

**East Sussex Health & Wellbeing
Strategy Literature Review**

**Priority Area 4: Preventing and
reducing falls, accidents and injuries**

Report

March 2013

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1. Introduction

1.1 Context

- 4.1.1 This report has been prepared by The Public Health Action Support Team (PHAST) in response to a request by Cynthia Lyons, Deputy Director of Public Health, NHS East Sussex.
- 4.1.2 PHAST is a not-for-profit group of experienced public health consultants who provide evidence based, high quality, outcome-focused public health services and support.
- 4.1.3 The overall work package comprises a collection of seven literature reviews addressing the seven priority areas outlined in the Health and Wellbeing Strategy for East Sussex 2012¹. See Table 1.1.
- 4.1.4 This report deals with Priority Area 4: Preventing and reducing falls, accidents and injuries. The sub-topics within this priority area are:
- a. Interventions to prevent falls, accidents and injuries amongst children and young people
 - b. Interventions to prevent falls, accidents and injuries (adults)
 - c. Interventions to prevent falls, accidents and injuries (elderly)
 - d. Integration of services to manage falls, accidents & injuries (elderly)
 - e. Interventions to prevent road traffic injuries
- 4.1.5 The literature review focus on delivering a summary of clear and concise evidence statements based on the 5-10 most recent and relevant systematic reviews or meta-analyses for each sub-topic. The review provides commissioners with a robust basis for decision making and directing needs assessments based on the evidence that is well accepted across the scientific community.
- 4.1.6 The review has been based on the framework methods previously developed for East Sussex. The review has been systematic and clearly documented, but does not represent the standards of a full systematic review. Due to the broad scope and finite resources available the review is necessarily a rapid review. This means that whilst the review aims to identify the most important and relevant messages that are well supported by the scientific literature; the findings do not extend to: all interventions and outcomes; nuances for different populations and contexts; or areas where the evidence is inconclusive.
- 4.1.7 The main outputs of the literature review are a series of evidence based recommendations which are set out in Section 2. Following this: Section 3 describes the detailed methods statement for the rapid review; Section 4 sets out the detailed results; and finally full details of search terms and sources are set out in the appendices.

¹ East Sussex Health and Wellbeing Board. Healthy Lives, Healthy People. East Sussex Health and Wellbeing Strategy 2013-2016. October 2012. Available at: <http://www.eastsussex.gov.uk>

Table 1.1: The seven priority areas and their sub-topics for the overall literature review

Priority area	Sub-topic
1 The best possible start for all babies and young children	<ul style="list-style-type: none"> a. Interventions to support smoking cessation during pregnancy b. Interventions to support breastfeeding initiation and continuation c. Interventions to support parents of babies with special educational needs/ disabilities d. Interventions to improve rates of infant immunisation & vaccination e. Interventions to achieve healthy weight during childhood (addressing obese & underweight)
2 Safe, resilient and secure parenting for all children and young people	<ul style="list-style-type: none"> a. Interventions to support parents who are struggling b. Quality training as an intervention for those who work with vulnerable families c. Effective parenting interventions to support children/ young people d. Interventions to reduce the number of young people entering the criminal justice system e. Interventions to improve outcomes for children in families supported by social care services
3 Enabling people of all ages to live healthy lives and have healthy lifestyles	<ul style="list-style-type: none"> a. Interventions to reduce the number of young people/ adults drinking alcohol at a high risk level b. Interventions to lower rates of smoking amongst young people/adults c. Interventions to support primary prevention of smoking in children/ young adults d. Interventions to support people to change behaviour (all ages) e. Interventions to promote physical activity (all ages) f. Interventions to promote healthy eating (all ages)
4 Preventing and reducing falls, accidents and injuries	<ul style="list-style-type: none"> a. Interventions to prevent falls, accidents and injuries amongst children and young people b. Interventions to prevent falls, accidents and injuries (adults) c. Interventions to prevent falls, accidents and injuries (elderly) d. Integration of services to manage falls, accidents & injuries (elderly) e. Interventions to prevent road traffic injuries
5 Enabling people to manage and maintain their mental health and wellbeing	<ul style="list-style-type: none"> a. Interventions to promote early identification, diagnosis, support and treatment of mental health conditions (all ages) b. Interventions to promote community based mental health services and support (all ages) c. Interventions to promote utilisation of comprehensive care plans for people with severe mental health needs (all ages) d. Interventions to reduce the incidents of self-harm and suicide (all ages) e. Interventions to improve the physical health of people with mental health conditions (all ages) f. Interventions to promote better mental health outcomes and quality of life for carers (all ages)
6 Supporting those with special educational needs, disabilities and long term conditions	<ul style="list-style-type: none"> a. Interventions to support person centred care in the community for people with special educational needs b. Interventions to support person centred care in the community for people with disabilities c. Interventions to support person centred care in the community for people with long term conditions d. Interventions to support self-management for people with long term conditions e. Interventions to promote better physical health outcomes and quality of life for carers (all ages) f. Integrated services as an intervention to avoid inappropriate attendance at A&E/ admissions/ bed days
7 High quality and choice of end of life care	<ul style="list-style-type: none"> a. Interventions to increase the number of people identified as approaching end of life b. Interventions to increase the number of people identified as approaching end of life with advanced care plans c. Interventions to promote the number of people dying in their preferred place of care & reduce the number dying in hospital d. Interventions to promote end of life care staff training

2. Recommendations

2.1 Interpreting recommendations

- 2.1.1 The objective of this section is to make evidenced based recommendations that support commissioners with a robust basis for decision making.
- 2.1.2 Scoring of recommendations is based on the SIGN methodology as set out in the methods statement, section 3.4. Recommendations graded 'A' are based on the highest quality evidence and those graded 'D' the least.
- 2.1.3 Recommendations for interventions are made where there is 'high' or 'moderate' strength evidence provided by '1++', '1+' or '2++' quality studies. For details of scoring of 'strength of evidence' and 'quality of studies' see sections 3.4.4.4 and 3.4.4.3.
- 2.1.4 The 'Evidence' column provides links to the sources set out in Appendix 2 that support each recommendation.
- 2.1.5 It is recommended that commissioners review the entire evidence base set out in this report, but that service planning focus on those issues highlighted by this recommendations section.
- 2.1.6 Recommendations are based on evidence from systematic reviews and meta-analyses.

2.2 Recommendations for interventions to prevent falls, accidents and injuries amongst children and young people

THIS EVIDENCE REVIEW RECOMMENDS:

Intervention	Evidence	Grade
4.2.1 Incorporate unintentional injury prevention into national and local strategies and policies to prevent falls accidents and injuries amongst children and young people. This includes: incorporating home safety assessments and equipment provision, injury surveillance policies for identifying and responding to attendances at emergency departments and minor injuries units; developing policies for public outdoor play providing education and advice on water safety; advising on off road safety; conducting local firework safety campaigns; multi-faceted home visiting programmes including integrating home safety into other home visits by practitioners. (SR1++HA1)	A1	A
4.2.2 Establish robust local strategies and policies to prevent falls accidents and injuries amongst children and young people. (SR1++HA1)	A1	A
4.2.3 Establish partnership working this includes working with a range of other organizations, including the NHS, local authorities, lay and voluntary groups and the media, to produce effective joint working. (SR1++HA1)	A1	A
4.2.4 Establish high quality professional and voluntary staff training including establishing reliable communication pathways. (SR1++HA1)	A1	A

4.2.5	Identify households at risk to prevent falls, accidents and injuries amongst children and young people. NICE guidance recommends prioritising households at greatest risk for home safety assessments and the supply and installation of home safety equipment. (SR1++HA2)	A2	A
4.2.6	Ensure home visits to conduct safety assessments include the installation of the necessary safety equipment. NICE guidance recommends ensuring assessment supply and installation of equipment is tailored to meet household specific needs and circumstances. (SR1++HA2)	A2	A
4.2.7	Include home safety education, with the provision of safety equipment. Interventions providing free or low cost home safety equipment and free installation are more effective. (SR1++HA2)	A2	A
4.2.8	Ensure community engagement, education and involvement to prevent falls, accidents and injuries amongst children and young people. (SR1++HA3)	A3	A
4.2.9	Ensure that professionals and facilitators who have on-going relationships with families are encouraged to deliver safety home safety messages. . (SR1++HA3)	A3	A
4.2.10	Target interventions to high risk populations to optimise cost-effectiveness. Cost-effective home visiting programmes use professional home visitors in a multidisciplinary team, target high risk populations and include more than just home visiting. (SR1+LA4)	A4	D

THIS EVIDENCE REVIEW DOES NOT RECOMMEND:

Intervention	Evidence	Grade
4.2.11 There was no consistent evidence that the effectiveness of home safety interventions varied by social group.	B	A12
4.2.12 Intervention features found to be barriers related to home injury prevention interventions for pre-school children (5 years and under) include: complex interventions, cultural, socio-economic, physical and behavioural barriers and deliverer constraints.	B	A5

2.3 Recommendations for interventions to prevent falls, accidents and injuries (adults)

THIS EVIDENCE REVIEW RECOMMENDS:

Intervention	Evidence	Grade
4.3.1 Promote physical activity interventions to prevent falls, accidents and injuries (adults), muscle strength, balance, and endurance can be improved by physical activity in people aged 40–65 years. (SR1+MB2)	B	B2
4.3.2 Promote alcohol reduction initiatives to prevent falls. Acute alcohol use (within six hours of the event) contributes to unintentional fall risk, resulting in serious injury among young and middle-aged adults. (SR1+MB3)	B	B3
4.3.3 Promote the use of mouth guards among previously injured athletes (adolescents and adults, elite and recreational players) consider promoting and ankle braces to prevent further injuries. (adults) (SR1+MB4 and SR1+MB6)	B B	B2 B6
4.3.4 Promote exercise programmes to prevent self-reported back problems in working age adults. (SR1+HB8)	A	B8

THIS EVIDENCE REVIEW DOES NOT RECOMMEND:

Intervention	Evidence	Grade
4.3.5 There is a lack of economic evidence surrounding injury prevention interventions, especially in low- and middle-income countries. In general, interventions targeted at high risk individuals are more cost-effective. (SR1+L B9)	C	B9
4.3.6 There is no evidence to support the following programmes are effective at preventing self-reported back problems in working age adults: education alone; shoe inserts, and programs for reducing lifting. (SR1+HB8)	A	B8

2.4 Recommendations for interventions to prevent falls, accidents and injuries (elderly)

THIS EVIDENCE REVIEW RECOMMENDS:

Intervention	Grade	Evidence
4.4.1 Elderly people with recurrent falls should be offered a multifactorial falls risk assessment that includes medication review normally in the setting of a specialist falls service. (SR1++H C1) (SR1++H C2)	A	C2
4.4.2 Multifactorial interventions should be offered to high risk elderly people groups following treatment for falls, these may include, exercise; and muscle strengthening and balance program promoting independence. (SR1++H C2) (SR1+M C6) (M1+M C14)	A B B	C2 C6 C14
4.4.3 Elderly people who have received treatment in hospital following a fall should be offered a home hazard assessment and safety intervention/modifications in conjunction with follow-up (SR1++HC1) (SR1++H C2)	A A	C1 C2
4.4.4 Offer falls prevention programmes that include home-based exercise programmes in elderly people living in the community should be offered. It is important to ensure that such programmes are flexible enough to accommodate participants' different needs (SR1++H C2) (SR1++H C1).	A A	C1 C2
4.4.5 Consider promoting Vitamin D supplements to elderly patients at risk. Although NICE guidance did not find evidence in 2004, r moderate evidence now indicates there is a protective effect of vitamin D supplementation on fall prevention in elderly adults. (SR1++H C1) (SR1+M C7) (SR1+M C9) (SR1+M C11)	A B B B	C1 C7 C9 C11
4.4.6 Health professionals should be encouraged to routinely ask elderly people whether they have fallen in the past year. (SR1++H C1)	A	C1
4.4.7 Education and information giving: Individuals at risk of falling, and their carers, should be offered information orally and in writing. (SR1++H C1).	A	C1
4.4.8 All healthcare professionals dealing with patients known to be at risk of falling should develop and maintain basic professional competence in falls assessment and prevention. (SR1++H C1).	A	C1
4.4.9 Economic evaluations of falls prevention interventions shows single interventions (such as the Otago Exercise Programme) targeted at high-risk groups can prevent the greatest number of falls at the lowest incremental costs. (SR2++M C10)	B	C10

2.5 Integration of services to manage falls, accidents & injuries (elderly)

THIS EVIDENCE REVIEW RECOMMENDS:

Intervention	Grade	Evidence
4.5.1 Elderly patients with hip fracture should be offered an integrated multidisciplinary rehabilitation program specifically darker designed with the specific aim of regaining sufficient function to return to their prefracture living arrangements.(SR 1++ H D1) (SR 1+M D10)	A B	D1 D10
4.5.2 Include early integrated multidisciplinary care that includes daily geriatric care to reduce hospital mortality and medical complications in elderly patients with hip fracture. (SR 1++ H D1) (SR 2++ M D6)	A B	D1 D6
4.5.3 Include early integrated multidisciplinary care that includes early individualised occupational therapy specifically designed for geriatric patients during hospital admission, as well as after discharge to improve physical outcomes in elderly patients with hip fracture. (SR 1++ H D1) (SR 1++ M D11)	A B	D1 D11
4.5.4 Integrate hip-fracture care pathways; this requires joined up care co-ordinated by a multidisciplinary team with shared communications from before admission, through to discharge, to optimize outcome after hospital discharge. (SR 1+ M D3) (SR 1+ M D5) (SR 1+M D10)	B B B	D3 D5 D9
4.5.5 Promote integrated early mobilisation, early discharge and on-going home-based rehabilitation to improve recovery and enable more direct discharges to home.(SR 1++ H D1)) (R2+M D9) (SR 1+M D10)	A B B	D1 D9 D10
4.5.6 As well as home-based rehabilitation, promote integrated extended outpatient rehabilitation that includes progressive resistance training to improve physical function and quality of life for elderly patients with hip fracture. (SR 1++ H D1)	A	D1
4.5.7 Promote education interventions to prevent future falls, exercise and balance training in ambulatory patients, and the education and treatment of osteoporosis as secondary prevention strategies for hip fracture. (SR 1+M D4) (R 2+M D9)	B B	D4 D9
4.5.8 Appoint a dedicated coordinator as cost effective strategy to promote prevention, support the integration of the multidisciplinary team and to act as the link between the: orthopaedic team, geriatric team, osteoporosis and falls teams, primary care and the patient. (SR 1+ M D5) (SR 1+M D10)	B B	D5 D10
4.5.9 Promote coordinator -based systems in order to facilitate bone mineral density testing, osteoporosis education and care in patients following a fragility fracture and have been shown to be cost-saving. (SR 1+ M D5)	B	D5
4.5.10 Ensure that fragility fractures are monitored by utilising an access fracture registry and a database. (SR 1+ M D5)	B	D5

2.6 Recommendations for interventions to prevent road traffic injuries

THIS EVIDENCE REVIEW RECOMMENDS:

Intervention	Grade	Evidence
4.6.1 Coordinated partnership working between health professionals, school staff, police and local highways authorities to promote changes to the road environment to prevent road traffic injuries. (SR1++ HE2)	A	E2
4.6.2 Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads, including: reallocating road space to support physically active modes of transport; restricting motor vehicle access; introducing traffic-calming; creating safe routes to schools; supporting the modification of the built environment; (SR 1++H E1) (SR1++ HE2)	A A	E1 E2
4.6.3 Authorities should work with other partners to introduce engineering measures to reduce speed as part of a broad strategy to prevent injuries and the risk of injuries. Areas addressed should include town wide 20 mph limits and reducing speed in: residential areas; rural roads where risk of injury is high; popular routes and routes commonly used by children and young people (SR1++ HE2) (SR 1+ M E3)	A B	E2 E3
4.6.4 Promote purpose-built bicycle only facilities (e.g. bike routes, bike lanes, bike paths, cycle tracks at roundabouts) to reduce the risk of crashes and injuries. (SR1++ HE15)	A	E15
4.6.5 Promote unintentional injury prevention activities to prevent unintentional injuries people under the age of 15. Ensure this injury prevention activity is repeated at regular intervals to maintain its impact. (SR 1+ M E3) (SR 1+ M E17)	B B	E3 E17
4.6.6 Review data regarding attendances at emergency departments and minor injuries units to prevent unintentional injuries among the under-15s. (SR 1+ M E3)	B	E3
4.6.7 Implement multi-component prevention programs in conjunction with community mobilization to reduce alcohol-related crashes. (SR 1+ M E5)	B	E5
4.6.8 Promote adequate street lighting and fluorescent outer clothing in yellow, red and orange colours to improve detection and recognition in the daytime plus lamps, flashing lights and retroreflective materials in red and yellow colours to increase detection and recognition in the night-time. (SR 1+ M E6) (SR 1+ M E7)	B B	E6 E7
4.6.9 Support well-executed mass media campaigns to promote reduction in alcohol impaired driving and alcohol-related crashes. (SR 1+ M E8)	B	E8

4.6.10	Promote education to parents and carers of young children to ensure they use car seats or booster seats appropriate to the child's age and height and weight. (SR 1+ M E7)	B	E7
4.6.11	Promote legislation regarding safety belt use. Primary laws are more effective than secondary laws in increasing safety belt use and decreasing fatalities. Enhanced enforcement is effective in increasing safety belt use. (SR 1+ M E9)	B	E9
4.6.12	Promote cycle helmet education interventions in schools and healthcare centres to young and old children. (SR1++ HE15)	A	E15

This evidence review does not recommend:

Intervention	Grade	Evidence
4.6.13 The evidence is equivocal on the benefits and harms of guard rails, crash cushions, and interventions to reduce vehicle speeds. (SR 1+ ME10)	B	E10

3. Methods statement:

3.1 General approach

Overview

- 4.1.1 PHAST adopted a focussed, pragmatic rapid review approach consistent with the time & financial resources. The method was systematic and clearly documented, but it did not attempt to meet all standards of a comprehensive systematic review.
- 4.1.2 The rapid reviews consisted of the following stages:
- Review of systematic reviews and meta-analyses to identify the 5-10 most robust publications relevant to each topic. Where such evidence did not exist randomised controlled trial evidence was identified where possible.
- 4.1.3 International literature has been included where it is relevant and generalisable i.e. largely this has been research conducted in 'Western-style' countries and not from developing countries.
- Evidence searches are from literature published since 2003 (last 10 years).
 - The evidence searches have been based on an agreed inclusion criteria and search strategy.
 - Commentary has been provided on the quality and relevance of the evidence.

The key stages

- 4.1.4 Identification of the seven priority areas, including inclusion and exclusion criteria for: sub-topics; populations (age, gender, ethnicity, geographical or social context); interventions; and outcomes.
- 4.1.5 Review of NICE guidance² relevant to each sub-topic, including: any review work supporting relevant NICE guidance; any key recommendations or evidence statements; and the use of key terminology that should form part of the search strategy.
- 4.1.6 Search term selection for each sub-topic of the review based on a review the U.S. National Library of Medicine³. See Appendix 1: Search terms.
- 4.1.7 PUBMED⁴, NHS Evidence⁵ and Cochrane library⁶ publication searches based on Appendix 1 search terms, including: records of search strings, number of hits and number of inclusions; a review of titles and abstracts for relevance; and sourcing of selected full articles.
- 4.1.8 Full publication review, including: scoring of publication quality based on the publications methodology section; identification of succinct evidence statements (quotes where possible) drawn primarily from the results and conclusion sections; and scoring of evidence statements for the strength of evidence. See Appendix 2.
- 4.1.9 Completion of Section 3 (Results) using Appendices 2, based on key evidence statements for each topic.
- 4.1.10 Completion of Section 2 (Recommendations) based on summarises of the results for each sub-topic, including: grading of the recommendations according to the recommendations classification methodology (Grade A recommendations first); clear identification of relevant NICE guidance; and clear links to the evidence statements that support each recommendation (using Appendix codes (e.g. [A1])).

2 <http://www.nice.org.uk/Guidance/Topic>

3 http://www.nlm.nih.gov/mesh/2012/mesh_browser/MBrowser.html

4 <http://www.ncbi.nlm.nih.gov/pubmed/advanced>

5 <http://www.evidence.nhs.uk/>

6 <http://onlinelibrary.wiley.com/cochranelibrary/search/>

3.2 Scope

- 4.2.1 This report deals with Priority Area 4: Preventing and reducing falls, accidents and injuries. The sub-topics within this priority area are:
- a. Interventions to prevent falls, accidents and injuries amongst children and young people
 - b. Interventions to prevent falls, accidents and injuries (adults)
 - c. Interventions to prevent falls, accidents and injuries (elderly)
 - d. Integration of services to manage falls, accidents & injuries (elderly)
 - e. Interventions to prevent road traffic injuries
- 4.2.2 The overall work package aim is to carry out a series of rapid evidence and literature reviews that will address the seven priority areas outlined in the Health and Wellbeing Strategy for East Sussex 2012.
- 4.2.3 The objectives are:
- To collate, analyse and summarise national and international published evidence relevant to each priority area.
 - To assess the quality of the available evidence for each topic area.
 - To present information on the research question that pertains to both health and social care needs.
 - To report on the evidence for effectiveness of services and interventions.
 - Within each of the priority areas the sub-topics listed in Table 1.1 review evidence to support health and social care interventions and services.

3.3 Search Strategy

- 4.3.1 The review searched the following databases: PubMed; NHS Evidence; Cochrane Library; AMED; CINAHL; HMIC; Embase; Medline; PsycINFO.
- 4.3.2 Where appropriate the reference lists of selected high quality recent studies were reviewed and selected citations followed up.
- 4.3.3 See Appendix 1 (Section 5) for a list of the search terms used for each of the sub-topics.

3.4 Evidence classification

Type of evidence

- 4.4.1 The review focused on: systematic reviews, meta-analyses and randomised controlled trials.
- 4.4.2 In reviewing sources of information to include, the following hierarchical evidence classification system was used based on the quality of the study design, (with systematic reviews being the strongest type of evidence and grey literature the weakest):
- Systematic reviews (or meta-analyses)
 - Individual randomised controlled trials
 - Quasi-experimental studies
 - Controlled observational studies

- Observational studies without control group
- Reviews (non-systematic)
- Grey literature

Quality of studies

4.4.3 The level of evidence was classified based on the Scottish Intercollegiate Guidelines Network (SIGN)⁷ methodology. SIGN work in collaboration with the National Institute of Clinical Excellence (NICE) to develop evidence based clinical practice guidelines for the National Health Service (NHS). SIGN has in part based its assessments on the MERGE (Method for Evaluating Research and Guideline Evidence) checklists developed by the New South Wales Department of Health⁸. As this review does not include a full systematic assessment of study quality, a professional judgement has been made in relation to perceived levels of bias and probabilities of causal relationships, based on a high level assessment of each source's methodology. Scorings are therefore indicative rather than definitive.

Table 3.1: Study Quality Classification

1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2++	High quality systematic reviews of case control or cohort or studies High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

Strength of evidence

4.4.4 The strength of evidence reported for each source has been scored using a simplified version of the Cochrane GRADE approach⁹. This scoring reflects how complete the scientific literature is in relation to an issue, not the quality of the reporting review study. There are four ratings: 'high', 'moderate', 'low' and 'very low'. 'High' signifies the strongest evidence and 'very low' the weakest. Where appropriate a range of ratings have been used. Scorings for strength of evidence used professional judgement based on an assessment of the overall quality and weight of evidence reported in the selected systematic reviews or evidence summaries. This review has not exhaustively examined the primary sources for each population, intervention or outcome subcategory within each topic. Scorings are therefore indicative rather than definitive. Factors taken into consideration in scoring the strength of evidence are listed in the right hand column of Table 3.2 below. The greater the number or severity of such factors, the lower the rating for strength of evidence.

Table 3.2: Evidence Strength Classification

7 See: <http://www.sign.ac.uk/guidelines/fulltext/50/annexb.html>

8 Liddle J, Williamson M, Irwig L. Method for evaluating research and guideline evidence. Sydney: New South Wales Department of Health; 1996

9 Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org

Rating	Factors that may decrease the strength rating of the evidence
High	<ul style="list-style-type: none"> •High quality studies identifying that the strength of evidence is moderate, low or very low.
Moderate	<ul style="list-style-type: none"> •Limitations in the design and implementation of available studies suggesting high likelihood of bias.
Low	<ul style="list-style-type: none"> •Indirectness of evidence (indirect population, intervention, control, outcomes).
Very low	<ul style="list-style-type: none"> •Unexplained heterogeneity or inconsistency of results (including problems with subgroup analyses). •Imprecision of results (wide confidence intervals). •High probability of publication bias.

Grades of recommendations

4.4.5 This review's recommendations for each topic have been classified based on the overall quality of identified evidence using the SIGN methodology:

Table 3.3: Recommendation Strength Classification

- A At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
- B A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1++ or 1+
- C A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++
- D Evidence level 3 or 4; or extrapolated evidence from studies rated as 2+

4. Results

Interpreting results

- 4.1.1 Each evidence statement is accompanied by four codes presented in columns to the right of each statement. These codes provide the reader with a quick summary of: the type of study from which the evidence statement is derived; the quality of that study; the strength of the evidence statement; and finally a reference ID that links to the full citation and further details of the study in the appendices. See the methods section for further details.

Abbreviations

Type of evidence		Strength of evidence	
Systematic review	SR	High	H
Meta-analysis	MA	Moderate	M
Randomised control trial	RCT	Low	L
Quasi-experimental study	QES	Very low	VL
Controlled observational study	COS		
Observational study without control group	OS		
Review (non-systematic)	R		
Grey literature	GL		
Cost-utility analysis	CA		

4.2 Evidence of the effectiveness of interventions to prevent falls, accidents & injuries amongst children & young people

4.2.1 The following evidence statements set out effective interventions that have been identified in the scientific literature.

Theme 1: Local and National strategies and policies to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
2010 NICE guidance recommends incorporating unintentional injury prevention within local and national plans and strategies for children and young people's health and wellbeing.	SR	1++	H	A1
2010 NICE guidance regarding home safety recommends incorporating home safety assessments and equipment provision within local plans and strategies for children and young people's health and wellbeing.	SR	1++	H	A1
2010 NICE guidance recommends coordinated delivery of home safety assessments and providing home safety equipment.	SR	1++	H	A2
2010 NICE guidance recommends identifying and responding to attendances at emergency departments and minor injuries units.	SR	1++	H	A1
2010 NICE guidance recommends injury surveillance. Commissioners of health services should take action to gather high quality injury data from emergency departments to benefit children and young people aged under 15, their parents and carers.	SR	1++	H	A1
2010 NICE guidance recommends developing policies for public outdoor play and leisure.	SR	1++	H	A1
2010 NICE guidance recommends providing education and advice on water safety.	SR	1++	H	A1
2010 NICE guidance recommends advising on off road safety using local information campaigns and on-going education to encourage cycle training and promote the use of correctly fitted and fastened cycle helmets while cycling off the road.	SR	1++	H	A1
2010 NICE guidance recommends conducting local firework safety campaigns.	SR	1++	H	A1
2010 NICE guidance recommends road safety partnerships, local child road safety reviews/ consultations, aligning local child road safety policies and promoting and enforcing speed reduction.	SR	1++	H	A1
2010 NICE guidance recommends integrating home safety into other home visits by practitioners who visit families and carers with children and young people aged under 15 (including GPs, midwives, social workers and health visitors). They should recognise the importance of measures to prevent unintentional injuries in the home, provide child-focused home safety advice, encourage parents/ carers/ others living with children and young people aged under 15 to conduct their own home safety assessment.	SR	1++	H	A2

There is evidence to support local government organizational change to increase safety behaviours. Others used a combination of multicomponent, multi-agency and media attention to achieve their goals.	SR	1+	M	A5
There is evidence to support legal, policy or organisational facilitators of unintentional injury in children in the home: Policy drivers and legislation, Multi-agency partnerships, linking with other health messages or initiatives, Good communication between organisations and target audiences. Involving local people (e.g., mothers) to be trained in health initiatives. Targeting of population (e.g., schoolchildren) to share information.	SR	1+	L	A7
There a some evidence to support physical or environmental facilitators of unintentional injury in children in the home: stable and child-friendly accommodation, control/ownership of home environment, landlords' attention to safety issues, provision of appropriate and durable equipment, maintenance of and confidence in other safety devices, training in installation and equipment use/replacement.	SR	1+	L	A7
Individual facilitators of unintentional injury in children in the home: culturally sensitive information and advice systems, social connectedness rather than isolation, building trust in officials via peer education.	SR	1+	L	A7

Theme2: Partnership working to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
2010 NICE guidance recommends partnerships and coordination of unintentional injury prevention activities between services and departments.	SR	1++	H	A1
2010 NICE guidance recommends working in partnership. Establishing local partnerships with relevant statutory and voluntary organisations or support existing ones. Use partnerships to collect information, determine and address barriers, get the community involved, carry out home safety assessments and supply and install equipment.	SR	1++	H	A2
Partnership working with a range of other organizations, including the National Health Service (NHS), local authorities, lay and voluntary groups and the media, to produce effective joint working were features of several successful studies.	SR	1+	M	A5

Theme 3: Training to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
2010 NICE guidance recommends workforce training and capacity building.	SR	1++	H	A1
Trained lay community volunteers able to deliver messages in the primary language of participants or of the same ethnic origin important. Trained local volunteers were more acceptable to some communities and their involvement was retained with team-building activities	SR	1+	M	A5
2010 NICE guidance recommends ensuring practitioners adhere to good practice on maintaining the confidentiality and security of personal information.	SR	1++	H	A2
2010 NICE guidance recommends providing practitioners who visit children and young people at home (including health visitors, social workers and GPs) with mechanisms for sharing information about households that might need a home safety assessment.	SR	1++	H	A2
Health professionals' knowledge regarding childhood injury prevention was reported to be variable.	SR	1-	M	A11
Health professionals' generally have a positive attitude towards childhood injury prevention.	SR	1-	M	A11
Even with health professionals having adequate knowledge and positive attitudes there appear to be barriers in prevention practice.	SR	1-	M	A11
Childhood injury prevention training may be effective at increasing health professionals' knowledge and changing their attitudes.	SR	1-	M	A11

Theme 4: Identifying households at risk to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
2010 NICE guidance recommends determining the types of household where children and young people aged under 15 are at greatest risk of unintentional injury based on surveys, needs assessments and existing datasets (such as local council housing records).	SR	1++	H	A2
2010 NICE guidance recommends prioritising households at greatest risk for home safety assessments and the supply and installation of home safety equipment.	SR	1++	H	A2
There is evidence that a program provided by nurses to first-time socially disadvantaged mothers beginning prenatally is effective in reducing reports of maltreatment and associated outcomes as well as additional benefits in maternal and child health in high-risk families.	R	3	M	A9
There is evidence that a program provided by nurses and social workers to at-risk families beginning postnatally shows reduced rates of parental reports of severe abuse and hospital attendance for injuries and poisonings, based on records.	R	3	M	A9
Most programs targeting at-risk families have not shown evidence of effectiveness in preventing abuse or neglect.	R	3	M	A9

Theme 5: Assessment supply and installation of equipment to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
2010 NICE guidance recommends ensuring assessment supply and installation of equipment is tailored to meet household specific needs and circumstances.	SR	1++	H	A2
2010 NICE guidance recommends ensuring education, advice and information is given during a home safety assessment, and during the supply and installation of home safety equipment.	SR	1++	H	A2
2010 NICE guidance recommends follow-up on home safety assessments and interventions including: preventing duplication of effort by keeping a record of households that have been assessed and given equipment, adhering to information	SR	1++	H	A2

collection and sharing standards, using records to identify when maintenance/ follow up is required, follow-up to check equipment is still appropriate/ functional, see if there are any new requirements, reinforce messages.	
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Theme 6: Home safety interventions to prevent falls, accidents and injuries amongst children and young people

Multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes have been found to be effective in reducing child injury rates.	SR	1++	M	A3
Home safety interventions most commonly provided as one-to-one, face-to-face education, especially with the provision of safety equipment, are effective in increasing a range of safety practices.	SR	1++	M	A3
Home safety education, especially with the provision of safety equipment, may reduce injury rates particularly where interventions are provided at home.	SR	1++	M	A3
Home safety interventions were effective in increasing the proportion of families with safe hot tap water temperatures, functional smoke alarms, a fire escape plan, storing medicines and cleaning products out of reach, having syrup of ipecac or poison control centre numbers accessible, having fitted stair gates and having socket covers on unused sockets.	SR	1++	M	A3
Interventions providing free, low cost or discounted home safety equipment appeared to be more effective in improving some safety practices than those interventions not doing so.	SR	1++	M	A3
Home safety interventions most commonly provided as one-to-one, face-to-face education, especially with the provision of safety equipment, are effective in increasing a range of safety practices.	SR	1++	M	A3
Home visiting programmes for the prevention of maltreatment must be carefully selected and well-targeted if net social benefits are to be realised.	SR	1+	L	A4
Provision of safety equipment with free installation requiring only minimal effort by participants were those that had greatest effect	SR	1+	M	A5
Provision and free fitting of safety equipment, particularly for low-income families, was important to the success of many studies. Provision of coupons to purchase equipment was less successful in increasing equipment use. Studies which did not have funds to provide free equipment gave advice, information about local suppliers and facilitated access to equipment for low-income families. While this was better than nothing, it was not found to be as successful as provision and free fitting.	SR	1+	M	A5
Intervention features found to be effective related to home injury prevention interventions for pre-school children (5 years and under) include behaviour change. Simple methods for reinforcing messages by sending annual reminders, continued contact with health professionals who reminded them, and group sessions in clinics and poster displays were all described as having some success. Motivational techniques were used to change behaviour, such as an elaboration likelihood model for injury prevention education, where motivation was shown to be greater when information was perceived as personally relevant to participants.	SR	1+	M	A5
Recommend targeted programmes that measure or involve behaviour change models.	SR	1+	M	A5
Intervention features found to be effective included facilitators promoting home injury prevention interventions for pre-school children (5 years and under) include focused messages. Some studies highlighted the success of this approach if they concentrated on one type of injury, a specific age of child or had a single focus.	SR	1+	M	A5
Home visits by appointment with provision of safety equipment and concentrating	SR	1+	M	A5

on home injury were felt to improve the success of interventions and use of safety devices and to reduce risks.				
Few programmes reduce injury rates in children (aged up to 15 years) except where home safety equipment is supplied in conjunction with a home risk assessment, although this effect was only evident in households where a child had previously suffered an unintentional injury.	SR	1+	M	A6
The distribution of smoke alarms alone is insufficient for improving installation rates; programmes containing an education component showed more success.	SR	1+	M	A6
The evidence of effectiveness on installation rates of other home safety equipment is highly mixed, although there is some evidence to suggest that installation rates always decrease after 6 months.	SR	1+	M	A6
Where stair gates are both supplied and installed, inequalities in rates of use may be reduced.	SR	1+	M	A6
Home-safety interventions, most of which provided free or subsidized stair gates, were effective in increasing stair-gate use.	M	1++	H	A13
There was little evidence that home-safety interventions increased possession of window locks, screens, or windows with limited opening or of nonslip bath mats or decals.				
There was some evidence that home-safety interventions reduced baby-walker use.	M	1++	M	A13
There was some evidence they increased possession of fitted fireguards, but there was a lack of evidence that interventions reduced medically attended thermal injury rates.	M	1+	M	A12

Theme 7: Community involvement to prevent falls, accidents and injuries amongst children and young people

Community involvement and awareness-raising helped to reduce the stigma from parenting interventions: advice from community leaders, using volunteer community workforce as home visitors to reach high-risk populations and to optimize the possibility of change, and sensitizing the whole community to normalize safety practices were all described as successful approaches to take.	SR	1+	M	A5
An important factor in many studies was the involvement and awareness of the local community, which improved participation and increased accident risk awareness over a longer period of time than the study lasted. Several studies suggested that it is vital to understand community perceptions and values and address them in order to be able to influence behaviour changes.	SR	1+	M	A5
Interventions integrated into wider health programmes, where trusting relationships with householders were cultivated and/or where specific safety issues identified by a community were responded to showed greater success in increasing smoke alarm installation rates.	SR	1+	M	A6

Theme 8: Different types of professionals or facilitators to prevent falls, accidents and injuries amongst children and young people

Professionals such as family caseworkers or parent educators were used in some studies; they had on-going relationships with the families and so were accepted in the home. Using child health professionals to deliver safety messages at pre-arranged appointments at home or the clinic had many benefits since they were trusted familiar figures and many had established relationships with families.	SR	1+	M	A5
There is evidence to support facilitators promoting home injury prevention interventions for pre-school children (5 years and under) include focused messages. Some studies highlighted the success of this approach if they concentrated on one type of injury, a specific age of child or had a single focus.	SR	1+	M	A5

Theme 9: Educating parents and other carers to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Home safety education, especially with the provision of safety equipment, is effective in increasing some childhood thermal injury prevention practices, but there is insufficient evidence to show whether this also reduces injury rates.	M	1+	M	A12
Home safety education was effective in increasing the proportion of families having a safe hot tap water temperature and a functional smoke alarm, and there was some evidence that it may be effective in increasing the use of fireguards. Effect sizes appeared to be larger where safety equipment was provided in addition to home safety education and over shorter rather than longer time periods for some outcomes. Significant effects were found for follow-up periods of 4 months or more for having a safe hot tap water temperature, a functional smoke alarm and a fitted fireguard.	M	1+	M	A12
In relation to preventing childhood falls at home, home-safety education and the provision of safety equipment improved some fall prevention practices (age 0-19 years).	M	1++	M	A13
In relation to preventing childhood falls at home, the impact of home-safety education and the provision of safety equipment on fall-injury rates is unclear (age 0-19 years).	M	1++	L	A13

Home safety education and the provision of safety equipment improve poison-prevention practices.	SR	1++	H	A14
The impact of home safety education and provision of safety equipment on poisoning rates is unclear.	SR	1++	L	A14
Home safety education and the provision of safety equipment interventions are unlikely to widen inequalities in childhood poisoning-prevention practices.	SR	1++	M	A14
Home safety education that includes poison prevention, especially where cupboard locks, ipecac and PCC number stickers are provided free or at low cost, is effective in increasing safe storage of medicines and cleaning products, the possession of ipecac, and having the primary care centre number accessible.	SR	1++	H	A14

4.2.2

Theme 10: Incentives to prevent falls, accidents and injuries amongst children and young people

Intervention features found to be effective in relation to home injury prevention interventions for pre-school children (5 years and under) included incentives. A range of incentives were used to encourage participation in the studies, including financial incentives to complete outcome assessments, free first-aid training and crèche facilities, activities for children while parents attended training and vouchers.	SR	1+	M	A5
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Theme 11: the cost-effectiveness of initiatives to prevent falls, accidents and injuries amongst children and young people

The most cost-effective home visiting programmes for the prevention of maltreatment use professional home visitors in a multidisciplinary team, target high risk populations and include more than just home visiting.	SR	1+	L	A4
There is great variation in the cost effectiveness of home visiting programmes for the prevention of maltreatment.	SR	1+	L	A4

Theme 12: Interventions outside the home to prevent falls, accidents and injuries amongst children and young people

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
There is evidence for the effectiveness of bicycle helmets in the prevention of children's injuries.	R	3	H	A8
There is evidence for the effectiveness of promotion of bicycle helmets at a community level and through physician counselling, and legislation in the prevention of children's injuries.	R	3	M	A8
There is evidence for the effectiveness of implementing playground safety standards in the prevention of children's injuries.	R	3	M	A8
There is evidence for the effectiveness of modifications to the pedestrian physical environment in the prevention of children's injuries.	R	3	H	A8
Injury prevention strategies for adolescent (12-18 year olds) sport that focus on preseason conditioning are effective. There is poor evidence from one cohort study and moderate evidence from one randomised controlled study that 6 weeks of preseason conditioning can significantly reduce injury rate in female athletes.	SR	1++	L	A10
Injury prevention strategies for adolescent (12-18 year olds) sport that focus on education, balance and sport-specific skills, which should be continued throughout the sporting season, are effective. There is moderate evidence that all the reviewed injury-prevention strategies carried out throughout the playing season prevented injury.	SR	1++	M	A10
The evidence for the effectiveness of protective equipment in adolescent (12-18 year olds) sport injury prevention is inconclusive.	SR	1++	L	A10
Interventions targeting non-agricultural work injuries among youth (12-24 years old) need to target modifiable risk factors. This systematic review pointed to two job/workplace factors that are potentially modifiable: hazard exposure and work pace pressure.	SR	1+	M	A15
Regarding non-agricultural work injuries among youth (12-24 years old), the multiple determinants of work injury highlight the need to develop interventions and policies that focus on multiple factors rather than one-dimensional approaches that target a specific factor.	SR	1+	M	A15

Theme 13: Social group effect on interventions to prevent falls, accidents and injuries amongst children and young people

Evidence statements

There was no consistent evidence that the effectiveness of home safety interventions varied by social group.	M	1+	M	A12
In relation to preventing childhood falls at home, there was some evidence that the effect of home-safety interventions varied by social group (age 0-19 years). There was a greater effect seen among families living in rented accommodation for stair-gate use, for families with male children for window locks, and a smaller effect for families from a black or minority ethnic group for baby-walker use.	M	1++	M	A13

Theme 14: Barriers to prevent falls, accidents and injuries amongst children and young people

Evidence statements

Intervention features found to be barriers related to home injury prevention interventions for pre-school children (5 years and under) include: complex interventions, cultural, socio-economic, physical and behavioural barriers and deliverer constraints.	SR	1+	M	A5
Physical or environmental barriers to unintentional injury in children in the home: Practical barriers due to poor quality (often rented) housing, Lack of maintenance of smoke alarms, Cost of installing safety devices, Costs of accessing treatment.	SR	1+	L	A7
Individual barriers to unintentional injury in children in the home: Lack of awareness of risk, Fatalism about nature of injuries, Cultural differences in experiences and expectations, Cultural practices in different cultural context, Language barriers, Relationship with partner, Mistrust of officials, Fear of being accused of abuse or neglect, Not trusting neighbours/non-family to look after child.	SR	1+	L	A7

4.3 Evidence of the effectiveness of interventions to prevent falls, accidents and injuries (adults)

4.3.1 The following evidence statements set out effective interventions that have been identified in the scientific literature.

Theme 1: Physical activity interventions to prevent falls, accidents and injuries (adults)

Evidence statements	Study type	Study quality	Evidence	Appendix
<i>This review found that muscle strength, balance, and endurance can be improved by physical activity in people aged 40–65 years. There were bigger effects on muscle strength from programs that used resistance exercises.</i>	SR	1+	M	B2
One trial documented a small and non-significant effect of physical activity on long-term falls but trials have not documented an effect of physical activity in people aged 40–65 on short-term falls.	SR	1+	L	B2
Given the importance of strength and balance as risk factors for falls in elderly people, it is possible that future falls would be prevented by adoption and maintenance of physical activity programs by people aged 40–65. Such programs should include strength and balance components.	SR	1+	L	B2

Theme 2: Alcohol use linked to falls, accidents and injuries (adults)

Evidence statements	Study type	Study quality	Evidence	Appendix
Studies showed an increased risk of unintentional falls among young and middle-aged adults with increasing exposure to alcohol use, the magnitude of this risk varied considerably across studies.	SR	1+	M	B3
Acute alcohol use (within six hours of the event) contributes to unintentional fall risk, resulting in serious injury among young and middle-aged adults, and accounts for at least a threefold increase in risk.	SR	1+	M	B3

Modest evidence of a dose-response relationship of acute alcohol use and unintentional falls among young and middle-aged adults was observed.	SR	1+	L	B3
The association between usual alcohol use and the risk of unintentional falls among young and middle-aged adults was inconclusive.	SR	1+	L	B3
Evidence of a gender difference regarding the role of alcohol in unintentional falls among young and middle-aged adults was inconsistent.	SR	1+	L	B3

Theme 3: Ankle brace among previously injured athletes to prevent falls, accidents and injuries (adults)

Evidence statements	Study type	Study quality	Evidence	Appendix
Found a reduction in ankle sprain by 69% (OR 0.31, 95% CI 0.18–0.51) with the use of ankle brace among previously injured athletes (adolescents and adults, elite and recreational players).	SR	1+	M	B4
Found a reduction in ankle sprain by 71% (OR 0.29, 95% CI 0.14–0.57) with the use of ankle tape among previously injured athletes (adolescents and adults, elite and recreational players).	SR	1+	M	B4
No type of ankle support was found to be superior than the other in reduction of ankle sprains among adolescents and adults, elite and recreational players.	SR	1+	L	B4
Education, leadership support, injury surveillance, and research were determined to be critical components of any successful injury prevention program for the military and any other active population.	SR	1+	L	B5

Theme 4: Accident prevention initiatives to reduce risk of injury for athletes and formal exercise training to prevent falls, accidents and injuries (adults)

Evidence statements	Study type	Study quality	Evidence	Appendix
The following interventions had strong enough evidence to become working group recommendations for implementation in the military services (and applicable to any other active population): prevent overtraining, agility-like training, mouthguards, semi-rigid ankle braces, nutrient replacement, and synthetic socks.	SR	1+	M	B5

Back braces and pre-exercise administration of anti-inflammatory medication were <u>not recommended</u> for implementation in the military services due to evidence of ineffectiveness or harm (also applicable to any other active population).	SR	1+	M	B5
Among participants undertaking sporting activities or exercise (participants in over half of studies were U.S. high-school students) mouthguard non-users received significantly more orofacial injuries (RR 1.86, 95% CI: 1.76, 1.96) than mouthguard users (all studies). This result remained significant for all subgroup analyses.	SR	2++	M	B6
There was insufficient evidence to determine protection of mouthguards against concussion among participants undertaking sporting activities or exercise (participants in over half of the included studies were U.S. high-school students).	SR	2++	L	B6
A decreased risk of sports injuries was associated with the use of insoles.	SR	1+	M	B7
In 5 trials including 6 different comparisons (2446 participants), custom-made or prefabricated insoles reduced lower limb injuries compared with no insoles in military recruits (risk reduction ~50% in 4 comparisons).	SR	1+	M	B7
A decreased risk of sports injuries was associated with the use of external joint supports.	SR	1+	M	B7

Theme 5: Exercise programmes to prevent back problems and injuries (adults)

Evidence statements	Study type	Study quality	Evidence	Appendix ID
Exercise programs are effective for preventing self-reported back problems in working-age adults.	SR	1+	H	B8
Interventions not effective for preventing self-reported back problems in working-age adults include education alone (ergonomic, back school, stress management).	SR	1+	H	B8
Interventions not effective for preventing self-reported back problems in working-age adults includes back supports (back belts).	SR	1+	H	B8
Interventions not effective for preventing self-reported back problems in working-age adults include shoe inserts.	SR	1+	H	B8
Interventions not effective for preventing self-reported back problems in working-age adults include programs for reducing lifting.	SR	1+	H	B8

Theme 6: Arm support to prevent neck and shoulder problems in relation to using a computer mouse (adults)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
There was moderate-quality evidence that arm support with alternative mouse reduced the incidence of neck/shoulder disorders but not the incidence of right upper limb MSDs in adults.	SR	1++	M	B9
There was low-quality evidence that evidence that arm support with alternative mouse reduced neck/shoulder discomfort and right upper limb discomfort in adults.	SR	1++	L	B9
There was moderate-quality evidence that the incidence of neck/shoulder and right upper limb disorders in adults were not reduced when comparing alternative mouse and conventional mouse, arm support and no arm support with conventional mouse and alternative mouse with arm support and conventional mouse with arm support.	SR	1++	M	B9
There was low-quality evidence that using an alternative mouse with arm support compared to conventional mouse with arm support reduced neck/shoulder discomfort in adults.	SR	1++	L	B9
There was low- to very low-quality evidence that other interventions were not effective in reducing work-related upper limb and neck MSDs in adults.	SR	1++	L	B9
The studies provided no evidence that the educational interventions had an injury reducing effect in the agricultural industry.	SR	1++	VL	B10

Theme 7: Prevention of injuries in the workplace -industrial injury prevention)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Insurance premium discounts as a financial incentive decreased injuries claims in one study on the agricultural industry.	SR	1++	L	B10
Specific legislative mandates expanding the use of Rollover Protective Structures (ROPS) on tractors were not associated with a reduction of injuries in one study on the agricultural industry.	SR	1++	L	B10
Legislation to ban Endosulfan pesticides was associated with a reduction in fatal poisonings in the long term in one study on the agricultural industry.	SR	1++	L	B10
There is <u>no evidence</u> that introducing regulations for reducing fatal and nonfatal injuries are effective at reducing injuries in construction workers.	SR	1++	L	B11
There is <u>no evidence</u> that regionally oriented safety campaigns, training, inspections nor the introduction of occupational health services are effective at reducing non-fatal injuries in construction companies.	SR	1++	L	B11

There is low quality evidence that company-oriented safety interventions such as a multifaceted safety campaign and a multifaceted drug workplace programme can reduce non-fatal injuries among construction workers.	SR	1++	L	B11
Continuing company-oriented interventions among management and construction workers, such as a targeted safety campaign or a drug-free workplace programme, seem to have an effect in reducing injuries among construction workers in the longer term.	SR	1++	L	B11

Theme 9: Cost effectiveness of interventions to prevent falls, accidents and injuries (adults)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Regarding cost effectiveness of injury prevention, results indicate that there are injury prevention interventions that offer good use of societal resources.	SR	1+	L	B1
Regarding cost effectiveness of injury prevention, there is a lack of economic evidence surrounding injury prevention interventions, especially in low- and middle-income countries.	SR	1+	L	B1
In general, it seems interventions targeted at high risk individuals are more cost-effective. Probably, this is the case if the cost of identification of high-risk individuals does not reduce cost-effectiveness.	SR	1+	L	B1

4.4 Evidence of the effectiveness of interventions to prevent falls, accidents and injuries (elderly)

4.4.1 The following evidence statements set out effective interventions that have been identified in the scientific literature.

Theme 1: Health professional interventions to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE Guidance 2004 -Case/ Risk identification: Elderly people in contact with healthcare professionals should be asked routinely whether they have fallen in the past year and asked about the frequency, context and characteristics of the fall/s.	SR	1+ +	H	C1
NICE Guidance 2004 -Case/ Risk identification: Elderly people reporting a fall or considered at risk of falling should be observed for balance and gait deficits and considered for their ability to benefit from interventions to improve strength and balance.	SR	1+ +	H	C1
NICE Guidance 2004 -Multifactorial falls risk assessment: Elderly people who present for medical attention because of a fall, or report recurrent falls in the past year, or demonstrate abnormalities of gait and/or balance should be offered a multifactorial falls risk assessment. This assessment should be performed by a healthcare professional with appropriate skills and experience, normally in the setting of a specialist falls service. This assessment should be part of an individualised, multifactorial intervention.	SR	1+ +	H	C1
NICE Guidance 2004 -Elderly people on psychotropic medications should have their medication reviewed, with specialist input if appropriate, and discontinued if possible to reduce their risk of falling.	SR	1+ +	H	C1
NICE Guidance 2004 -Cardiac pacing should be considered for elderly people with cardio-inhibitory carotid sinus hypersensitivity who have experienced unexplained falls.	SR	1+ +	H	C1
NICE Guidance 2004 -Healthcare professionals involved in the assessment and prevention of falls should discuss which changes a person is willing to make to prevent falls.	SR	1+ +	H	C1
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include referral for correction of visual impairment.	SR	1+ +	L	C1

Theme 2: Multifactorial falls risk assessment and multifactorial interventions to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE Guidance 2004 -Multifactorial interventions: Following treatment for an injurious fall, elderly people should be offered a multidisciplinary assessment to identify and address future risk and individualised intervention aimed at promoting independence and improving physical and psychological function.	SR	1++	H	C1
NICE Guidance 2004 -Multifactorial interventions with an exercise component are recommended for elderly people in extended care settings who are at risk of falling.	SR	1++	H	C1
Cochrane 2012- Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling in elderly people living in the community.	SR	1++	H	C2
In 19 trials involving multifactorial assessment and management, interventions with comprehensive management seemed to reduce falling, although overall pooled estimates were not statistically significant (risk ratio, 0.94 [CI, 0.87 to 1.02]).	SR	1+	M	C7
Short-term interventions, smaller samples, and younger age related to better outcomes for multifactorial interventions and exercise-alone interventions for community-dwelling elderly people at risk to fall.	M	1+	M	C1 2
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include cognitive/behavioural interventions.	SR	1++	L	C1

Theme 3: Exercise interventions to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE Guidance 2004 -Strength and balance training is recommended. Those most likely to benefit are elderly community-dwelling people with a history of recurrent falls and/or balance and gait deficit. A muscle-strengthening and balance programme should be offered. This should be individually prescribed and monitored by an appropriately trained professional.	SR	1++	H	C1
Cochrane 2012- Group and home-based exercise programmes reduce rate of falls and risk of falling in elderly people living in the community.	SR	1++	H	C2
Cochrane 2012- Tai Chi reduces risk of falling in elderly people living in the community.	SR	1++	H	C2
Exercise as a single intervention can prevent falls in elderly adults.	SR	1+	M	C6
Exercise programs that included balance training, contained a higher dose of exercise and did not include walking training have the greatest effect on reducing falls in elderly adults.	SR	1+	M	C6
Exercise programs that included balance training, contained a higher dose of exercise and did not include walking training have the greatest effect on reducing falls in elderly adults.	SR	1+	M	C6
On-going exercise is necessary; the benefits of exercise are rapidly lost when exercise is ceased therefore on-going exercise would be necessary for a lasting falls prevention effect.	SR	1+	M	C6

Elderly adult falls prevention exercise should target both the general community and those at high risk for falls.	SR	1+	M	C6
In exercise programs to prevent falls in elderly adults exercise may be undertaken in a group or home-based setting.	SR	1+	N/A	C6
Strength and walking training may be included in addition to balance training in exercise programs to prevent falls in elderly adults but high risk individuals should not be prescribed brisk walking programs.	SR	1+	M	C6
In exercise programs to prevent falls in elderly adults other health-related risk factors should also be addressed.	SR	1+	M	C6
Primary care-relevant interventions exist that can reduce falling among community-dwelling elderly adults.	SR	1+	M	C6
In 16 RCTs evaluating exercise or physical therapy, interventions reduced falling (risk ratio, 0.87 [95% CI, 0.81 to 0.94]).	SR	1+	M	C7
In pooled analysis, exercise or physical therapy interventions reduced the risk for falling by 13% (CI, 6% to 19%), although most trials showed non-statistically significant differences.	SR	1+	M	C7
The 'Otago exercise programme', a strength and balance retraining programme designed to prevent falls in elderly people living in the community: •Significantly reduces the risk of death in elderly community-dwelling adults.	SR	1+	M	C8

•Significantly reduces the risk of falling in elderly community-dwelling adults.				
Both exercise-alone (i.e., strength, balance training, coordination of movements) and multifactorial targeted interventions were appropriate in reducing recurrent falls among community-dwelling elderly people at risk to fall however exercise-alone interventions were about 5 times more effective compared to multifactorial ones	M	1+	M	C12
There is strong evidence that exercise programs can reduce fall rates in elderly people (overall reduction of 17%).	SR	1+	H	C13
Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that include exercises that challenge balance.	SR	1+	M	C13
Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that use a higher dose of exercise.	SR	1+	M	C13
Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that do not include a walking program.	SR	1+	M	C13
The pooled estimate of the effect of exercise on the rate of falls indicates a 16% reduction.	SR	1+	M	C6
NICE Guidance 2004 -There is <u>no evidence</u> that brisk walking reduces the risk of falling.	SR	1++	L	C1
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include low intensity exercise combined with incontinence programmes.	SR	1++	L	C1
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include group exercise (untargeted).	SR	1++	L	C1

Theme 4: Home hazard and safety interventions to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE Guidance 2004 -Home hazard and safety intervention: Elderly people who have received treatment in hospital following a fall should be offered a home hazard assessment and safety intervention/modifications by a suitably trained healthcare professional. This should normally be part of discharge planning and be carried out within a timescale agreed by the patient or carer, and appropriate members of the healthcare team.	SR	1++	H	C1

NICE Guidance 2004 -Home hazard and safety intervention: Home hazard assessment is shown to be effective only in conjunction with follow-up and intervention, not in isolation.	SR	1++	H	C1
NICE Guidance 2004 -Information should be relevant and available in languages other than English.	SR	1++	H	C1
Cochrane 2012- Home safety interventions reduce rate of falls and risk of falling in elderly people living in the community.	SR	1++	H	C2
Cochrane 2012- Group and home-based exercise programmes reduce rate of falls and risk of falling in elderly people living in the community.	SR	1++	H	C2
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include Hip protectors.	SR	1++	L	C1

Theme 5: Prevention programmes to prevent falls, accidents and injuries (elderly)

	Study type	Study quality	Evidence strength	Appendix source ID
Evidence statements				
NICE Guidance 2004 -Encouraging the participation of elderly people in falls prevention programmes: Practitioners who are involved in developing falls prevention programmes should ensure that such programmes are flexible enough to accommodate participants' different needs and preferences and should promote the social value of such programmes.	SR	1++	H	C1
Fall prevention programmes were modestly effective. Identifying what were the most effective components of such a programme was extremely difficult and unclear from available research.	SR	1+	L	C3
Determining how to best promote falls prevention for all stakeholders will depend on the setting, preferences of the individual groups served, local resources, and available programmes and healthcare services.	R	3	L	C4

Theme 6: Education and information giving interventions to prevent falls, accidents and injuries (elderly)

	Study type	Study quality	Evidence strength	Appendix source ID
Evidence statements				

<p>NICE Guidance 2004 -Education and information giving: Individuals at risk of falling, and their carers, should be offered information orally and in writing about:</p> <ul style="list-style-type: none"> •What measures they can take to prevent further falls •How to stay motivated if referred for falls prevention strategies that include exercise or strength and balancing components •The preventable nature of some falls •The physical and psychological benefits of modifying falls risk •Where people can seek further advice and assistance <p>How to cope if they have a fall, including how to summon help and how to avoid a long</p>	SR	1++	H	C1
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Theme 7: Health professional training to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE Guidance 2004 -Education and information giving: All healthcare professionals dealing with patients known to be at risk of falling should develop and maintain basic professional competence in falls assessment and prevention.	SR	1++	H	C1
Health care providers have the knowledge and can provide leadership for determining best practices across the care continuum and overcoming barriers to effective fall prevention.	R	3	L	C4
Interventions that involved the active training of healthcare professionals improved implementation of interventions for preventing falls among community-dwelling elderly people.	SR	1+	M	C5

Theme 8: Vitamin D supplements to prevent falls, accidents and injuries (elderly)				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID

Cochrane 2012- Vitamin D supplementation <u>does not appear</u> to reduce falls in elderly people living in the community but may be effective in people who have lower vitamin D levels before treatment.	SR	1++	L	C2
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include Vitamin D.	SR	1++	L	C1
There is a protective effect of vitamin D supplementation on fall prevention in community-dwelling and institutionalized elderly adults. An overall RR of 0.86 (95% CI 0.79–0.93) suggested a 14% lower risk of falls.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: community-dwelling participants with a mean age younger than 80.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: adjunctive calcium therapy.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: no history of fracture or fall.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: duration longer than 6 months.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: dose of 800 IU or greater.	SR	1+	M	C9
The effect of vitamin D on fall reduction was significant in several subgroups of individuals: cholecalciferol therapy.	SR	1+	M	C9
In 9 RCTs of vitamin D supplementation, interventions reduced falling (risk ratio, 0.83 [CI, 0.77 to 0.89]).	SR	1+	M	C7
Vitamin D with or without calcium was associated with a 17% (CI, 11% to 23%) reduced risk for falling during 6 to 36 months of follow-up.	SR	1+	M	C7
Supplemental vitamin D in a dose of 700- 1000 IU a day reduced the risk of falling among elderly individuals by 19% and to a similar degree as active forms of vitamin D.	SR	1+	M	C11
Doses of supplemental vitamin D of less than 700 IU or serum 25-hydroxyvitamin D concentrations of less than 60 nmol/l may not reduce the risk of falling among elderly individuals.	SR	1+	M	C11

Theme 9: Cost-effectiveness of interventions to prevent falls, accidents and injuries (elderly)

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Economic evaluations of falls prevention interventions shows single interventions (such as the Otago Exercise Programme) targeted at high-risk groups can prevent the greatest number of falls at the lowest incremental costs.	SR	2++	M	C10
In eight studies that reported incremental cost per fall prevented, effective interventions included strength and balance retraining.	SR	2++	M	C10
The studies testing strength and balance retraining, which had the highest quality assessment scores, prevented the greatest number of falls at the least cost.	SR	2++	M	C10
In eight studies that reported incremental cost per fall prevented, effective interventions included cataract surgery.	SR	2++	M	C10
In eight studies that reported incremental cost per fall prevented, effective interventions included home safety interventions.	SR	2++	M	C10
A multifactorial programme was cost saving in a narrow range of individuals with four or more of eight specified risk factors for falls.	SR	2++	M	C10
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include cognitive/behavioural interventions.	SR	1++	L	C1
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include referral for correction of visual impairment.	SR	1++	L	C1
NICE Guidance 2004 -Interventions that <u>cannot be recommended</u> because of insufficient evidence include Hip protectors.	SR	1++	L	C1
Theme 10: Community interventions to prevent falls, accidents and injuries (elderly)				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID

Informal caregivers may prove an under-utilized asset that can support elderly adults at risk of falls.	R	3	L	C4
Health care providers have the knowledge and can provide leadership for determining best practices across the care continuum and overcoming barriers to effective fall prevention.	R	3	L	C4
Community efforts need to be strengthened to support adoption of fall prevention and a safe built environment.	R	3	L	C4
The evidence around layperson delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.	SR	1+	L	C5
The evidence around peer delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.	SR	1+	L	C5
The evidence around community delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.	SR	1+	L	C5
Home assessment interventions that are comprehensive, are well focused, and incorporate an environmental-fit perspective with adequate follow-up can be successful in reducing falls with significant effects among community-dwelling elderly people.	M	1+	M	C14
Regarding interventions to prevent falls in community-dwelling elderly people, the highest effects are associated with interventions that are conducted with high-risk groups.	M	1+	M	C14

4.5 Evidence - Integration of services to manage falls, accidents & injuries (elderly)

4.5.1 The following evidence statements set out effective interventions that have been identified in the scientific literature. The main evidence relating to integration of services for this section focusses on hip fractures in the elderly

Theme 1: Integrated multidisciplinary rehabilitation program that includes geriatric care to improve outcomes following hip fracture

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Patients with hip fracture should be offered a coordinated multidisciplinary rehabilitation program with the specific aim of regaining sufficient function to return to their prefracture living arrangements.	SR	1++	H	D1
Early multidisciplinary daily geriatric care reduces in hospital mortality and medical complications in older patients with hip fracture, but does not reduce length of stay or functional recovery.	SR	1++	H	D1
Multidisciplinary programs — comprising early individualised occupational therapy during hospital admission, continuous rehabilitation as well as discharge planning (including a home visit and post-acute care coordination when appropriate) — improve physical outcomes, quality of life and self-care abilities, reduce readmission rates and depression, may reduce risk of falling and may be associated with cost savings.	SR	1++	H	D1
Management of hip-fracture patients to optimize outcome after hospital discharge requires several stages of care co-ordinated by a multidisciplinary team from before admission through to discharge.	SR	1+	M	D3
Successful transformation of care relies upon consensus amongst all participants in the multi-disciplinary team that cares for fragility fracture patients.	SR	1+	M	D5
Models of ortho-geriatric service: The group with integrated care show the lowest in-hospital mortality rate, the lowest length of stay, and the lowest mean time to surgery.	SR	2++	M	D6
A five step plan for management of patients who present with a fracture (Case finding, Evaluation, Differential diagnosis, Therapy, Follow is recommended.	SR	2++	M	D8
Regarding models of care for the acute and post-acute management of elderly adults with hip fracture, the more complex and sophisticated services characterized by a multidisciplinary approach demonstrated to produce better outcomes compared to the traditional or simplest models.	SR	1+	M	D10

When designing, programming and implementing a service for hip fracture, physicians, administrative employees and team members should consider and optimise all "steps" of the care pathway.	SR	1+	M	D10
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Theme 2: Early mobilisation and discharge program linked to home rehabilitation improves likelihood of returning home

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Mobilisation: Early assisted ambulation (begun within 48 h of surgery) accelerates functional recovery and is associated with more direct discharges to home and less discharges to high-level care in previously community dwelling individuals.	SR	1++	H	D1
A program of accelerated discharge and home-based rehabilitation may lead to functional improvement, greater confidence in avoiding subsequent falls, improvements in health related quality of life and less caregiver burden.	SR	1++	H	D1
Alternative models of care for the acute and post-acute management of older adults with hip fracture aim to minimize in-hospital complications, streamline hospital care and provide early discharge with the main objectives of improving functional and clinical outcomes, and reducing healthcare costs associated with hip and other fractures.	SR	1+	M	D10

Theme 3: Rehabilitation improves outcomes in hip fractures

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Extended outpatient rehabilitation that includes progressive resistance training can also improve physical function and quality of life compared with home exercise alone.	SR	1++	H	D1

Hip fracture rehabilitation is essential to improve functional disabilities and survival rates.	SR	1+	M	D4
Rehabilitation after hip fracture surgery ideally should start on the first postoperative day with progression to ambulation as tolerated. Continued physical therapy is crucial after discharge from the hospital to ensure optimal functional recovery.	R	2+	M	D9
Inpatient rehabilitation specifically designed for geriatric patients has the potential to improve outcomes related to function, admission to nursing homes, and mortality.	SR	1+	M	D11
Theme 4: Fall prevention improves outcomes in hip fractures				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Hip fracture rehabilitation - Fall prevention and functional recovery strategies should include patient education and training to improve balance and increase muscle strength and mobility.	SR	1+	M	D4
Hip fracture rehabilitation -Appropriate management can prevent further fractures and it is critical that high-risk patients are identified and treated.	SR	1+	M	D4
Interventions to help prevent future falls, exercise and balance training in ambulatory patients, and the treatment of osteoporosis are important strategies for the secondary prevention of hip fracture	R	2+	M	D9
Theme 5: A dedicated falls coordinator improves outcomes in hip fractures				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
There is evidence to support a dedicated coordinator who acts as the link between the orthopaedic team, the osteoporosis and falls services, the patient and the primary care physician.	SR	1+	M	D5

The main feature that distinguishes models of care for the acute and post-acute management of older adults with hip fracture is the different healthcare professional that retains the responsibility of the care during the acute and post acute phases.	SR	1+	M	D10
Theme 6: Osteoporosis screening and monitoring improves outcomes in hip fractures				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Coordinator-based systems facilitate bone mineral density testing, osteoporosis education and care in patients following a fragility fracture and have been shown to be cost-saving.	SR	1+	M	D5
Other success factors in improving diagnosis and treatment of osteoporosis in patients with fragility fractures include an open-access fracture registry and a database to monitor the care provided to the fracture patient.	SR	1+	M	D5

4.6

4.7 Evidence of the effectiveness of interventions to prevent road traffic injuries

4.7.1 The following evidence statements set out effective interventions that have been identified in the scientific literature.

Theme 1: Road design and traffic calming interventions to prevent road traffic injuries				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE 2008 - Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads.	SR	1++	H	E1
NICE 2008 re-allocate road space to support physically active modes of transport (as an example, this could be achieved by widening pavements and introducing cycle lanes)	SR	1++	H	E1
NICE 2008 restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity)	SR	1++	H	E1
NICE 2008 introduce road-user charging schemes	SR	1++	H	E1
NICE 2008 introduce traffic-calming schemes to restrict vehicle speeds (using signage and changes to highway design)	SR	1++	H	E1
NICE 2008 create safe routes to schools (for example, by using traffic-calming measures near schools and by creating or improving walking and cycle routes to schools).	SR	1++	H	E1
NICE 2010 -Support and promote changes to the road environment as part of a broader strategy to prevent injuries and the risk of injuries.	SR	1++	H	E2
Cochrane - The consistency of reported reductions in speed and crash outcomes across all studies show that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths.	SR	1++	H	E4
Modification of the built environment can substantially reduce the risk of pedestrian-vehicle crashes.	SR	1+	M	E10
High effect counter measures include single-lane roundabouts, sidewalks, exclusive pedestrian signal phasing, pedestrian refuge islands, and increased intensity of roadway lighting.	SR	1+	M	E10
The evidence is equivocal on the benefits and harms of guard rails, crash cushions, and interventions to reduce vehicle speeds.	SR	1+	H	E11

Theme 2: Coordinated working between health professionals, school staff, police and local highways authorities to promote changes to the road environment to prevent road traffic injuries

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
NICE 2010 -Support coordinated working between health professionals, school teachers and local highways authorities to promote changes to the road environment	SR	1++	H	E2
NICE 2010 -Authorities should work with other partners to introduce engineering measures to reduce speed as part of a broad strategy to prevent injuries and the risk of injuries).	SR	1++	H	E2
NICE 2010 Introduce engineering measures to reduce speed in streets that are primarily residential or where pedestrian and cyclist movements are high.	SR	1++	H	E2
NICE 2010 Implement city or town-wide 20 mph limits and zones on appropriate roads.	SR	1++	H	E2
NICE 2010 Consider changes to speed limits and appropriate engineering measures on rural roads where the risk of injury is relatively high.	SR	1++	H	E2
NICE 2010 - Consider popular routes, directors of public health, Local highways authorities, Local strategic partnerships, Public health professionals with an injury prevention remit, School travel planners should:	SR	1++	H	E2
NICE 2010 -Consider opportunities to develop engineering measures to provide safer routes commonly used by children and young people, including to school and other destinations.	SR	1++	H	E2
NICE 2010 Include school governors and head teachers in discussions about changes relating to school travel.	SR	1++	H	E2
NICE 2010 - Maintaining and managing road safety partnerships to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
NICE 2010 -Carrying out local child road safety reviews and consultations to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
NICE 2010 Align local child road safety policies to prevent unintentional injuries among the under-15s.	SR	1++	H	E3

NICE 2010 promote and enforce speed reduction to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
Theme 3: Coordinate unintentional injury prevention activities and interventions to reduce road traffic injuries				
	Study type	Study quality	Evidence strength	Appendix source ID
Evidence statements				
NICE 2010 involve the police in driver education initiatives and activities to reduce traffic speed to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
NICE 2010 - Incorporate unintentional injury prevention within local and national plans and strategies for children and young people's health and wellbeing	SR	1++	H	E3
NICE 2010 Coordinate unintentional injury prevention activities to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
NICE 2010 - Provide the wider childcare workforce with access to injury prevention training to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
NICE 2010 -Develop professional standards for injury prevention to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
Cochrane 2009 - Pedestrian safety education can result in improvement in children's knowledge and can change observed road crossing behaviour, but whether this reduces the risk of pedestrian motor vehicle collision and injury occurrence is unknown.	SR	1++	M	E17
Cochrane 2009 - There is evidence that changes in safety knowledge and observed behaviour decline with time, suggesting that safety education must be repeated at regular intervals.	SR	1++	M	E17
Theme 4: Review injury data to reduce road traffic injuries				
	Study type	Study quality	Evidence strength	Appendix source ID
Evidence statements				
NICE 2010 – Identify and respond to attendances at emergency departments and minor injuries units to prevent unintentional injuries among the under-15s.	SR	1++	H	E3

NICE 2010 Gather high quality injury data from emergency departments to prevent unintentional injuries among the under-15s.	SR	1++	H	E3
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Theme 5: Interventions to prevent alcohol related road traffic injuries					
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID	
The studies reviewed provided strong evidence that carefully planned, well-executed multi-component programs, when implemented in conjunction with community mobilization efforts, are effective in reducing alcohol-related crashes.	SR	1+	M	E5	
Three studies reported economic evidence that suggests community mobilization for reducing alcohol-impaired driving produce cost savings.	SR	1+	M	E5	
Multi-component programs for reducing alcohol-impaired driving generally included a combination of efforts to limit access to alcohol (particularly among youth), responsible beverage service training, sobriety checkpoints or other well-defined enforcement efforts, public education, and media advocacy designed to gain the support of both policymakers and the general public for reducing alcohol-impaired driving.	SR	1+	M	E5	
Some modes of drink driving remediation, including mandatory jail sentences and laws to enforce studded tyres, are associated with harmful effects on health.	SR	1+	M	E11	

Theme 6: Lighting and garment visibility interventions to prevent road traffic injuries					
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID	
Cochrane - Street lighting may prevent road traffic crashes, injuries and fatalities.	SR	1++	M	E6	
Cochrane -The effect of visibility aids on pedestrian and cyclist safety remains unknown.	SR	1+	M	E7	
Cochrane -Visibility aids have the potential to increase visibility and enable drivers to detect pedestrians and cyclists earlier.	SR	1+	M	E7	
Cochrane -Public acceptability of Interventions for increasing pedestrian and cyclist visibility would merit further development.	SR	1+	M	E7	

Cochrane -Fluorescent materials in yellow, red and orange colours improve detection and recognition in the daytime.	SR	1+	M	E7
Cochrane -For night-time visibility, lamps, flashing lights and retroreflective materials in red and yellow colours increase detection and recognition.	SR	1+	M	E7
Cochrane -Retroreflective materials arranged in a 'biomotion' configuration enhance recognition.	SR	1+	M	E7
Cochrane -Found no trials assessing the effect of visibility aids on pedestrian and cyclist-motor vehicle collisions and injuries.	SR	1+		E7

Theme 7: Media campaign interventions to prevent road traffic injuries

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
The studies reviewed indicate that under some conditions, well-executed mass media campaigns can contribute to a reduction in alcohol impaired driving (AID) and alcohol-related crashes.	SR	1+	M	E8
The median decrease in crashes across all studies and all levels of crash severity was 13%. The median decrease in injury-producing crashes, the most common crash outcome, was 10%.	SR	1+	M	E8
There was no clear difference in the effectiveness of campaigns that used legal deterrence messages and those that used social and health consequences messages.	SR	1+	M	E8
Economic analyses of campaign effects indicated that the societal benefits were greater than the costs.	SR	1+	M	E8
A systematic summary of 119 individual road safety campaign effects suggests that road safety campaigns have an overall significant accident-reducing effect of 9%.	M	1+	M	E12
Meta-regression analysis suggests that those campaigns using personal communication, roadside and/or enforcement strategies to deliver their message are associated with greater accident reductions.	M	1+	M	E12
Achieving immediacy in the delivery of a campaign message, in terms of proximity to the target behaviour, might tend to increase campaign effect in the shorter term, and complement any long-term campaign effects achieved using mass media delivery.	M	1+	M	E12

Theme 8: Legislation to prevent road traffic injuries

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
Results provide strong evidence that primary laws are more effective than secondary laws in increasing safety belt use and decreasing fatalities.	SR	1+	H	E9
Enhanced enforcement is effective in increasing safety belt use.	SR	1+	M	E9
Ignition interlock devices, daytime running lights, public lighting, graduated driver licensing, and laws to enforce seatbelt use may all be effective in improving health.	SR	1+	M	E11

Theme9: Infant car seat and booster seat interventions to prevent road traffic injuries

Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
All Infants and Toddlers Should Ride in a Rear-Facing CSS Until They Are 2 Years of Age or Until They Reach the Highest Weight or Height Allowed by the Manufacturer of Their CSS.	SR	1+	M	E13
All Children 2 Years or Elderly, or Those Younger Than 2 Years Who Have Outgrown the Rear-Facing Weight or Height Limit for Their CSS, Should Use a Forward-Facing CSS With a Harness for as Long as Possible, up to the Highest Weight or Height Allowed by the Manufacturer of Their CSS	SR	1+	M	E13

All Children Whose Weight or Height Is Above the Forward - Facing Limit for Their CSS Should Use a Belt-Positioning Booster Seat Until the Vehicle Lap-and- Shoulder Seat Belt Fits Properly, Typically When They Have Reached 4 Feet 9 Inches in Height and Are Between 8 and 12 Years of Age	SR	1+	M	E13
When Children Are Old Enough and Large Enough to Use the Vehicle Seat Belt Alone, They Should Always Use Lap-and-Shoulder Seat Belts for Optimal Protection	SR	1+	M	E13
All Children Younger Than 13 Years Should Be Restrained in the Rear Seats of Vehicles for Optimal Protection.	SR	1+	M	E13
Cochrane 2006 - Available evidence suggests that interventions to increase use of booster seats among children age four to eight years are effective.	SR	1++	M	E16
Cochrane 2006 Combining incentives (booster seat discount coupons or gift certificates) or distribution of free booster seats with education demonstrated marked beneficial outcomes for acquisition and use of booster seats for four to eight year olds.	SR	1++	M	E16
Cochrane 2006 There is some evidence of beneficial effect of legislation on acquisition and use of booster seats but this was mainly from uncontrolled before-and-after studies, which did not meet the criteria for inclusion in the meta-analysis.	SR	1++	M	E16

Theme10: Bike routes and cyclist helmet interventions to prevent road traffic injuries				
Evidence statements	Study type	Study quality	Evidence strength	Appendix source ID
The evidence to date suggests that purpose-built bicycle only facilities (e.g. bike routes, bike lanes, bike paths, cycle tracks at roundabouts) reduce the risk of crashes and injuries compared to cycling on-road with traffic or off road with pedestrians.	SR	1+	M	E14
Street lighting, paved surfaces, and low-angled grades are additional factors that appear to improve cyclist safety.	SR	1+	M	E14

Cochrane 2011 -Non-legislative interventions appear to be effective in increasing observed helmet use, particularly community-based interventions and those providing free helmets.	SR	1++	H	E15
Cochrane 2011 Those helmet use interventions set in schools appear to be effective but possibly less so than community-based interventions.	SR	1++	H	E15
Cochrane 2011 -Interventions providing education only are less effective than those providing free helmets.	SR	1++	H	E15
Cochrane 2011 -There is insufficient evidence to recommend providing subsidised helmets at present.	SR	1++	L	E15
Cochrane 2011 –Cyclist helmet interventions may be more effective if provided to younger rather than elderly children.	SR	1++	M	E15
Cochrane 2011 -There is evidence that interventions offered in healthcare settings can increase self-reported helmet wearing.	SR	1++	H	E15

5. Appendix 1: Search Terms

General approach

- 4.1.1 As this review does not follow a full systematic approach an exhaustive list of search terms has not been used. The review has taken a more iterative approach. Stage one used search terms based on the topic titles. Stage two expanded this list base on key terms used in the literature identified during Stage one. The sections below list the search terms used in the literature review.
- 4.1.2 Medical Subject Headings (MeSH) are a system used by the U.S. National Library of Medicine to give uniformity and consistency to the indexing and cataloguing of biomedical literature¹⁰. Terms are arranged in a hierarchical manner called a MeSH Tree Structure. MeSH is an effective means of identifying the most appropriate search terms to use, particularly when accessing MEDLINE/PubMed.
- 4.1.3 In addition to the MeSHs, other subsidiary search terms based on the project scope were used to refine results. These search terms were limited to titles and abstracts.

Table 5.1: Search Term Key

MeSH	= Medical Subject Heading
ti	= title
ab	= abstract
pt	= publication type
*	= truncation

- 4.1.4 The following publication filters were used:
- Publication data range of 2003 - 2013 (i.e. the last 10 years)
 - English language
 - Human species studies
 - Where abstracts available
 - Where full text available
- 4.1.5 The review used a pragmatic approach to identify the most relevant sources using combinations of MeSH terms, subsidiary search terms and publication filters. The review did not exhaustively applying ever combination of search terms and filters.
- 4.1.6 N.B. The terms 'health' and 'social care' are too broad to be used in the search strategy; however search results will include all relevant publications that fall within both these fields. The short listing of publications for inclusion within the review aims to include relevant evidence on 'social care' where it exists.

10 See http://www.nlm.nih.gov/mesh/2012/mesh_browser/MBrowser.html

5.2 Search terms: common to all

Study		
a	Systematic review	ti,ab
b	Review	pt
c	Meta analysis	pt
Filter		
d	English language	language
e	Human	filter
f	"2003/01/01 - 2013/01/01"	date - publication

((("systematic review"[Title/Abstract]) OR "review"[Publication Type]) OR "meta analysis"[Publication Type])

((("english"[Language]) AND "humans"[Filter]) AND ("2003/01/01"[Date - Publication] : "3000"[Date - Publication]))

5.3 Search terms: Interventions to prevent falls, accidents and injuries amongst children and young people

Intervention / Outcome		
1	Accidents	MeSH
2	Injur*	ti,ab
3	Wound*	ti,ab
4	Burn*	ti,ab
5	Scald*	ti,ab
6	Drown*	ti,ab
7	Fall*	ti,ab
8	Poison*	ti,ab
9	Suffocat*	ti,ab
10	Fire	ti,ab
11	Smoke	ti,ab
12	Abuse	ti,ab
13	Maltreat*	ti,ab
14	Prevent	ti,ab
15	Prevention	ti,ab
16	Avoid	ti,ab
17	Protective Devices	MeSH
18	Alarm	ti,ab
19	Detector	ti,ab
20	Guard	ti,ab
21	Safety	ti,ab
22	Device*	ti,ab
23	Equipment*	ti,ab
24	Appliance	ti,ab
Population		
	Child: birth-18 years	Filter

PubMed Search string	
Study:	(a OR b OR c) AND
Filter:	(d AND e AND f) AND
Intervention / Outcome:	((1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13) AND (14 OR 15 OR 16)) OR ((17 OR 18 OR 19 OR 20) AND (21 AND (22 OR 23 OR 24))) AND
Population:	
Hits	
Filters activated: Meta-Analysis, Systematic Reviews, Abstract available, Full text available, published in the last 10 years, Humans, English, Child: birth-18 years = 318	

5.4 Search terms: Interventions to prevent falls, accidents and injuries (adults)

Intervention / Outcome		
1	Accidents	MeSH
2	Injur*	ti,ab
3	Wound*	ti,ab
4	Burn*	ti,ab
5	Scald*	ti,ab
6	Drown*	ti,ab
7	Fall*	ti,ab
8	Poison*	ti,ab
9	Suffocat*	ti,ab
10	Fire	ti,ab
11	Smoke	ti,ab
12	Abuse	ti,ab
13	Maltreat*	ti,ab
14	Prevent	ti,ab
15	Prevention	ti,ab
16	Avoid	ti,ab
17	Protective Devices	MeSH
18	Alarm	ti,ab
19	Detector	ti,ab
20	Guard	ti,ab
21	Safety	ti,ab
22	Device*	ti,ab
23	Equipment*	ti,ab
24	Appliance	ti,ab
25	Sport	ti,ab
26	Occupation	ti,ab
27	Work	ti,ab
Population		
	Adult: 19-64 years	Filter
PubMed Search string		
Study:	(a OR b OR c) AND	
Filter:	(d AND e AND f) AND	

Intervention / Outcome:	((1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13) AND (14 OR 15 OR 16)) OR ((17 OR 18 OR 19 OR 20) AND (21 AND (22 OR 23 OR 24)) AND (25 OR 26 OR 27))
Population:	
Hits	
Filters activated: Meta-Analysis, Systematic Reviews, Abstract available, Full text available, published in the last 10 years, Humans, English, Adult: 19-64 years = 403	

5.5 Search terms: Interventions to prevent falls, accidents and injuries (elderly)

Intervention / Outcome		
1	Accidents	MeSH
2	Injur*	ti,ab
3	Wound*	ti,ab
4	Burn*	ti,ab
5	Scald*	ti,ab
6	Drown*	ti,ab
7	Fall*	ti,ab
8	Poison*	ti,ab
9	Suffocat*	ti,ab
10	Fire	ti,ab
11	Smoke	ti,ab
12	Abuse	ti,ab
13	Maltreat*	ti,ab
14	Prevent	ti,ab
15	Prevention	ti,ab
16	Avoid	ti,ab
17	Protective Devices	MeSH
18	Alarm	ti,ab
19	Detector	ti,ab
20	Guard	ti,ab
21	Safety	ti,ab
22	Device*	ti,ab
23	Equipment*	ti,ab
24	Appliance	ti,ab
Population		
	Aged: 65+ years	Filter
PubMed Search string		
Study:	(a OR b OR c) AND	
Filter:	(d AND e AND f) AND	
Intervention / Outcome:	((1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13) AND (14 OR 15 OR 16)) OR ((17 OR 18 OR 19 OR 20) AND (21 AND (22 OR 23 OR 24)) AND	
Population:		
Hits		
Filters activated: Meta-Analysis, Systematic Reviews, Abstract available, Full text available, published in the last 10 years, Humans, English, Aged: 65+ years = 202		

5.6 Search terms: Integration of services to manage falls, accidents & injuries (elderly)

Intervention / Outcome		
1	Fall	ti,ab
2	Falls	ti,ab
3	Falling	ti,ab
4	Faller*	ti,ab
5	Fallen	ti,ab
6	Slip*	ti,ab
7	Trip*	ti,ab
8	Accidental-Falls	ti,ab
9	Manag*	ti,ab
10	Rehabil*	ti,ab
11	Support*	ti,ab
12	Discharge*	ti,ab
13	Educat*	ti,ab
14	Counsel*	ti,ab
15	Cope*	ti,ab
16	Coping	ti,ab
17	Strateg*	ti,ab
18	Follow up	ti,ab
19	Improv*	ti,ab
20	Reduc*	ti,ab
21	Self-efficacy	ti,ab
22	Mobility	ti,ab
23	Mobile	ti,ab
24	Functional*	ti,ab
25	Independen*	ti,ab
26	Dependen*	ti,ab
27	Re-admit*	ti,ab
28	Re-admission*	ti,ab
29	Service	ti,ab
30	Integrat*	ti,ab
31	Multidisciplinary	ti,ab
32	Joint working	ti,ab
33	Care plan	ti,ab
Population		
34	old	ti,ab
35	elderly	ti,ab
36	senior*	ti,ab
37	elder*	ti,ab
38	aged	ti,ab
39	geriatric*	ti,ab
PubMed Search string		
Study:	(a OR b OR c) AND	
Filter:	(d AND e AND f) AND	
Intervention / Outcome:	(1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8) AND (9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24	

	OR 25 OR 26 OR 27 OR 28) AND (29 OR 30 OR 31 OR 32 OR 33) AND
Population:	(34 OR 35 OR 36 OR 37 OR 38 OR 39)
Hits	
Filters activated: Meta-Analysis, Systematic Reviews, Abstract available, Full text available, published in the last 10 years, Humans, English, Aged: 65+ years = 57 [searches of related studies undertaken to broaden catchment]	

5.7 Search terms: Interventions to prevent road traffic injuries

Intervention / Outcome		
1	Traffic	ti,ab
2	walk*	ti,ab
3	Pedestrian*	ti,ab
4	Cycle*	ti,ab
5	Cycling	ti,ab
6	Bicycle	ti,ab
7	Bicycling	ti,ab
8	Travel	ti,ab
9	Road*	ti,ab
10	Street*	ti,ab
11	Highway*	ti,ab
12	Pavement*	ti,ab
13	Lane*	ti,ab
14	Path*	ti,ab
15	Speed*	ti,ab
16	Sign*	ti,ab
17	Injur*	ti,ab
18	Accident*	ti,ab
19	Death*	ti,ab
20	Fatal*	ti,ab
21	Collision	ti,ab
22	Crash*	ti,ab
23	Accidents, Traffic	MeSH
24	Protective Devices	MeSH
Population		
	All	
PubMed Search string		
Study:	(a OR b OR c) AND	
Filter:	(d AND e AND f) AND	
Intervention / Outcome:		
Population:		
Hits		
Filters activated: Meta-Analysis, Systematic Reviews, Abstract available, Full text available, published in the last 10 years, Humans, English = 204		

6. Appendix 2: Tabulated Results: Systematic reviews and Meta-analyses

6.1 Sub-topic: Interventions to prevent falls, accidents and injuries amongst children and young people

Search record

4.1.1 15 publications met the search criteria.

Full Tabulated results

The following data forms present the detailed systematic review and meta-analysis findings of the literature review. For further information on: 'type of evidence', 'quality of study' and 'strength of evidence' see the methods statement on evidence classification (Section 3.4). Summary results are provided in the results section (Section 4). Results are presented chronologically starting with the most recent.

ID	A1		
Citation	NICE. Strategies to prevent unintentional injuries among children and young people aged under 15. November 2010- This is one of three pieces of NICE guidance on how to prevent unintentional injuries among children and young people aged under 15		
Web link	http://publications.nice.org.uk/strategies-to-prevent-unintentional-injuries-among-the-under-15s-ph29		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	2010 NICE guidance recommends incorporating unintentional injury prevention within local and national plans and strategies for children and young people's health and wellbeing.	Strength of evidence	High
	2010 NICE guidance recommends partnerships and coordination of unintentional injury prevention activities between services and departments.		High
	2010 NICE guidance recommends identifying and responding to attendances at emergency departments and minor injuries units.		High
	2010 NICE guidance recommends workforce training and capacity building.		High
	2010 NICE guidance recommends injury surveillance. Commissioners of health services should take action to gather high quality injury data from emergency departments to benefit children and young people aged under 15, their parents and carers.		High
	2010 NICE guidance regarding home safety recommends incorporating home safety assessments and equipment provision within local plans and strategies for children and young people's health and wellbeing.		High
	2010 NICE guidance recommends developing policies for public outdoor play and leisure.		High
	2010 NICE guidance recommends providing education and advice on water safety.		High
	2010 NICE guidance recommends advising on off road safety using local information campaigns and ongoing education to encourage cycle training and promote the use of correctly fitted and fastened cycle helmets while cycling off the road.		High
	2010 NICE guidance recommends conducting local firework safety campaigns.		High
2010 NICE guidance recommends road safety partnerships, local child road safety reviews/ consultations, aligning local child road safety policies and promoting and enforcing speed reduction.	High		

Comments	Many of these recommendations should be acted upon in partnership.
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ID	A2		
Citation	NICE. Preventing unintentional injuries in the home among children and young people aged under 15. November 2010		
Web link	http://publications.nice.org.uk/preventing-unintentional-injuries-among-the-under-15s-in-the-home-ph30		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	2010 NICE guidance recommends determining the types of household where children and young people aged under 15 are at greatest risk of unintentional injury based on surveys, needs assessments and existing datasets (such as local council housing records).	Strength of evidence	High
	2010 NICE guidance recommends prioritising households at greatest risk for home safety assessments and the supply and installation of home safety equipment.		High
	2010 NICE guidance recommends providing practitioners who visit children and young people at home (including health visitors, social workers and GPs) with mechanisms for sharing information about households that might need a home safety assessment.		High
	2010 NICE guidance recommends ensuring practitioners adhere to good practice on maintaining the confidentiality and security of personal information.		High
	2010 NICE guidance recommends working in partnership. Establishing local partnerships with relevant statutory and voluntary organisations or support existing ones. Use partnerships to collect information, determine and address barriers, get the community involved, carry out home safety assessments and supply and install equipment.		High
	2010 NICE guidance recommends coordinated delivery of home safety assessments and providing home safety equipment.		High
	2010 NICE guidance recommends ensuring assessment supply and installation of equipment is tailored to meet household specific needs and circumstances.		High
	2010 NICE guidance recommends ensuring education, advice and information is given during a home safety assessment, and during the supply and installation of home safety equipment.		High
	2010 NICE guidance recommends follow-up on home		High

	<p>safety assessments and interventions including: preventing duplication of effort by keeping a record of households that have been assessed and given equipment, adhering to information collection and sharing standards, using records to identify when maintenance/ follow up is required, follow-up to check equipment is still appropriate/ functional, see if there are any new requirements, reinforce messages.</p> <p>2010 NICE guidance recommends integrating home safety into other home visits by practitioners who visit families and carers with children and young people aged under 15 (including GPs, midwives, social workers and health visitors). They should recognise the importance of measures to prevent unintentional injuries in the home, provide child-focused home safety advice, encourage parents/ carers/ others living with children and young people aged under 15 to conduct their own home safety assessment.</p>		
Other comments			

ID	A3		
Citation	Cochrane Database Syst Rev. 2012 Sep 12;9:CD005014. doi: 10.1002/14651858.CD005014.pub3. Home safety education and provision of safety equipment for injury prevention. Kendrick D, Young B, Mason-Jones AJ, Ilyas N, Achana FA, Cooper NJ, Hubbard SJ, Sutton AJ, Smith S, Wynn P, Mulvaney C, Watson MC, Coupland C.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22972081		
Type of evidence	Systematic review	Publication Date	September 2012
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Home safety interventions most commonly provided as one-to-one, face-to-face education, especially with the provision of safety equipment, are effective in increasing a range of safety practices.	Strength of evidence	Moderate
	Home safety education, especially with the provision of safety equipment, may reduce injury rates particularly where interventions are provided at home.		Moderate
	Home safety interventions were effective in increasing the proportion of families with safe hot tap water temperatures, functional smoke alarms, a fire escape plan, storing medicines and cleaning products out of reach, having syrup of ipecac or poison control centre numbers accessible, having fitted stair gates and having socket covers on unused sockets.		Moderate
	Interventions providing free, low cost or discounted safety equipment appeared to be more effective in improving some safety practices than those		Moderate

	interventions not doing so.		
	There was no consistent evidence that home safety education, with or without the provision of safety equipment, was less effective in those participants at greater risk of injury.		Low
	Multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes have been found to be effective in reducing child injury rates. (Elkan 2000; Roberts 1996b).		N/A
Other comments	<p>Ninety-eight studies, involving 2,605,044 people</p> <p>More than 90% of included studies were from higher income countries, predominantly from the USA, UK and Australia: Forty-nine (50%) studies were from the USA, 14 from the UK (14%), six from Australia (6%), four (4%) each from Canada, South Africa and Sweden, three (4%) each from France and New Zealand, two (3%) each from Denmark and China, and one (1%) each from Singapore, Norway, Greece, Hong Kong, Israel, Italy and Mexico.</p> <p>Randomised controlled trials (RCTs), non-randomised controlled trials and controlled before and after (CBA) studies where home safety education with or without the provision of safety equipment was provided to those aged 19 years and under, and which reported injury, safety practices or possession of safety equipment.</p> <p>Conflicting findings regarding interventions providing safety equipment on safety practices and injury outcomes are likely to be explained by two large studies; one clinic-based study provided equipment but did not reduce injury rates and one school-based study did not provide equipment but did demonstrate a significant reduction in injury rates.</p> <p>We excluded multi-faceted home visiting programmes aimed at improving a range of maternal and child health outcomes which reported injury outcomes but not possession and use of safety equipment or safety practices, as these are the subject of a Cochrane review currently undergoing revision (Bennett 2008).</p>		

ID	A4		
Citation	Arch Dis Child. 2012 Sep;97(9):787-98. doi: 10.1136/archdischild-2011-300795. Epub 2012 Jul 4. Home visiting programmes for the prevention of child maltreatment: cost-effectiveness of 33 programmes. Dalziel K, Segal L.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22764090		
Type of evidence	Systematic review	Publication Date	July 2012
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	There is great variation in the cost effectiveness of home visiting programmes for the prevention of maltreatment.	Strength of evidence	Low
	The most cost-effective home visiting programmes for the prevention of maltreatment use professional home visitors in a multidisciplinary team, target high risk populations and include more than just home		Low

	visiting.		
	Home visiting programmes for the prevention of maltreatment must be carefully selected and well targeted if net social benefits are to be realised.		Low
Other comments	<p>33 home visiting programmes were evaluated and cost-effectiveness estimates derived for the 25 programmes not dominated.</p> <p>The quality of the studies was considered good for five (15%) programmes, adequate for 16 (48%) and poor for 12 (36%).</p> <p>The incremental cost of home visiting compared to usual care ranged from A\$1800 to A\$30 000 (US\$1800–US\$30 000) per family. Cost-effectiveness estimates ranged from A\$22 000 per case of maltreatment prevented to several million. Seven of the 22 programmes (32%) of at least adequate quality were cost saving when including lifetime cost offsets.</p>		

ID	A5		
Citation	Health Educ Res. 2012 Apr;27(2):258-68. doi: 10.1093/her/cyr066. Epub 2011 Aug 26. Identifying facilitators and barriers for home injury prevention interventions for pre-school children: a systematic review of the quantitative literature. Ingram JC, Deave T, Towner E, Errington G, Kay B, Kendrick D.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21873613		
Type of evidence	Systematic review	Publication Date	April 2012
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Intervention features found to be facilitators related to home injury prevention interventions for pre-school children (5 years and under) include focused messages. Some studies highlighted the success of this approach if they concentrated on one type of injury, a specific age of child or had a single focus.	Strength of evidence	Moderate
	Intervention features found to be facilitators related to home injury prevention interventions for pre-school children (5 years and under) include minimal changes. Educational materials (tailored hand-outs, easy to use instructions and stickers) to encourage use of devices and reinforce messages featured in many studies. Physical changes requiring minimal simple non-repetitive action to implement were more likely to be successful as they are easy to achieve. Provision of safety equipment with free installation required only minimal effort by participants and so were those that had greatest effect		Moderate
	Intervention features found to be facilitators related to home injury prevention interventions for pre-		Moderate

	<p>school children (5 years and under) include deliverer characteristics.</p> <p>Professionals such as family caseworkers or parent educators were used in some studies; they had on-going relationships with the families and so were accepted in the home.</p> <p>Using child health professionals to deliver safety messages at pre-arranged appointments at home or the clinic had many benefits since they were trusted familiar figures and many had established relationships with families.</p> <p>Some studies found trained lay community volunteers able to deliver messages in the primary language of participants or of the same ethnic origin important. Trained local volunteers were more acceptable to some communities and their involvement was retained with team-building activities.</p> <p>Benefits to the deliverers of the study interventions include: improved communication and counselling skills and provision of anticipatory guidance about home safety, which helped with sustaining the interventions.</p> <p>The time or place of delivering the intervention was highlighted in some studies, including using a computer kiosk in a busy ED and a paediatric setting providing credibility and relevance for some messages.</p>		
	<p>Intervention features found to be facilitators related to home injury prevention interventions for pre-school children (5 years and under) include equipment accessibility.</p> <p>Provision and free fitting of safety equipment, particularly for low-income families, was important to the success of many studies.</p> <p>Provision of coupons to purchase equipment was less successful in increasing equipment use.</p> <p>Studies which did not have funds to provide free equipment gave advice, information about local suppliers and facilitated access to equipment for low-income families. While this was better than nothing, it was not found to be as successful as provision and free fitting.</p>		Moderate
	<p>Intervention features found to be facilitators related to home injury prevention interventions for pre-school children (5 years and under) include behaviour change.</p>		Moderate

	<p>Simple methods for reinforcing messages by sending annual reminders, continued contact with health professionals who reminded them, and group sessions in clinics and poster displays were all described as having some success.</p> <p>Motivational techniques were used to change behaviour, such as an elaboration likelihood model for injury prevention education, where motivation was shown to be greater when information was perceived as personally relevant to participants.</p> <p>Increasing self-efficacy through skills training was used successfully in several studies. Others used combinations of self-efficacy with health belief models, behaviour profiles and educational principles, which have been shown to be effective for other health education interventions. These combinations were thought to maximize the potential for behaviour change.</p> <p>Several studies stressed the importance of achieving organizational change (particularly in local government) to increase safety behaviours. Others used a combination of multicomponent, multi-agency and media attention to achieve their goals.</p> <p>An important factor in many studies was the involvement and awareness of the local community, which improved participation and increased accident risk awareness over a longer period of time than the study lasted. Several studies suggested that it is vital to understand community perceptions and values and address them in order to be able to influence behaviour changes.</p>		
	<p>Intervention features found to be facilitators related to home injury prevention interventions for pre-school children (5 years and under) include incentives.</p> <p>A range of incentives were used to encourage participation in the studies, including financial incentives to complete outcome assessments, free first-aid training and crèche facilities, activities for children while parents attended training and vouchers.</p>		Moderate
	<p>Facilitator: Approach used</p> <p>Home visits by appointment with provision of safety equipment and concentrating on home injury were felt to improve the success of interventions and use of safety devices and to reduce risks.</p> <p>A combination of tailored education and environmental measures was identified in many</p>		Moderate

	<p>studies as important for success.</p> <p>Sessions which incorporated health education linked to the causes of home injuries were well accepted by parents and found to be cost effective to deliver.</p> <p>Community involvement and awareness raising helped to reduce the stigma from parenting interventions: advice from community leaders, using volunteer community workforce as home visitors to reach high-risk populations and to optimize the possibility of change, and sensitizing the whole community to normalize safety practices were all described as successful approaches to take.</p> <p>Partnership working with a range of other organizations, including the National Health Service (NHS), local authorities, lay and voluntary groups and the media, to produce effective joint working were features of several successful studies.</p> <p>Tailored methods for different socio-economic, ethnic and educational groups were felt to be more likely to change behaviour especially for those with less education</p>		
	<p>Intervention features found to be barriers related to home injury prevention interventions for pre-school children (5 years and under) include: complex interventions, cultural, socio-economic, physical and behavioural barriers and deliverer constraints.</p>		Moderate
	<p>Recommend targeted programmes involving a combination of education and environmental change.</p>		Moderate
	<p>Recommend targeted programmes that measure or involve behaviour change models.</p>		Moderate
Other comments	<p>57 papers included in the analysis</p> <p>Study designs included were randomized and nonrandomized controlled trials (including quasirandomized studies) and controlled before and after studies.</p> <p>Interventions included in the review were home safety education provided by health or social care professionals, lay workers or voluntary or other facilitators and barriers for home injury prevention organizations, to individual, or groups of, children or families, aiming to increase home safety practices or use of home safety equipment or reduce home injuries. Interventions offered in health care settings (primary care and secondary care e.g. primary care practices, clinics, out-patient departments EDs and hospital wards) and the homes of children and families were included. Community-based trials with multi-faceted interventions were included if they incorporated individual home safety education or group education. Interventions involving the provision of free, low cost or discounted safety equipment were also included.</p> <p>Limitations to the studies found in the reviews included the length of follow-up available and the contamination of control groups.</p>		

ID	A6		
Citation	Health Promot Int. 2011 Sep;26(3):376-92. doi: 10.1093/heapro/daq074. Epub 2010 Dec 3. Preventing unintentional injuries to children in the home: a systematic review of the effectiveness of programmes supplying and/or installing home safety equipment. Pearson M, Garside R, Moxham T, Anderson R.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21131627		
Type of evidence	Systematic review	Publication Date	December 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Few programmes reduce injury rates in children (aged up to 15 years) except where home safety equipment is supplied in conjunction with a home risk assessment, although this effect was only evident in households where a child had previously suffered an unintentional injury.	Strength of evidence	Moderate
	The distribution of smoke alarms alone is insufficient for improving installation rates; programmes containing an education component showed more success.		Moderate
	Interventions integrated into wider health programmes, where trusting relationships with householders were cultivated and/or where specific safety issues identified by a community were responded to showed greater success in increasing smoke alarm installation rates.		Moderate
	The evidence of effectiveness on installation rates of other home safety equipment is highly mixed, although there is some evidence to suggest that installation rates always decrease after 6 months.		Moderate
	Where stair gates are both supplied and installed, inequalities in rates of use may be reduced.		Moderate
Other comments	19 included studies: 9 randomized-controlled trials, 3 were cluster randomized-controlled trials, 3 were controlled before and after studies and 4 were before and after studies. Quality appraisal resulted in 10 of the reports being rated as '++', 8 as '+' and 4 as '-'.		

ID	A7		
Citation	Inj Prev. 2011 Apr;17(2):119-26. doi: 10.1136/ip.2010.026989. Epub 2010 Nov 21. Barriers to, and facilitators of, the prevention of unintentional injury in children in the home: a systematic review and synthesis of qualitative research. Smithson J, Garside R, Pearson M.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21097943		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence	External (legal, policy or organisational) barriers to	Strength of	Low

statements (note population, intervention and outcomes)	unintentional injury in children in the home: Weak legislation, Absence of policy drivers influencing resources, Lack of appropriate information to parents/households about legislation and policies, disempowering effects of living in rented or overcrowded living conditions.	evidence	
	External (legal, policy or organisational) facilitators of unintentional injury in children in the home: Policy drivers and legislation, Multi-agency partnerships, linking with other health messages or initiatives, Good communication between organisations and target audiences. Involving local people (eg, mothers) to be trained in health initiatives. Targeting of population (eg, schoolchildren) to share information.		Low
	Physical or environmental barriers to unintentional injury in children in the home: Practical barriers due to poor quality (often rented) housing, Lack of maintenance of smoke alarms, Cost of installing safety devices, Costs of accessing treatment.		Low
	Physical or environmental facilitators of unintentional injury in children in the home: Stable and child-friendly accommodation, Control/ownership of home environment, Landlords' attention to safety issues, Provision of appropriate and durable equipment, Maintenance of and confidence in other safety devices, Training in installation and equipment use/replacement		Low
	Individual barriers to unintentional injury in children in the home: Lack of awareness of risk, Fatalism about nature of injuries, Cultural differences in experiences and expectations, Cultural practices in different cultural context, Language barriers, Relationship with partner, Mistrust of officials, Fear of being accused of abuse or neglect, Not trusting neighbours/non-family to look after child.		Low
	Individual facilitators of unintentional injury in children in the home: Culturally sensitive information and advice systems, Social connectedness rather than isolation, Building trust in officials via peer education.		Low
Other comments	<p>Nine peer-reviewed journal articles were included The methodological quality of the study reports was mixed four were rated as poor, four as adequate, one as good.</p> <p>The review highlights ways in which health inequalities affect the take up and success of home safety interventions, and how health workers can use this knowledge to facilitate future interventions.</p>		

ID	A8
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Citation	Curr Opin Pediatr. 2008 Dec;20(6):719-23.Advances in the prevention of children's injuries: an examination of four common outdoor activities. Parkin PC, Howard AW.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19023919		
Type of evidence	Review (non-systematic)	Publication Date	December 2008
Quality of study	3 (non-analytic studies, e.g. case reports, case series)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	There is evidence for the effectiveness of bicycle helmets in the prevention of children's injuries.	Strength of evidence	High
	There is evidence for the effectiveness of promotion of bicycle helmets at a community level and through physician counselling, and legislation in the prevention of children's injuries.		Moderate
	There is evidence for the effectiveness for the effectiveness of implementing playground safety standards in the prevention of children's injuries.		Moderate
	There is evidence for the effectiveness for the effectiveness of modifications to the pedestrian physical environment in the prevention of children's injuries.		High
Other comments	This review highlights findings from recent literature regarding the prevention of injuries from four common outdoor activities: bicycling, snowboarding and skiing, walking and playground activity.		

ID	A9		
Citation	J Postgrad Med. 2008 Oct-Dec;54(4):280-6.Preventing child maltreatment: an evidence-based update. Gonzalez A, MacMillan HL.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18953147		
Type of evidence	Review (non-systematic)	Publication Date	December 2008
Quality of study	3 (non-analytic studies, e.g. case reports, case series)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Most programs targeting at-risk families have not shown evidence of effectiveness in preventing abuse or neglect.	Strength of evidence	Moderate
	The American 'Nurse Family Partnership' (NFP) is a program provided by nurses to first-time socially disadvantaged mothers beginning prenatally that shows consistent effects in reducing reports of maltreatment and associated outcomes as well as additional benefits in maternal and child health in high-risk families.		Moderate
	New Zealand's 'Early Start' program provided by nurses and social workers to at-risk families beginning postnatally shows reduced rates of parental reports of severe abuse and hospital attendance for injuries and		Moderate

	poisonings, based on records.		
Other comments	<p>This review summarizes information about programs aimed at the prevention of child maltreatment evaluated by controlled trials, with a focus on home visitation programs.</p> <p>The review is not exhaustive in its discussion of prevention programs, but highlights major interventions that meet stringent methodological criteria.</p>		

ID	A10		
Citation	Br J Sports Med. 2007 Oct;41(10):627-38. Epub 2007 May 11. Strategies to prevent injury in adolescent sport: a systematic review. Abernethy L, Bleakley C.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/17496070		
Type of evidence	Systematic review	Publication Date	October 2007
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	<p>Injury prevention strategies for adolescent (12-18 year olds) sport that focus on preseason conditioning are effective.</p> <p>There is poor evidence from one cohort study and moderate evidence from one randomised controlled study that 6 weeks of preseason conditioning can significantly reduce injury rate in female athletes.</p>	Strength of evidence	Low
	<p>Injury prevention strategies for adolescent (12-18 year olds) sport that focus on education, balance and sport-specific skills, which should be continued throughout the sporting season, are effective.</p> <p>There is moderate evidence that all the reviewed injury-prevention strategies carried out throughout the playing season prevented injury.</p>		Moderate
	<p>The evidence for the effectiveness of protective equipment in adolescent (12-18 year olds) sport injury prevention is inconclusive.</p>		Low
Other comments	<p>Assessment of 154 papers found 12 studies eligible for inclusion.</p> <p>Randomised controlled trials, non-randomised intervention studies and cohort studies, published in English, were considered.</p>		

ID	A11		
Citation	Patient Educ Couns. 2006 Dec;64(1-3):35-42. Epub 2006 Sep 29. The role of health professionals in childhood injury prevention: a systematic review of the literature. Woods AJ.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/17011153		
Type of evidence	Systematic review	Publication Date	December 2006
Quality of study	Choose an item	Region	International - western style

			countries
Evidence statements (note population, intervention and outcomes)	Health professionals' knowledge regarding childhood injury prevention was reported to be variable.	Strength of evidence	Low
	Health professionals' generally have a positive attitude towards childhood injury prevention.		Low
	Even with health professionals having adequate knowledge and positive attitudes there appear to be barriers in prevention practice.		Low
	Childhood injury prevention training may be effective at increasing health professionals' knowledge and changing their attitudes.		Low
	Legislative and engineering measures regarding childhood injury prevention may be more effective at reducing the burden of childhood injuries.		Low
Other comments	<p>25 primary studies were retrieved, the majority of which were surveys.</p> <p>The quality of the studies varied with one systematic review and two randomized controlled trials. Most of the studies were postal surveys from Europe and North America.</p> <p>The limitations of the data are such that any conclusions have to be drawn tentatively.</p>		

ID	A12		
Citation	Inj Prev. 2009 Jun;15(3):197-204. doi: 10.1136/ip.2008.020677.The effect of education and home safety equipment on childhood thermal injury prevention: meta-analysis and meta-regression. Kendrick D, Smith S, Sutton AJ, Mulvaney C, Watson M, Coupland C, Mason-Jones A.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19494100		
Type of evidence	Meta analysis	Publication Date	June 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Home safety education, especially with the provision of safety equipment, is effective in increasing some childhood thermal injury prevention practices, but there is insufficient evidence to show whether this also reduces injury rates.	Strength of evidence	Moderate
	<p>Home safety education was effective in increasing the proportion of families having a safe hot tap water temperature and a functional smoke alarm, and there was some evidence that it may be effective in increasing the use of fireguards.</p> <p>Effect sizes appeared to be larger where safety equipment was provided in addition to home safety education and over shorter rather than longer time periods for some outcomes.</p> <p>Significant effects were found for follow-up periods of</p>		Moderate

	4 months or more for having a safe hot tap water temperature, a functional smoke alarm and a fitted fireguard.		
	There was some evidence they increased possession of fitted fireguards, but there was a lack of evidence that interventions reduced medically attended thermal injury rates.		Moderate
	There was no consistent evidence that the effectiveness of interventions varied by social group.		Moderate
	Overall there was a lack of evidence that home safety education increased possession of fire extinguishers, helped parents keep matches and lighters or hot food and drinks out of reach, or reduced rates of thermal injuries.		Moderate
Other comments	<p>110 articles included in the review, 24 studies included in meta-analysis (RCTs=17, Non-RCTs=3, CBAs=4)</p> <p>Systematic review and meta-analysis using individual participant data (IPD) evaluating home safety education with or without provision of free or discounted safety equipment provided to children or young people aged 0–19 years.</p> <p>The findings were robust to study quality except that effect sizes were smaller among the two studies reporting having a functional smoke alarm with blinding of outcome assessment (OR 1.02, 95% CI 0.73 to 1.43) than among those without blinded outcome assessment (OR 3.50, 95% CI 1.47 to 8.36).</p>		

ID	A13		
Citation	Am J Prev Med. 2008 Oct;35(4):370-379. doi: 10.1016/j.amepre.2008.06.038.Preventing childhood falls at home: meta-analysis and meta-regression. Kendrick D, Watson MC, Mulvaney CA, Smith SJ, Sutton AJ, Coupland CA, Mason-Jones AJ.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18779031		
Type of evidence	Meta analysis	Publication Date	October 2008
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	In relation to preventing childhood falls at home, home-safety education and the provision of safety equipment improved some fall prevention practices (age 0-19 years).	Strength of evidence	Moderate
	In relation to preventing childhood falls at home, the impact of home-safety education and the provision of safety equipment on fall-injury rates is unclear (age 0-19 years).		Low
	In relation to preventing childhood falls at home, there was some evidence that the effect of home-safety interventions varied by social group (age 0-19 years).		Moderate

	There was a greater effect seen among families living in rented accommodation for stair-gate use, for families with male children for window locks, and a smaller effect for families from a black or minority ethnic group for baby-walker use.		
	Home-safety interventions, most of which provided free or subsidized stair gates, were effective in increasing stair-gate use.		High
	There was some evidence that home-safety interventions reduced baby-walker use.		Moderate
	There was little evidence that home-safety interventions increased possession of window locks, screens, or windows with limited opening or of nonslip bath mats or decals.		Low
Other comments	<p>Included 21 studies, 13 of which contributed to meta-analyses.</p> <p>A systematic review of literature was conducted up to June 2004 and meta-analysis using individual patient data to evaluate the effect of home-safety interventions on fall-prevention practices and fall-injury rates. Meta-regression examined the effect of interventions by child age, gender, and social variables.</p> <p>Randomized controlled trials (RCTs), non-RCTs (e.g., quasi-RCTs), and controlled before-and-after studies were included that involved participants aged 0–19 years; that provided home safety education (with or without free, low-cost, or discounted safety equipment); and that reported fall-prevention practices and/or self-reported or medically attended falls.</p> <p>Home-safety education could be provided by health or social care professionals, school teachers, lay workers, volunteers, or other organizations to individual children, families, or groups of children and families, with the aim of either increasing home-safety practices or the use of home-safety equipment or reducing home injuries.</p>		

ID	A14		
Citation	Arch Dis Child. 2008 Jul;93(7):599-608. doi: 10.1136/adc.2007.133686. Epub 2008 Mar 12. Effect of education and safety equipment on poisoning-prevention practices and poisoning: systematic review, meta-analysis and meta-regression. Kendrick D, Smith S, Sutton A, Watson M, Coupland C, Mulvaney C, Mason-Jones A.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18337279		
Type of evidence	Systematic review	Publication Date	July 2008
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention)	Home safety education and the provision of safety equipment improve poison-prevention practices.	Strength of evidence	High
	The impact of home safety education and the provision of safety equipment on poisoning rates is unclear.		Low

n and outcomes)	Home safety education and the provision of safety equipment interventions are unlikely to widen inequalities in childhood poisoning-prevention practices.		Moderate
	Home safety education that includes poison prevention, especially where cupboard locks, ipecac and PCC number stickers are provided free or at low cost, is effective in increasing safe storage of medicines and cleaning products, the possession of ipecac, and having the PCC number accessible.		High
	Interventions were more effective in increasing having the PCC number accessible among families with at least one unemployed parent than among families with both parents employed.		Moderate
Other comments	<p>18 studies included in meta analysis (14 RCTs, 2 non-RCTs. 2 CBAs)</p> <p>Objective: To assess (a) the effect of home safety education and the provision of safety equipment on poison-prevention practices and poisoning rates, and (b) whether the effect of interventions differs by social group.</p>		

ID	A15		
Citation	Am J Prev Med. 2007 Feb;32(2):151-62.Non-agricultural work injuries among youth: a systematic review. Breslin FC, Day D, Tompa E, Irvin E, Bhattacharyya S, Clarke J, Wang A.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/17234490		
Type of evidence	Systematic review	Publication Date	February 2007
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Interventions targeting non-agricultural work injuries among youth (12-24 years old) need to target modifiable risk factors. This systematic review pointed to two job/workplace factors that are potentially modifiable: hazard exposure and work pace pressure.	Strength of evidence	Moderate
	Regarding non-agricultural work injuries among youth (12-24 years old), the multiple determinants of work injury highlight the need to develop interventions and policies that focus on multiple factors rather than one-dimensional approaches that target a specific factor.		Moderate
Other comments	Only nine studies met the relevance and quality criteria.		

6.2 Sub-topic: Interventions to prevent falls, accidents and injuries (adults)

Search record

4.2.1 11 publications met the search criteria.

Full Tabulated results

The following data forms present the detailed systematic review and meta-analysis findings of the literature review. For further information on: 'type of evidence', 'quality of study' and 'strength of evidence' see the methods statement on evidence classification (Section 3.4). Summary results are provided in the results section (Section 4). Results are presented chronologically starting with the most recent.

ID	B1		
Citation	Cost-effectiveness of injury prevention -a systematic review of municipality based interventions Harald Gyllensvärd.2010		
Web link	http://www.resource-allocation.com/content/pdf/1478-7547-8-17.pdf		
Type of evidence	Systematic review	Publication Date	January 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Regarding cost effectiveness of injury prevention, results indicate that there are injury prevention interventions that offer good use of societal resources.	Strength of evidence	Low
	Regarding cost effectiveness of injury prevention, there is a lack of economic evidence surrounding injury prevention interventions, especially in low- and middle-income countries.		Low
	In general, it seems interventions targeted at high risk individuals are more cost-effective. Probably, this is the case if the cost of identification of high-risk individuals does not reduce cost-effectiveness.		Low
Other comments	<p>Of 791 potential articles 20 were accepted for inclusion</p> <p>The interventions targeted a range of areas such as traffic safety, fire safety, hip fractures, and sport injuries.</p> <p>Studies were also conducted across different settings, comprising eight studies from North America, eight from Europe, and four from Australia and New Zealand as well as different populations, with the main focus on elderly people with 15 interventions solely targeting them.</p> <p>Results indicate great disparities in methodologies used, which make comparisons more difficult. The outcomes of many interventions are also context dependent. Hence, the results and their transferability should be interpreted with caution.</p>		

ID	B2		
Citation	J Physiother. 2012;58(3):145-56. doi: 10.1016/S1836-9553(12)70105-4. Physical activity improves strength, balance and endurance in adults aged 40-65 years: a systematic review. Ferreira ML, Sherrington C, Smith K, Carswell P, Bell R, Bell M, Nascimento DP, Máximo Pereira LS, Vardon P.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22884181		
Type of evidence	Systematic review	Publication Date	January 2012
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	This review found that muscle strength, balance, and endurance can be improved by physical activity in people aged 40–65 years. There were bigger effects on muscle strength from programs that used resistance exercises.	Strength of evidence	Moderate
	One trial documented a small and non-significant effect of physical activity on long-term falls but trials have not documented an effect of physical activity in people aged 40–65 on short-term falls.		Low
	Given the importance of strength and balance as risk factors for falls in elderly people, it is possible that future falls would be prevented by adoption and maintenance of physical activity programs by people aged 40–65. Such programs should include strength and balance components.		Low
Other comments	<p>Twenty-three eligible trials were identified and 17 of these were pooled in the meta-analyses</p> <p>Earliest record to February 2010</p> <p>Question: Can physical activity in healthy adults aged 40–65 years enhance strength and balance and prevent falls?</p> <p>Intervention: Programs that involved the performance of any physical activity in community settings and workplaces.</p> <p>Outcome measures: Strength, balance, endurance, and falls rate.</p>		

ID	B3		
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Citation	Inj Prev. 2009 Oct;15(5):341-7. doi: 10.1136/ip.2008.021303.The role of alcohol in unintentional falls among young and middle-aged adults: a systematic review of epidemiological studies. Kool B, Ameratunga S, Jackson R.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19805604		
Type of evidence	Systematic review	Publication Date	October 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Studies showed an increased risk of unintentional falls among young and middle-aged adults with increasing exposure to alcohol use, the magnitude of this risk varied considerably across studies.	Strength of evidence	Moderate
	Acute alcohol use (within six hours of the event) contributes to unintentional fall risk, resulting in serious injury among young and middle-aged adults, and accounts for at least a threefold increase in risk.		Moderate
	Modest evidence of a dose-response relationship of acute alcohol use and unintentional falls among young and middle-aged adults was observed.		Low
	The association between usual alcohol use and the risk of unintentional falls among young and middle-aged adults was inconclusive.		Low
	Evidence of a gender difference regarding the role of alcohol in unintentional falls among young and middle-aged adults was inconsistent.		Low
Other comments	<p>Four case-control, three cohort and one case-crossover study fulfilled the inclusion criteria</p> <p>Of the 106 studies identified from the search strategy, 54 were considered potentially relevant based on the title or abstract and the full text retrieved for detailed evaluation.</p> <p>Eight studies from the United States, 15–18 Finland, 13 19 Sweden, 20 and Canada, 21 published between 1983 and January 2005, fulfilled the review inclusion criteria</p>		

ID	B4		
Citation	J Sci Med Sport. 2010 May;13(3):309-17. doi: 10.1016/j.jsams.2009.05.002. Epub 2009 Jul 7. A systematic review on the effectiveness of external ankle supports in the prevention of inversion ankle sprains among elite and recreational players. Dizon JM, Reyes JJ.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19586798		
Type of evidence	Systematic review	Publication Date	May 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Found a reduction in ankle sprain by 69% (OR 0.31, 95% CI 0.18–0.51) with the use of ankle brace among previously injured athletes (adolescents and adults, elite and recreational players).	Strength of evidence	Moderate
	Found a reduction in ankle sprain by 71% (OR 0.29, 95% CI 0.14–0.57) with the use of ankle tape among previously injured athletes (adolescents and adults, elite and recreational players).		Moderate
	No type of ankle support was found to be superior than the other in reduction of ankle sprains among adolescents and adults, elite and recreational players.		Low
Other comments	Total of seven trials were finally included in this study. The studies included were of moderate quality, with blinding as the hardest criteria to fulfill.		

ID	B5		
Citation	Am J Prev Med. 2010 Jan;38(1 Suppl):S156-81. doi: 10.1016/j.amepre.2009.10.023.Prevention of physical training-related injuries recommendations for the military and other active populations based on expedited systematic reviews. Bullock SH, Jones BH, Gilchrist J, Marshall SW.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/20117590		
Type of evidence	Systematic review	Publication Date	Click here to enter a date.
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Education, leadership support, injury surveillance, and research were determined to be critical components of any successful injury prevention program for the military and any other active population.	Strength of evidence	Low
	The following interventions had strong enough evidence to become working group recommendations for implementation in the military services (and applicable to any other active population): prevent overtraining, agility-like training, mouthguards, semirigid ankle braces, nutrient replacement, and synthetic socks.		Moderate
	Back braces and pre-exercise administration of anti-inflammatory medication were not recommended for implementation in the military services due to evidence of ineffectiveness or harm (also applicable to any other active population).		Moderate
Other comments	This review was completed as a result of collaboration between the U.S. Army Center for Health Promotion and Preventive Medicine and injury prevention and fitness experts for the Military Training Task Force of the Defense Safety Oversight Council.		

ID	B6		
Citation	Sports Med. 2007;37(2):117-44.Mouthguards in sport activities : history, physical properties and injury prevention effectiveness. Knapik JJ, Marshall SW, Lee RB, Darakjy SS, Jones SB, Mitchener TA, delaCruz GG, Jones BH.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed?term=17241103		
Type of evidence	Systematic review	Publication Date	January 2007
Quality of study	2++ (High quality SR of non-RCT studies; or high quality non-RCT studies with a very low bias risk and high probability of a causal relationship)	Region	North America
Evidence statements (note population, intervention and outcomes)	Among participants undertaking sporting activities or exercise (participants in over half of studies were U.S. high-school students) mouthguard non-users received significantly more orofacial injuries (RR 1.86, 95% CI: 1.76, 1.96) than mouthguard users (all studies). This result remained significant for all subgroup analyses.	Strength of evidence	Moderate
	There was insufficient evidence to determine protection of mouthguards against concussion among participants undertaking sporting activities or exercise (participants in over half of the included studies were U.S. high-school students).		Low
Other comments	<p>Fourteen studies were included in the review. Thirteen studies reported 296,967 participants. The other study reported only the number of sporting exposures, of which there were 70,936, rather than the number of participants.</p> <p>There was one randomised controlled trial (n=301), two non-randomised interventions (n=1000), four prospective cohorts (n=1,043 plus 70,936 exposures), three ecological interventions (n=246,319), three cross-sectional surveys (n=47,914) and one unclear study design (n=390).</p> <p>The quality of the included studies ranged from 16 to 75 out of a possible 100, with elderly studies generally receiving lower scores than more recent studies. Few studies reported on the compliance of participants to wear mouthguards.</p> <p>The extent to which these conclusions are reliable is unclear given the limited reporting of review methods and questions about the appropriateness of pooling results from variable studies.</p>		

ID	B7		
Citation	Arch Intern Med. 2007 Aug 13-27;167(15):1585-92.Prevention of sports injuries: systematic review of randomized controlled trials. Aaltonen S, Karjalainen H, Heinonen A, Parkkari J, Kujala UM.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed?term=17698680		
Type of evidence	Systematic review	Publication Date	August 2007
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	A decreased risk of sports injuries was associated with the use of insoles. In 5 trials including 6 different comparisons (2446 participants), custom-made or prefabricated insoles reduced lower limb injuries compared with no insoles in military recruits (risk reduction _50% in 4 comparisons).	Strength of evidence	Moderate
	A decreased risk of sports injuries was associated with the use of external joint supports. All 7 studies investigating external joint supports (10 300 participants) showed a tendency to prevent ankle, wrist, or knee injuries (risk reduction _50% in 5 studies).		Moderate
	A decreased risk of sports injuries was associated with the use of multi-intervention training programs. All 6 multi-intervention training programs (2809 participants) were effective in preventing sports injuries (risk reduction _50% in 5 studies).		Moderate
Other comments	Thirty-two trials (24 931 participants) met the inclusion criteria. The scores for methodological quality of the 32 trials varied from 1 to 8 of 11 points. The mean score was 3.8 points, which we deemed as poor to- moderate general methodological quality.		

ID	B8		
Citation	Spine J. 2009 Feb;9(2):147-68. doi: 10.1016/j.spinee.2008.11.001.High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults. Bigos SJ, Holland J, Holland C, Webster JS, Battie M, Malmgren JA.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19185272		
Type of evidence	Systematic review	Publication Date	February 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Exercise programs are effective for preventing self-reported back problems in working-age adults.	Strength of evidence	High
	Interventions not effective for preventing self-reported back problems in working-age adults includes education alone (ergonomic, back school, stress management)		High
	Interventions not effective for preventing self-reported back problems in working-age adults includes back supports (back belts).		High
	Interventions not effective for preventing self-reported back problems in working-age adults includes shoe inserts		High
	Interventions not effective for preventing self-reported back problems in working-age adults includes programs for reducing lifting		High
Other comments	<p>Of 185 articles identified as potentially relevant, 20 trials (11%) met inclusion criteria.</p> <p>Systematic review followed a rigorous methodology and included only high-quality prospective controlled trials.</p> <p>Review found remarkable consistency, as each type of intervention had strong evidence that the intervention either was or was not effective.</p> <p>90% of the included trials were in workplace settings, and half evaluated health-care workers, therefore findings should be particularly relevant to workplace prevention efforts.</p>		

ID	B9		
Citation	Cochrane Database Syst Rev. 2012 Aug 15;8:CD008570. doi: 10.1002/14651858.CD008570.pub2. Ergonomic design and training for preventing work-related musculoskeletal disorders of the upper limb and neck in adults. Hoe VC, Urquhart DM, Kelsall HL, Sim MR.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22895977		
Type of evidence	Systematic review	Publication Date	August 2012
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	There was moderate-quality evidence that arm support with alternative mouse reduced the incidence of neck/shoulder disorders but not the incidence of right upper limb MSDs in adults.	Strength of evidence	Moderate
	There was low-quality evidence that evidence that arm support with alternative mouse reduced neck/shoulder discomfort and right upper limb discomfort in adults.		Low
	There was moderate-quality evidence that the incidence of neck/shoulder and right upper limb disorders in adults were not reduced when comparing alternative mouse and conventional mouse, arm support and no arm support with conventional mouse and alternative mouse with arm support and conventional mouse with arm support.		Moderate
	There was low-quality evidence that using an alternative mouse with arm support compared to conventional mouse with arm support reduced neck/shoulder discomfort in adults.		Low
	There was low- to very low-quality evidence that other interventions were not effective in reducing work-related upper limb and neck MSDs in adults.		Low
Other comments	Included 13 RCTs (2397 workers). Eleven studies were conducted in an office environment and two in a healthcare setting. US, Canada, Finland & Sweden.		

ID	B10		
Citation	Cochrane Database Syst Rev. 2008 Jan 23;(1):CD006398. doi: 10.1002/14651858.CD006398.pub2. Interventions for preventing injuries in the agricultural industry. Rautiainen RH, Lehtola MM, Day LM, Schonstein E, Suutarinen J, Salminen S, Verbeek J.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18254102		
Type of evidence	Systematic review	Publication Date	January 2008
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	The studies provided no evidence that the educational interventions had an injury reducing effect in the agricultural industry.	Strength of evidence	Very low
	Insurance premium discounts as a financial incentive decreased injuries claims in one study on the agricultural industry.		Low
	Specific legislative mandates expanding the use of Rollover Protective Structures (ROPS) on tractors were not associated with a reduction of injuries in one study on the agricultural industry.		Low
	Legislation to ban Endosulfan pesticides was associated with a reduction in fatal poisonings in the long term in one study on the agricultural industry.		Low
Other comments	Five randomised controlled trials (RCTs) with 11,565 participants and three interrupted time series studies (ITs) with 26.3 data points on average met the criteria. The methodological quality was rated as less than high for all included studies.		

ID	B11		
Citation	Cochrane Database Syst Rev. 2012 Dec 12;12:CD006251. doi: 10.1002/14651858.CD006251.pub3. Interventions to prevent injuries in construction workers. van der Molen HF, Lehtola MM, Lappalainen J, Hoonakker PL, Hsiao H, Haslam R, Hale AR, Frings-Dresen MH, Verbeek JH.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/23235627		
Type of evidence	Systematic review	Publication Date	December 2012
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	There is no evidence that introducing regulations for reducing fatal and nonfatal injuries are effective at reducing injuries in construction workers.	Strength of evidence	Low
	There is no evidence that regionally oriented safety campaigns, training, inspections nor the introduction of occupational health services are effective at reducing non-fatal injuries in construction companies.		Low
	There is low quality evidence that company-oriented safety interventions such as a multifaceted safety campaign and a multifaceted drug workplace programme can reduce non-fatal injuries among construction workers.		Low
	Continuing company-oriented interventions among management and construction workers, such as a targeted safety campaign or a drug-free workplace programme, seem to have an effect in reducing injuries among construction workers in the longer term.		Moderate
Other comments	<p>Thirteen studies, 12 ITS and one CBA study met the inclusion criteria.</p> <p>The overall risk of bias among the included studies was high as it was uncertain for the ITS studies whether the intervention was independent from other changes and thus could be regarded as the main reason of change in the outcome.</p> <p>USA, UK, Italy, Denmark, Finland, Austria, Belgium, Germany.</p>		

6.3 Sub-topic: Interventions to prevent falls, accidents and injuries (elderly)

Search record

4.3.1 17 publications met the search criteria.

Full Tabulated results

The following data forms present the detailed systematic review and meta-analysis findings of the literature review. For further information on: 'type of evidence', 'quality of study' and 'strength of evidence' see the methods statement on evidence classification (Section 3.4). Summary results are provided in the results section (Section 4). Results are presented chronologically starting with the most recent.

ID	C1		
Citation	NICE Guidance. Falls: The assessment and prevention of falls in elderly people. November 2004		
Web link	http://publications.nice.org.uk/falls-cg21		
Type of evidence	Systematic review	Publication Date	November 2004
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	Case/ Risk identification: Elderly people in contact with healthcare professionals should be asked routinely whether they have fallen in the past year and asked about the frequency, context and characteristics of the fall/s.	Strength of evidence	High
	Case/ Risk identification: Elderly people reporting a fall or considered at risk of falling should be observed for balance and gait deficits and considered for their ability to benefit from interventions to improve strength and balance.		High
	Multifactorial falls risk assessment: Elderly people who present for medical attention because of a fall, or report recurrent falls in the past year, or demonstrate abnormalities of gait and/or balance should be offered a multifactorial falls risk assessment. This assessment should be performed by a healthcare professional with appropriate skills and experience, normally in the setting of a specialist falls service. This assessment should be part of an individualised, multifactorial intervention.		High
	Multifactorial falls risk assessment may include the following: identification of falls history, assessment of gait, balance and mobility, and muscle weakness, assessment of osteoporosis risk, assessment of the elderly person's perceived functional ability and fear relating to falling, assessment of visual impairment,		High

assessment of cognitive impairment and neurological examination, assessment of urinary incontinence, assessment of home hazards, cardiovascular examination and medication review.	
Multifactorial interventions: All elderly people with recurrent falls or assessed as being at increased risk of falling should be considered for an individualised multifactorial intervention. In successful multifactorial intervention programmes the following specific components are common (against a background of the general diagnosis and management of causes and recognised risk factors): strength and balance training, home hazard assessment and intervention, vision assessment and referral, medication review with modification/withdrawal.	High
Multifactorial interventions: Following treatment for an injurious fall, elderly people should be offered a multidisciplinary assessment to identify and address future risk and individualised intervention aimed at promoting independence and improving physical and psychological function.	High
Strength and balance training is recommended. Those most likely to benefit are elderly community-dwelling people with a history of recurrent falls and/or balance and gait deficit. A muscle-strengthening and balance programme should be offered. This should be individually prescribed and monitored by an appropriately trained professional.	High
Multifactorial interventions with an exercise component are recommended for elderly people in extended care settings who are at risk of falling.	High
Home hazard and safety intervention: Elderly people who have received treatment in hospital following a fall should be offered a home hazard assessment and safety intervention/modifications by a suitably trained healthcare professional. This should normally be part of discharge planning and be carried out within a timescale agreed by the patient or carer, and appropriate members of the healthcare team.	High
Home hazard and safety intervention: Home hazard assessment is shown to be effective only in conjunction with follow-up and intervention, not in isolation.	High
Elderly people on psychotropic medications should have their medication reviewed, with specialist input if appropriate, and discontinued if possible to reduce their risk of falling.	High
Cardiac pacing should be considered for elderly people with cardioinhibitory carotid sinus	High

	hypersensitivity who have experienced unexplained falls.		
	<p>To promote the participation of elderly people in falls prevention programmes the following should be considered:</p> <p>Healthcare professionals involved in the assessment and prevention of falls should discuss which changes a person is willing to make to prevent falls.</p> <p>Information should be relevant and available in languages other than English.</p> <p>Falls prevention programmes should also address potential barriers such as low self-efficacy and fear of falling, and encourage activity change as negotiated with the participant.</p>		High
	<p>Encouraging the participation of elderly people in falls prevention programmes: Practitioners who are involved in developing falls prevention programmes should ensure that such programmes are flexible enough to accommodate participants' different needs and preferences and should promote the social value of such programmes.</p>		High
	<p>Education and information giving: All healthcare professionals dealing with patients known to be at risk of falling should develop and maintain basic professional competence in falls assessment and prevention.</p>		High
	<p>Education and information giving: Individuals at risk of falling, and their carers, should be offered information orally and in writing about:</p> <ul style="list-style-type: none"> what measures they can take to prevent further falls how to stay motivated if referred for falls prevention strategies that include exercise or strength and balancing components the preventable nature of some falls the physical and psychological benefits of modifying falls risk where they can seek further advice and assistance how to cope if they have a fall, including how to summon help and how to avoid a long lie. 		High
	<p>There is no evidence that brisk walking reduces the risk of falling.</p>		Low
	<p>Interventions that cannot be recommended because of insufficient evidence include low intensity exercise combined with incontinence programmes.</p>		Low
	<p>Interventions that cannot be recommended because</p>		Low

	of insufficient evidence include group exercise (untargeted).		
	Interventions that cannot be recommended because of insufficient evidence include cognitive/behavioural interventions.		Low
	Interventions that cannot be recommended because of insufficient evidence include referral for correction of visual impairment.		Low
	Interventions that cannot be recommended because of insufficient evidence include Vitamin D.		Low
	Interventions that cannot be recommended because of insufficient evidence include Hip protectors.		Low
Other comments			

ID	C2		
Citation	Cochrane Database Syst Rev. 2012 Sep 12;9:CD007146. doi: 10.1002/14651858.CD007146.pub3. Interventions for preventing falls in elderly people living in the community. Gillespie LD, Robertson MC, Gillespie WJ, Sherrington C, Gates S, Clemson LM, Lamb SE.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22972103		
Type of evidence	Systematic review	Publication Date	September 2012
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Group and home-based exercise programmes reduce rate of falls and risk of falling in elderly people living in the community.	Strength of evidence	High
	Home safety interventions reduce rate of falls and risk of falling in elderly people living in the community.		High
	Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling in elderly people living in the community.		High
	Tai Chi reduces risk of falling in elderly people living in the community.		High
	Vitamin D supplementation does not appear to reduce falls in elderly people living in the community but may be effective in people who have lower vitamin D levels before treatment.		Low
Other comments	159 trials with 79,193 participants. Included randomised controlled trials and quasi-randomised trials.		

ID	C3		
Citation	J Am Med Dir Assoc. 2012 Feb;13(2):188.e13-21. doi: 10.1016/j.jamda.2011.04.022. Epub 2011 Jun 15. Effectiveness of intervention programs in preventing falls: a systematic review of recent 10 years and meta-analysis. Choi M, Hector M.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21680249		
Type of evidence	Systematic review	Publication Date	February 2012
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Fall prevention programmes were modestly effective. Identifying what were the most effective components of such a programme was extremely difficult and unclear from available research.	Strength of evidence	Low
Other comments	Seventeen studies were included in the systematic review (5,501 participants)		

ID	C4		
Citation	Int J Elderly People Nurs. 2011 Dec;6(4):299-306. doi: 10.1111/j.1748-3743.2011.00298.x. Best practice in fall prevention: roles of informal caregivers, health care providers and the community. Lach HW, Krampe J, Phongphanngam S.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22078020		
Type of evidence	Review (non-systematic)	Publication Date	December 2011
Quality of study	3 (non-analytic studies, e.g. case reports, case series)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Determining how to best promote falls prevention for all stakeholders will depend on the setting, preferences of the individual groups served, local resources, and available programmes and healthcare services.	Strength of evidence	Low
	Informal caregivers may prove an under-utilized asset that can support elderly adults at risk of falls.		Low
	Health care providers have the knowledge and can provide leadership for determining best practices across the care continuum and overcoming barriers to effective fall prevention.		Low
	Community efforts need to be strengthened to support adoption of fall prevention and a safe built environment.		Low
Other comments			

ID	C5		
Citation	J Safety Res. 2011 Dec;42(6):443-51. doi: 10.1016/j.jsr.2011.07.008. Epub 2011 Nov 10. Implementing the evidence for preventing falls among community-dwelling elderly people: a systematic review. Goodwin V, Jones-Hughes T, Thompson-Coon J, Boddy K, Stein K.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22152262		
Type of evidence	Systematic review	Publication Date	December 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Interventions that involved the active training of healthcare professionals improved implementation of interventions for preventing falls among community-dwelling elderly people.	Strength of evidence	Moderate
	The evidence around changing the way people who fall are managed within primary care practices was mixed.		Low
	The evidence around layperson delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.		Low
	The evidence around peer delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.		Low
	The evidence around community delivered models for interventions for preventing falls among community-dwelling elderly people was mixed.		Low
	Translating the evidence-base into practice involves changing the attitudes and behaviours of elderly people, healthcare professionals and organisations. There is a need for further evaluation on how this can be best achieved.		Moderate
Other comments	15 studies met the selection criteria and were included in the review. Studies undertaken in: US, Australia, Canada, New Zealand, Sweden, Belgium, Hong Kong. When examining the quality of each study (Table 1), all were found to be at a high risk of bias		

ID	C6		
Citation	N S W Public Health Bull. 2011 Jun;22(3-4):78-83. doi: 10.1071/NB10056.Exercise to prevent falls in elderly adults: an updated meta-analysis and best practice recommendations. Sherrington C, Tiedemann A, Fairhall N, Close JC, Lord SR.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21632004		
Type of evidence	Systematic review	Publication Date	June 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Exercise as a single intervention can prevent falls in elderly adults. The pooled estimate of the effect of exercise on the rate of falls indicates a 16% reduction.	Strength of evidence	Moderate
	Exercise programs that included balance training, contained a higher dose of exercise and did not include walking training have the greatest effect on reducing falls in elderly adults.		Moderate
	Ongoing exercise is necessary; the benefits of exercise are rapidly lost when exercise is ceased therefore ongoing exercise would be necessary for a lasting falls prevention effect.		Moderate
	Elderly adult falls prevention exercise should target both the general community and those at high risk for falls.		Moderate
	in exercise programs to prevent falls in elderly adults exercise may be undertaken in a group or home-based setting.		N/A
	Strength and walking training may be included in addition to balance training in exercise programs to prevent falls in elderly adults but high risk individuals should not be prescribed brisk walking programs.		Moderate
	In exercise programs to prevent falls in elderly adults other health-related risk factors should also be addressed.		Moderate
Other comments	Systematic review update includes 54 randomised controlled trials		

ID	C7		
Citation	Ann Intern Med. 2010 Dec 21;153(12):815-25. doi: 10.1059/0003-4819-153-12-201012210-00008. Primary care-relevant interventions to prevent falling in elderly adults: a systematic evidence review for the U.S. Preventive Services Task Force. Michael YL, Whitlock EP, Lin JS, Fu R, O'Connor EA, Gold R; US Preventive Services Task Force.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21173416		
Type of evidence	Systematic review	Publication Date	December 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Primary care-relevant interventions exist that can reduce falling among community-dwelling elderly adults.	Strength of evidence	Moderate
	In 16 RCTs evaluating exercise or physical therapy, interventions reduced falling (risk ratio, 0.87 [95% CI, 0.81 to 0.94]). In pooled analysis, exercise or physical therapy interventions reduced the risk for falling by 13% (CI, 6% to 19%), although most trials showed non-statistically significant differences.		Moderate
	In 9 RCTs of vitamin D supplementation, interventions reduced falling (risk ratio, 0.83 [CI, 0.77 to 0.89]). Vitamin D with or without calcium was associated with a 17% (CI, 11% to 23%) reduced risk for falling during 6 to 36 months of follow-up.		Moderate
	In 19 trials involving multifactorial assessment and management, interventions with comprehensive management seemed to reduce falling, although overall pooled estimates were not statistically significant (risk ratio, 0.94 [CI, 0.87 to 1.02]).		Moderate
	Limited evidence suggested that serious clinical harms were no more common for elderly adults in intervention groups than for those in control groups.		Low
Other comments	Included 54 RCTs (with a total of 26 102 participants) that tested primary care interventions to prevent falling. Overall, the included evidence was of fair quality. Limitations: Interventions and methods of fall ascertainment were heterogeneous. Data on potential harms of interventions were scant and often not reported.		

ID	C8		
Citation	Age Ageing. 2010 Nov;39(6):681-7. doi: 10.1093/ageing/afq102. Epub 2010 Sep 4. Does the 'Otago exercise programme' reduce mortality and falls in elderly adults?: a systematic review and meta-analysis. Thomas S, Mackintosh S, Halbert J.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/20817938		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	The 'Otago exercise programme', a strength and balance retraining programme designed to prevent falls in elderly people living in the community, significantly reduces the risk of death in elderly community-dwelling adults. The OEP significantly reduced the risk of death over 12 months [risk ratio = 0.45, 95% confidence interval (CI) = 0.25–0.80].	Strength of evidence	Moderate
	The 'Otago exercise programme', a strength and balance retraining programme designed to prevent falls in elderly people living in the community, significantly reduces the risk of falling in elderly community-dwelling adults. The OEP significantly reduced fall rates (incidence rate ratio = 0.68, 95% CI = 0.56–0.79).		Moderate
	Regarding the 'Otago exercise programme', a strength and balance retraining programme designed to prevent falls in elderly people living in the community, there was no significant difference in the risk of a serious or moderate injury occurring as the result of a fall (risk ratio = 1.05, 95% CI = 0.91–1.22).		Moderate
Other comments	The 'Otago exercise programme' (OEP) is a strength and balance retraining programme designed to prevent falls in elderly people living in the community. 7 trials, involving 1503 participants were included. The mean age of participants was 81.6 (±3.9) years.		

ID	C9		
Citation	J Am Geriatr Soc. 2010 Jul;58(7):1299-310. doi: 10.1111/j.1532-5415.2010.02949.x. Epub 2010 Jun 23. Vitamin D treatment for the prevention of falls in elderly adults: systematic review and meta-analysis. Kalyani RR, Stein B, Valiyil R, Manno R, Maynard JW, Crews DC.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/20579169		
Type of evidence	Systematic review	Publication Date	July 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Vitamin D treatment effectively reduces the risk of falls in elderly adults. There is a protective effect of vitamin D supplementation on fall prevention in community-dwelling and institutionalized elderly adults. An overall RR of 0.86 (95% CI 0.79–0.93) suggested a 14% lower risk of falls.	Strength of evidence	Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: community-dwelling participants with a mean age younger than 80.		Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: adjunctive calcium therapy.		Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: no history of fracture or fall.		Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: duration longer than 6 months.		Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: dose of 800 IU or greater.		Moderate
	The effect of vitamin D on fall reduction was significant in several subgroups of individuals: cholecalciferol therapy.		Moderate
	Other comments		Of 1,679 potentially relevant articles, 10 met inclusion criteria. The 10 studies included 2,932 participants. The included studies spanned eight countries.

ID	C10		
Citation	Br J Sports Med. 2010 Feb;44(2):80-9. doi: 10.1136/bjsm.2008.060988. Does a home-based strength and balance programme in people aged > or =80 years provide the best value for money to prevent falls? A systematic review of economic evaluations of falls prevention interventions. Davis JC, Robertson MC, Ashe MC, Liu-Ambrose T, Khan KM, Marra CA.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/20154094		
Type of evidence	Systematic review	Publication Date	February 2010
Quality of study	2++ (High quality SR of non-RCT studies; or high quality non-RCT studies with a very low bias risk and high probability of a causal relationship)	Region	Australasia
Evidence statements (note population, intervention and outcomes)	Economic evaluations of falls prevention interventions shows single interventions (such as the Otago Exercise Programme) targeted at high-risk groups can prevent the greatest number of falls at the lowest incremental costs.	Strength of evidence	Moderate
	In eight studies that reported incremental cost per fall prevented, effective interventions included strength and balance retraining. The studies testing strength and balance retraining, which had the highest quality assessment scores, prevented the greatest number of falls at the least cost.		Moderate
	In eight studies that reported incremental cost per fall prevented, effective interventions included cataract surgery.		Moderate
	In eight studies that reported incremental cost per fall prevented, effective interventions included home safety interventions.		Moderate
	A multifactorial programme was cost saving in a narrow range of individuals with four or more of eight specified risk factors for falls.		Moderate
Other comments	Nine studies meeting our inclusion criteria included eight cost-effectiveness analyses, one cost-utility and one cost-benefit analysis.		

ID	C11		
Citation	BMJ. 2009 Oct 1;339:b3692. doi: 10.1136/bmj.b3692. Fall prevention with supplemental and active forms of vitamin D: a meta-analysis of randomised controlled trials. Bischoff-Ferrari HA, Dawson-Hughes B, Staehelin HB, Orav JE, Stuck AE, Theiler R, Wong JB, Egli A, Kiel DP, Henschkowski J.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19797342		
Type of evidence	Meta analysis	Publication Date	October 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Supplemental vitamin D in a dose of 700- 1000 IU a day reduced the risk of falling among elderly individuals by 19% and to a similar degree as active forms of vitamin D.	Strength of evidence	Moderate
	Doses of supplemental vitamin D of less than 700 IU or serum 25-hydroxyvitamin D concentrations of less than 60 nmol/l may not reduce the risk of falling among elderly individuals.		Moderate
Other comments	Eight randomised controlled trials (n=2426) of supplemental vitamin D met inclusion criteria.		

ID	C12		
Citation	J Aging Health. 2009 Aug;21(5):713-29. doi: 10.1177/0898264309338298. Epub 2009 Jun 3. What works better for community-dwelling elderly people at risk to fall?: a meta-analysis of multifactorial versus physical exercise-alone interventions. Petridou ET, Manti EG, Ntinapogias AG, Negri E, Szczerbinska K.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19494361		
Type of evidence	Meta analysis	Publication Date	August 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Both exercise-alone (i.e., strength, balance training, coordination of movements) and multifactorial targeted interventions were appropriate in reducing recurrent falls among community-dwelling elderly people at risk to fall however exercise-alone interventions were about 5 times more effective compared to multifactorial ones	Strength of evidence	Moderate
	Short-term interventions, smaller samples, and younger age related to better outcomes for multifactorial interventions and exercise-alone interventions for community-dwelling elderly people at risk to fall.		Moderate
Other comments	Ten of the 52 identified studies met the preset criteria and were included in the analysis: 5 multifactorial interventions and 5 exercise-alone interventions. Four of the studies under consideration were conducted in Europe (the Netherlands, United Kingdom, Finland), four in the USA (Mississippi, Oregon, Texas, and Arkansas), one in Australia (Sydney) and one in Japan.		

ID	C13		
Citation	J Am Geriatr Soc. 2008 Dec;56(12):2234-43. doi: 10.1111/j.1532-5415.2008.02014.x.Effective exercise for the prevention of falls: a systematic review and meta-analysis. Sherrington C, Whitney JC, Lord SR, Herbert RD, Cumming RG, Close JC.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19093923		
Type of evidence	Systematic review	Publication Date	December 2008
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	There is strong evidence that exercise programs can reduce fall rates in elderly people (overall reduction of 17%).	Strength of evidence	High
	Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that include exercises that challenge balance.		Moderate
	Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that use a higher dose of exercise.		Moderate
	Greater relative effects on reducing fall rates in elderly people are seen in exercise programs that do not include a walking program.		Moderate
Other comments	44 trials involving 9,603 participants		

ID	C14		
Citation	J Aging Health. 2008;20(8):954-71. doi: 10.1177/0898264308324672.Environmental interventions to prevent falls in community-dwelling elderly people: a meta-analysis of randomized trials. Clemson L, Mackenzie L, Ballinger C, Close JC, Cumming RG.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18815408		
Type of evidence	Meta analysis	Publication Date	September 2008
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Home assessment interventions that are comprehensive, are well focused, and incorporate an environmental-fit perspective with adequate follow-up can be successful in reducing falls with significant effects among community-dwelling elderly people.	Strength of evidence	Moderate
	Regarding interventions to prevent falls in community-dwelling elderly people, the highest effects are associated with interventions that are conducted with high-risk groups.		Moderate
Other comments	6 trials eligible for inclusion. Countries of origin were Australia for three trials, Germany for one, France for one, and New Zealand for one.		

ID	C15		
Citation	J Rehabil Res Dev. 2008;45(8):1167-81.Optimizing footwear for elderly people at risk of falls. Menant JC, Steele JR, Menz HB, Munro BJ, Lord SR.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19235118		
Type of evidence	Systematic review	Publication Date	November 2008
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Optimizing footwear for elderly people at risk of falls: elderly people should wear shoes with low heels and firm slip-resistant soles both inside and outside the home.	Strength of evidence	Moderate
	Prevention of falls should also include education of elderly people and their caregivers/family regarding footwear recommendations as financial and comfort aspects likely currently outweigh safety considerations when elderly people purchase shoes.		Moderate
Other comments	Included 79 articles in this literature review		

ID	C16		
Citation	Age Ageing. 2007 Nov;36(6):656-62.Rethinking individual and community fall prevention strategies: a meta-regression comparing single and multifactorial interventions. Campbell AJ, Robertson MC.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18056731		
Type of evidence	Meta analysis	Publication Date	November 2007
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Single interventions were as effective in reducing falls in people aged 65 years and elderly as interventions with multiple components.	Strength of evidence	Moderate
	Multifactorial fall prevention interventions are effective for individual patients aged 65 years and elderly.		Moderate
	For community programmes for populations at risk, targeted single interventions are as effective as multifactorial interventions and may be more acceptable and cost effective.		Moderate
Other comments	participants were aged 65 years or elderly From the community trials, 14 trials (5,968 participants, with 3,991 (67%) being women) met initial criteria.		

ID	C17		
Citation	Gerontology. 2011;57(3):276-86. doi: 10.1159/000322241. Epub 2010 Oct 29. Interventions aiming at balance confidence improvement in elderly adults: an updated review. Büla CJ, Monod S, Hoskovec C, Rochat S.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21042008		
Type of evidence	Systematic review	Publication Date	October 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Interventions to improve balance confidence are feasible and effective among community-dwelling elderly persons.	Strength of evidence	Moderate
	Numerous interventions can improve balance confidence, most of these successful interventions included some exercise component.		Moderate
	Cognitive behavioral training and, to a lesser extent, guided relaxation and exercise imagery have shown benefits by improving balance confidence.		Low
	The effect of various interventions among community-dwelling elderly persons on activity restriction associated with poor balance confidence have been less well studied, but some studies also suggest potential benefits.		Low
	Multicomponent behavioral group interventions provided the most robust evidence of benefits in improving balance confidence and in decreasing activity avoidance.		Moderate
Other comments	A total of 46 randomized controlled trials were identified		

6.4 Sub-topic: Integration of services to manage falls, accidents & injuries (elderly)

Search record

4.4.1 11 publications met the search criteria.

Full Tabulated results

The following data forms present the detailed systematic review and meta-analysis findings of the literature review. For further information on: 'type of evidence', 'quality of study' and 'strength of evidence' see the methods statement on evidence classification (Section 3.4). Summary results are provided in the results section (Section 4). Results are presented chronologically starting with the most recent.

ID	D1		
Citation	Med J Aust. 2010 Jan 4;192(1):37-41.Evidence-based guidelines for the management of hip fractures in elderly persons: an update. Mak JC, Cameron ID, March LM; National Health and Medical Research Council.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/20047547		
Type of evidence	Systematic review	Publication Date	January 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Time to surgery: Early surgery (within 24–36 h) is recommended for most patients once a medical assessment has been made and the patient's condition has been stabilised appropriately. Undue delay to surgery (> 48 h) in elderly patients using antiplatelet agents may be associated with higher morbidity, which may indirectly affect mortality.	Strength of evidence	High
	Preoperative traction: There is no evidence to support the routine use of preoperative traction. The routine use of preoperative skin and skeletal traction should be abandoned.		High
	Prevention of pressure sores: All patients should be nursed on a pressure-relieving mattress rather than a standard hospital mattress. Patients at very high risk of pressure sores should ideally be nursed on a large-cell, alternating-pressure air mattress or similar device.		High
	Oxygen therapy: Some evidence supports the routine use of oxygen therapy for the first 72 h after surgery. All patients should have oximetry assessment from the time of emergency admission to 48 h after surgery, and		High

	oxygen administered as necessary.		
	<p>Thromboprophylaxis:</p> <p>The substantial majority of hip fracture patients should receive low molecular weight heparin. Mechanical devices should be used for patients in whom anticoagulants and antiplatelet agents are contraindicated.</p>		High
	<p>Pressure gradient stockings:</p> <p>Patients should be wearing pressure gradient stockings as soon as possible after admission.</p>		High
	<p>Type of anaesthesia:</p> <p>Regional anaesthesia is recommended for most patients, and may reduce acute postoperative confusion. For continuous spinal anaesthesia, the paramedian approach is associated with a better catheter insertion rate compared with the classic midline approach.</p>		High
	<p>Type of analgesia: Adequate analgesia should be administered before and immediately after surgery. Three-in-one femoral nerve block is an effective method of providing analgesia to patients with hip fracture in the emergency department and is useful for reducing postoperative pain. Intrathecal morphine is a useful and safe technique for providing postoperative pain relief after hip fracture surgery.</p>		High
	<p>Prophylactic antibiotics:</p> <p>Prophylactic intravenous antibiotics should be given at induction of anaesthesia. Prolonged antibiotic use is of no proven benefit for prophylaxis of wound infection. There is no evidence to suggest that topical antibiotics reduce wound infection.</p>		High
	<p>Type of surgery:</p> <p>Extracapsular (trochanteric) fractures should be treated surgically. A sliding hip screw appears to be superior to fixation with intramedullary nails, given the lower complication rate of the sliding hip screw. Unstable intertrochanteric fractures reduced in a slightly valgus position may achieve a better position after fracture healing. There is insufficient evidence from randomised trials to determine important differences in outcome between different designs of intramedullary nails, or whether replacement arthroplasty has any advantage over internal fixation.</p> <p>Undisplaced intracapsular fractures should have internal fixation with a widely used method that is familiar to the surgeon (cancellous bone screws or</p>		High

	<p>compression screw and plate).</p> <p>Displaced intracapsular fractures have no clearly superior surgical treatment. The options for surgical treatment of this fracture are internal fixation or arthroplasty. Hemiarthroplasty (femoral head replacement) is associated with greater initial operative trauma but has a lower risk of implant failure requiring reoperation of the hip than internal fixation, making it a cost-efficient treatment.³⁸ At present the choice of treatment is best determined by patient factors (including age, presence of arthritis, availability and cost of the different types of treatment, surgeon experience and preference).</p> <p>Subtrochanteric fractures (including reverse oblique and transverse intertrochanteric fractures) can be treated with an intramedullary nail (eg, proximal femoral nail), which appears to be superior to a sliding hip screw because of shorter duration of surgery, shorter hospital stay, fewer orthopaedic complications and less need for major reoperations.</p>		
	<p>Surgical wound drains: Surgical wound drains may not be required as often as currently used and early removal is advised (about 24 h after insertion).</p>		High
	<p>Surgical wound closure:</p> <p>Superficial wound complication rates are higher for wounds closed with metallic staples compared to wounds closed with subcuticular vicryl.</p>		High
	<p>Postoperative blood transfusion:</p> <p>Routine transfusion in asymptomatic patients with a haemoglobin level ≥ 80 g/L may not be required.</p>		High
	<p>Surgical swabs:</p> <p>Calcium alginate swabs should be considered in hip fracture surgery.</p>		High
	<p>Urinary catheterisation:</p> <p>Avoid indwelling catheters (where possible). Intermittent catheterisation is preferable and has been shown not to increase the incidence of urinary tract infections.</p>		High
	<p>Nutritional status:</p> <p>All patients should have a nutritional assessment, so that protein and energy supplements can be provided as needed. The use of protein and energy feeds may reduce “unfavourable outcome” (combined outcome of mortality and survivors with medical complications), but has no effect on mortality. The use of dietetic assistants to help improve nutritional</p>		High

	<p>intake may result in a slight reduction in mortality.</p> <p>Reducing postoperative delirium: Proactive geriatric consultation may reduce incidence and severity of delirium in patients undergoing surgery for hip fracture. Prophylactic low-dose haloperidol may reduce severity and duration of delirium episodes and shorten length of hospital admission for hip surgery.</p> <p>Mobilisation: Early assisted ambulation (begun within 48 h of surgery) accelerates functional recovery and is associated with more direct discharges to home and less discharges to high-level care in previously community dwelling individuals. No particular mobilisation strategies (including neuromuscular stimulation of the quadriceps) can be recommended over others. Aerobic endurance exercise (upper body) may be integrated into standard rehabilitation to enhance patients' aerobic fitness and mobility after hip fracture surgery. A weight-bearing home exercise program improves balance and functional ability among elderly people who have completed usual care after a hip fracture.</p> <p>Rehabilitation: Patients with hip fracture should be offered a coordinated multidisciplinary rehabilitation program with the specific aim of regaining sufficient function to return to their prefracture living arrangements. Early multidisciplinary daily geriatric care reduces inhospital mortality and medical complications in elderly patients with hip fracture, but does not reduce length of stay or functional recovery. A program of accelerated discharge and home-based rehabilitation may lead to functional improvement, greater confidence in avoiding subsequent falls, improvements in health related quality of life and less caregiver burden.</p> <p>Multidisciplinary programs — comprising early individualised occupational therapy during hospital admission, continuous rehabilitation as well as discharge planning (including a home visit and post-acute care coordination when appropriate) — improve physical outcomes, quality of life and self-care abilities, reduce readmission rates and depression, may reduce risk of falling and may be associated with cost savings. Extended outpatient rehabilitation that includes progressive resistance training can also improve physical function and quality</p>		<p></p> <p></p> <p>High</p> <p>High</p>
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	of life compared with home exercise alone.		
	<p>Osteoporosis treatment:</p> <p>Vitamin D supplementation, injected or given orally, suppresses parathyroid hormone, increases bone mineral density and reduces falls after hip fracture in previously independent elderly women. Frail elderly people confined to institutions may sustain fewer hip and other non-vertebral fractures if given vitamin D with calcium supplements.</p> <p>An annual infusion of zoledronic acid is associated with a reduction in rate of new clinical vertebral and non-vertebral fractures and may improve survival after a low-trauma hip fracture Oral alendronate⁸⁶ and oral risedronate are associated with reductions in rates of vertebral and non-vertebral fractures. In postmenopausal women with osteoporosis, strontium ranelate is associated with reductions in rates of vertebral and non-vertebral fractures, but reduced risk of hip fracture associated with strontium ranelate treatment has only been observed in women aged 74 years or elderly whose bone mineral density fits clinical criteria for osteoporosis. Of these studies, only the zoledronic acid trial was conducted in a population of patients who had undergone repair of a hip fracture.</p> <p>After hip fracture, the use of a case manager may help to increase the number of investigations (such as bone mineral density testing) performed and increase prescription rates of bone-protective agents. A perioperative inpatient intervention program, involving patient education and provision of a list of questions for the general practitioner, may increase appropriate therapeutic intervention by GPs.</p>		High
	<p>Hip protectors:</p> <p>Hip protectors may reduce the risk of hip fracture in institutionalised patients, but not in community-dwelling elderly people. Patient acceptance of hip protectors and adherence to their use remain poor due to discomfort and practicality.</p>		High
Other comments	<p>Evidence-based clinical practice guidelines for the treatment of proximal femoral fractures were first published in the Journal in 1999 and were updated in 2003. This article updates the 2003 guidelines.</p> <p>128 new studies were identified and 81 met our inclusion criteria</p>		

ID	D2		
Citation	Cochrane Database Syst Rev. 2009 Oct 7;(4):CD007125. doi: 10.1002/14651858.CD007125.pub2. Multidisciplinary rehabilitation for elderly people with hip fractures. Handoll HH, Cameron ID, Mak JC, Finnegan TP.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19821396		
Type of evidence	Systematic review	Publication Date	October 2009
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	While there is no conclusive evidence of the effectiveness of multidisciplinary inpatient rehabilitation following hip fracture surgery in elderly people, there is a trend towards effectiveness in all main outcomes.	Strength of evidence	High
	Overall, the evidence indicates that multidisciplinary rehabilitation is not harmful- no serious detriment (in terms of patient outcomes or crude cost comparisons) has been demonstrated as a result of this care.		High
Other comments	13 included trials involved 2498 elderly, usually female, patients who had undergone hip fracture surgery The 13 trials took place in one of six countries: Australia (3 trials); Canada (1); Spain (1); Sweden (2); Taiwan (1); and UK (4). Multidisciplinary rehabilitation was provided primarily in an inpatient setting in 11 trials		

ID	D3		
Citation	Injury. 2009 Nov;40(11):1226-30. doi: 10.1016/j.injury.2009.06.167. Epub 2009 Jul 31. The national clinical audit of falls and bone health: the clinical management of hip fracture patients. Youde J, Husk J, Lowe D, Grant R, Potter J, Martin F.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19647251		
Type of evidence	Review (non-systematic)	Publication Date	November 2009
Quality of study	3 (non-analytic studies, e.g. case reports, case series)	Region	UK
Evidence statements (note population, intervention and outcomes)	There are currently unacceptable wide variations in the delivery of clinical care to elderly people presenting with a fractured neck of femur. Of concern were the long lengths of time in A&E for many patients and the low level of routine access to pre-operative medical assessment.	Strength of evidence	Moderate
Other comments	Clinical Audit: Data was entered for 3184 fractured neck of femur patients. 80% were female with a median age of 83 years admitted from their own home.		

ID	D4		
Citation	Curr Med Res Opin. 2008 Oct;24(10):2841-51. doi: 10.1185/03007990802381430 . Epub 2008 Aug 28. Post-fracture management of patients with hip fracture: a perspective. Bruyere O, Brandi ML, Burlet N, Harvey N, Lyritis G, Minne H, Boonen S, Reginster JY, Rizzoli R, Akesson K.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/18759997		
Type of evidence	Systematic review	Publication Date	October 2008
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	Europe
Evidence statements (note population, intervention and outcomes)	Although hip fracture is generally associated with poor outcomes, appropriate management can ensure optimal recovery and survival, and should be prioritized after a hip fracture to avoid deterioration of health and prevent subsequent fracture.	Strength of evidence	Moderate
	Management of hip-fracture patients to optimize outcome after hospital discharge requires several stages of care co-ordinated by a multidisciplinary team from before admission through to discharge.		Moderate
	Proper nutrition is vital to assist bone repair and prevent further falls, particularly in malnourished patients		Moderate
	Vitamin D, calcium and protein supplementation is associated with an increase in hip BMD and reduction in falls.		Moderate
	Rehabilitation is essential to improve functional disabilities and survival rates.		Moderate
	Fall prevention and functional recovery strategies should include patient education and training to improve balance and increase muscle strength and mobility.		Moderate
	Appropriate management can prevent further fractures and it is critical that high-risk patients are identified and treated.		Moderate
Other comments	<p>A limitation to this review was that the Medline database was the only online source used to perform the literature search.</p> <p>Article based on the outcomes of a Working Group meeting convened 18 April 2008, by the European Society on Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO),</p>		

ID	D5		
Citation	Osteoporos Int. 2011 Jul;22(7):2051-65. doi: 10.1007/s00198-011-1642-x. Epub 2011 May 24.Coordinator-based systems for secondary prevention in fragility fracture patients. Marsh D, Akesson K, Beaton DE, Bogoch ER, Boonen S, Brandi ML, McLellan AR, Mitchell PJ, Sale JE, Wahl DA; IOF CSA Fracture Working Group.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21607807		
Type of evidence	Systematic review	Publication Date	July 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	A systematic review of the literature showed that 65% of systems reported include a dedicated coordinator who acts as the link between the orthopaedic team, the osteoporosis and falls services, the patient and the primary care physician.	Strength of evidence	Moderate
	Coordinator-based systems facilitate bone mineral density testing, osteoporosis education and care in patients following a fragility fracture and have been shown to be cost-saving.		Moderate
	Other success factors in improving diagnosis and treatment of osteoporosis in patients with fragility fractures include an open-access fracture registry and a database to monitor the care provided to the fracture patient.		
	Successful transformation of care relies upon consensus amongst all participants in the multi-disciplinary team that cares for fragility fracture patients.		Moderate
Other comments	Forty-eight studies focusing on OP intervention within 6 months following a fragility fracture were identified in the literature reviewed (up to September 2008).		

ID	D6		
Citation	Osteoporos Int. 2010 Dec;21(Suppl 4):S637-46. doi: 10.1007/s00198-010-1396-x. Epub 2010 Nov 6.Ortho-geriatric service--a literature review comparing different models. Kammerlander C, Roth T, Friedman SM, Suhm N, Luger TJ, Kammerlander-Knauer U, Krappinger D, Blauth M.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21058004		
Type of evidence	Systematic review	Publication Date	December 2010
Quality of study	2++ (High quality SR of non-RCT studies; or high quality non-RCT studies with a very low bias risk and high probability of a causal relationship)	Region	International - western style countries
Evidence statements (note population,	Models of ortho-geriatric service: Although many studies conclude that more than just standard care is needed to treat our geriatric fracture patients properly, it is still not clear which model leads to the	Strength of evidence	Moderate

intervention and outcomes)	best outcome.		
	Models of ortho-geriatric service: Regarding the main outcome parameters, the group with integrated care could show the lowest in-hospital mortality rate (1.14%), the lowest length of stay (7.39 days), and the lowest mean time to surgery (1.43 days).		Moderate
	Models of ortho-geriatric service: No clear statement could be found for the medical complication rates and the activities of daily living due to their inhomogeneity when comparing the models.		Low
	Models of ortho-geriatric service: The review of these investigations cannot tell us the best model, but there is a trend toward more recent models using an integrated approach.		Moderate
Other comments	21 articles included: All studies with a multidisciplinary approach to elderly hip fracture patients including at least a geriatrician and an orthopedic surgeon.		

ID	D7		
Citation	Hosp Pract (Minneap). 2011 Feb;39(1):52-61. doi: 10.3810/hp.2011.02.374.Hip fracture management for the hospital-based clinician: a review of the evidence and best practices. Hughson J, Newman J, Pendleton RC.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21441759		
Type of evidence	Systematic review	Publication Date	February 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	N/A	Strength of evidence	N/A
Other comments	Hospital-based clinicians are increasingly asked to co-manage these patients. The purpose of this article is to summarize evidence-based clinical management practices that are relevant to hospitalist clinicians who manage hip fracture patients, and to highlight the current evidence for implementing a formal hospitalist and orthopedic co-management care model.		

ID	D8		
Citation	Nat Rev Rheumatol. 2012 Jan 17;8(3):163-72. doi: 10.1038/nrrheum.2011.217.Osteoporosis, frailty and fracture: implications for case finding and therapy.van den Bergh JP, van Geel TA, Geusens PP.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22249162		
Type of evidence	Systematic review	Publication Date	January 2012
Quality of study	2++ (High quality SR of non-RCT studies; or high quality non-RCT studies with a very low bias risk and	Region	International - all

	high probability of a causal relationship)		
Evidence statements (note population, intervention and outcomes)	Evidence suggests that risk of subsequent fracture and mortality are highest immediately after a fracture is incurred in patients over the age of 50; although the risk decreases with time, patients with a fracture might be at increased risk, compared with patients without a fracture, for up to 15 years.	Strength of evidence	Moderate
	A number of factors can influence fracture risk including frailty, falls and contributors to SECOB, intervention should be considered for all patients over 50 years of age who present with a fracture to prevent subsequent fractures and mortality.		Moderate
	A five-step plan for management of patients who present with a fracture (Case finding, Evaluation, Differential diagnosis, Therapy, Follow Up), includes: Immediate attention to enable systematic case finding, Evaluation of clinical risk factors for fractures, bone density assessment, imaging of the spine, analysis of fall risk and dietary calcium intake, followed by laboratory testing for the presence of SECOB contributors. After differential diagnosis, treatment should be initiated in selected patients, including lifestyle recommendations, adequate calcium and vitamin D supplementation and specific anti-osteoporotic therapy. Systematic follow-up is then required for all patients.		Moderate
Other comments	Articles to include in this Review were selected after searching the PubMed database for articles published from 2001 to September 2011 using the keywords “osteoporosis”, “fracture”, “subsequent fracture”, “mortality”, “secondary osteoporosis”, “metabolic bone disease”, “frailty”, “falls” and “fall risk”, used alone and/or in combination. English-language original publications and review articles were selected on the basis of their relevance for inclusion in the bibliography. Reference lists of those publications were also screened for additional relevant material.		

ID	D9		
Citation	Am Fam Physician. 2006 Jun 15;73(12):2195-200. Management of hip fracture: the family physician's role. Rao SS, Cherukuri M.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/16836036		
Type of evidence	Review (non-systematic)	Publication Date	June 2006
Quality of study	2+ (well conducted non-RCT studies with a low bias risk and moderate probability of a causal relationship)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Although surgery is the main treatment for hip fracture, family physicians play a key role as patients' medical consultants: supporting patients through the treatment process, facilitating rehabilitation and recovery, and initiating secondary prevention strategies.	Strength of evidence	Moderate
	Surgical repair is recommended for stable patients		Moderate

	within 24 to 48 hours of hospitalization.		
	Antibiotic prophylaxis is indicated to prevent infection after surgery.		Moderate
	Thromboprophylaxis has become the standard of care for management of hip fracture. Effective agents include unfractionated heparin, low-molecular-weight heparin, fondaparinux, and warfarin.		Moderate
	Optimal pain control, usually with narcotic analgesics, is essential to ensure patient comfort and to facilitate rehabilitation.		Moderate
	Rehabilitation after hip fracture surgery ideally should start on the first postoperative day with progression to ambulation as tolerated. Cohort studies suggest that intense physical therapy (twice-daily therapy sessions) may help improve long term functional outcomes. Continued physical therapy is crucial after discharge from the hospital to ensure optimal functional recovery.		Moderate
	Indwelling urinary catheters should be removed within 24 hours of surgery.		Moderate
	Prevention, early recognition, and treatment of contributing factors for delirium also are crucial.		Moderate
	Interventions to help prevent future falls, exercise and balance training in ambulatory patients, and the treatment of osteoporosis are important strategies for the secondary prevention of hip fracture.		Moderate
Other comments			

ID	D10		
Citation	Eur J Phys Rehabil Med. 2011 Jun;47(2):281-96. Epub 2011 May 10. Optimal setting and care organization in the management of elderly adults with hip fracture. Giusti A, Barone A, Razzano M, Pizzonia M, Pioli G.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21555985		
Type of evidence	Systematic review	Publication Date	May 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Alternative models of care for the acute and post-acute management of elderly adults with hip fracture aim to minimize in-hospital complications, streamline hospital care and provide early discharge with the main objectives of improving functional and clinical outcomes, and reducing healthcare costs associated with hip and other fractures.	Strength of evidence	Moderate

	The main feature that distinguishes models of care for the acute and post-acute management of elderly adults with hip fracture is the different healthcare professional that retains the responsibility of the care during the acute and post acute phases.		Moderate
	On the basis of available studies, it is not possible to define the best model of care for hip fracture in elderly adults.		Moderate
	Regarding models of care for the acute and post-acute management of elderly adults with hip fracture, the more complex and sophisticated services characterized by a multidisciplinary approach demonstrated to produce better outcomes compared to the traditional or simplest models.		Moderate
	When designing, programming and implementing a service for hip fracture, physicians, administrative employees and team members should consider and optimise all "steps" of the care pathway.		Moderate
Other comments			

ID	D11		
Citation	BMJ. 2010; 340: c1718. Published online 2010 April 20. doi: 10.1136/bmj.c1718PMCID: PMC2857746 Inpatient rehabilitation specifically designed for geriatric patients: systematic review and meta-analysis of randomised controlled trials Stefan Bachmann, Christoph Finger, Anke Huss, Matthias Egger, Andreas E Stuck and Kerri M Clough-Gorr		
Web link	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2857746/		
Type of evidence	Systematic review	Publication Date	April 2010
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Inpatient rehabilitation specifically designed for geriatric patients has the potential to improve outcomes related to function, admission to nursing homes, and mortality.	Strength of evidence	Moderate
	Insufficient data are available for defining characteristics and cost effectiveness of successful inpatient rehabilitation programmes for geriatric patients.		Moderate
Other comments	17 trials with 4780 people comparing the effects of general or orthopaedic geriatric rehabilitation programmes with usual care were included		

6.5 Sub-topic: Interventions to prevent road traffic injuries

Search record

4.5.1 17 publications met the search criteria.

Full Tabulated results

The following data forms present the detailed systematic review and meta-analysis findings of the literature review. For further information on: 'type of evidence', 'quality of study' and 'strength of evidence' see the methods statement on evidence classification (Section 3.4). Summary results are provided in the results section (Section 4). Results are presented chronologically starting with the most recent.

ID	E1		
Citation	NICE Public Health Guidance. 2008 January. Physical Activity and the Environment.		
Web link	http://publications.nice.org.uk/physical-activity-and-the-environment-ph8		
Type of evidence	Systematic review	Publication Date	January 2008
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	<p>Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads by:</p> <ul style="list-style-type: none"> re-allocate road space to support physically active modes of transport (as an example, this could be achieved by widening pavements and introducing cycle lanes) restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity) introduce road-user charging schemes introduce traffic-calming schemes to restrict vehicle speeds (using signage and changes to highway design) create safe routes to schools (for example, by using traffic-calming measures near schools and by creating or improving walking and cycle routes to schools). 	Strength of evidence	High
Other comments			

ID	E2		
Citation	NICE Public Health Guidance. 2010 November. Preventing unintentional road injuries among under-15s		
Web link	http://publications.nice.org.uk/preventing-unintentional-road-injuries-among-under-15s-ph31		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	<p>To prevent unintentional road injuries among under-15s through health advocacy and engagement, Directors of public health, other health professionals with responsibility for preventing or treating injuries and local strategic partnerships should:</p> <p>Ensure a senior public health position includes leading on, and responsibility for, the health sector's involvement in injury prevention and risk reduction.</p> <p>Support and promote changes to the road environment as part of a broader strategy to prevent injuries and the risk of injuries.</p> <p>Support coordinated working between health professionals and local highways authorities to promote changes to the road environment</p>	Strength of evidence	High
	<p>To prevent unintentional road injuries among under-15s through needs assessment and planning, local highways authorities should work with other partners to introduce engineering measures to reduce speed as part of a broad strategy to prevent injuries and the risk of injuries). These measures should be:</p> <p>Developed after considering data on risk of injury and injuries.</p> <p>Designed and constructed in line with current good practice guidelines and case, and determined by local context and the characteristics of the site.</p> <p>Designed taking into account all road users, including vulnerable road users such as pedestrians, cyclists and those with impaired mobility.</p> <p>Developed using effective processes of community engagement to seek the views of children, young people, their parents and carers and with involvement of other interested parties such as the emergency services and local businesses.</p> <p>Implemented based on local priorities for modifying the transport infrastructure.</p>		High

	<p>Evaluated for their effect in terms of reducing the risk of injury and reducing the number of actual injuries.</p> <p>Evaluated for any unintended consequences.</p>		
	<p>To prevent unintentional road injuries among under-15s through measures to reduce speed local highways authorities and local strategic partnerships should:</p> <p>Introduce engineering measures to reduce speed in streets that are primarily residential or where pedestrian and cyclist movements are high.</p> <p>Implement city or town-wide 20 mph limits and zones on appropriate roads.</p> <p>Consider changes to speed limits and appropriate engineering measures on rural roads where the risk of injury is relatively high.</p>		High
	<p>To prevent unintentional road injuries among under-15s through considering popular routes, directors of public health, Local highways authorities, Local strategic partnerships, Public health professionals with an injury prevention remit, School travel planners should:</p> <p>Consider opportunities to develop engineering measures to provide safer routes commonly used by children and young people, including to school and other destinations. This should be done as part of the development of a broad package of measures to address travel, for instance when developing school travel plans.</p> <p>Include school governors and head teachers in discussions about changes relating to school travel.</p>		High
Other comments			

ID	E3		
Citation	NICE Public Health Guidance. 2010 November. Strategies to prevent unintentional injuries among the under-15s		
Web link	Click here to enter text.		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	UK
Evidence statements (note population, intervention and outcomes)	Maintaining and managing road safety partnerships to prevent unintentional injuries among the under-15s.	Strength of evidence	High
	Carrying out local child road safety reviews and consultations to prevent unintentional injuries among the under-15s.		High
	Aligning local child road safety policies to prevent unintentional injuries among the under-15s.		High
	Promoting and enforcing speed reduction to prevent unintentional injuries among the under-15s.		High
	Involving the police in driver education initiatives and activities to reduce traffic speed to prevent unintentional injuries among the under-15s.		High
	Incorporating unintentional injury prevention within local and national plans and strategies for children and young people's health and wellbeing to prevent unintentional injuries among the under-15s.		High
	Coordinating unintentional injury prevention activities to prevent unintentional injuries among the under-15s.		High
	Identifying and responding to attendances at emergency departments and minor injuries units to prevent unintentional injuries among the under-15s.		High
	Developing professional standards for injury prevention to prevent unintentional injuries among the under-15s.		High
	Providing the wider childcare workforce with access to injury prevention training to prevent unintentional injuries among the under-15s.		High
Gathering high quality injury data from emergency departments to prevent unintentional injuries among the under-15s.	High		
Other comments			

ID	E4		
Citation	Cochrane Database Syst Rev. 2010 Nov 10;(11):CD004607. doi: 10.1002/14651858.CD004607.pub4.Speed cameras for the prevention of road traffic injuries and deaths. Wilson C, Willis C, Hendrikz JK, Le Brocque R, Bellamy N.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21069682		
Type of evidence	Systematic review	Publication Date	November 2010
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	The consistency of reported reductions in speed and crash outcomes across all studies show that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths. An overall magnitude of this effect is currently not deducible due to heterogeneity and lack of methodological rigour.	Strength of evidence	High
Other comments	Thirty five studies met the inclusion criteria.		

ID	E5		
Citation	Am J Prev Med. 2009 Oct;37(4):360-71. doi: 10.1016/j.amepre.2009.07.005.Effectiveness of multicomponent programs with community mobilization for reducing alcohol-impaired driving.Shults RA, Elder RW, Nichols JL, Sleet DA, Compton R, Chattopadhyay SK; Task Force on Community Preventive Services.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19765509		
Type of evidence	Systematic review	Publication Date	October 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	North America
Evidence statements (note population, intervention and outcomes)	The studies reviewed provided strong evidence that carefully planned, well-executed multi-component programs, when implemented in conjunction with community mobilization efforts, are effective in reducing alcohol-related crashes.	Strength of evidence	Moderate
	Three studies reported economic evidence that suggests community mobilization for reducing alcohol-impaired driving produce cost savings.		Moderate
	Multi-component programs for reducing alcohol-impaired driving generally included a combination of efforts to limit access to alcohol (particularly among youth), responsible beverage service training, sobriety checkpoints or other well-defined enforcement efforts, public education, and media advocacy designed to gain the support of both policymakers and the general public for reducing alcohol-impaired driving.		Moderate
Other	Six studies of programs qualified for the review.		

comments	
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ID	E6		
Citation	Cochrane Database Syst Rev. 2009 Jan 21;(1):CD004728. doi: 10.1002/14651858.CD004728.pub2.Street lighting for preventing road traffic injuries.Beyer FR, Ker K.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19160240		
Type of evidence	Systematic review	Publication Date	January 2009
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Results from this systematic review suggest that street lighting may prevent road traffic crashes, injuries and fatalities.	Strength of evidence	Moderate
Other comments	17 controlled before-after studies of street lighting Randomised controlled trials, non-randomised controlled trials and controlled before-after studies, comparing new street lighting with unlit roads, or improved street lighting with the pre-existing lighting level.		

ID	E7		
Citation	Cochrane Database Syst Rev. 2006 Oct 18;(4):CD003438.Interventions for increasing pedestrian and cyclist visibility for the prevention of death and injuries.Kwan I, Mapstone J.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/17054171		
Type of evidence	Systematic review	Publication Date	October 2006
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	The effect of visibility aids on pedestrian and cyclist safety remains unknown.	Strength of evidence	Low
	Visibility aids have the potential to increase visibility and enable drivers to detect pedestrians and cyclists earlier.		Moderate
	Public acceptability of Interventions for increasing pedestrian and cyclist visibility would merit further development.		Moderate
	Fluorescent materials in yellow, red and orange colours improve detection and recognition in the daytime.		Moderate
	For night-time visibility, lamps, flashing lights and retroreflective materials in red and yellow colours increase detection and recognition.		Moderate
	Retroreflective materials arranged in a 'biomotion' configuration enhance recognition.		Moderate

Other comments	<p>Found no trials assessing the effect of visibility aids on pedestrian and cyclist-motor vehicle collisions and injuries.</p> <p>Identified 39 trials assessing the effect of visibility aids on drivers' responses.</p> <p>Substantial heterogeneity between and within the trials limited the possibility for meta-analysis</p>
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ID	E8		
Citation	Am J Prev Med. 2004 Jul;27(1):57-65.Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes: a systematic review.Elder RW, Shults RA, Sleet DA, Nichols JL, Thompson RS, Rajab W; Task Force on Community Preventive Services.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/15212776		
Type of evidence	Systematic review	Publication Date	Click here to enter a date.
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	The studies reviewed indicate that under some conditions, well-executed mass media campaigns can contribute to a reduction in alcohol impaired driving (AID) and alcohol-related crashes.	Strength of evidence	Moderate
	The median decrease in crashes across all studies and all levels of crash severity was 13%. The median decrease in injury-producing crashes, the most common crash outcome, was 10%.		Moderate
	The mass media campaigns reviewed were generally carefully planned, well executed, attained adequate audience exposure, and were implemented in conjunction with other ongoing prevention activities, such as high visibility enforcement.		Moderate
	There was no clear difference in the effectiveness of campaigns that used legal deterrence messages and those that used social and health consequences messages.		Moderate
	Economic analyses of campaign effects indicated that the societal benefits were greater than the costs.		Moderate
Other comments	eight studies that met quality criteria for inclusion in the review		

ID	E9		
Citation	J Safety Res. 2004;35(2):189-96.Effectiveness of primary enforcement safety belt laws and enhanced enforcement of safety belt laws: a summary of the Guide to Community Preventive Services systematic reviews. Shults RA, Nichols JL, Dinh-Zarr TB, Sleet DA, Elder RW.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/15178238		
Type of evidence	Systematic review	Publication Date	May 2004
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Results provide strong evidence that primary laws are more effective than secondary laws in increasing safety belt use and decreasing fatalities.	Strength of evidence	High
	Enhanced enforcement is effective in increasing safety belt use.		Moderate
Other comments	<p>Identified 19 studies examining the effectiveness of primary laws, 13 met the quality criteria and were included in the review.</p> <p>Identified 18 studies of enhanced enforcement programs to increase safety belt use, 15 met quality criteria and were included.</p>		

ID	E10		
Citation	Am J Public Health. 2003 Sep;93(9):1456-63.A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes. Retting RA, Ferguson SA, McCartt AT.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/12948963		
Type of evidence	Systematic review	Publication Date	September 2003
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Modification of the built environment can substantially reduce the risk of pedestrian-vehicle crashes.	Strength of evidence	Moderate
	High effect counter measures include single-lane roundabouts, sidewalks, exclusive pedestrian signal phasing, pedestrian refuge islands, increased intensity of roadway lighting.		Moderate
Other comments			

ID	E11		
Citation	J Epidemiol Community Health. 2003 May;57(5):327-33.What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews. Morrison DS, Petticrew M, Thomson H.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/12700214		
Type of evidence	Systematic review	Publication Date	May 2003
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	The highest quality reviews indicate that the most effective transport interventions to improve health are: health promotion campaigns (to prevent childhood injuries, to increase bicycle and motorcycle helmet use, and to promote children's car seat and seatbelt use), traffic calming, and specific legislation against drink driving.	Strength of evidence	High
	Driver improvement and education courses may increase accidents by encouraging greater numbers of inexperienced drivers on to the roads and are not recommended.		Moderate
	Ignition interlock devices, daytime running lights, public lighting, graduated driver licensing, and laws to enforce seatbelt use may all be effective in improving health.		Moderate
	The evidence is equivocal on the benefits and harms of guard rails, crash cushions, and interventions to reduce vehicle speeds.		High
	Some modes of drink driving remediation, including mandatory jail sentences and laws to enforce studded tyres, are associated with harmful effects on health.		Moderate
Other comments	28 systematic reviews were identified.		

ID	E12		
Citation	Accid Anal Prev. 2011 May;43(3):1204-18. doi: 10.1016/j.aap.2011.01.002. Epub 2011 Feb 1. Meta-analysis of the effect of road safety campaigns on accidents. Phillips RO, Ulleberg P, Vaa T.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21376920		
Type of evidence	Meta analysis	Publication Date	May 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	A systematic summary of 119 individual road safety campaign effects suggests that road safety campaigns have an overall significant accident-reducing effect of 9%.	Strength of evidence	Moderate
	Meta-regression analysis suggests that those campaigns using personal communication, roadside and/or enforcement strategies to deliver their message are associated with greater accident reductions.		Moderate
	Achieving immediacy in the delivery of a campaign message, in terms of proximity to the target behaviour, might tend to increase campaign effect in the shorter term, and complement any long-term campaign effects achieved using mass media delivery.		Moderate
Other comments	meta-analysis of 119 effects extracted from 67 studies		

ID	E13		
Citation	Pediatrics. 2011 Apr;127(4):788-93. doi: 10.1542/peds.2011-0213. Epub 2011 Mar 21. Child passenger safety. Committee on Injury, Violence, and Poison Prevention, Durbin DR.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/21422088		
Type of evidence	Systematic review	Publication Date	April 2011
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	North America
Evidence statements (note population, intervention and outcomes)	All Infants and Toddlers Should Ride in a Rear-Facing CSS Until They Are 2 Years of Age or Until They Reach the Highest Weight or Height Allowed by the Manufacturer of Their CSS.	Strength of evidence	Moderate
	All Children 2 Years or Elderly, or Those Younger Than 2 Years Who Have Outgrown the Rear-Facing Weight or Height Limit for Their CSS, Should Use a Forward-Facing CSS With a Harness for as Long as Possible, up to the Highest Weight or Height Allowed by the Manufacturer of Their CSS		Moderate
	All Children Whose Weight or Height Is Above the Forward - Facing Limit for Their CSS Should Use a Belt-Positioning Booster Seat Until the Vehicle Lap-and-Shoulder Seat Belt Fits Properly, Typically When They Have Reached 4 Feet 9 Inches in Height and Are Between 8 and 12 Years of Age		Moderate
	When Children Are Old Enough and Large Enough to Use the Vehicle Seat Belt Alone, They Should Always Use Lap-and-Shoulder Seat Belts for Optimal Protection		Moderate
	All Children Younger Than 13 Years Should Be Restrained in the Rear Seats of Vehicles for Optimal Protection.		Moderate
Other comments	This technical report provides a summary of the evidence in support of 5 recommendations for best practices to optimize safety in passenger vehicles for children from birth through adolescence that all pediatricians should know and promote in their routine practice.		

ID	E14		
Citation	Environ Health. 2009 Oct 21;8:47. doi: 10.1186/1476-069X-8-47.The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. Reynolds CC, Harris MA, Teschke K, Cripton PA, Winters M.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/19845962		
Type of evidence	Systematic review	Publication Date	October 2009
Quality of study	1+ (well-conducted MA, SR, or RCTs with a low risk of bias)	Region	International - all
Evidence statements (note population, intervention and outcomes)	The evidence to date suggests that purpose-built bicycle only facilities (e.g. bike routes, bike lanes, bike paths, cycle tracks at roundabouts) reduce the risk of crashes and injuries compared to cycling on-road with traffic or off road with pedestrians.	Strength of evidence	Moderate
	Street lighting, paved surfaces, and low-angled grades are additional factors that appear to improve cyclist safety.		Moderate
Other comments	23 papers were identified that met the inclusion criteria.		

ID	E15		
Citation	Cochrane Database Syst Rev. 2011 Nov 9;(11):CD003985. doi: 10.1002/14651858.CD003985.pub3.Non-legislative interventions for the promotion of cycle helmet wearing by children.Owen R, Kendrick D, Mulvaney C, Coleman T, Royal S.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/22071810		
Type of evidence	Systematic review	Publication Date	November 2011
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Non-legislative interventions appear to be effective in increasing observed helmet use, particularly community-based interventions and those providing free helmets.	Strength of evidence	High
	Those set in schools appear to be effective but possibly less so than community-based interventions.		High
	Interventions providing education only are less effective than those providing free helmets.		High
	There is insufficient evidence to recommend providing subsidised helmets at present.		Low
	Interventions may be more effective if provided to younger rather than elderly children.		Moderate
	There is evidence that interventions offered in healthcare settings can increase self reported helmet wearing.		High
Other comments	Included 29 studies in the review		

ID	E16		
Citation	Cochrane Database Syst Rev. 2006 Jan 25;(1):CD004334.Interventions for promoting booster seat use in four to eight year olds traveling in motor vehicles.Ehiri JE, Ejere HO, Magnussen L, Emusu D, King W, Osberg JS.		
Web link	http://www.ncbi.nlm.nih.gov/pubmed/16437484		
Type of evidence	Systematic review	Publication Date	January 2006
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - western style countries
Evidence statements (note population, intervention and outcomes)	Available evidence suggests that interventions to increase use of booster seats among children age four to eight years are effective.	Strength of evidence	Moderate
	Combining incentives (booster seat discount coupons or gift certificates) or distribution of free booster seats with education demonstrated marked beneficial outcomes for acquisition and use of booster seats for four to eight year olds.		Moderate
	There is some evidence of beneficial effect of legislation on acquisition and use of booster seats but this was mainly from uncontrolled before-and-after studies, which did not meet the criteria for inclusion in the meta-analysis.		Moderate
Other comments	5 studies met inclusion criteria. A total of 3,070 individuals were involved in the five studies.		

ID	E17		
Citation	Cochrane. 2009 January. Safety education of pedestrians for injury prevention. Olivier Duperrex, Ian Roberts, Frances Bunn3		
Web link	Click here to enter text.		
Type of evidence	Systematic review	Publication Date	January 2009
Quality of study	1++ (high quality MA; or SR of RCTs; or RCT with very low bias risk)	Region	International - all
Evidence statements (note population, intervention and outcomes)	Pedestrian safety education can result in improvement in children's knowledge and can change observed road crossing behaviour, but whether this reduces the risk of pedestrian motor vehicle collision and injury occurrence is unknown.	Strength of evidence	Moderate
	There is evidence that changes in safety knowledge and observed behaviour decline with time, suggesting that safety education must be repeated at regular intervals.		Moderate
Other comments	15 studies met inclusion criteria.		

7. References

7.1 Selected studies: Interventions to prevent falls, accidents and injuries amongst children and young people

NICE:

NHS - NICE - Nov 2010 <http://publications.nice.org.uk/strategies-to-prevent-unintentional-injuries-among-the-under-15s-ph29>

NHS - NICE - Nov 2010 no 2 <http://publications.nice.org.uk/preventing-unintentional-injuries-among-the-under-15s-in-the-home-ph30>

PubMed Results:

- 1.Kendrick - Cochrane - Sep 2012 [Home safety education and provision of safety equipment for injury prevention.](#)
- 2.Dalziel - Arch Dis Child - Sep 2012 [Home visiting programmes for the prevention of child maltreatment: cost-effectiveness of 33 programmes.](#)
- 3.Ingram - Health Educ Res - Apr 2012 [Identifying facilitators and barriers for home injury prevention interventions for pre-school children: a systematic review of the quantitative literature.](#)
- 4.Pearson - Health Promot Int - Sep 2011 [Preventing unintentional injuries to children in the home: a systematic review of the effectiveness of programmes supplying and/or installing home safety equipment.](#)
- 5.Smithson - Inj Prev - Apr 2011 [Barriers to, and facilitators of, the prevention of unintentional injury in children in the home: a systematic review and synthesis of qualitative research.](#)
- 6.Parkin - Curr Opin Pediatr - Dec 2008 [Advances in the prevention of children's injuries: an examination of four common outdoor activities.](#) (play ground standards)
- 7.Gonzalez - J Postgrad Med - Oct 2008 [Preventing child maltreatment: an evidence-based update.](#)
- 8.Abernethy - Br J Sports Med - Oct 2007 [Strategies to prevent injury in adolescent sport: a systematic review.](#)
- 9.Woods - Patient Educ Couns - Dec 2006 [The role of health professionals in childhood injury prevention: a systematic review of the literature.](#)
- 10.Kendrick - Inj Prev - Jun 2009 [The effect of education and home safety equipment on childhood thermal injury prevention: meta-analysis and meta-regression.](#) (improves prevention practice but unclear on actual thermal injury)
- 11.Kendrick - Am J Prev Med - Oct 2008 [Preventing childhood falls at home: meta-analysis and meta-regression.](#) (improves prevention practice but unclear on actual falls)
- 12.Kendrick - Arch Dis Child - Jul 2008 [Effect of education and safety equipment on poisoning-prevention practices and poisoning: systematic review, meta-analysis and meta-regression.](#) (improves prevention practice but unclear on actual poisoning)
- 13.Breslin - Am J Prev Med - Feb 2007 [Non-agricultural work injuries among youth: a systematic review.](#)

7.2 Selected studies: Interventions to prevent falls, accidents and injuries (adults)

PubMed Results:

Falls

1. Gyllensvard - Cost effecti and res alloc – 2010 [Cost-effectiveness of injury prevention - a systematic review of municipality based interventions](#)
2. Ferreira - J Physiother – 2012 [Physical activity improves strength, balance and endurance in adults aged 40-65 years: a systematic review.](#)
3. Kool - Inj Prev - Oct 2009 [The role of alcohol in unintentional falls among young and middle-aged adults: a systematic review of epidemiological studies.](#) (not intervention study itself, but links to alcohol reduction (3a) as an important intervention in reducing adult falls)

Sports

4. Dizon - J Sci Med Sport - May 2010 [A systematic review on the effectiveness of external ankle supports in the prevention of inversion ankle sprains among elite and recreational players.](#)
5. Bullock - Am J Prev Med - Jan 2010 [Prevention of physical training-related injuries recommendations for the military and other active populations based on expedited systematic reviews.](#)
6. Knapik - Sports Med – 2007 [Mouthguards in sport activities : history, physical properties and injury prevention effectiveness.](#)
7. Aaltonen - Arch Intern Med - Aug 2007 [Prevention of sports injuries: systematic review of randomized controlled trials.](#)

Occupational

8. Bigos - Spine J - Feb 2009 [High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults.](#)
9. Hoe - Cochrane - Aug 2012 [Ergonomic design and training for preventing work-related musculoskeletal disorders of the upper limb and neck in adults.](#)
10. Rautiainen - Cochrane - Jul 2009 [Interventions for preventing injuries in the agricultural industry.](#) (null result)
11. Van der Molen - Cochrane - Dec 2012 [Interventions to prevent injuries in construction workers.](#) (null result)

7.3 Selected studies: Interventions to prevent falls, accidents and injuries (elderly)

N.B. the NICE guidance is rather out of date (2004) there is a lot of recent work in this field that should be covered.

NICE: NHS - NICE - Nov 2004 <http://publications.nice.org.uk/falls-cg21>

PubMed Results:

1. Gillepsie - Cochrane - Sep 2012 [Interventions for preventing falls in elderly people living in the community.](#)
2. Choi - J Am Med Dir Assoc - Feb 2012 [Effectiveness of intervention programs in preventing falls: a systematic review of recent 10 years and meta-analysis.](#)
3. [Psychotropic drug-induced falls in elderly people: a review of interventions aimed at reducing the problem.](#)
4. Lach - Int J Elderly People Nurs - Dec 2011 [Best practice in fall prevention: roles of informal caregivers, health care providers and the community.](#)
5. Goodwin - J Safety Res - Dec 2011 [Implementing the evidence for preventing falls among community-dwelling elderly people: a systematic review.](#)
6. Sherrington - N S W Public Health Bull - Jun 2011 [Exercise to prevent falls in elderly adults: an updated meta-analysis and best practice recommendations.](#)
7. Michael - Ann Intern Med - Dec 2010 [Primary care-relevant interventions to prevent falling in elderly adults: a systematic evidence review for the U.S. Preventive Services Task Force.](#)
8. Thomas - Age Ageing - Nov 2010 [Does the 'Otago exercise programme' reduce mortality and falls in elderly adults?: a systematic review and meta-analysis.](#)
9. Kalyani - J Am Geriatr Soc - Jul 2010 [Vitamin D treatment for the prevention of falls in elderly adults: systematic review and meta-analysis.](#)
10. Davis - Br J Sports Med - Feb 2010 [Does a home-based strength and balance programme in people aged > or =80 years provide the best value for money to prevent falls? A systematic review of economic evaluations of falls prevention interventions.](#)
11. Bischoff - Ferrari - BMJ - Oct 2009 [Fall prevention with supplemental and active forms of vitamin D: a meta-analysis of randomised controlled trials.](#)
12. Petridou - J Aging Health - Aug 2009 [What works better for community-dwelling elderly people at risk to fall?: a meta-analysis of multifactorial versus physical exercise-alone interventions.](#)
13. Sherrington - J Am Geriatr Soc - Dec 2008 [Effective exercise for the prevention of falls: a systematic review and meta-analysis.](#)
14. Clemson - J Aging Health - Sep 2008 [Environmental interventions to prevent falls in community-dwelling elderly people: a meta-analysis of randomized trials.](#)
15. Menant - J Rehabil Res Dev - Nov 2008 [Optimizing footwear for elderly people at risk of falls.](#)
16. Campbell - Age Ageing - Nov 2007 [Rethinking individual and community fall prevention strategies: a meta-regression comparing single and multifactorial interventions.](#)

17.Monod - Gerontology – 2011 [Interventions aiming at balance confidence improvement in elderly adults: an updated review.](#)

7.4 Selected studies: Integration of services to manage falls, accidents & injuries (elderly)

The focus of the literature is on hip fracture

PubMed Results:

1. Jenson - Med J Aust - Jan 2010 [Evidence-based guidelines for the management of hip fractures in older persons: an update.](#)
2. Handoll - Cochrane - Oct 2009 [Multidisciplinary rehabilitation for elderly people with hip fractures.](#) (Cochrane)
3. Youde - Injury - Nov 2009 [The national clinical audit of falls and bone health: the clinical management of hip fracture patients.](#)
4. Bruyere - Curr Med Res Opin - Oct 2008 [Post-fracture management of patients with hip fracture: a perspective.](#)
5. Marsh - Osteoporos Int - Jul 2011 [Coordinator-based systems for secondary prevention in fragility fracture patients.](#)
6. Kammerlander - Osteoporos Int - Dec 2010 [Ortho-geriatric service--a literature review comparing different models.](#)
7. [Hip fracture management for the hospital-based clinician: a review of the evidence and best practices.](#)
8. Van den Bergh - Nat Rev Rheumatol - Jan 2012 [Osteoporosis, frailty and fracture: implications for case finding and therapy.](#)
9. Rao - Am Fam Physician - Jun 2006 [Management of hip fracture: the family physician's role.](#)
10. Giusti - Eur J Phys Rehabil Med - Jun 2011 [Optimal setting and care organization in the management of elderly adults with hip fracture.](#)
11. Bachmann - BMJ - Apr 2010 [Inpatient rehabilitation specifically designed for geriatric patients: systematic review and meta-analysis of randomised controlled trials](#)

7.5 Selected studies: Interventions to prevent road traffic injuries

NICE:

NHS - NICE - Jan 2008 <http://publications.nice.org.uk/physical-activity-and-the-environment-ph8>

NHS - NICE - Nov 2012 <http://publications.nice.org.uk/walking-and-cycling-local-measures-to-promote-walking-and-cycling-as-forms-of-travel-or-recreation-ph41>

NHS - NICE - Nov 2010 <http://publications.nice.org.uk/preventing-unintentional-road-injuries-among-under-15s-ph31>

NHS - NICE - Nov 2010 no 2 <http://publications.nice.org.uk/strategies-to-prevent-unintentional-injuries-among-the-under-15s-ph29>

PubMed Results:

1. Wilson - Cochrane - Nov 2010 [Speed cameras for the prevention of road traffic injuries and deaths.](#)
2. Shults - Am J Prev Med - Oct 2009 [Effectiveness of multicomponent programs with community mobilization for reducing alcohol-impaired driving.](#)
3. Beyer - Cochrane - Feb 2010 [Street lighting for preventing road traffic injuries.](#)
4. Kwan - Cochrane - Oct 2009 [Interventions for increasing pedestrian and cyclist visibility for the prevention of death and injuries.](#)
5. Elder - Am J Prev Med - Jul 2004 [Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes: a systematic review.](#)
6. Shults - J Safety Res - May 2004 [Effectiveness of primary enforcement safety belt laws and enhanced enforcement of safety belt laws: a summary of the Guide to Community Preventive Services systematic reviews.](#) (Enhanced enforcement of safety belt laws)
7. Retting - Am J Public Health - Sep 2003 [A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes.](#)
8. Morrison - J Epidemiol Community Health - May 2003 [What are the most effective ways of improving population health through transport interventions? Evidence from systematic reviews.](#)
9. Phillips - Accid Anal Prev - May 2011 [Meta-analysis of the effect of road safety campaigns on accidents.](#)
10. Committee on Inj, Viol, and Pois Prev - Pediatrics - Mar 2011 [Child passenger safety.](#)
11. Korner - Bitensky - J Safety Res – 2009 [Elderly driver retraining: an updated systematic review of evidence of effectiveness.](#)
12. Reynolds - Environ Health - Oct 2009 [The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature.](#)
13. Owen - Cochrane - Nov 2011 [Non-legislative interventions for the promotion of cycle helmet wearing by children.](#)
14. Ehiri - Cochrane - Jan 2009 [Interventions for promoting booster seat use in four to eight year olds traveling in motor vehicles.](#)

15. Duperrex - Cochrane - Jan 2009 [Safety education of pedestrians for injury prevention](#)

OTHER STUDIES TO CONSIDER

1. [Graduated driver licensing for reducing motor vehicle crashes among young drivers.](#)
2. [Interventions to increase children's booster seat use: a review.](#)
3. [Motorcycle helmet use and legislation: a systematic review of the literature.](#)
4. [Do light truck vehicles \(LTV\) impose greater risk of pedestrian injury than passenger cars? A meta-analysis and systematic review.](#)
5. [Bicycle helmet legislation for the uptake of helmet use and prevention of head injuries.](#)
6. [Helmets for preventing injury in motorcycle riders.](#)
7. [Effectiveness of speed cameras in preventing road traffic collisions and related casualties: systematic review.](#)
8. [Community-based programs to promote car seat restraints in children 0-16 years -- a systematic review.](#)
9. [Traffic calming for the prevention of road traffic injuries: systematic review and meta-analysis.](#)
10. [Roadway characteristics and pediatric pedestrian injury.](#)
11. [Interventions to reduce risks associated with vehicle incompatibility.](#)
12. [Associating crash avoidance maneuvers with driver attributes and accident characteristics: a mixed logit model approach.](#)
13. [Bull bars and vulnerable road users.](#)
14. [Red-light cameras for the prevention of road traffic crashes.](#)
15. [Red light for red-light cameras? A meta-analysis of the effects of red-light cameras on crashes.](#)
16. [A meta-analysis of the effects of cell phones on driver performance.](#)
17. [Safety effects of blue cycle crossings: a before-after study.](#)

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