during the first meeting based on the outcomes of the preparative systematic review, are summarised below. The subtopics that the different Working Groups will reflect on in their recommendations will include (where relevant) the constructs depicted in our framework (overall recommendations, assessment, risk stratification and interventions) as well as the elements of the personalised P4 approach (personalisation, prediction, prevention and participation).

- **Working Group 1: gait and balance assessment tools to assess risk for falls.** There are multiple validated assessment tools and instruments of gait and balance being used worldwide to predict falls, with little consensus on the most appropriate tool for risk stratification across different settings.
- **Working Group 2: polypharmacy, fall risk increasing drugs and falls**. An established risk factor for falls is the use of specific medications known as fall-risk-increasing drugs (FRIDs). However, there is limited evidence on the effectiveness of deprescribing (reducing or stopping) FRIDs as a single intervention in falls prevention.
- **Working Group 3: cardiovascular risk factors for falls**. There is limited research on optimal assessment and treatment of cardiovascular related falls with the best practices and advice differing considerably across guidelines from various countries.
- **Working Group 4: exercise interventions for prevention of falls and related injuries.** There is a growing body of evidence showing a relationship between physical exercises and fall risk reduction on a population level, including older persons at low to moderate risk for falls; but a judicious conceptualisation of the research evidence on physical activity and exercise as interventions for the prevention and management of falls is needed.
- **Working Group 5: falls in hospitals and nursing homes**. A substantial number of older adults fall in acute hospitals, subacute/rehabilitation units, assisted living settings and nursing homes. However, the unique fall risk factors in these settings and consensus on reducing these risks are not well captured in current clinical practice guidelines.
- **Working Group 6: cognition and falls**. There is an emerging awareness of cognition in fall risk stratification;

Table 1. Working Groups and their topics to address

Group leaders (alphabetical by last name)	Topic	Synthesis of the evidence being performed	Region(s)
Preparative Working Group on guidelines • David Hogan • Tahir Masud • Manuel Montero-Odasso	Review of existing guidelines on fall prevention and management	Falls prevention and management in older adults. A systematic review of clinical practice guidelines PROSPERO Registration #CRD42020173597	Canada and United Kingdom
Working Group 1 • Tahir Masud • Jesper Ryg	Gait and balance assessment tools to assess risks for falls	Predicting falls in older adults: an umbrella review of instruments assessing gait and balance PROSPERO Registration# CRD42020225101	United Kingdom and Denmark
Working Group 2 • Mirko Petrovic • Nathalie van der Velde • Louise Mallet	Polypharmacy and falls	Systematic review and meta-analysis assessing the effectiveness of deprescribing in falls prevention in older people PROSPERO Registration #CRD42020219231	Belgium and Netherlands
Working Group 3 • Rose Anne Kenny • Lewis Lipsitz	Hemodynamic risk factors for falls	Cardiovascular-caused falls: What are the appropriate assessments for evaluation, diagnostic tests, and treatment options for cardiovascular-caused falls?	United States and Ireland
Working Group 4 • Stephen Lord • Catherine Sherrington • Dawn Skelton	Exercise interventions	Evidence-based review to discern the efficacy of exercise interventions for fall reduction in older adults	Australia and United Kingdom
Working Group 5 • Gustavo Duque • Koen Milisen • Cathy Said • Meg Morris • Ellen Vlaeyen	Falls in hospitals and nursing homes	Evidence-based review to determine the risk factors for falls in hospitals and nursing homes	Australia and Belgium
Working Group 6 • Manuel Montero-Odasso • Joe Verghese • Neil B. Alexander • Susan W. Hunter	Cognition and falls	Evidence-based review investigating the cognitive risk factors for falls in older adults	United States and Canada
Working Group 7 • Richard Camicioli • Jeffrey Hausdorff • Alice Nieuwboer	Falls and Parkinson's disease	Evidence-based review examining the current efficacy of interventions to prevent falls in older adults with Parkinson's Disease Based on 2021 Cochrane Review in the topic	Canada, Israel and Belgium
Working Group 8 • Clemens Becker • Ervin Sejdic • Tischa van der Cammen • Jeffrey Hausdorff	Falls and technology	Evidence-based review on the efficacy of wearable technology for falls prevention and management in older adults	Germany, The Netherlands, Israel, and United States
Working Group 9 • José Fernando Gómez-Montes • Maw Pin Tan • Devinder Kaur Ajit Singh • Sumaiyah Mat	Falls in developing countries	Evidence-based review to determine gaps and barriers in falls assessment, prevention, and management for older adults living in developing countries	Malaysia and Colombia
Working Group 10 • Mark Speechley • Pip Logan • Manuel Montero-Odasso • Ian Cameron • Jennifer Watt	Multifactorial interventions for falls	Evidence-based review to discern the efficacy of multifactorial interventions for falls prevention and management in older adults	Australia, Canada, and United Kingdom
Cross-cutting theme (across all groups) • David B. Hogan	Patient perspectives and stakeholders	Evidence-based review of empirical papers with patient stakeholder perspectives on falls recommendations	Canada and other countries (to be confirmed)

nevertheless, how to represent this role in practice guidelines and how to adapt interventions in the cognitively impaired are not clearly defined.

- **Working Group 7: falls and Parkinson's disease and related disorders**. Parkinson's disease and related disorders are important conditions in older adults in whom falls are very frequent. Current clinical practice guidelines do not address this population and their distinctive risks for falls and fall-related injuries and emerging strategies to reduce falls in this group are available but not yet represented in general guidelines.
- **Working Group 8: falls and technology**. Current advances and research concerning the role of digital technology in falls assessment and management is not consistently included in current clinical practice guidelines.
- **Working Group 9: falls in developing countries**. There is a paucity of fall-related data and independent clinical practice guidelines from lower to middle income countries.
- **Working Group 10: multifactorial interventions for falls**. The use of multifactorial interventions to prevent, treat and manage falls has been established, but there are conflicting data on the efficacy, effectiveness and successful implementation of this strategy across the world. In addition, there is uncertainty regarding the optimal content of multifactorial fall prevention interventions.
- **Cross-cutting theme: patient and stakeholder perspectives.** The experiences and perspectives of older people and community stakeholders will serve as a cross-cutting theme to enhance the personalised approach (P4) and will be taken into account by all Working Groups. Obtaining this perspective is acknowledged as challenging. It will include a systematic review of formal studies of patients' values and preferences, patient membership on Working Groups and/or the creation of a patient panel.

Each Working Group has been tasked to review the literature on its specific topic, and based on this, to provide expert-based recommendations by June 2021 using the Grading of Recommendations, Assessment and Evaluation (GRADE) criteria [40]. For each recommendation, the GRADE approach allows for a graded appraisal that considers the quality of the evidence, the risks and benefits of implementing the recommendations and the implications from a clinical and person-centred perspective.

The results from these reviews and recommendations will be discussed by the steering committee members who will draft the preliminary recommendations based on the findings from the Working Groups (summer 2021). These preliminary recommendations will be released to the patient panel, worldwide experts and stakeholders with the aim of obtaining feedback and developing a consensus using a modified version of the interactive Delphi technique. Specifically, the Delphi technique uses a systematic, interactive method that depends on the input of experts in a stepwise, forecasting manner. That is, several rounds of revisions take place and responses have the potential to be changed and updated as new information comes in. In the initial round, the patient panel, world-wide experts and other stakeholders will provide their responses (i.e. a recommendation based on the GRADE approach on a particular recommendation) after which an anonymised summary of the initial set of forecasts is generated (i.e. a table summarizing the score of each GRADE response) and sent to the steering committee and Working Group for review. In the successive rounds, the respondents will be asked to read the anonymised results of the previous first round and are encouraged to update their response as necessary. This process continues until consensus is achieved among all members. The final result is a comprehensive and accurate consensus based on continuous monitoring and ongoing feedback.

By the spring of 2022, an ad-hoc writing committee will incorporate the revisions stemming from the Delphi process and create a revised recommendations document. These revised recommendations will be encrypted and posted in our website (www.worldfallsguidelines.com) enabling the Steering Committee, Working Groups leaders and country leaders of our worldwide experts to access and participate in a web-based voting procedure in the spring 2022.

Subsequently, in the fourth Steering Committee meeting (summer 2022), each Working Group leader will present their group's recommendations and the results, using the criteria below:

- Recommendations receiving 80–100% agree or strongly agree are deemed to have consensus, thus they will be approved and will be a part of the final consensus falls guidelines.
- Recommendations receiving 50–79% agree or strongly agree are deemed to have partial support, thus they will be discussed until consensus among Steering Committee and Working Group leaders is reached or tabled if consensus is not achieved.
- Recommendations receiving 0–49% agree or strongly agree are deemed to have limited support and will be not be approved.

Based on these outcomes, the final guidelines and recommendations will be written and submitted for peer review, as well as presented at an international geriatric medicine conference by Autumn 2022.

This formal document will also align these recommendations within one or more algorithms that will be formulated according to the earlier described framework of the task force as well as the P4 approach. It will thus include decisions trees with regard to both assessment and management of falls, taking into account the population and/or individual characteristics of the older person, the setting (community, nursing homes, or hospital), culture, and needs and preferences of older adults at risk of falling. We anticipate that there will be a minimal core recommendation set that applies generally and specific recommendations that are dependent on the specific situations, settings and clinical group characteristics.

Significance, relevance and conclusions

This is an ambitious attempt to create standardised global clinical recommendations for falls prevention and management with worldwide consensus from experts and stakeholders. The team of world experts in falls prevention and management has significant representation from key clinicians from all relevant disciplines and researchers in geriatric medicine and falls related disorders, as well as from various scientific societies and institutes in 35 countries around the globe that represent high and low-middle income countries. This includes the support of leading scientists in the field of fall prevention and management in geriatric medicine settings from the continents of North America, South America, Europe, Oceania, Asia and Africa. Because our initiative includes several stakeholders, this will be one of few guidelines incorporating feedback from older people, caregivers and community members from across the world. Thus, we expect that the anticipated guideline/s and accompanying decision tree/decision tool will be pragmatic and adaptable to older persons' needs in different scenarios. In addition, the Working Groups and steering committee will also identify remaining knowledge gaps, allowing experts to make recommendations for further research in areas for which the evidence is promising but inconclusive. Our strategy includes the involvement of several geriatric medicine and gerontological scientific societies across the globe to obtain their feedback and suggestions towards global endorsements. Through this initiative and using our website (www.worldfallsguidelines.com) we will generate an easily accessible, up to date and comprehensive consensus on a list of evidence-based recommendations with an accompanying decision tree/tool for the use and benefit of clinicians from around the globe.

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