

Skadeforebygging, oversikt over gjennomførte systematiske oversikter

Notat fra Kunnskapsenteret
Systematisk litteratursøk med
sortering
Oktober 2012

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Nasjonalt kunnskapssenter for helsetjenesten fremskaffer og formidler kunnskap om effekt av metoder, virkemidler og tiltak og om kvalitet innen alle deler av helsetjenesten. Målet er å bidra til gode beslutninger slik at brukerne får best mulig helsetjenester. Kunnskapssenteret er formelt et forvaltningsorgan under Helse- direktoratet, men har ingen myndighetsfunksjoner og kan ikke instrueres i faglige spørsmål.

Nasjonalt kunnskapssenter for helsetjenesten
Oslo, oktober 2012

Hovedfunn

Nasjonalt kunnskapssenter for helsetjenesten har, basert på bestilling fra Skadeforebyggende forum, utført et systematisk litteratursøk etter oppsummert kunnskap med påfølgende sortering av mulig relevante publikasjoner. Oppdraget var å finne oppsummert litteratur/forskning om praktisk forebygging av skader.

Metode

Vi utarbeidet søkestrategi for et systematisk litteratursøk. Det ble søkt i Medline Ovid, Pubmed, Cochrane Library og CRD etter systematiske oversikter om skadeforebygging. Søket omfatter skadeforebygging generelt, samt noen spesifikke steder eller situasjoner som kan føre til skade. Søket ble utført i august 2012 og tidsbegrenset bakover i tid til 2007. Begge prosjektmedarbeiderne gikk uavhengig av hverandre gjennom identifiserte publikasjoner/referanser og vurderte relevans i forhold til inklusjonskriteriene. Publikasjonene ble ikke innhentet og lest i fulltekst.

Resultater

Vi identifiserte totalt 1331 referanser. Av disse ble 138 vurdert som mulig relevante. Vi har delt dem inn i grupper etter i hvilken sammenheng skaden påføres, men fall er en egen gruppe, uansett hvor eller hvordan fallet skjer.

- 50 oversikter om ulike typer trafikkskader,
 - 21 for bil
 - 4 for motorsykkel
 - 11 for sykkel
 - 2 for fotgjengere
 - 12 for andre typer trafikkskader
- 8 oversikter om skader som følge av alkoholbruk utenom trafikkskader
- 14 oversikter om skader i hjemmet
- 5 oversikter om forgiftninger
- 18 oversikter om sport og treningsskader
- 23 oversikter om forebygging av fall
- 20 oversikter om andre temaer

Tittel:

Skadeforebygging, oversikt over gjennomførte systematiske oversikter

Publikasjonstype:

Systematisk litteratursøk med sortering

Systematisk litteratursøk med sortering er resultatet av å

- søke etter relevant litteratur ifølge en søkestrategi og
- eventuelt sortere denne litteraturen i grupper presentert med referanser og vanligvis sammendrag

Svarer ikke på alt:

- Ingen kritisk vurdering av studienes kvalitet
- Ingen analyse eller sammenfatning av studiene
- Ingen anbefalinger

Hvem står bak denne publikasjonen?

Kunnskapssenteret har gjennomført oppdraget etter forespørsel fra Skadeforebyggende forum

Når ble litteratursøket utført?

Søk etter studier ble avsluttet august 2012.

Key messages

Norwegian Knowledge center has, based on a commission by the Norwegian Safety Forum, performed a systematic literature search for systematic reviews examining practical interventions to prevent injuries.

Methods

We developed and performed systematic searches in the databases Medline Ovid, Pubmed, Cochrane Library and CRD for systematic reviews about interventions to prevent injuries. The search comprised prevention of injuries in general in addition to some specific places and situations that are prone to injuries. The search was performed in august 2012 and was limited in time to 2007-2102. Both authors screened the identified references for relevance in accordance with the inclusion criteria. The publications were not collected or read in full text.

Results

We identified 1331 unique references in total. Of these were 138 considered potentially relevant for prevention of injuries. We arranged the references in groups according to the situation the injury could occur. However, falls is a separate group, regardless of where or how the fall happens.

- 50 reviews was about various types of traffic injuries
 - 21 about car
 - 4 about motorcycle
 - 11 about bicycle
 - 2 about pedestrians
 - 12 about various other types of traffic injuries
- 8 review about injuries due to alcohol, not traffic related
- 5 review about poisoning
- 18 review about sport and exercise
- 23 about fall prevention
- 20 reviews about various other topics

Title:

Injury prevention, a mapping of systematic reviews

Type of publication:

Systematic reference list

A systematic reference list is the result of a search for relevant literature according to a specific search strategy. The references resulting from the search are then grouped and presented with their abstracts.

Doesn't answer everything:

- No critical evaluation of study quality
- No analysis or synthesis of the studies
- No recommendations

Publisher:

Norwegian Knowledge Centre for the Health Services

Updated:

Last search for studies: August 2012.

Innhold

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Forord

Kunnskapssenteret mottok en bestilling fra Skadeforebyggende forum ved Eva Vaagland om en oppsummering av publiserte systematiske oversikter om praktisk skadeforebygging.

Bakgrunnen for bestillingen er at Regjeringen har utarbeidet nasjonal strategi for forebygging av ulykker i 2009 og ny folkehelsehelselov i 2012 som begge definerer ulykkesskader som kan forhindres gjennom skadeforebyggende tiltak som et vesentlig helseproblem. Man ønsket en oppsummering av den forskning som finnes om effekt av skadeforebygging.

Prosjektgruppen har bestått av:

- Hilde H. Holte, seniorforsker, Kunnskapssenteret
- Mariann Mathisen, bibliotekar, Kunnskapssenteret

Gro Jamtvedt
Avdelingsdirektør

Gunn E. Vist
Seksjonsleder

Hilde H. Holte
Prosjektleder

Innledning

Styrker og svakheter ved litteratursøk med sortering

I Kunnskapssenterets produkt, litteratursøk med sortering, gjennomfører vi systematiske søk for en gitt problemstilling. Resultatene fra søket blir i sin helhet overlevert oppdragsgiver, eller vi kan gjennomgå søkeresultatet før overleveringen og sortere ut ikke-relevante artikler. Dette gjøres basert på tittel og sammendrag. Artikkene innhentes ikke i fulltekst. Det gjør at vi kan ha inkludert titler som ville vist seg ikke å være relevante ved gjennomlesning av fulltekst. Vi benytter kun databaser for identifisering av litteratur og kan derfor ha gått glipp av potensielt relevante studier. Andre måter å identifisere studier på, som søk i referanselister, kontakt med eksperter på fagfeltet og upublisert litteratur, er ikke utført i dette oppdraget. Vi gjennomførte ingen kvalitetsvurdering av artiklene.

Ved en full forskningsoppsummering ville vi ha innhentet artiklene/rapportene i fulltekst for endelig vurdering opp mot inklusjonskriteriene. Inkluderte studier ville så blitt kvalitetsvurdert i henhold til våre sjekklister og resultater sammenstilt og diskutert.

Vi har søkt etter allerede gjennomførte oversikter, og fanger dermed ikke opp de nyeste studiene på feltet som er publisert senere enn arbeidet med oversiktene. Vi fanger heller ikke opp studier som omhandler skadeforebygging, men som av ulike grunner ikke allerede er oppsummert.

Fordelen med å fokusere på oversikter er at man får et innblikk i hva som er gjort på feltet som har vært av interesse for andre forskere å se på virkningen av. En slik oversikt over oversikter gir et godt utgangspunkt for å identifisere hvilket felt man ønsker ytterligere oppsummeringer fra, enten det gjelder effekt av gitte tiltak eller en identifisering av tiltak som er gjennomført for et spesifikt problem. Hvis man alltid skal vurdere enkeltstudier vil det bli et mye større prosjekt som krever mer arbeid for å sammenstille resultatene.

Begrunnelse for valg av søkestrategi

Vi har søkt i elektroniske databaser etter systematiske oversikter. Søket er gjort for tidsperioden fra 2007 fram til august 2012. Vi har ikke søkt etter grå litteratur eller liknende.

Innenfor temaet skadeforebygging er det noen områder som dekkes dårlig med det søket vi har gjennomført. Slike temaer omfatter alkoholrelaterte skader, voldsrelaterte skader, selvmord, soling og skader som oppstår som følge av ulike former for trening. Vi har søkt etter oversikter som omfatter forebygging mer generelt, og temaer som krever spesifikke søk, enten på et konkret sted eller situasjon hvor skaden oppstår eller en gitt type skade, vil kreve mer spesifikke søk en det vi har gjennomført i dette søket.

Problemstilling

I prosjektet har vi søkt etter oversikter som skal belyse problemstillinger knyttet til forebygging av skader.

Metode

Litteratursøking

Vi søkte systematisk etter litteratur i følgende databaser:

- Medline Ovid
- Cochrane Database of Systematic Reviews
- CRD – DARE og HTA
- PubMed (artikler som er Ahead of print).

Bibliotekar Mariann Mathisen planla og utførte samtlige søk i perioden 8. august 2012- 10.august 2012. De fullstendige søkestrategiene er visst i vedlegg 1.

Vi la bestillingen til grunn ved utarbeiding av litteratursøket og søkte etter systematiske oversikter som oppfylte våre inklusjonskriterier for populasjon og intervensjon.

Inklusjonskriterier

Populasjon:	Alle personer utenfor institusjon
Tiltak:	Skadeforebyggende tiltak
Sammenlikning:	Andre forebyggende tiltak eller ingen tiltak
Utfall:	Skade på person
Studiedesign	Systematiske oversikter
Språk:	Alle, ingen språkbegrensning i søket

Artikkelutvelging

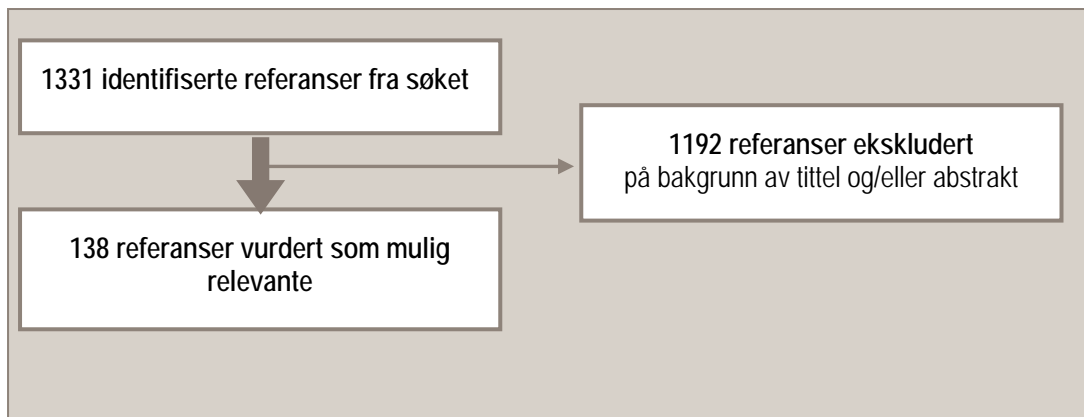
Begge prosjektmedarbeiderne, Hilde H. Holte og Mariann Mathisen, gikk gjennom alle titler og sammendrag for å vurdere relevans i henhold til inklusjonskriteriene. Vurderingene gjorde de uavhengig av hverandre og sammenlignet i etterkant. Der det var uenighet om vurderingene, ble inklusjon eller eksklusjon avgjort ved konsensus.

Utvelging av litteratur ble kun gjort basert på tittel og sammendrag. Vi bestilte ikke fulltekst av artiklene.

Resultat

Resultat av søk

Søket resulterte i 1331 unike referanser. Vi vurderte 138 av de identifiserte referansene til å være mulig relevante i henhold til inklusjonskriteriene.



Figur 1. Flytskjema over identifisert litteratur

Resultat av sorteringen

De mulig relevante referansene ble sortert i 6 hovedkategorier ut fra hvor skaden forekommer eller hva som kan forårsake skaden. To av områdene er ytterligere oppdelt i undergrupper, trafikk i 5 undergrupper, og i hjemmet er forgiftninger skilt ut.

Her presenterer vi referansene fordelt i kategoriene og alfabetisk etter førsteforfatter. Vi oppgir forfattere, tittel på publikasjonen, publikasjonssted og sammendrag slik de fremkom i de elektroniske databasene.

Tabell 1: Antall oversikter sortert etter skadeforebyggende sted.

Tiltak	Antall referanser:
Trafikk	50
Bil	21
Motersykkel	4
Sykkel	11
Fotgjenger	2
Andre typer trafikkskader	12
Alkoholrelaterte skader utenom trafikk	8
I hjemmet	14
Forgiftninger	5
Sport/trening	18
Fall	23
Annet	20

Nedenfor listes referansene til oversiktene innen hver kategori. Innenfor hver kategori er oversiktene sortert alfabetisk etter førsteforfatter.

Trafikk

Bil

Cashman CM, Ruotsalainen JH, Greiner BA, Beirne PV, Verbeek JH. [Alcohol and drug screening of occupational drivers for preventing injury](#). [Review] [39 refs]. Cochrane Database of Systematic Reviews (2):CD006566, 2009 2009;(2):CD006566.

Abstract: BACKGROUND: Workforce alcohol and drug testing is commonplace but its effect in reducing occupational injuries remains unclear. OBJECTIVES: To assess the effects of alcohol and drug screening of occupational drivers (operating a motorised vehicle) in preventing injury or work-related effects such as sickness absence related to injury. SEARCH STRATEGY: We searched the following databases up to June 2007 (or up to the latest issue then available): MEDLINE, EMBASE, The Cochrane Library, Cochrane Occupational Health Field's specialised register, DARE, PsychINFO, ERIC, ETOH, CISDOC, NIOSHTIC, TRANSPORT, Zetoc, Science Citation Index and Social Science Citation index and HSELINE. We also searched reference lists, relevant websites and conducted hand searching. SELECTION CRITERIA: Randomised controlled trials (RCTs), cluster-randomised trials, controlled clinical trials, controlled before and after studies (more than three time points to be measured before and after the study) and interrupted time-series (ITS) studies that evaluated alcohol or drug screening interventions for occupational drivers (compared to another intervention or no intervention) with an outcome measured as a reduction in injury or a proxy measure thereof. DATA COLLECTION AND ANALYSIS: Two review authors independently extracted data and assessed study quality. We contacted authors of the

included studies for further information. MAIN RESULTS: We included two interrupted time-series studies conducted in the USA. One study was conducted in five large US transportation companies (N = 115,019) that carried passengers and/or cargo. Monthly injury rates were available from 1983 to 1999. In the study company, two interventions of interest were evaluated: mandatory random drug testing and mandatory random and for-cause alcohol testing programmes. The third study focused only on mandatory random drug testing and was conducted on federal injury data that covered all truck drivers of interstate carriers. We recalculated the results from raw data provided by the study authors. Following reanalysis, we found that in one study mandatory random and for-cause alcohol testing was associated with a significant decrease in the level of injuries immediately following the intervention (-1.25 injuries/100 person years, 95% CI -2.29 to -0.21) but did not significantly affect the existing long-term downward trend (-0.28 injuries/100 person years/year, 95% CI -0.78 to 0.21). Mandatory random drug testing was significantly associated with an immediate change in injury level following the intervention (1.26 injuries/100 person years, 95% CI 0.36 to 2.16) in one study, and in the second study there was no significant effect (-1.36/injuries/100 person years, 95% CI -1.69 to 0.41). In the long term, random drug testing was associated with a significant increase in the downward trend (-0.19 injuries/100 person years/year, 95% CI -0.30 to -0.07) in one study, the other study was also associated with a significant improvement in the long-term downward trend (-0.83 fatal accidents/100 million vehicle miles/year, 95% CI -1.08 to -0.58). AUTHORS' CONCLUSIONS: There is insufficient evidence to advise for or against the use of drug and alcohol testing of occupational drivers for preventing injuries as a sole, effective, long-term solution in the context of workplace culture, peer interaction and other local factors. Cluster-randomised trials are needed to better address the effects of interventions for injury prevention in this occupational setting. [References: 39]

Cassidy JD, Cote P. Is it time for a population health approach to neck pain?. [Review] [40 refs]. *Journal of Manipulative & Physiological Therapeutics* 2008;31(6):442-6.

Abstract: OBJECTIVE: Neck pain and its associated disorders (NPAD) cause significant health burden in the general population and after road traffic and occupational injury. Individual-level health care treatments have been well studied, but population-health approaches to this problem have not. We used a best-evidence synthesis to examine population-level approaches to the prevention and control of NPAD. METHODS: The systematic review examined studies published between 1980 and 2006 that addressed the incidence, prevalence, risk factors, prevention, cost, assessment and classification, interventions, and course and prognostic factors for NPAD. Citations were screened for relevance, scientifically reviewed, and synthesized. Valid studies addressing public policies or population-level approaches to the prevention and control of NPAD were identified and used in the evidence synthesis. RESULTS: Only 8 of the 552 scientifically admissible studies were considered relevant to a public or population health approach to preventing and controlling the burden of NPAD. For whiplash-associated disorders, active head restraints and seat backs were protective in rear-end collisions; insurance policies affected the incidence and recovery; government funding of multidisciplinary rehabilitation programs did not benefit recovery; and early intensive health care delayed recovery. In the workplace, 2 randomized trials failed to show any preventive effect for ergonomic interventions or physical training and stress management. One study documented the societal cost of neck pain. CONCLUSIONS: There is little evidence on which to make public or population-level recommendations, despite the important public health burden and costs of NPAD. Population-level approaches to preventing and controlling NPAD should be investigated. [References: 40]

Desapriya E, Wijeratne H, Subzwari S, Babul-Wellar S, Turcotte K, Rajabali F, et al. Vision screening of older drivers for preventing road traffic injuries and fatalities. [Review][Update of Cochrane Database Syst Rev. 2009;(1):CD006252; PMID: 19160271]. *Cochrane Database of Systematic Reviews* (3):CD006252, 2011 2011;(3):CD006252.

Abstract: BACKGROUND: Demographic data in North America, Europe, Asia, Australia and New Zealand suggest a rapid growth in the number of persons over the age of 65 years as the baby boomer generation passes retirement age. As older adults make up an increasing proportion of the population, they are an important consideration when designing future evidence-based traffic safety policies, particularly those that lead to restrictions or cessation of driving.[NON-BREAKING SPACE]Research has shown that cessation of driving among older drivers can lead to negative emotional consequences such as loss of independence and depression.[NON-BREAKING SPACE]Those older adults who continue to drive tend to do so less frequently than other demographic groups and are more likely to be involved in a road traffic crash, probably due to what is termed the 'low mileage bias'. There is universal agreement among researchers that vision plays a significant role in driving performance, and that there are age-related visual changes. Vision testing of all drivers, and in particular of older drivers, is therefore an important road safety issue. The components of visual function essential for driving are acuity, field, depth perception and contrast sensitivity, which are currently not fully measured by licensing agencies. Furthermore, it is not known how effective vision screening tools are, and current vision screening regulations and cut-off values required to pass a licensing test vary from country to country. There is, therefore, a need to develop evidence-based tools for vision screening for driving, thereby increasing road safety. OBJECTIVES: To assess the effects of vision screening interventions for older drivers to prevent road traffic injuries and fatalities. SEARCH STRATEGY: We searched the Cochrane Injuries Group's Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 2), MEDLINE (Ovid), TRANSPORT (Ovid), IBSS (International Bibliography of Social Sciences), ASSIA: Applied Social Sciences Index and Abstracts, ISI Web of Science: Social Sciences Citation Index (SSCI), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) and PubMed. We also searched the Internet and checked the reference lists of relevant papers to identify any further studies. The searches were conducted up to the first week of June 2010. SELECTION CRITERIA: Randomised controlled trials (RCTs) and controlled before and after studies comparing vision screening to non-screening of drivers aged 55 years and older, and which assessed the effect on road traffic crashes, injuries, fatalities and any involvement in traffic law violations, were included. DATA COLLECTION AND ANALYSIS: Two authors independently screened the reference lists for eligible articles and independently assessed the articles for inclusion against the criteria. Two authors independently extracted data using a standardised extraction form. MAIN RESULTS: No studies were found which met the inclusion criteria for this review. AUTHORS' CONCLUSIONS: Most countries require a vision screening test for the renewal of an individual's driver's license. There is, however insufficient evidence to assess the effects of vision screening tests on subsequent motor vehicle crash reduction. There is a need to develop valid and reliable tools of vision screening that can predict driving performance

Desapriya EB, Joshi P, Subzwari S, Nolan M. Infant injuries from child restraint safety seat misuse at British Columbia Children's Hospital. *Pediatr Int* 2008;50(5):674-8.

Abstract: BACKGROUND: Child restraint safety seats (CRS) are used to prevent injuries or deaths among child passengers involved in a motor vehicle crash. When used outside of a motor vehicle, CRS use could potentially place an infant at risk of injury. The objective of the current study was to describe the proportion of CRS misuse injuries among infants <12 months old and associated factors presenting to the British Columbia (BC) Children's Hospital Emergency Department over 5 years (1997-2002). METHODS: The Canadian Hospital Injury Reporting and Prevention Program (CHIRPP) was the source for the emergency department injury surveillance data used in the present study. BC Children's Hospital is the participating CHIRPP site in British Columbia. A search of individual level patient records was conducted to capture all injuries from CRS misuse taking place during the study period using a predetermined code for 'child car seat-related injuries'. A retrospective analysis of 87 infants <12 months old, who presented at BC Children's Hospital for CRS-related injuries between January 1997 and December 2002 was performed in order to describe the epidemiologic and background factors related to injury occurrence. RE-

SULTS: Infants aged 0-4 months accounted for approximately 59.7% of cases (52/87). Among all infants, falls were a common mechanism of injury resulting from CRS misuse (98.8%, 86/87). Falls from elevated surfaces (e.g. chairs, tables, counters) were also common among infants presenting to the emergency departments and accounted for 43% of all falls (37/86). CONCLUSIONS: Injury prevention efforts should be focused on reducing CRS outside the motor vehicle setting and preventing placement of the CRS at an elevated surface. Educating caregivers on the dangers of falls resulting from CRS misuse in a variety of care settings is also recommended

Donaldson WF, III, Hanks SE, Nassr A, Vogt MT, Lee JY. Cervical spine injuries associated with the incorrect use of airbags in motor vehicle collisions. Spine 2008;33(6):631-4.

Abstract: STUDY DESIGN: Retrospective database review and analysis. OBJECTIVE: The purpose of this study is to determine the rate of cervical spine injuries with correct and incorrect use of front driver and passenger-side airbags. Summary of Background Data. Although there are abundant literature showing reduced injury severity and fatalities from seatbelts and airbags, no recent studies have delineated the affect of incorrect use of airbags in cervical spine injuries. METHODS: The database from the Pennsylvania Trauma Systems Foundation was searched for drivers and front-seat passenger injuries from 1990 to 2002. The resulting records were then grouped into those using both seatbelt and the airbag, airbag-only, seatbelt-only, and no restraints. The data were then analyzed for frequency of cervical spine fractures with or without spinal cord injury and injury severity indexes. RESULTS: The drivers using the airbag-only had significantly higher rate (54.1%) of cervical fractures than those using both airbag and a seatbelt (42.1%). Overall, drivers using the airbag-alone were 1.7 times more likely to suffer a cervical spine fracture than those using both protective devices. Likewise, passengers using the airbag-alone were 6.7 times more likely to suffer from a cervical spine fracture with spinal cord injury than those using both protective devices. In addition, the injury severity indexes (Glasgow coma scale, Injury Severity Score, Intensive Care Unit stays, and Total Hospital days) were significantly worse in patients who used an airbag-only. CONCLUSION: Airbag use without the concomitant use of a seatbelt is associated with a higher incidence of cervical spine fractures with or without spinal cord injuries. Airbag misuse is also associated with higher Injury Severity Score, lower Glasgow coma scale, and longer intensive care unit and total hospital stays, indicating that these patients suffer worse injury than those who use the airbag

Ehiri JE, Ejere Henry OD, Magnussen L, Emusu D, King W, Osberg SJ. Interventions for promoting booster seat use in four to eight year olds travelling in motor vehicles. Cochrane Database of Systematic Reviews 2006;(1):CD004334.

Abstract: BACKGROUND: Public health and traffic safety agencies recommend use of booster seats in motor vehicles for children aged four to eight years, and various interventions have been implemented to increase their use by individuals who transport children in motor vehicles. There is little evidence regarding the effectiveness of these interventions, hence the need to examine what works and what does not. OBJECTIVES: To assess the effectiveness of interventions intended to increase acquisition and use of booster seats in motor vehicles among four to eight year olds. SEARCH METHODS: We searched the Cochrane Injuries Group's Specialized Register, the Cochrane Central Register of Controlled Trials, MEDLINE (January 1966 to April 2005), EMBASE (1980 to April 2005), LILACS, Transport Research Databases (1988 to April 2005), Australian Transport Index (1976 to April 2005), additional databases and reference lists of relevant articles. We also contacted experts in the field. SELECTION CRITERIA: We included randomized and controlled before-and-after trials that investigated the effects of interventions to promote booster seat use. DATA COLLECTION AND ANALYSIS: Two authors independently assessed trial quality and extracted data. Study authors were contacted for additional information. MAIN RESULTS: Five studies involving 3,070 individuals met the criteria for inclusion in the meta-analysis. All interventions for promoting use of booster seats among 4 to 8 year olds demonstrated a positive effect (relative risk (RR) 1.43; 95% confidence intervals (CI) 1.05 to 1.96).

Incentives combined with education demonstrated a beneficial effect (RR 1.32, 95% CI 1.12 to 1.55; n = 1,898). Distribution of free booster seats combined with education also had a beneficial effect (RR 2.34; 95% CI 1.50 to 3.63; n = 380) as did education-only interventions (RR 1.32; 95% CI 1.16 to 1.49; n = 563). One study which evaluated enforcement of booster seat law met the criteria for inclusion in the meta-analysis, but demonstrated no marked beneficial effect. **AUTHORS' CONCLUSIONS:** Available evidence suggests that interventions to increase use of booster seats among children age four to eight years are effective. 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. 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. **INTERVENTIONS FOR PROMOTING THE USE OF BOOSTER SEATS IN FOUR TO EIGHT YEAR OLDS TRAVELLING IN MOTOR VEHICLES: HOW EFFECTIVE ARE THEY?:** Booster seats are designed for use by children aged four to eight years, while travelling in motor vehicles. They aim to raise the child off the vehicle seat so that the adult seat belt fits correctly and the child can travel in greater comfort and safety. Public health and traffic safety agencies recommend the use of booster seats in children until the vehicle seat-belt fits properly; typically when the child is at least 58 inches tall, has a sitting height of 29 inches and weighs about 80 pounds. In children aged four to seven years, booster seats are estimated to reduce the odds of sustaining clinically significant injuries during a crash by 59%, when compared to using ordinary vehicle seatbelts. Despite the evidence of effectiveness, many children are not restrained in age-appropriate booster seats. In light of the strong evidence for the safety benefits of booster seats, interventions specifically aimed at promoting their use have been implemented. To evaluate the effectiveness of such interventions, the authors of this systematic review examined all high quality trials investigating their effect on acquisition and use of booster seats. The authors found five studies involving a total of 3,070 participants. All interventions investigated by the studies were found to increase the use of booster seats, compared to the group receiving no intervention. The distribution of free booster seats combined with education on their use, had a marked beneficial effect, as did incentives (for example, booster seat discount coupons or gift certificates) combined with education. Education-only interventions also produced beneficial outcomes. One of the studies evaluated the effectiveness of the enforcement of a booster seat law, but did not detect an effect on usage. The authors concluded that the current evidence suggests that several types of interventions aimed at increasing the use of booster seats among children aged four to eight years, are effective. However, there is still a need for further high quality trials, especially those conducted outside of the USA and Australia, where current research dominates

Erke A. Red light for red-light cameras? [A meta-analysis of the effects of red-light cameras on crashes.](#) *Accident Analysis & Prevention* 2009;41(5):897-905.

Abstract: A meta-analysis has been conducted on the effects of red-light cameras (RLCs) on intersection crashes. The size and direction of results reported from studies included in the meta-analysis are strongly affected by study methodology. The studies that have controlled for most confounding factors yield the least favourable results. Based on these studies, installation of RLCs leads to an overall increase in the number of crashes by about 15%. Rear-end collisions increase by about 40% and right angle collisions, which are the target crashes for RLC, are reduced by about 10%. All effects are, however, non-significant. Meta-regression analysis shows that results are more favourable when there is a lack of control for regression to the mean (RTM). An interaction is found between control for RTM and control for those spillover effects that result from the tendency of RLCs to affect crash levels in nearby intersections without RLC. In studies controlling for RTM, additional control for spillover effects reduces the favourability of results still further. Studies controlling for both RTM and spillover effects tend also to control for more additional factors than other studies. It is likely that the results are affected by additional moderator variables, which could not be investigated in this meta-analysis. RLCs may re-

duce crashes under some conditions, but on the whole RLCs do not seem to be a successful safety measure

Hoye A. Are airbags a dangerous safety measure? A meta-analysis of the effects of frontal airbags on driver fatalities. *Accident Analysis & Prevention* 2010;42(6):2030-40.

Abstract: A meta-analysis has been conducted of the effectiveness of frontal airbags in reducing driver fatalities, and some potential moderator variables for airbag effectiveness have been investigated. The results confirm the assumption that airbags reduce accident fatalities among belted drivers, but the results are too heterogeneous for drawing conclusions about the size of the overall effect. No support has been found for the hypothesis that airbags increase overall fatality risk, as has been found in the study by Meyer and Finney (Meyer, M., Finney, T., 2005. Who wants Airbags? *Chance*, 18 (19) 3-16). The results do not seem to be affected by publication bias, and no indications of confounding effects of vehicle characteristics or impact velocity have been found. In frontal collisions belted driver fatalities were found to be reduced by about 22% when all types of airbags are regarded together. The revision of the test criteria for airbags in the USA in 1997 has improved airbag effectiveness. For unbelted drivers airbags are neither effective nor counterproductive, but may increase fatality risk in single vehicle accidents. The results show that there is a lack of knowledge about the effects of airbags in accidents that are not frontal collisions.

Hoye A. The effects of electronic stability control (ESC) on crashes--an update. *Accident Analysis & Prevention* 2011;43(3):1148-59.

Abstract: The present study is an update of the meta-analysis by Erke (Erke, A., 2008. Effects of Electronic Stability Control (ESC) on accidents: a review of empirical evidence. *Accident Analysis & Prevention*, 40 (1), 167-173). Results from 12 studies of the effects of Electronic Stability Control (ESC) on the number of different types of crashes were summarized by means of meta-analysis. The results indicate that ESC prevents about 40% of all crashes involving loss of control. The greatest reductions were found for rollover crashes (-50%), followed by run-off-road (-40%) and single vehicle crashes (-25%). These results are however likely to be somewhat overestimated, especially for non-fatal crashes. Multiple vehicle crashes were found to be largely unchanged. Reductions were found for some types of multiple vehicle crashes. Rear-end collisions are unchanged or may increase. Fatal crashes involving pedestrians, bicycles or animals were found to increase as well. ESC was found to be more effective in preventing fatal crashes than non-fatal crashes. ESC is often found to be more effective in Sports Utility Vehicles (SUVs) than in passenger cars. This may be due to differences between drivers of SUVs and passenger cars. The results from meta-analysis indicate that drivers of ESC-equipped vehicles are likely to be safer drivers than other drivers. All the same, ESC may lead to behavioural adaptation in some cases, but it is not likely that behavioural adaptation offsets the positive safety effects. This may be due to a lack of knowledge about ESC.

Ker K, Roberts IG, Collier T, Beyer FR, Bunn F, Frost C. Post-licence driver education for the prevention of road traffic crashes. *Cochrane Database of Systematic Reviews* 2003;(3):CD003734.

Abstract: BACKGROUND: Worldwide, each year over a million people are killed and some ten million people are permanently disabled in road traffic crashes. Post-licence driver education is used by many as a strategy to reduce traffic crashes. However, the effectiveness of post-licence driver education has yet to be ascertained. OBJECTIVES: To quantify the effectiveness of post-licence driver education in reducing road traffic crashes. SEARCH METHODS: We searched the following electronic databases: the Cochrane Injuries Group's Specialised Register, Cochrane CENTRAL Register of Controlled Trials, MEDLINE, EMBASE, TRANSPORT (NTIS, TRIS, TRANSDOC, IRRD), Road Res (ARRB), ATRI, National Research Register, PsycInfo, ERIC, C2-SPECTR, Zetoc, SIGLE, Science (and Social Science) Citation Index. We searched the Internet, checked ref-

erence lists of relevant papers and contacted appropriate organisations. The search was not restricted by language or publication status. The search was last updated in October 2005. SELECTION CRITERIA: Randomised controlled trials comparing post-licence driver education versus no education, or one form of post-licence driver education versus another. DATA COLLECTION AND ANALYSIS: Two reviewers independently screened search results, extracted data and assessed methodological trial quality. MAIN RESULTS: We found 24 trials of driver education, 23 conducted in the USA and one in Sweden. Twenty trials studied remedial driver education. The methodological quality of the trials was poor and three reported data unsuitable for meta-analysis. Nineteen trials reported traffic offences: pooled relative risk (RR) = 0.96, 95% confidence interval (95% CI) = 0.94, 0.98; trial heterogeneity was significant ($p < 0.00001$). Fifteen trials reported traffic crashes: pooled RR = 0.98 (95% CI 0.96, 1.01), trial heterogeneity was not significant ($p = 0.75$). Four trials reported injury crashes: pooled RR = 1.12 (95% CI 0.88, 1.41), trial heterogeneity was significant ($p < 0.00001$). No one form of education (correspondence, group or individual) was found to be substantially more effective than another, nor was a significant difference found between advanced driver education and remedial driver education. Funnel plots indicated the presence of publication bias affecting the traffic offence and crash outcomes. AUTHORS' CONCLUSIONS: This systematic review provides no evidence that post-licence driver education is effective in preventing road traffic injuries or crashes. Although the results are compatible with a small reduction in the occurrence of traffic offences, this may be due to selection biases or bias in the included trials. Because of the large number of participants included in the meta-analysis (close to 300,000 for some outcomes) we can exclude, with reasonable precision, the possibility of even modest benefits. STRONG EVIDENCE THAT ADVANCED AND REMEDIAL DRIVER EDUCATION DOES NOT REDUCE ROAD TRAFFIC CRASHES OR INJURIES: Road traffic crashes are a major cause of death and injury worldwide. As drivers' errors are a factor often contributing to traffic crashes, driver education is often used in the belief that this makes drivers safer. Driver education for licensed drivers can be remedial programmes for those with poor driving records, or advanced courses for drivers generally. They can be offered by correspondence, in groups or with individualised training. The review of trials found strong evidence that no type of driver education for licensed drivers leads to a reduction in traffic crashes or injuries

Kua A, Korner-Bitensky N, Desrosiers J, Man-Son-Hing M, Marshall S. Older driver retraining: a systematic review of evidence of effectiveness. Journal of Safety Research 2007;38(1):81-90.

Abstract: RECORD STATUS: This is a systematic review that meets the criteria for inclusion on DARE. If you would like us to consider prioritising the writing of a critical abstract for this review please e-mail CRD-DARE@york.ac.uk quoting the Accession Number of this record. Please note that priority is given to fast track requests from the UK National Health Service

Mandell SP, Kaufman R, Mack CD, Bulger EM. Describing a problem: rear seatback failure and unsecured cargo. Prehospital & Disaster Medicine 2010;25(2):152-7.

Abstract: INTRODUCTION: Currently, there is little in the literature regarding the ability of rear seatbacks to act as a protective barrier from cargo in frontal crashes. However, it has been shown that unrestrained rear passengers pose a danger to front seat occupants. The association of rear seatback failures and intrusions with mortality and serious injury were examined. METHODS: The Seattle CIREN database for restrained, rear-seat passengers in front-end crashes with seatback failure or intrusion was searched. Injury patterns and crash characteristics, including the role of unrestrained cargo were examined. Next, the National Automotive Sampling System-Crashworthiness Data System (NASS-CDS) database was queried for restrained rear-seat passengers in front-end crashes with recorded seat failure or intrusion. Mortality, maximum Abbreviated Injury Scale (AIS) score and mean Injury Severity Scale (ISS) scores were compared with passengers who had no failure or intrusion. Linear regression was used to identify the differences between the groups. Logistic regression was used to estimate the mortality risk asso-

ciated with seat failure. RESULTS: There were four CIREN cases that met the criteria. In each case, the occupant suffered significant injury or death. All four of the seat failures were the result of unrestrained cargo striking the seatback. The CDS data revealed a statistically significantly increased mortality (OR = 18.9, 95% CI = 14.0-25.7) associated with seat failure. Both the maximum AIS and mean of the ISS scores were higher in the failure/intrusion group ($p < 0.0001$). CONCLUSIONS: Rear seatback failure/intrusion is associated with increased mortality and injury. Case reports suggest unrestrained cargo plays a significant role in these injuries

McIntyre SE. Capturing attention to brake lamps. Accident Analysis & Prevention 2008;40(2):691-6.

Abstract: Rear-end collisions and distraction are major concerns and basic research in cognitive psychology concerning attention in visual search is applicable to these problems. It is proposed that using yellow tail lamps will result in faster reaction times and fewer errors than current tail lamp coloring (red) in detecting brake lamps (red) in a "worst case" scenario where brake lamp onset, lamp intensity and temporal and contextual cues are not available. Participants engaged in a visual search for brake lamps in two conditions, one using red tail lamps with red brake lamps and one with the proposed combination of yellow tail lamps with red brake lamps in which they indicated by keyboard response the presence or absence of braking cars. The hypothesis that separating brake and tail lamps by color alone would produce faster RTs, reduce errors, and provide greater conspicuity was supported. Drivers and non-drivers detect absence and presence of red brake lamps faster and with greater accuracy with the proposed yellow tail lamps than red tail lamps without the aid of any of the aforementioned cues. Vehicle conspicuity will be improved and reductions in rear-end collisions and other accidents will be reduced by implementing the proposed yellow tail lamp coloring

Mertz HJ, Dalmotas DJ. Effects of shoulder belt limit forces on adult thoracic protection in frontal collisions. Stapp Car Crash Journal 2007;51:361-80.

Abstract: Three-point restraint systems have been installed in vehicles since the early 1960s. However, it wasn't until the automatic protection rule became effective for 1987 Model Year vehicles that manufacturers began installing 3-point restraints with force-limiting shoulder belts and frontal airbags for the driver and right front passenger. This was the first time that all vehicle manufacturers had to certify that their cars would meet the 50th percentile, adult male protection requirements in the 48 km/h frontal, rigid-barrier test specified in FMVSS 208. To assess the effectiveness of these certified 3-point restraint systems, a search was done of the 1988-2005 NASS data for 3-point belted, front outboard-seated, adult occupants in passenger vehicles that were equipped with airbags and that were involved in frontal, towaway collisions. These data showed that i) half of the occupants with AIS ≥ 3 chest injuries were in collisions with a $\Delta V \leq 40$ km/h; ii) for older occupants (50+ years), half experienced their chest injuries at ΔV s ≤ 34 km/h; and iii) the chest injury rate for the older occupants was more than double that of the younger occupants. An analysis was done to estimate the effectiveness of various levels of shoulder belt limit loads in reducing chest injuries to older occupants. The result of the analysis indicated that a 2.5 kN shoulder belt limit load would substantially reduce shoulder belt-induced AIS ≥ 3 chest injuries in 99 percent of frontal collisions to all adult, front outboard seated occupants whose normalized bone strengths are greater than 0.4

Rasouli MR, Rahimi-Movaghar V, Maheronnaghsh R, Yousefian A, Vaccaro AR. Preventing motor vehicle crashes related spine injuries in children. World Journal of Pediatrics 2011;7(4):311-7.

Abstract: BACKGROUND: Spinal cord injury (SCI) is a devastating event that results in permanent disability for injured children. Among all etiologies of SCI, motor vehicle crashes (MVCs) are the leading cause and account for 29% of all traumatic SCIs in children. We tried to evaluate types and mechanisms of MVC-related spinal column and spinal cord injuries, risk factors, safety

issues and legislation. DATA SOURCES: A literature review was performed using PubMed from 1966 to 12th April 2010 with the following key words: children OR pediatric, spine, injury OR trauma, restraint, seat belt, motor vehicle, road OR traffic, collision OR crash, safety. Cross referencing of discovered articles was also performed. RESULTS: Risk factors for MVC-related SCI include single vehicle crashes, vehicle rollover, and ejection of the passenger from the vehicle. Any anatomic region of the spinal cord may be injured as a result of MVC and may vary according to the type of accident and restraint system usage. Increasing use of three-point seat belts, which are more protective than isolated lap seat belts, has decreased the incidence of MVC-related SCI. There is evidence that airbag use without seatbelt use is associated with an increased risk of cervical spine fractures with or without SCI. Vehicle designers need to give more attention to the prevention of vehicle rollover and to improve occupant protection when rollover occurs. CONCLUSIONS: MVC is a common cause of SCI in children; therefore, paying attention to risk factors and modes of prevention is important. As MVC-related SCI can lead to permanent disability, prevention and education play an important role in decreasing childrens' morbidity and mortality. Making behavior, roads and vehicles safer can significantly reduce MVC-related SCI in children

Roberts IG, Kwan I. School-based driver education for the prevention of traffic crashes. Cochrane Database of Systematic Reviews 2001;(3):CD003201.

Abstract: BACKGROUND: In the UK, drivers aged 17 to 21 years make up 7% of licence holders but 13% of drivers involved in road traffic crashes resulting in injury. As in many countries, the UK government has proposed to tackle this problem with driver education programmes in schools and colleges. However, there is a concern that if driver education leads to earlier licensing this could increase the number of teenagers involved in road traffic crashes. OBJECTIVES: To quantify the effect of school-based driver education on licensing and road traffic crashes. SEARCH METHODS: We searched CENTRAL, CIG's specialised register, MEDLINE, National Research Register, and the Science & Social Science Citation Index. We also checked reference lists of identified papers and contacted authors and experts in the field. SELECTION CRITERIA: Randomised controlled trials comparing school-based driver education to no driver education and assessing the effect on licensing and road traffic crash involvement. DATA COLLECTION AND ANALYSIS: Two authors independently screened search results, extracted data and assessed trial quality. MAIN RESULTS: Three trials, conducted between 1982 and 1984, met the inclusion criteria (n=17,965). Two trials examined the effect of driver education on licensing. In the trial by Stock (USA) 87% of students in the driver education group obtained their driving licence as compared to 84.3% in the control group (RR 1.04; 95% CI 1.02 to 1.05). In the trial by Wynne-Jones (New Zealand) the time from trial enrolment to licensing was 111 days in males receiving driver education compared with 300 days in males who did not receive driver education, and 105 days in females receiving driver education compared with 415 days in females who did not receive driver education. All three trials examined the effect of driver education on road traffic crashes. In the trial by Strang (Australia), 42% of students in each group had one or more crashes since being licensed (RR 1.01, 95% CI 0.83 to 1.23). In the trial by Stock, the number of students involved in one or more crashes as a driver was 27.5% in the driver education group compared to 26.7% in the control group (RR 1.03; 95% CI 0.98 to 1.09). In the trial by Wynne-Jones, the number of students who experienced crashes was 16% in the driver education group as compared to 14.5% in the control group (RR 1.10; 95% CI 0.76 to 1.59). AUTHORS' CONCLUSIONS: The results show that driver education leads to early licensing. They provide no evidence that driver education reduces road crash involvement, and suggest that it may lead to a modest but potentially important increase in the proportion of teenagers involved in traffic crashes. SCHOOL BASED DRIVER EDUCATION LEADS TO EARLY LICENSING AND MAY INCREASE ROAD CRASH RATES.: Teenagers have a higher risk of road death and serious injury than any other group. School based driver education has been promoted as a strategy to reduce the number of road crashes involving teenagers. The results of this systematic review show that driver education in schools leads to early licensing. They provide no evidence that driver education reduces

road crash involvement, and suggest that it may lead to a modest but potentially important increase in the proportion of teenagers involved in traffic crashes

Russell KF, Vandermeer B, Hartling L. Graduated driver licensing for reducing motor vehicle crashes among young drivers. Cochrane Database of Systematic Reviews 2011;(10):CD003300.

Abstract: BACKGROUND: Graduated driver licensing (GDL) has been proposed as a means of reducing crash rates among novice drivers by gradually introducing them to higher risk driving situations. OBJECTIVES: To examine the effectiveness of GDL in reducing crash rates among young drivers. SEARCH METHODS: Studies were identified through searching MEDLINE, EMBASE, CINAHL, Healthstar, Web of Science, NTIS Bibliographic Database, TRIS Online, SIGLE, the World Wide Web, conference proceedings, consultation with experts and reference lists in relevant published literature. The searches were conducted from the time of inception to May 2009, and the Cochrane Injuries Group conducted an updated search of the TRANSPORT database in September 2009. SELECTION CRITERIA: Studies were included if: 1) they compared outcomes pre- and post-implementation of a GDL program within the same jurisdiction, 2) comparisons were made between jurisdictions with and without GDL, or 3) both. Studies had to report at least one objective, quantified outcome. DATA COLLECTION AND ANALYSIS: Results were not pooled due to substantial heterogeneity. Percentage change was calculated for each year after the intervention, using one year prior to the intervention as baseline. Results were adjusted by internal controls. Analyses were stratified by denominators (population, licensed drivers). Results were calculated for the different crash types and presented for 16 year-olds alone as well as all teenage drivers. MAIN RESULTS: We included 34 studies evaluating 21 GDL programs and 2 analyses of >40 US states. GDL programs were implemented in the US (n=16), Canada (n=3), New Zealand (n=1), and Australia (n=1) and varied in their restrictions during the intermediate stage. Based on the Insurance Institute for Highway Safety (IIHS) classification, eleven programs were good, four were fair, five were marginal, one was poor and two could not be assessed. Reductions in crash rates were seen in all jurisdictions and for all crash types. Among 16 year-old drivers, the median decrease in per population adjusted overall crash rates during the first year was 15.5% (range -27 to -8%, five studies). There was a decrease in per population adjusted injury crash rates (median -21%, range -46 to -2%, five studies). Results for all teenage drivers, rates per licensed driver, and rates adjusting for internal controls were generally reduced when comparing within jurisdictions. AUTHORS' CONCLUSIONS: GDL is effective in reducing crash rates among young drivers, although the magnitude of the effect varies. The conclusions are supported by consistent findings, temporal relationship, and plausibility of the association. Stronger GDL programs (i.e. more restrictions or higher quality based on IIHS classification) appear to result in greater fatality reduction. Future studies should focus on which components and combination of components yield the greatest reductions. GRADUATED DRIVER LICENSING FOR REDUCING MOTOR VEHICLE CRASHES AMONG YOUNG DRIVERS: Young drivers are at high risk of involvement in motor vehicle crashes. Graduated driver licensing (GDL) has been proposed as a means of reducing crash rates among novice drivers by gradually introducing them to higher risk driving situations. This review found 34 studies that have evaluated various types of GDL programs. All of the studies reported positive findings, with reductions for all types of crashes among all teenage drivers. However, the size of the reductions varied and, based on the included studies it is not possible to say which aspects of GDL programs have the biggest effect. Future research on GDL should evaluate the relative impact of different program components

Subzwari S, Desapriya E, Babul-Wellar S, Pike I, Turcotte K, Rajabali F, et al. Vision screening of older drivers for preventing road traffic injuries and fatalities. [Review] [54 refs][Update in Cochrane Database Syst Rev. 2011;(3):CD006252; PMID: 21412894]. Cochrane Database of Systematic Reviews (1):CD006252, 2009 2009;(1):CD006252.

Abstract: BACKGROUND: Demographic data in North America, Europe, Asia, Australia and New Zealand suggest a rapid growth in the number of persons over the age of 65 years as the baby

boomer generation passes retirement age. As older adults make up an increasing proportion of the population, they are an important consideration when designing future evidence-based traffic safety policies, particularly those that lead to restrictions or cessation of driving. Research has shown that cessation of driving among older drivers can lead to negative emotional consequences such as loss of independence and depression. Those older adults who continue to drive tend to do so less frequently than other demographic groups and are more likely to be involved in a road traffic crash, probably due to what is termed the 'low mileage bias'. There is universal agreement among researchers that vision plays a significant role in driving performance, and that there are age-related visual changes. Vision testing of all drivers, and in particular of older drivers, is therefore an important road safety issue. The components of visual function essential for driving are acuity, field, depth perception and contrast sensitivity, which are currently not fully measured by licensing agencies. Furthermore, it is not known how effective vision screening tools are, and current vision screening regulations and cut-off values required to pass a licensing test vary from country to country. There is, therefore, a need to develop evidence-based tools for vision screening for driving, thereby increasing road safety. OBJECTIVES: To assess the effects of vision screening interventions for older drivers to prevent road traffic injuries and fatalities. SEARCH STRATEGY: We searched the Cochrane Injuries Group Specialized Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2006, issue 3), MEDLINE, EMBASE, TRANSPORT, AgeInfo, AgeLine, the National Research Register, the Science (and Social Science) Citation Index, IBSS (International Bibliography of Social Sciences), PsycINFO, and Zetoc. We also searched the Internet and checked the reference lists of relevant papers to identify any further studies. The searches were conducted up to September 2006. SELECTION CRITERIA: Randomized controlled trials (RCTs) and controlled before and after studies comparing vision screening to non-screening of drivers aged 55 years and older, and which assessed the effect on road traffic crashes, injuries, fatalities and any involvement in traffic law violations, were included. DATA COLLECTION AND ANALYSIS: Two authors independently screened the reference lists for eligible articles and independently assessed the articles for inclusion against the criteria. Two authors independently extracted data using a standardized extraction form. MAIN RESULTS: No studies were found which met the inclusion criteria for this review. AUTHORS' CONCLUSIONS: Most countries require a vision screening test for the renewal of an individual's driver's license. There is, however, insufficient evidence to assess the effect of vision screening tests on subsequent motor vehicle crash reduction. There is a need to develop valid and reliable tools of vision screening that can predict driving performance. [References: 54]

Williams S, Whitlock E, Smith P, Edgerton B, Beil T. Primary care interventions to prevent motor vehicle occupant injuries. 2007.

Abstract: RECORD STATUS: This is a systematic review that meets the criteria for inclusion on DARE. If you would like us to consider prioritising the writing of a critical abstract for this review please e-mail CRD-DARE@york.ac.uk quoting the Accession Number of this record. Please note that priority is given to fast track requests from the UK National Health Service

Williams SB, Whitlock EP, Edgerton EA, Smith PR, Beil TL, U.S.Preventive Services Task Force. Counseling about proper use of motor vehicle occupant restraints and avoidance of alcohol use while driving: a systematic evidence review for the U.S. Preventive Services Task Force. [Review] [51 refs][Summary for patients in Ann Intern Med. 2007 Aug 7;147(3):I32; PMID: 17679701]. Ann Intern Med 2007;147(3):194-206.

Abstract: BACKGROUND: Motor vehicle-related injuries are the leading cause of death among children, adolescents, and young adults. PURPOSE: To systematically review evidence of the effectiveness of counseling people of any age in primary care settings about occupant restraints or alcohol-related driving to prevent injuries. DATA SOURCES: MEDLINE, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, PsycINFO, CINAHL, and Traf-

fic Research Information Service; published systematic evidence reviews; experts; and bibliographies of selected trials. STUDY SELECTION: Randomized, controlled trials (RCTs); controlled clinical trials (CCTs); or comparative observational research studies that evaluated behavioral counseling interventions feasible to conduct in primary care or referral from primary care. DATA EXTRACTION: Investigators abstracted data on study design, setting, patients, interventions, outcomes, and quality-related study details. DATA SYNTHESIS: Trials report that counseling to increase the use of child safety seats leads to increased short-term restraint use (7 CCTs, 6 RCTs). Interventions that included a demonstration of correct use or distribution of a free or reduced-cost child safety seat reported larger effects. Few trials described the effect of counseling children 4 to 8 years of age to use booster seats (1 RCT); counseling older children, adolescents, or adults to use seat belts (1 CCT, 2 RCTs); or counseling unselected primary care patients to reduce alcohol-related driving behaviors (no trials). LIMITATIONS: Most of the relevant trials were published before the widespread enactment of child safety seat legislation and had methodological flaws. CONCLUSIONS: The incremental effect of primary care counseling to increase the correct use of child safety seats in the current regulatory environment is not established. The effectiveness of primary care counseling to reduce alcohol-related driving has not been tested. Studies are needed. [References: 51]

Willis C, Lybrand S, Bellamy N. Alcohol ignition interlock programmes for reducing drink driving recidivism. Cochrane Database of Systematic Reviews 2004;(3):CD004168.

Abstract: BACKGROUND: An ignition interlock device is part of a multi-dimensional programme aimed at reducing recidivism in convicted drink drivers. To operate a vehicle equipped with an ignition interlock device, the driver must first provide a breath specimen. If the breath alcohol concentration of the specimen exceeds the predetermined level, the vehicle will not start. As a measure to reduce circumvention of the device (i.e. someone else blows into the mouthpiece), random retests are required while the vehicle is running. Other components of the drink driving programme include information seminars for the driver and downloading data from the device's data logger, which logs all test attempts and records all passes, warnings and failures. OBJECTIVES: To systematically assess the effectiveness of ignition interlock programmes on recidivism rates of drink drivers, by examining rates of recidivism while the ignition interlock device was installed in the vehicle and after removal of the device. SEARCH METHODS: We searched The Cochrane Injuries Group's Specialised register (Sept 2002), MEDLINE (1966 to August 2002), PubMed (to Aug 2002), EMBASE (1980 to Sept 2002), TRANSPORT (1988 to 2002 issue 06), CENTRAL (The Cochrane Library 2002, Issue 3), The Science Citation Index (1980 to Sept 2002) National Research Register (2002, issue 3). We also searched the Internet using various search engines. SELECTION CRITERIA: Controlled trials in which offenders have been charged with drink driving and have either been sentenced to participate in an ignition interlock programme or the usual punishment (either licence suspension or some form of treatment programme). This study was not restricted by language or status of publication. DATA COLLECTION AND ANALYSIS: One randomised controlled trial (RCT) and ten controlled trials were identified, and also three ongoing trials. Data regarding recidivism while the interlock is installed in the vehicle; after the interlock has been removed from the vehicle and total recidivism during the study were extracted and entered into analyses using RevMan. MAIN RESULTS: The RCT showed that the interlock programme was effective while the device was installed in the vehicle; relative risk 0.36 (95% confidence interval 0.21 to 0.63). Controlled trials support this conclusion, with a general trend towards lower recidivism rates when the interlock device is installed. Neither the RCT nor the controlled trials provide evidence for any effectiveness of the programmes continuing once the device has been removed. AUTHORS' CONCLUSIONS: In order to eliminate potential selection bias, more RCTs need to be conducted in this area so that effectiveness, as well as efficacy, can be ascertained. The interlock programme appears to be effective while the device is installed in the vehicle of the offender. Studies need to address ways of improving recidivism rates in the long term, as the major challenges are participation rates, compliance and durability. ALCOHOL IGNITION INTERLOCKS

MAY STOP REPEAT DRINK DRIVING OFFENCES, BUT ONLY AS LONG AS THEY ARE STILL FITTED: Convicted drink drivers are sometimes offered the choice of a standard punishment, or for an alcohol ignition interlock to be fitted to their car for a fixed period. To operate a vehicle equipped with an interlock, the driver must first give a breath specimen. If the breath alcohol concentration of the specimen is too high, the vehicle will not start. A number of studies have been conducted to see whether the interlock stops drink drivers from offending again. Most of these studies have not been of high quality. The interlock seems to reduce re-offending as long as it is still fitted to the vehicle, but there is no long-term benefit after it has been removed. However, more studies of good quality are needed to confirm these findings. The low percentage of offenders who choose to have an interlock fitted also makes it difficult to reach firm conclusions about their effectiveness

Motorsykkel

Byrnes M, Gerberich S. Motorcycle helmet use and legislation: a systematic review of the literature. *Minn Med* 2012;95(1):60-5.

Abstract: Although there has been a marked improvement in the safety profiles of cars and in car crash outcomes, there has been a marked worsening in outcomes of motorcycle collisions. Motorcycles account for only 2% of vehicle registrations in the United States, but motorcycle collisions account for 10% of traffic deaths. Further, motorcycle riders are 34 times more likely to die in a traffic collision than automobile drivers. Motorcycle helmet use has been suggested to be an effective way to reduce death and disability after traffic collisions, and enactment of universal helmet laws has been suggested as a means to enforce helmet use. This article presents findings from an analysis of National Highway Traffic Safety Administration data and studies in the medical literature on the impact of motorcycle helmet use and helmet legislation on the risk of death or injury in motorcycle accidents. The authors found voluminous support for motorcycle helmet use as a way to prevent severe traumatic brain injury and traffic fatalities

Kardamanidis K, Martiniuk A, Ivers RQ, Stevenson MR, Thistlethwaite K. Motorcycle rider training for the prevention of road traffic crashes. [Review]. *Cochrane Database of Systematic Reviews* (10):CD005240, 2010 2010;(10):CD005240.

Abstract: BACKGROUND: Riding a motorcycle (a two-wheeled vehicle that is powered by a motor and has no pedals) is associated with a high risk of fatal crashes, particularly in new riders. Motorcycle rider training has therefore been suggested as an important means of reducing the number of crashes, and the severity of injuries. OBJECTIVES: To quantify the effectiveness of pre- and post-licence motorcycle rider training on the reduction of traffic offences, traffic crash involvement, injuries and deaths of motorcycle riders. SEARCH STRATEGY: We searched the Cochrane Injuries Group Specialised Register, CENTRAL (The Cochrane Library 2008, Issue 3), TRANSPORT, MEDLINE, EMBASE, CINAHL, WHOLIS (World Health Organization Library Information System), PsycInfo, LILACS (Latin American and Caribbean Health Sciences), ISI Web of Science: Social Sciences Citation Index (SSCI), ERIC, ZETOC and SIGLE. Database searches covered all available dates up to October 2008. We also checked reference lists of relevant papers and contacted study authors in an effort to identify published, unpublished and ongoing trials related to motorcycle rider training. SELECTION CRITERIA: We included all relevant intervention studies such as randomised and non-randomised controlled trials, interrupted time-series and observational studies such as cohort and case-control studies. DATA COLLECTION AND ANALYSIS: Two review authors independently analysed data about the study population, study design and methods, interventions and outcome measures as well as data quality from each included study, and compared the findings. We resolved differences by discussion with a third review author. MAIN RESULTS: We reviewed 23 studies: three randomised trials, two non-randomised trials, 14 cohort studies and four case-control studies. Five examined mandatory pre-licence training, 14 assessed non-mandatory training, three of the case-control studies as-

sessed 'any' type of rider training, and one case-control study assessed mandatory pre-licence training and non-mandatory training. The types of assessed rider training varied in duration and content. Most studies suffered from serious methodological weaknesses. Most studies were non-randomised and controlled poorly for confounders. Most studies also suffered from detection bias due to the poor use of outcome measurement tools such as the sole reliance upon police records or self-reported data. Small sample sizes and short follow-up time after training were also common. AUTHORS' CONCLUSIONS: Due to the poor quality of studies identified, we were unable to draw any conclusions about the effectiveness of rider training on crash, injury, or offence rates. The findings suggest that mandatory pre-licence training may be an impediment to completing a motorcycle licensing process, possibly indirectly reducing crashes through a reduction in exposure. [NON-BREAKING SPACE] It is not clear if training (or what type) reduces the risk of crashes, injuries or offences in motorcyclists, and a best rider training practice can therefore not be recommended. As some type of rider training is likely to be necessary to teach motorcyclists to ride a motorcycle safely, rigorous research is needed

Liu BC, Ivers R, Norton R, Boufous S, Blows S, Lo SK. [Helmets for preventing injury in motorcycle riders](#). [Review] [107 refs][Update of Cochrane Database Syst Rev. 2004;(2):CD004333; PMID: 15106247]. Cochrane Database of Systematic Reviews (1):CD004333, 2008 2008;(1):CD004333.

Abstract: BACKGROUND: Motorcycle crash victims form a high proportion of those killed or injured in road traffic crashes. Injuries to the head, following motorcycle crashes, are a common cause of severe morbidity and mortality. It seems intuitive that helmets should protect against head injuries but it has been argued that motorcycle helmet use decreases rider vision and increases neck injuries. This review will collate the current available evidence on helmets and their impact on mortality, and head, face and neck injuries following motorcycle crashes. OBJECTIVES: To assess the effects of wearing a motorcycle helmet in reducing mortality and head and neck injury following motorcycle crashes. SEARCH STRATEGY: We searched the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials (The Cochrane Library issue 2, 2007), MEDLINE (up to April 2007), EMBASE (up to April week 16, 2007), CINAHL (January 1982 to February 2003), TRANSPORT (up to issue 12, 2006) (TRANSPORT combines the following databases: Transportation Research Information Services (TRIS) International Transport Research Documentation (ITRD) formerly International Road Research Documentation (IRRD), ATRI (Australian Transport Index) (1976 to Feb 2003), Science Citation Index were searched for relevant articles. Websites of traffic and road safety research bodies including government agencies were also searched. Reference lists from topic reviews, identified studies and bibliographies were examined for relevant articles. SELECTION CRITERIA: We considered studies that investigated a population of motorcycle riders who had crashed, examining helmet use as an intervention and with outcomes that included one or more of the following: death, head, neck or facial injury. We included any studies that compared an intervention and control group. Therefore the following study designs were included: randomised controlled trials, non-randomised controlled trials, cohort, case-control and cross-sectional studies. Ecological and case series studies were excluded. DATA COLLECTION AND ANALYSIS: Two authors independently screened reference lists for eligible articles. Two authors independently assessed articles for inclusion criteria. Data were abstracted by two independent authors using a standard abstraction form. MAIN RESULTS: Sixty-one observational studies were selected of varying quality. Despite methodological differences there was a remarkable consistency in results, particularly for death and head injury outcomes. Motorcycle helmets were found to reduce the risk of death and head injury in motorcyclists who crashed. From four higher quality studies helmets were estimated to reduce the risk of death by 42% (OR 0.58, 95% CI 0.50 to 0.68) and from six higher quality studies helmets were estimated to reduce the risk of head injury by 69% (OR 0.31, 95% CI 0.25 to 0.38). Insufficient evidence was found to estimate the effect of motorcycle helmets compared with no helmet on facial or neck injuries. However, studies of poorer quality suggest that helmets have no effect on the risk of neck injuries and are protective for facial injury. There was insufficient evidence to demonstrate whether differences in helmet type confer more or less

advantage in injury reduction. AUTHORS' CONCLUSIONS: Motorcycle helmets reduce the risk of death and head injury in motorcycle riders who crash. Further well-conducted research is required to determine the effects of helmets and different helmet types on mortality, head, neck and facial injuries. However, the findings suggest that global efforts to reduce road traffic injuries may be facilitated by increasing helmet use by motorcyclists. [References: 107]

Pai CW. Motorcycle right-of-way accidents--a literature review. [Review]. Accident Analysis & Prevention 2011;43(3):971-82.

Abstract: UNLABELLED: The most typical automobile-motorcycle collision take places when an automobile manoeuvres into the path of an approaching motorcycle by violating the motorcycle's right of way (ROW). AIM: The present paper provides a comprehensive review of past research that examined motorcycle ROW accidents. METHODS: Articles and publications were selected for relevance and research strength through a comprehensive search of major databases such as Transportation Research Information Services (TRIS), Compendex, and Medline. RESULTS: Two major causes of such a crash scenario are the lack of motorcycle conspicuity and motorist's speed/distance judgment error, respectively. A substantial number of studies have manipulated physical characteristics of motorcycles and motorcyclists to enhance conspicuity, along with research addressing motorists' gap-acceptance behaviours and arrival time judgments when confronting motorcycles. Although various conspicuity aids have proven effective, some researchers reported that motorcyclist's/motorcycle's brightness per se may be less important as a determinant of conspicuity than brightness contrast between the motorcyclists and the surroundings. Larger vehicles tended to be judged to arrive sooner than motorcycles. Such a speed/distance judgment error is likely attributable to some psychological effects such that larger automobiles appear more threatening than motorcycles. Older motorists particularly have difficulties in accurately estimating the distance and the speed of an approaching motorcycle. Research examining the effects of conspicuity measures on motorists' speed/distance judgments when confronting motorcycles has been rather inconclusive. CONCLUSIONS: Past research offers valuable insight into the underlying motorcycle ROW crash mechanisms. However, with ageing society and a rapid change in traffic composition (e.g., more larger motorcycles) in recent years, prior research findings should be updated. The present study finally provides recommendations for future research on motorcycle ROW accidents.

Sykkel

Carmont MR. Mountain biking injuries: a review. [Review] [43 refs]. Br Med Bull 2008;85:101-12.

Abstract: INTRODUCTION: Mountain biking is a fast, exciting adventure sport with increasing numbers of participants and competitions. METHODS AND RESULTS: A search of PubMed, Medline, CINAHL, DH data, and Embase databases was performed using the following keywords: mountain, biking and injuries. This revealed 2 review articles, 17 case controlled studies, 4 case series and 5 case reports. This review summarises the published literature on mountain biking injuries, discusses injury frequency and common injury mechanisms. CONCLUSIONS: Riders are quick to adopt safety measures. Helmet usage is now increasingly common and handlebar adaptations have been discontinued. Although the sport has a reputation for speed and risk with research and awareness, injury prevention measures are being adopted making the sport as safe as possible. [References: 43]

Elvik R. Publication bias and time-trend bias in meta-analysis of bicycle helmet efficacy: a re-analysis of Attewell, Glase and McFadden, 2001. Accident Analysis & Prevention 2011;43(3):1245-51.

Abstract: This paper shows that the meta-analysis of bicycle helmet efficacy reported by Atte-

well, Glase, and McFadden (Accident Analysis and Prevention 2001, 345-352) was influenced by publication bias and time-trend bias that was not controlled for. As a result, the analysis reported inflated estimates of the effects of bicycle helmets. This paper presents a re-analysis of the study. The re-analysis included: (1) detecting and adjusting for publication bias by means of the trim-and-fill method; (2) ensuring the inclusion of all published studies by means of continuity corrections of estimates of effect rely on zero counts; (3) detecting and trying to account for a time-trend bias in estimates of the effects of bicycle helmets; (4) updating the study by including recently published studies evaluating the effects of bicycle helmets. The re-analysis shows smaller safety benefits associated with the use of bicycle helmets than the original study.

Jensen SU. Safety effects of blue cycle crossings: a before-after study. Accident Analysis & Prevention 2008;40(2):742-50.

Abstract: This paper presents a before-after accident study of marking blue cycle crossings in 65 signalised junctions. Correction factors for changes in traffic volumes and accident/injury trends are included using a general comparison group in this non-experimental observational study. Analysis of long-term accident trends point towards no overall abnormal accident counts in the before period. The safety effect depends on the number of blue cycle crossings at the junction. One blue cycle crossing reduces the number of junction accidents by 10%, whereas marking of two and four blue cycle crossings increases the number of accidents by 23% and 60%, respectively. Larger reduction and increases are found for injuries. Safety gains at junctions with one blue cycle crossing arise because the number of accidents with cyclists and moped riders that may have used the blue cycle crossing in the after period and pedestrians in the pedestrian crossing parallel and just next to the blue marking was statistically significantly reduced. Two or four blue cycle crossings especially increase the number of rear-end collisions only with motor vehicles involved and right-angle collisions with passenger cars driving on red traffic lights

Kiss K, Pinter A. Are bicycle helmets necessary for children? Pros and cons. [Hungarian]. Orv Hetil 2009;150(24):1129-33.

Abstract: UNLABELLED: Prevalence of severe head injuries and deaths in children due to bicycle accidents is high in Hungary. The aim of this review was to investigate the effectiveness of bicycle helmets in preventing head injuries in children. METHODS: Review of literature was based on Hungarian and international studies published on MEDLINE. Furthermore, we used official statistical databases and investigations of some international child safety organizations. RESULTS: The effectiveness of bicycle helmets in reducing the number of severe head injuries and bicycle deaths is very well established. Several countries have mandatory helmet laws, which lowered bicycle deaths and severe head injuries. It was proved that helmets are effective only if worn properly. Otherwise the risk of head injuries might increase. In spite of the findings, counter-arguments question the effectiveness of helmets; moreover, give account of a helmet's risk growing effect. CONCLUSIONS: Upon the literature, the number of studies proving the necessity of helmets is higher than those objecting to them. However, this positive effect can be achieved only if several factors are present at the same time. In Hungary there is a need for effective prevention strategies such as the popularization of properly-worn helmets

Kwan I, Mapstone J. Interventions for increasing pedestrian and cyclist visibility for the prevention of death and injuries. Cochrane Database of Systematic Reviews 2006;(4):CD003438.

Abstract: BACKGROUND: Pedestrians and cyclists account for nearly one in three of all road users killed and seriously injured in road traffic crashes. Late detection of other road users is one of the basic driver failures responsible for collisions. Aids to improve pedestrians and cyclist visibility have been used to avert potential collisions. However, the impact of these strategies on drivers' responses, and on pedestrian and cyclist safety is unknown. OBJECTIVES: 1. To quantify the effect of visibility aids versus no visibility aids, and of different visibility aids on the occur-

rence of pedestrian and cyclist-motor vehicle collisions and injuries. 2. To quantify the effect of visibility aids versus no visibility aids, and of different visibility aids on drivers' detection and recognition responses. SEARCH METHODS: Searches were not restricted by date, language or publication status. All electronic databases were searched from date of inception to the most recent date available. We searched CENTRAL (The Cochrane Library 2009, Issue 2), MEDLINE (Ovid SP), TRANSPORT (to 2007/06), PsycINFO (Ovid SP), PsycEXTRA (Ovid SP), ISI Web of Science: Social Sciences Citation Index (SSCI) and ISI Web of Science: Conference Proceedings Citation Index- Science (CPCI-S). We searched the reference lists of included trials, contacted authors and searched the websites of relevant transport research organisations. The searches were last updated in May 2009. SELECTION CRITERIA: 1. Randomised controlled trials and controlled before-and-after studies of the effect of visibility aids on the occurrence of pedestrian and cyclist-motor collisions and injuries. 2. Randomised controlled trials of the effect of visibility aids on drivers' detection and recognition responses. This included trials where the order of presentation of visibility aids was randomised or balanced using a Latin Square design. DATA COLLECTION AND ANALYSIS: Two authors independently screened records, extracted data and assessed trial quality. MAIN RESULTS: We found no trials assessing the effect of visibility aids on pedestrian and cyclist-motor vehicle collisions and injuries. To date we have identified 42 trials assessing the effect of visibility aids on drivers' responses. Fluorescent materials in yellow, red and orange colours improve detection and recognition in the daytime. For night-time visibility, lamps, flashing lights and retroreflective materials in red and yellow colours increase detection and recognition. Retroreflective materials enhance recognition, in particular when arranged in a 'biomotion' configuration, taking advantage of the motion from a pedestrian's limbs. Substantial heterogeneity between and within the trials limited the possibility for meta-analysis. Summary statistics and descriptive summaries of the outcomes were presented for individual trials when appropriate. AUTHORS' CONCLUSIONS: Visibility aids have the potential to increase visibility and enable drivers to detect pedestrians and cyclists earlier. Biomotion markings, which highlight the movement and form of the pedestrian, showed evidence of improving pedestrians' conspicuity at night. Public acceptability of various effective strategies which improve visibility would merit further development. However, the effect of visibility aids on pedestrian and cyclist safety remains unknown. A cluster randomised controlled trial involving large communities may provide an answer to this question. It would, however, be a challenging trial to conduct. Studies that collect data of road traffic injuries relating to the use of visibility aids also warrant consideration. INCREASING PEDESTRIAN AND CYCLIST VISIBILITY TO PREVENT DEATHS AND INJURIES: Pedestrians and cyclists are often killed or seriously injured in traffic crashes, especially in developing countries where walking and bicycling are essential modes of transportation. In the UK, one in three road traffic fatalities is a pedestrian or cyclist. Usually, in these crashes drivers fail to see the pedestrian or cyclist until it is too late. In recent years reflective garments, flashing lights, and other visibility aids have been used to try to prevent crashes. The authors of this Cochrane review looked for studies which showed how effective visibility aids are for protecting pedestrians and cyclists. They focused their search on a type of study called a randomised controlled trial, which compares two similar groups of people who only differ on the issue being studied, for instance, the rate of crashes in communities with and without introduction of visibility aids. The authors found no studies that compared number of crashes but to date they have found 42 studies which compare driver detection of people with or without visibility aids. These studies showed that fluorescent materials in yellow, red and orange improved driver detection during the day; while lamps, flashing lights and retroreflective materials in red and yellow, particularly those with a 'biomotion' configuration (taking advantage of the motion from a pedestrian's limbs), improved pedestrian recognition at night. Although these visibility measures help drivers see pedestrians and cyclists, more research should be done to determine whether the increased visibility actually does prevent deaths and serious injuries

Lee RS, Hagel BE, Karkhaneh M, Rowe BH. [A systematic review of correct bicycle helmet use: how varying definitions and study quality influence the results.](#) [Review] [16 refs]. *Inj Prev* 2009;15(2):125-31.

Abstract: BACKGROUND: Bicycle helmets effectively reduce the risk of bicycle-related head injuries and trauma; however, they must fit properly to be effective. Little is known about the prevalence of correctly worn helmets and factors associated with proper helmet use. OBJECTIVE: To examine proper bicycle helmet use through a systematic review. METHODS: Comprehensive searches of electronic medical databases were performed, and completed by grey literature and reference list checks to identify eligible studies. Studies eligible for inclusion had to involve cyclists and report on the prevalence of correct or incorrect helmet use. Two reviewers independently selected studies and data were extracted regarding the prevalence and factors influencing proper helmet wearing of cyclists. RESULTS: An inclusive search strategy led to 2285 pre-screened citations; 11 of the studies were finally included in the review. Overall, correct helmet use varied from 46% to 100%, depending on the criteria used by researchers to define proper helmet use; stricter criteria reduced the proportion of properly worn helmets. Adulthood, female sex and educational interventions were associated with correct helmet use in some studies. Self-reported poor helmet fit (OR = 1.96; 95% CI 1.10 to 3.75), posterior positioning of helmet (OR = 1.52; 95% CI 1.02 to 2.26) and helmet loss in crash (OR = 3.25; 95% CI 1.82 to 5.75) increased the risk of head injury. In addition, educational programmes on helmet use in schools increased correct helmet use among schoolchildren. CONCLUSIONS: This systematic review outlines the current state of the literature including the variability in research methodology and definitions used to study proper helmet-wearing behaviour among cyclists. [References: 16]

Macpherson A, Spinks A. Bicycle helmet legislation for the uptake of helmet use and prevention of head injuries. [Review] [39 refs][Update of Cochrane Database Syst Rev. 2007;(2):CD005401; PMID: 17443588]. Cochrane Database of Systematic Reviews (3):CD005401, 2008 2008;(3):CD005401.

Abstract: BACKGROUND: Evidence exists to suggest that bicycle helmets may reduce the risk of head injuries to cyclists, however helmets are not uniformly worn by all bicycle users. Legislation has been enacted in some countries to mandate helmet use by cyclists, however the issue remains controversial with opponents arguing that this may inhibit people from bicycle riding and thus from gaining the associated health benefits, or that other countermeasures may have been responsible for decline in head injuries. OBJECTIVES: To assess the effects of bicycle helmet legislation on bicycle-related head injuries and helmet use, and the occurrence of unintended adverse consequences. SEARCH STRATEGY: We searched CENTRAL, the Cochrane Injuries Group's specialised register, MEDLINE, EMBASE, TRANSPORT and other specialist electronic databases, up to February 2006. In addition we searched government websites, handsearched selected journals and examined the reference lists of selected publications. SELECTION CRITERIA: We included studies that reported changes in either the number of head injuries, helmet use or bicycle use post- versus pre-legislation. Only studies that included a concurrent control group and which reported on the effect of legislation implemented at either the country, state or province wide level were included. DATA COLLECTION AND ANALYSIS: Two authors independently extracted data and assessed methodological quality. The data were not appropriate for meta-analysis, thus the results of the included studies have been reviewed narratively. MAIN RESULTS: Five studies, all from North America, met the inclusion criteria. For each of the studies, bicycle helmet legislation had been enacted for children only. Adults were used as controls in four of the studies, whilst jurisdictions with no helmet legislation were used as controls in the fifth. Three of the studies reported on changes in head injury rates and three reported on changes in helmet use. There were no included studies reporting change in bicycle use or other adverse consequences of legislation. In two studies, statistically significant decreases in head injuries were reported following the implementation of helmet legislation compared with controls, whilst one reported a non-statistically significant decline. Bicycle helmet use increased statistically significantly post-legislation in all three of the studies reporting on helmet use. AUTHORS' CONCLUSIONS: Bicycle helmet legislation appears to be effective in increasing helmet use and decreasing head injury rates in the populations for which it is implemented. However,

there are very few high quality evaluative studies that measure these outcomes, and none that reported data on an possible declines in bicycle use. [References: 39]

Owen R, Kendrick D, Mulvaney C, Coleman T, Royal S. Non-legislative interventions for the promotion of cycle helmet wearing by children. [Review][Update of Cochrane Database Syst Rev. 2005;(2):CD003985; PMID: 15846689]. Cochrane Database of Systematic Reviews (11):CD003985, 2011 2011;(11):CD003985.

Abstract: **BACKGROUND:** Helmets reduce bicycle-related head injuries, particularly in single vehicle crashes and those where the head strikes the ground. We aimed to identify non-legislative interventions for promoting helmet use among children, so future interventions can be designed on a firm evidence base. **OBJECTIVES:** To assess the effectiveness of non-legislative interventions in increasing helmet use among children; to identify possible reasons for differences in effectiveness of interventions; to evaluate effectiveness with respect to social group; to identify adverse consequences of interventions. **SEARCH METHODS:** We searched the following databases: Cochrane Injuries Group Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); MEDLINE; EMBASE; PsycINFO (Ovid); PsycEXTRA (Ovid); CINAHL (EBSCO); ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED); Social Sciences Citation Index (SSCI); Conference Proceedings Citation Index-Science (CPCI-S); and PubMed from inception to April 2009; TRANSPORT to 2007; and manually searched other sources of data. **SELECTION CRITERIA:** We included RCTs and CBAs. Studies included participants aged 0 to 18 years, described interventions promoting helmet use not requiring enactment of legislation and reported observed helmet wearing, self reported helmet ownership or self reported helmet wearing. **DATA COLLECTION AND ANALYSIS:** Two independent review authors selected studies for inclusion and extracted data. We used random-effects models to estimate pooled odds ratios (ORs) (with 95% confidence interval (CI)). We explored heterogeneity with subgroup analyses. **MAIN RESULTS:** We included 29 studies in the review, 21 of which were included in at least one meta-analysis. Non-legislative interventions increased observed helmet wearing (11 studies: OR 2.08, 95% CI 1.29 to 3.34). The effect was most marked amongst community-based interventions (four studies: OR 4.30, 95% 2.24 to 8.25) and those providing free helmets (two studies: OR 4.35, 95% CI 2.13 to 8.89). Significant effects were also found amongst school-based interventions (eight studies: OR 1.73, CI 95% 1.03 to 2.91), with a smaller effect found for interventions providing education only (three studies: OR 1.43, 95% CI 1.09 to 1.88). No significant effect was found for providing subsidised helmets (seven studies: OR 2.02, 95% CI 0.98 to 4.17). Interventions provided to younger children (aged under 12) may be more effective (five studies: OR 2.50, 95% CI 1.17 to 5.37) than those provided to children of all ages (five studies: OR 1.83, 95% CI 0.98 to 3.42). Interventions were only effective in increasing self reported helmet ownership where they provided free helmets (three studies: OR 11.63, 95% CI 2.14 to 63.16). Interventions were effective in increasing self reported helmet wearing (nine studies: OR 3.27, 95% CI 1.56 to 6.87), including those undertaken in schools (six studies: OR 4.21, 95% CI 1.06 to 16.74), providing free helmets (three studies: OR 7.27, 95% CI 1.28 to 41.44), providing education only (seven studies: OR 1.93, 95% CI 1.03 to 3.63) and in healthcare settings (two studies: OR 2.78, 95% CI 1.38 to 5.61). **AUTHORS' CONCLUSIONS:** Non-legislative interventions appear to be effective in increasing observed helmet use, particularly community-based interventions and those providing free helmets. Those set in schools appear to be effective but possibly less so than community-based interventions. Interventions providing education only are less effective than those providing free helmets. There is insufficient evidence to recommend providing subsidised helmets at present. Interventions may be more effective if provided to younger rather than older children. There is evidence that interventions offered in healthcare settings can increase self reported helmet wearing. Further high-quality studies are needed to explore whether non-legislative interventions increase helmet wearing, and particularly the effect of providing subsidised as opposed to free helmets, and of providing interventions in healthcare settings as opposed to in schools or communities. Alternative interventions (e.g. those including peer educators, those aimed at developing safety skills including skills in decision making and resisting peer pressure

or those aimed at improving self esteem or self efficacy) need developing and testing, particularly for 11 to 18 year olds. The effect of interventions in countries with existing cycle helmet legislation and in low and middle-income countries also requires investigation

Royal S, Kendrick D, Coleman T. Promoting bicycle helmet wearing by children using non-legislative interventions: systematic review and meta-analysis. *Inj Prev* 2007;13(3):162-7.

Abstract: RECORD STATUS: This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn

AUTHOR'S OBJECTIVES: To determine the effectiveness of non-legislative interventions in increasing bicycle helmet use in children and young people

SEARCHING: The Cochrane CENTRAL Register, DARE, MEDLINE, EMBASE, TRL, CINAHL, ERIC, PsycINFO, TRIS and British Education Index were searched from inception to October 2006. In addition, five online bibliographies were searched. The references from relevant systematic reviews and key papers were also checked, as were the proceedings of the first eight World Conferences on Injury Prevention and Safety Promotion and the journal *Injury Prevention*

VALIDITY ASSESSMENT: The quality of RCTs was assessed using the following criteria: allocation concealment, blinding of the outcome assessment and completeness of follow-up. Non-RCTs were assessed on the basis of blinding of the outcome assessment, completeness of follow-up and the assessment of distribution of confounders. Two reviewers independently assessed the quality of the included studies. Inter-reviewer agreement was measured (allocation agreement 86% and blinding of the outcomes 100%)

DATA EXTRACTION: Data were extracted onto a standard data extraction form and authors were contacted where additional information was required. Two reviewers independently extracted data from the primary studies (blinded to author or institution); any disagreements were resolved through consensus

RESULTS OF THE REVIEW: Thirteen studies (number of participants unclear) were included in the review: 3 cluster RCTs and 10 controlled before-and-after studies. Eleven studies were included in the meta-analysis. The studies were set in the USA, Canada, New Zealand and Australia. None of the studies adjusted for a clustering effect, allocation concealment was unclear in all of the included RCTs, and completeness of follow-up could not be assessed in the majority of studies. The odds of observed helmet wearing were significantly greater amongst those receiving non-legislative interventions (OR 2.13, 95% CI: 1.35, 3.35; 11 studies, adjusted n=3,046). Significant statistical heterogeneity was found. Adjusting for baseline helmet wearing rates did not significantly alter the results. A significantly greater effect of non-legislative interventions was still found when the analysis was restricted to RCTs (OR 1.15, 95% CI: 0.51, 2.62). Subgroup analyses found a greater effect for community-based interventions (OR 4.47, 95% CI: 2.37, 8.81; 4 studies) than school-based interventions (OR 1.73, 95% CI: 1.04, 2.89; 7 studies) and programmes that provided free helmets (OR 4.60, 95% CI: 2.25, 9.43; 2 studies) than those that provided subsidised or discounted helmets (OR 2.11, 95% CI: 1.09, 4.06; 7 studies). A greater effect was also found in interventions with a follow-up period of 6 months or less (OR 2.23, 95% CI: 1.27, 3.90; 7 studies) than those with longer-term follow-up (OR 1.63, 95% CI: 0.91, 2.91; 4 studies). Similar effect sizes were found in the 2 studies involving low-income families or areas (OR 2.14, 95% CI: 0.40, 11.46) than in those studies including a range of income levels (OR 2.13, 95% CI: 1.33, 3.39). Evidence of significant statistical heterogeneity was found for school-based and subsidised or discounted programmes. Of the 2 studies not included in the meta-analysis, one found a significant increase in observed bicycle helmet use in the intervention arm but not in the control arm. None of the included studies reported adverse effects. There was no evidence of publication bias (Egger's test, p=0.56)

AUTHOR'S CONCLUSION: Non-legislative interventions are effective in increasing bicycle helmet use in children and young people. Community-based programmes that include the provision of free helmets may increase observed helmet use more than interventions based in schools or

those providing subsidised helmets

CRD COMMENTARY: The review question was supported by clear inclusion criteria and a number of relevant sources were searched. No language restrictions were employed and publication bias was assessed. The methods used to select studies, assess their quality and extract the data were likely to have minimised the possibility of reviewer error and bias. The statistical analysis methods used in the meta-analysis were appropriate. Statistical heterogeneity was assessed and potential reasons for heterogeneity were explored. The authors stated that caution should be exercised in extrapolating to middle- or low-income countries as all the studies were conducted in high-income countries. In addition, as most of the studies included were completed over 10 years ago, current helmet costs and prevalence of helmet use may have an impact on the effectiveness of these interventions. The results are likely to be reliable but the conclusions should be tempered by the issue of generalisability, as the authors highlighted

IMPLICATIONS OF THE REVIEW FOR PRACTICE AND RESEARCH: Practice: The authors stated that agencies and organisations with a responsibility for child health or child injury prevention should consider bicycle helmet promotion programmes, particularly programmes set in the community that provide free rather than subsidised helmets. Research: The authors stated that further research is required on longer-term effects; whether the provision of subsidised helmets is as effective as the provision of free helmets in community settings; whether the effect of promotional programmes varies according to social groups; the effect of interventions in low- and middle-income countries; and the effect of these interventions on cycling activity

Thompson DC, Rivara F, Thompson R. [Helmets for preventing head and facial injuries in bicyclists](#). Cochrane Database of Systematic Reviews 1999;(4):CD001855.

Abstract: BACKGROUND: Each year, in the United States, approximately 900 persons die from injuries due to bicycle crashes and over 500,000 persons are treated in emergency departments. Head injury is by far the greatest risk posed to bicyclists, comprising one-third of emergency department visits, two-thirds of hospital admissions, and three-fourths of deaths. Facial injuries to cyclists occur at a rate nearly identical to that of head injuries. Although it makes inherent sense that helmets would be protective against head injury, establishing the real-world effectiveness of helmets is important. OBJECTIVES: To determine whether bicycle helmets reduce head, brain and facial injury for bicyclists of all ages involved in a bicycle crash or fall. SEARCH METHODS: We searched CENTRAL, MEDLINE, EMBASE, Sport, ERIC, NTIS, Expanded Academic Index, CINAHL, PsycINFO, Occupational Safety and Health, and Dissertations Abstracts. We checked reference lists of past reviews and review articles, studies from government agencies in the United States, Europe and Australia, and contacted colleagues from the International Society for Child and Adolescent Injury Prevention, World Injury Network, CDC-funded Injury Control and Research Centers, and staff in injury research agencies around the world. The searches were last updated in November 2006. SELECTION CRITERIA: Controlled studies that evaluated the effect of helmet use in a population of bicyclists who had experienced a crash. We required studies to have complete outcome ascertainment, accurate exposure measurement, appropriate selection of the comparison group and elimination or control of factors such as selection bias, observation bias and confounding. DATA COLLECTION AND ANALYSIS: Two authors independently extracted data. Odds ratios with 95% confidence intervals were calculated for the protective effect of helmets for head and facial injuries. Study results are presented individually. Head and brain injury results were also summarized using meta-analysis techniques. MAIN RESULTS: We found no randomized controlled trials, but five well conducted case-control studies met our inclusion criteria. Helmets provide a 63 to 88% reduction in the risk of head, brain and severe brain injury for all ages of bicyclists. Helmets provide equal levels of protection for crashes involving motor vehicles (69%) and crashes from all other causes (68%). Injuries to the upper and mid facial areas are reduced 65%. AUTHORS' CONCLUSIONS: Helmets reduce bicycle-related head and facial injuries for bicyclists of all ages involved in all types of crashes, including those involving motor vehicles. Our response to comments from critics are presented in the Feedback section. WEARING A HELMET DRAMATICALLY REDUCES THE RISK OF HEAD AND FACIAL IN-

JURIES FOR BICYCLISTS INVOLVED IN A CRASH, EVEN IF IT INVOLVES A MOTOR VEHICLE:

Cycling is a healthy and popular activity for people of all ages. Crashes involving bicyclists are, however, common and often involve motor vehicles. Head injuries are responsible for around three-quarters of deaths among bicyclists involved in crashes. Facial injuries are also common. The review found that wearing a helmet reduced the risk of head or brain injury by approximately two-thirds or more, regardless of whether the crash involved a motor vehicle. Injuries to the mid and upper face were also markedly reduced, although helmets did not prevent lower facial injuries

Uibel S, Muller D, Klingelhoef D, Groneberg DA. Bicycle helmet use and non-use - recently published research. Journal of occupational medicine and toxicology (London, England) 2012;7(1):9.

Abstract: ABSTRACT: Bicycle traumata are very common and especially neurologic complications lead to disability and death in all stages of the life. This review assembles the most recent findings concerning research in the field of bicycle traumata combined with the factor of bicycle helmet use. The area of bicycle trauma research is by nature multidisciplinary and relevant not only for physicians but also for experts with educational, engineering, judicial, rehabilitative or public health functions. Due to this plurality of global publications and special subjects, short time reviews help to detect recent research directions and provide also information from neighbour disciplines for researchers. It can be stated that to date, that although a huge amount of research has been conducted in this area more studies are needed to evaluate and improve special conditions and needs in different regions, ages, nationalities and to create successful prevention programs of severe head and face injuries while cycling. Focus was explicit the bicycle helmet use, wherefore sledding, ski and snowboard studies were excluded and only one study concerning electric bicycles remained due to similar motion structures within this review. The considered studies were all published between January 2010 and August 2011 and were identified via the online databases Medline PubMed and ISI Web of Science

Fotgjenger

Desapriya E, Subzwari S, Sasges D, Basic A, Alidina A, Turcotte K, et al. Do light truck vehicles (LTV) impose greater risk of pedestrian injury than passenger cars? A meta-analysis and systematic review. [Review] [72 refs]. Traffic Injury Prevention 2010;11(1):48-56.

Abstract: OBJECTIVE: Pedestrian crashes present a growing challenge for public health trauma and road safety researchers around the world. They are associated with substantial morbidity, mortality, and cost, yet there is an international lack of published work on the topic, especially when compared with vehicle occupant safety studies. Our review attempts to quantify the risk of fatal injury among vulnerable road users. The specific objective of this systematic review and meta-analysis is to quantify and compare the impact of light truck vehicles (LTVs) versus conventional cars on pedestrian fatal injury. METHODS: A protocol was developed using methods of the Cochrane Collaboration. We conducted a search for the studies in bibliographic databases that included ATI (Australian Transport Index); Cochrane Injuries Group Specialized Register; EMBASE; ERIC; MEDLINE; National Research Register; PsycINFO; Road Res (ARRB); SIGLE; Science (and Social Science) Citation Index; TRANSPORT (NTIS, TRIS, TRANSDOC, IRRD). Web sites of traffic and road accident research bodies, government agencies, and injury prevention organizations were searched for grey literature. Reference lists from selected papers or topic reviews were scanned for potentially relevant papers. RESULTS: Our initial search identified 878 potentially eligible studies. After thorough review by three of the researchers a total of 12 studies were included in the systematic review, 11 of which were included in the meta-analysis. The overall pooled odds ratio for the risk of fatal injury in pedestrian collisions with LTVs compared to conventional cars was odds ratio 1.54, 95 percent confidence interval 1.15-1.93, $p = 0.001$. Thus, the risk for pedestrians of sustaining fatal injury is 50 percent greater in collisions with LTVs than in collisions with conventional cars. CONCLUSIONS: Our systematic review and meta-

analysis suggests that LTVs pose a greater risk of pedestrian injury death compared to conventional cars. These findings have important implications for the automotive industry and the safety of vulnerable road users. [References: 72]

Duperrex O, Roberts I, Bunn F. Safety education of pedestrians for injury prevention. Cochrane Database of Systematic Reviews 2002;(2):CD001531.

Abstract: BACKGROUND: Each year about one million people die and about 10 million are seriously injured on the world's roads. Educational measures to teach pedestrians how to cope with the traffic environment are considered to be an essential component of any prevention strategy, and pedestrian education has been recommended in many countries. However, as resources available for road safety are limited, a key question concerns the relative effectiveness of different prevention strategies. OBJECTIVES: To quantify the effectiveness of pedestrian safety education programmes in preventing pedestrian-motor vehicle collisions. SEARCH METHODS: We searched the Cochrane Injuries Group's Specialised Register, Cochrane Controlled Trials Register, TRANSPORT, MEDLINE, EMBASE, ERIC, PSYCHLIT, SPECTR, and the WHO database on the Internet. We checked reference lists of relevant reviews and papers and contacted experts in the field. Most database searching was conducted in 1999, and updated in May 2003. SELECTION CRITERIA: Randomised controlled trials of safety education programmes for pedestrians of all ages. DATA COLLECTION AND ANALYSIS: One author screened records. Two authors independently extracted data and assessed methodological quality of trials. Because of differences in the types of interventions and outcome measures used in the trials, meta-analyses were not carried out. MAIN RESULTS: We found 15 randomised-controlled trials of pedestrian safety education programmes, conducted between 1976 and 1997. The methodological quality of the included trials was generally poor. Allocation concealment was adequate in three trials, outcome assessment was blinded in eight, and in most of the studies large numbers of participants were lost to follow up. Study participants were children in 14 studies and institutionalised adults in one. Eight studies involved direct education of participants, seven used parents as educators. No trials were conducted in a developing country and there were none of pedestrian safety training in the elderly. None of the trials assessed the effect of pedestrian safety education on the occurrence of pedestrian injury, but six assessed the effect on observed behaviour. Some trials showed evidence of behavioural change following pedestrian safety education but it is difficult to predict what effect this might have on pedestrian injury risk. AUTHORS' CONCLUSIONS: 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. There is evidence that changes in safety knowledge and observed behaviour decline with time, suggesting that safety education must be repeated at regular intervals. PEDESTRIAN SAFETY EDUCATION FOR CHILDREN CAN IMPROVE THEIR KNOWLEDGE AND CHANGE THEIR ROAD CROSSING BEHAVIOUR, BUT EFFECTS ON INJURY ARE UNKNOWN: A major proportion of the people killed or seriously injured in road traffic crashes are pedestrians, and children are particularly vulnerable. Education programmes try to teach people how to cope with the road environment. Parents are sometimes used as educators. The review of trials (mostly in children) found that pedestrian safety education can improve children's road safety knowledge and their observed road crossing behaviour. Education may need to be repeated at regular intervals, as the effect can decline with time. However, whether these changes to knowledge or behaviour can be linked to a reduction in pedestrian deaths and injuries is unknown

Trafikk mer generelt

Aeron-Thomas A, Hess S. Red-light cameras for the prevention of road traffic crashes. Cochrane Database of Systematic Reviews 2005;(2):CD003862.

Abstract: **BACKGROUND:** Road crashes are a prime cause of death and disability and red-light running is a common cause of crashes at signalised intersections. Red-light cameras are increasingly used to promote compliance with traffic signals. Manual enforcement methods are resource intensive and high risk, whereas red-light cameras can operate 24 hours a day and do not involve high-speed pursuits. **OBJECTIVES:** To quantify the impact of red-light cameras on the incidence and severity of road crashes and casualties, and the incidence of red-light violations. **SEARCH METHODS:** We searched the following electronic databases: TRANSPORT (NTIS, TRIS, IRRD, TRANSDOC), Cochrane Injuries Group Specialised Register, Cochrane Controlled Trials Register, MEDLINE, EMBASE and the Australian Transport Index. We checked the reference lists of relevant papers and contacted research and advocacy organisations. **SELECTION CRITERIA:** Randomised or quasi-controlled trials and controlled before-after studies of red-light cameras. For crash impact evaluation, the before and after periods each had to be at least one year in length. For violation studies, the after period had to occur at least one year after camera installation. **DATA COLLECTION AND ANALYSIS:** Two reviewers independently extracted data on study type, characteristics of camera and control areas, and data collection period. Before-after data were collected on number of crashes by severity, collision type, deaths and injuries, and red-light violations. Rate ratio was calculated for each study. Where there was more than one, rate ratios were pooled to give an overall estimate, using a generic inverse variance method and a random-effects model. **MAIN RESULTS:** No randomised controlled trials were identified but 10 controlled before-after studies from Australia, Singapore and the USA met our inclusion criteria. We grouped them according to the extent to which they adjusted for regression to the mean (RTM) and spillover effects. Total casualty crashes: the only study that adjusted for both reported a rate ratio of 0.71 (95% CI to 0.55, 0.93); for three that partially adjusted for RTM but failed to consider spillover, rate ratio was 0.87 (95% CI to 0.77, 0.98); one that made no adjustments had a rate ratio of 0.80 (95% CI 0.58 to 1.12). Right-angle casualty crashes: rate ratio for two studies that partially addressed RTM was 0.76 (95% CI 0.54 to 1.07). Total crashes: the study addressing both RTM and spillover reported a rate ratio of 0.93 (95% CI 0.83 to 1.05); one study that partially addressed RTM had a rate ratio of 0.92 (95% CI 0.73 to 1.15); the pooled rate ratio from the five studies with no adjustments was 0.74 (95% CI 0.53 to 1.03). Red-light violations: one study found a rate ratio of 0.53 (95% CI 0.17 to 1.66). **AUTHORS' CONCLUSIONS:** Red-light cameras are effective in reducing total casualty crashes. The evidence is less conclusive on total collisions, specific casualty collision types and violations, where reductions achieved could be explained by the play of chance. Most evaluations did not adjust for RTM or spillover, affecting their accuracy. Larger and better controlled studies are needed. **'RED-LIGHT CAMERAS' CUT CASUALTY CRASHES AT JUNCTIONS WITH TRAFFIC LIGHTS:** Road crashes are a leading cause of death and injury. One common place for these to happen is at junctions (intersections) controlled by traffic signals. 'Red-light cameras' are now widely used to identify drivers that jump ('run') red lights, who can then be prosecuted. This review looked for studies of their effectiveness in reducing the number of times that drivers drive through red lights and the number of crashes. Very little research has been done and much of it has not allowed for the statistical problems that occur when recording this kind of information. However, five studies in Australia, Singapore and the USA all found that use of red-light cameras cut the number of crashes in which there were injuries. In the best conducted of these studies, the reduction was nearly 30%. More research is needed to determine best practice for red-light camera programmes, including how camera sites are selected, signing policies, publicity programmes and penalties

Bacchieri G, Barros AJ. Traffic accidents in Brazil from 1998 to 2010: many changes and few effects. [Review]. Rev Saude Publica 2011;45(5):949-63.

Abstract: The paper describes the situation of road traffic accidents in Brazil since 1998, when a new Brazilian traffic law was approved, up to the year 2010. A review of both academic and non-academic literature was carried out, including journals (both indexed and non-indexed), technical reports, author searches, searches in paper reference lists and direct contact with researchers. The main problems related to road traffic accidents in Brazil identified were the in-

crease in the absolute number of deaths and in the mortality rates, a rapid increase in the number of motorcycles, and drink & driving. Influential authors in the field and centers of expertise were identified. Some potential solutions are presented by the authors, who suggest that the public offices related to traffic regulation and control are not taking suitable measures for control and reduction of road traffic accidents

Beyer FR, Ker K. Street lighting for preventing road traffic injuries. [Review] [78 refs]. Cochrane Database of Systematic Reviews (1):CD004728, 2009 2009;(1):CD004728.

Abstract: BACKGROUND: Road traffic crashes are a major cause of death and injury, especially in low and middle-income countries. It is estimated that road traffic injuries will have risen from ninth to third in world disease burden rankings by 2020, accounting for 2.3 million deaths globally. Street lighting has been suggested as a relatively low cost intervention with the potential to prevent traffic crashes. OBJECTIVES: To assess the effects of street lighting on injuries caused by road traffic crashes. SEARCH STRATEGY: We searched the Cochrane Injuries Group's Specialised Register, CENTRAL, MEDLINE, EMBASE, TRANSPORT, Australian Transport Index. We also searched the Internet and checked reference lists of relevant papers. The search was not restricted by language or publication status. The searches were conducted to October 2008. SELECTION CRITERIA: 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. DATA COLLECTION AND ANALYSIS: Two authors screened search results, extracted data, assessed risk of bias and analysed the data. MAIN RESULTS: We found 16 controlled before-after studies of street lighting, all reporting crash data, of which 14 contributed data to the meta-analysis. Seven trials included a designated control site, the other nine collected data at one site with the daytime data being used as the control. The methodological quality of the trials was generally poor. Three trials compared street lighting with an area control on total crashes; pooled rate ratio (RR) = 0.45 (95% Confidence Interval (CI) 0.29 to 0.69). Two trials compared street lighting with an area control on total injury crashes (all severities); RR = 0.78 (95% CI 0.63 to 0.97). No trials compared the number of fatal crashes with an area control. Ten trials compared street lighting with a day time control on total crashes; pooled RR = 0.68 (95% CI 0.56 to 0.83). Five trials compared street lighting with a day time control on total injury crashes; pooled RR = 0.68 (95% CI 0.59 to 0.79). Three trials compared street lighting with a day time control on fatal crashes; pooled RR = 0.33 (95% CI 0.17 to 0.66). AUTHORS' CONCLUSIONS: The results from this systematic review suggests that street lighting may prevent road traffic crashes, injuries and fatalities. However, further well designed studies are needed to determine the effectiveness of street lighting in middle and low-income countries. [References: 78]

Bunn F, Collier T, Frost C, Ker K, Steinbach R, Roberts I, et al. Area-wide traffic calming for preventing traffic related injuries. Cochrane Database of Systematic Reviews 2003;(1):CD003110.

Abstract: BACKGROUND: It is estimated that by 2020 road traffic crashes will have moved from ninth to third in the world disease burden ranking, as measured in disability adjusted life years, and to second in developing countries. Area-wide traffic calming schemes that discourage through traffic on residential roads is one strategy for preventing traffic related injuries. OBJECTIVES: To assess the effects of area-wide traffic calming for preventing traffic related crashes, injuries, and deaths. SEARCH METHODS: We searched the the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE and TRANSPORT. We searched the web sites of road safety organisations, handsearched conference proceedings, checked reference lists of relevant papers and contacted experts in the area. The search was not restricted by language or publication status. The searches were last updated in 2008. SELECTION CRITERIA: Randomised controlled trials and controlled before-after studies of area-wide traffic calming schemes. DATA COLLECTION AND ANALYSIS: Two authors indepen-

dently extracted data on type of study, characteristics of intervention and control areas, and length of data collection periods. Before and after data were collected on the total number of road traffic crashes, all road user deaths and injuries, pedestrian-motor vehicle collisions and road user deaths. The results of each study were expressed as rate ratios. MAIN RESULTS: We found no randomised controlled trials, but 22 controlled before-and-after studies met our inclusion criteria. Seven studies were conducted in Germany, seven in the UK, two in Australia, two in the Netherlands, two in Denmark, one in Japan, and one in Spain. There were no studies in low or middle income countries. Nine trials reported the number of road traffic crashes resulting in deaths; pooled rate ratio 0.79 (95% CI 0.23 to 2.68). Eighteen studies reported the number of road traffic crashes resulting in injuries (fatal and non-fatal); pooled rate ratio 0.85 (95% CI 0.75 to 0.96). Twelve studies reported the total number of road traffic crashes; pooled rate ratio 0.89 (95% CI 0.76 to 1.05). Fourteen trials reported the number of pedestrian-motor vehicle collisions; pooled rate ratio 1.01 (95% CI 0.88 to 1.16). There was evidence of significant heterogeneity for the total number of crashes and road user injuries outcomes. AUTHORS' CONCLUSIONS: The results from this review suggest that area-wide traffic calming in towns and cities may be a promising intervention for reducing the number of road traffic injuries and deaths. However, further rigorous evaluations of such interventions are needed. AREA-WIDE TRAFFIC CALMING (SUCH AS INTRODUCING ROAD/SPEED HUMPS) MAY REDUCE DEATH AND INJURY FROM ROAD TRAFFIC CRASHES BUT MORE RESEARCH IS NEEDED: Road traffic crashes are a major problem worldwide. In high-income countries, traffic calming schemes aim to make the roads safer (particularly for vulnerable road users such as pedestrians and cyclists) in areas that are particular 'hot spots'. Strategies include slowing down traffic (eg road/speed humps, mini-roundabouts, reduced speed limit zones), visual changes (road surface treatment, changes to road lighting), redistributing traffic (blocking roads, creating one-way streets), and/or changes to road environments (such as trees). This review found that area-wide traffic calming may have the potential to reduce death and injuries, but more research is needed particularly in low and middle income countries

Erke A, Goldenbeld C, Vaa T. The effects of drink-driving checkpoints on crashes--a meta-analysis. *Accident Analysis & Prevention* 2009;41(5):914-23.

Abstract: A meta-analysis has been conducted on the effects on crashes of DUI-checkpoints (DUI, driving under the influence). The results indicate that crashes involving alcohol are reduced by 17% at a minimum and that all crashes, independent of alcohol involvement, are reduced by about 10-15%. In a moderator analysis the effects of a number of factors that may affect the effectiveness of DUI-checkpoints were investigated by means of subgroup analyses and meta-regression. Those moderator variables that were found to be most relevant, are the time period studied, country, and study design. DUI-checkpoints were found to be most effective during the first half year. Australian checkpoints were found to be more effective than checkpoints in other countries. Smaller crash reductions were found in studies that have applied a control group than in other studies. Testing all drivers who are stopped at a checkpoint may improve the effectiveness of DUI-checkpoints. The results do not indicate that DUI-checkpoints have greater effects on more severe crashes or that the use of paid publicity improves the effectiveness. Most likely there are further factors that affect the effectiveness of DUI-checkpoints that could not be investigated in the present analysis

Goss CW, Van Bramer LD, Gliner JA, Porter TR, Roberts IG, Diguisseppi C. Increased police patrols for preventing alcohol-impaired driving. [Review] [127 refs]. *Cochrane Database of Systematic Reviews* (4):CD005242, 2008 2008;(4):CD005242.

Abstract: BACKGROUND: Road traffic injuries cause 1.2 million deaths worldwide each year. Alcohol consumption increases the risk of traffic crashes, especially fatal crashes. Increased police patrols aim to increase both the perceived and actual likelihood of being caught driving while alcohol-impaired, potentially reducing alcohol-related driving, crashes and injuries. OB-

OBJECTIVES: To assess the effects on injuries and crashes of increased police patrols that target alcohol-impaired driving. **SEARCH STRATEGY:** We searched the Cochrane Injuries Group Specialised Register (5/2006), CENTRAL (The Cochrane Library 2006, Issue 2), MEDLINE (1966 to 5/2006), TRANSPORT (1968 to 5/2006), C2-SPECTR (2/2005), NCJRS (1/1951 to 5/2006), PsycINFO (1872 to 5/2006), Social Science Citation Index (1974 to 5/2006), SIGLE (1980 to 2/2006), Science Citation Index Expanded (1970 to 5/2006), Dissertation Abstracts (1870 to 5/2006), NTIS (1964 to 12/2004), conference proceedings, and reference lists. We contacted authors of eligible studies. **SELECTION CRITERIA:** Randomized controlled trials, controlled trials, controlled before and after studies, interrupted time series (ITS) studies, and controlled ITS studies evaluating increased police patrols, either alone or combined with other interventions, targeting alcohol-impaired motor vehicle drivers. **DATA COLLECTION AND ANALYSIS:** Two investigators independently screened citations, extracted data, and assessed quality criteria. We compared intervention and no-intervention geographical areas or time periods. We re-analyzed study data as required. Results are presented narratively. **MAIN RESULTS:** The 32 eligible studies included one randomized controlled trial, eight controlled before-after studies, 14 controlled ITS studies, six ITS studies, and three studies with both ITS and controlled before-after analyses. Most interventions targeted only alcohol-impaired driving (69%) and included additional interventions such as media campaigns or special training for police officers (91%). Only two studies reported sufficient information to assess study quality completely. Two-thirds of studies were scored 'not adequate' on at least one feature. Five of six studies evaluating traffic fatalities reported reductions with the intervention, but differences were statistically significant in only one study. Effects of intervention on traffic injuries were inconsistent in the six studies evaluating this outcome, and no results were statistically significant. All four controlled studies evaluating fatal crashes reported reductions with the intervention, which were statistically significant in one study. All 12 controlled studies assessing injury crashes reported greater reductions with the intervention, though effects were minimal or not significant in several studies. ITS studies showed less consistent effects on fatal crashes (three studies) and injury crashes (four studies), and effect estimates were typically imprecise. Thirteen of 20 studies showed reductions in total crashes and about two-thirds of these were statistically significant. **AUTHORS' CONCLUSIONS:** Studies examining increased police patrol programs were generally consistent in reporting beneficial effects on traffic crashes and fatalities, but study quality and reporting were often poor. Methodological limitations included inadequate sample size, dissimilar baseline measures, contamination, and inadequate data analysis. Thus existing evidence, although supportive, does not firmly establish whether increased police patrols, implemented with or without other intervention elements, reduce the adverse consequences of alcohol-impaired driving. [References: 127]

Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. Cochrane Database of Systematic Reviews 2010;(3):CD005575.

Abstract: **BACKGROUND:** Dependence on car use has a number of broad health implications, including contributing to physical inactivity, road traffic injury, air pollution and social severance, as well as entrenching lifestyles that require environmentally unsustainable energy use. Travel plans are interventions that aim to reduce single-occupant car use and increase the use of alternatives such as walking, cycling and public transport, with a variety of behavioural and structural components. This review focuses on organisational travel plans for schools, tertiary institutes and workplaces. These plans are closely aligned in their aims and intervention design, having emerged from a shared theoretical base. **OBJECTIVES:** To assess the effects of organisational travel plans on health, either directly measured, or through changes in travel mode. **SEARCH METHODS:** We searched the following electronic databases; Transport (1988 to June 2008), MEDLINE (1950 to June 2008), EMBASE (1947 to June 2008), CINAHL (1982 to June 2008), ERIC (1966 to June 2008), PSYCINFO (1806 to June 2008), Sociological Abstracts (1952 to June 2008), BUILD (1989 to 2002), Social Sciences Citation Index (1900 to June 2008), Science Citation Index (1900 to June 2008), Arts & Humanities Index (1975 to June 2008), Cochrane Da-

tabase of Systematic Reviews (to August 2008), CENTRAL (to August 2008), Cochrane Injuries Group Register (to December 2009), C2-RIPE (to July 2008), C2-SPECTR (to July 2008), ProQuest Dissertations & Theses (1861 to June 2008). We also searched the reference lists of relevant articles, conference proceedings and Internet sources. We did not restrict the search by date, language or publication status. SELECTION CRITERIA: We included randomised controlled trials and controlled before-after studies of travel behaviour change programmes conducted in an organisational setting, where the measured outcome was change in travel mode or health. Both positive and negative health effects were included. DATA COLLECTION AND ANALYSIS: Two authors independently assessed eligibility, assessed trial quality and extracted data. MAIN RESULTS: Seventeen studies were included. Ten were conducted in a school setting, two in universities, and five in workplaces. One study directly measured health outcomes, and all included studies measured travel outcomes. Two cluster randomised controlled trials in the school setting showed either no change in travel mode or mixed results. A randomised controlled trial in the workplace setting, conducted in a pre-selected group who were already contemplating or preparing for active travel, found improved health-related quality of life on some sub scales, and increased walking. Two controlled before-after studies found that school travel interventions increased walking. Other studies were judged to be at high risk of bias. No included studies were conducted in low- or middle-income countries, and no studies measured the social distribution of effects or adverse effects, such as injury. AUTHORS' CONCLUSIONS: There is insufficient evidence to determine whether organisational travel plans are effective for improving health or changing travel mode. Organisational travel plans should be considered as complex health promotion interventions, with considerable potential to influence community health outcomes depending on the environmental context in which they are introduced. Given the current lack of evidence, organisational travel plans should be implemented in the context of robustly-designed research studies, such as well-designed cluster randomised trials. TRAVEL PLANS IN ORGANISATIONS (SCHOOLS, TERTIARY EDUCATION INSTITUTIONS AND WORKPLACES) FOR IMPROVING HEALTH: Travel plans aim to reduce car use and promote more active and sustainable travel such as walking and cycling. This review focuses on travel plans for organisations, such as workplaces or schools. The main reasons for using travel plans are to reduce congestion and to be environmentally friendly, but travel plans are also commonly claimed to improve health. We included 17 studies in this review. One study found that promoting walking in a workplace improved some aspects of health, including mental health, but no other studies directly measured health effects. All 17 studies looked at changes in travel. Although some found that travel plans increased walking, others did not. Overall, there is not enough evidence to know whether travel plans are effective at changing the way people travel, or whether they improve health. Currently, organisational travel plans should be put in place as part of well-designed research studies

Jaarsma R, Louwerse R, Dijkstra A, de VJ, Spaas JP. Making minor rural road networks safer: The effects of 60 km/h-zones. *Accident Analysis & Prevention* 2011;43(4):1508-15.

Abstract: For safety reasons a maximum speed limit of 60km/h has been applied to minor rural roads in the Netherlands since 1998. To support this structurally, a part of these roads have also received additional physical measures in a so-called "low cost design" that is expected to reduce the number of traffic casualties by 10-20%. This measure has been implemented as much as possible in an area oriented way. To measure the design's effectivity, road safety in 20 specific rural areas was studied for 5 years before changes were implemented and, on average, 3.5 years thereafter. The study examined 851km of roads, and a control study was done on 2105km of comparable roads with a speed limit of 80km/h. Both the study and the control roads are managed by water boards. Results show that the measures implemented on the roads in the 60km/h-zones had statistically significant effects ($p < 0.05$) on casualty accidents (-24% overall), especially at intersections (-44%). This high reduction is probably caused by the concentration of technical interventions at intersections. Both outcomes are somewhat higher than previously expected and are comparable with the outcome of a meta-analysis of safety effects on area-wide urban traffic calming schemes. However, the cost-effectiveness ratio of the 60km/h zones meas-

ures ([Euro sign]33,000 per prevented KSI-casualty) is much more favourable than the ratio in urban 30km/h-zones ([Euro sign]86,000 per prevented KSI-casualty).

Novoa AM, Perez K, Borrell C. [Evidence-based effectiveness of road safety interventions: a literature review]. [Review] [76 refs] [Spanish]. Gac Sanit 2009;23(6):553-14.

Abstract: INTRODUCTION: Only road safety interventions with scientific evidence supporting their effectiveness should be implemented. The objective of this study was to identify and summarize the available evidence on the effectiveness of road safety interventions in reducing road traffic collisions, injuries and deaths. METHODOLOGY: All literature reviews published in scientific journals that assessed the effectiveness of one or more road safety interventions and whose outcome measure was road traffic crashes, injuries or fatalities were included. An exhaustive search was performed in scientific literature databases. The interventions were classified according to the evidence of their effectiveness in reducing road traffic injuries (effective interventions, insufficient evidence of effectiveness, ineffective interventions) following the structure of the Haddon matrix. RESULTS: Fifty-four reviews were included. Effective interventions were found before, during and after the collision, and across all factors: a) the individual: the graduated licensing system (31% road traffic injury reduction); b) the vehicle: electronic stability control system (2 to 41% reduction); c) the infrastructure: area-wide traffic calming (0 to 20%), and d) the social environment: speed cameras (7 to 30%). Certain road safety interventions are ineffective, mostly road safety education, and others require further investigation. CONCLUSION: The most successful interventions are those that reduce or eliminate the hazard and do not depend on changes in road users' behavior or on their knowledge of road safety issues. Interventions based exclusively on education are ineffective in reducing road traffic injuries. [References: 76]

Phillips RO, Ulleberg P, Vaa T. Meta-analysis of the effect of road safety campaigns on accidents. Accident Analysis & Prevention 2011;43(3):1204-18.

Abstract: A meta-analysis of 67 studies evaluating the effect of road safety campaigns on accidents is reported. A total of 119 results were extracted from the studies, which were reported in 12 different countries between 1975 and 2007. After allowing for publication bias and heterogeneity of effects, the weighted average effect of road safety campaigns is a 9% reduction in accidents (with 95% confidence that the weighted average is between -12 and -6%). To account for the variability of effects measured across studies, data were collected to characterise aspects of the campaign and evaluation design associated with each effect, and analysed to identify a model of seven campaign factors for testing by meta-regression. The model was tested using both fixed and random effect meta-regression, and dependency among effects was accounted for by aggregation. These analyses suggest positive associations between accident reduction and the use of personal communication or roadside media as part of a campaign delivery strategy. Campaigns with a drink-driving theme were also associated with greater accident reductions, while some of the analyses suggested that accompanying enforcement and short campaign duration (less than one month) are beneficial. Overall the results are consistent with the idea that campaigns can be more effective in the short term if the message is delivered with personal communication in a way that is proximal in space and time to the behaviour targeted by the campaign.

Rodriguez-Hernandez JM, Campuzano-Rincon JC. [Primary prevention measures for controlling pedestrian injuries and deaths and improving road safety]. [Review] [Spanish]. Revista de Salud Publica 2010;12(3):497-509.

Abstract: At least 30 % of traffic-related injuries involve pedestrians. These events typically result in incapacitating physical injury and may even cause death. Productive-aged men, aged 20 to 45, represent the people generally affected in Latin-America. They tend to be heads of household supporting their families and whose absence greatly affects the home's financial situation. A

systematic review was conducted of the burden represented by traffic-related injuries, especially those involving pedestrians, and of the primary preventative measures designed and implemented for controlling fatal and non-fatal injuries to pedestrians by improving road safety. There have been few studies in Latin-America regarding these types of accidents and most interventions aimed at reducing traffic-related injuries have been directed towards vehicle drivers and passengers, little attention being focused on other traffic-related actors. This increases pedestrian inequality and vulnerability. There is a consensus among experts worldwide that rigorous investigation is needed (especially in low- and middle-income countries) to evaluate the effectiveness of interventions focused on other traffic-related actors. This review presents a variety of primary prevention strategies, other than pedestrian bridges, which (according to the available evidence) should start to be implemented. These would include modifying the physical environment, education, speed controls, enforcing legislation and imposing respect for pedestrians, valuing their limitations and vulnerability

Wilson C, Willis C, Hendrikz JK, Le BR, Bellamy N. [Speed cameras for the prevention of road traffic injuries and deaths](#). [Review][Update of Cochrane Database Syst Rev. 2006;(2):CD004607; PMID: 16625608]. Cochrane Database of Systematic Reviews (11):CD004607, 2010 2010;(11):CD004607.

Abstract: BACKGROUND: It is estimated that by 2020, road traffic crashes will have moved from ninth to third in the world ranking of burden of disease, as measured in disability adjusted life years. The prevention of road traffic injuries is of global public health importance. Measures aimed at reducing traffic speed are considered essential to preventing road injuries; the use of speed cameras is one such measure. OBJECTIVES: To assess whether the use of speed cameras reduces the incidence of speeding, road traffic crashes, injuries and deaths. SEARCH STRATEGY: We searched the following electronic databases covering all available years up to March 2010; the Cochrane Library, MEDLINE (WebSPIRS), EMBASE (WebSPIRS), TRANSPORT, IRRD (International Road Research Documentation), TRANSDOC (European Conference of Ministers of Transport databases), Web of Science (Science and Social Science Citation Index), PsycINFO, CINAHL, EconLit, WHO database, Sociological Abstracts, Dissertation Abstracts, Index to Theses. SELECTION CRITERIA: Randomised controlled trials, interrupted time series and controlled before-after studies that assessed the impact of speed cameras on speeding, road crashes, crashes causing injury and fatalities were eligible for inclusion. DATA COLLECTION AND ANALYSIS: We independently screened studies for inclusion, extracted data, assessed methodological quality, reported study authors' outcomes and where possible, calculated standardised results based on the information available in each study. Due to considerable heterogeneity between and within included studies, a meta-analysis was not appropriate. MAIN RESULTS: Thirty five studies met the inclusion criteria. Compared with controls, the relative reduction in average speed ranged from 1% to 15% and the reduction in proportion of vehicles speeding ranged from 14% to 65%. In the vicinity of camera sites, the pre/post reductions ranged from 8% to 49% for all crashes and 11% to 44% for fatal and serious injury crashes. Compared with controls, the relative improvement in pre/post injury crash proportions ranged from 8% to 50%. AUTHORS' CONCLUSIONS: Despite the methodological limitations and the variability in degree of signal to noise effect, 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. However, whilst the the evidence base clearly demonstrates a positive direction in the effect, an overall magnitude of this effect is currently not deducible due to heterogeneity and lack of methodological rigour. More studies of a scientifically rigorous and homogenous nature are necessary, to provide the answer to the magnitude of effect

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Banfield JM, Gomez M, Kiss A, Redelmeier DA, Brennehan F. Effectiveness of the P.A.R.T.Y. (Prevent Alcohol and Risk-related Trauma in Youth) program in preventing traumatic injuries: a 10-year analysis. *Journal of Trauma-Injury Infection & Critical Care* 2011;70(3):732-5.

Abstract: BACKGROUND: The P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) program is a 1-day injury awareness and prevention program for youth aged 15 years and older. The goal is to teach adolescents to recognize their injury risks and make informed decisions to reduce them. This study assessed the effectiveness of the P.A.R.T.Y. Program in preventing traumatic injuries during a period of 10 years (1992-2004). METHODS: P.A.R.T.Y. participants (STUDY) were matched with subjects having the same age, gender, residential area, and initial year in database, who did not attend the P.A.R.T.Y. Program (CONTROL). Data from hospital discharge database, and provincial health claims, were searched to determine the incidence of traumatic injuries in both groups. Statistical comparisons were made for the two groups, gender, calendar year, and before and after the graduating driver licensing system was implemented, using the chi and conditional logistic regression analysis with a $p < 0.05$ considered significant. RESULTS: Of 3,905 P.A.R.T.Y. participants, 1,281 were successfully randomly matched on the above 4 variables with 1,281 controls. The most frequent injury was injury by other or homicide 373 of 2,562 (14.8%). There were fewer traumatic injuries in the STUDY group than in the CONTROL group (43.3% vs. 47.4%; $p = 0.02$; OR, 1.22; 95% CI, 1.03-1.45). This difference was stronger in females (44.4% vs. 49.0%; $p = 0.04$) and before the graduating driver licensing system implementation (60.1% vs. 67.2%; $p = 0.04$). CONCLUSIONS: The P.A.R.T.Y. Program effectively reduced the incidence of traumatic injuries among its participants. This effectiveness was stronger among females and before the driver licensing system was implemented.

Crombie IK, Irvine L, Elliott L, Wallace H. How do public health policies tackle alcohol-related harm: a review of 12 developed countries. *Alcohol & Alcoholism* 2007;42(5):492-9.

Abstract: AIMS: To identify how current public health policies of 12 developed countries assess alcohol-related problems, the goals and targets that are set and the strategic directives proposed. METHODS: Policy documents on alcohol and on general public health were obtained through repeated searches of government websites. Documents were reviewed by two independent observers. RESULTS: All the countries studied state that alcohol causes substantial harm to individual health and family well-being, increases crime and social disruption, and results in economic loss through lost productivity. All are concerned about consumption of alcohol by young adults and by heavy and problem drinkers. Few aim to reduce total consumption. Only five of the countries set specific targets for changes in drinking behaviour. Countries vary in their commitment to intervene, particularly on taxation, drink-driving, the drinking environment and for high-risk groups. Australia and New Zealand stand out as having coordinated intervention programmes in most areas. CONCLUSIONS: Policies differ markedly in their organization, the goals and targets that are set, the strategic approaches proposed and areas identified for intervention. Most countries could improve their policies by following the recommendations in the World Health Organization's European Alcohol Action Plan

Dinh-Zarr TB, Goss CW, Heitman E, Roberts IG, DiGuseppi C. Interventions for preventing injuries in problem drinkers. *Cochrane Database of Systematic Reviews* 2004;(3):CD001857.

Abstract: BACKGROUND: Alcohol consumption has been linked with injuries through motor vehicle crashes, falls, drowning, fires and burns, and violence. In the US, half of the estimated 100,000 deaths attributed to alcohol each year are due to intentional and unintentional injuries. The identification of effective interventions for the reduction of unintentional and intentional injuries due to problem drinking is, therefore, an important public health goal. OBJECTIVES: To assess the effect of interventions for problem drinking on subsequent injury risk. SEARCH ME-

THODS: We searched 12 twelve computerized databases: MEDLINE (1966 to 2002), EMBASE (1982 to 2002), CENTRAL (The Cochrane Library 2002, Issue 2), PsycINFO (1967 to 2002), CINAHL (1982 to 10/96), ERIC (1966 to 12/96), Dissertation Abstracts International (1861 to 11/96), IBSS (1961 to 2002), ISTP (1982 to 2002) and three specialized transportation databases (Transport 1988 to 2002/03). Bibliographies of relevant trials were searched and authors were contacted. Government agencies were also contacted for further information and grey literature. Most of the electronic and bibliographic database searches were last run in May 2002. SELECTION CRITERIA: Randomized controlled trials of interventions among participants with problem drinking, which are intended to reduce alcohol consumption or to prevent injuries or their antecedents, and which measured injury-related outcomes. DATA COLLECTION AND ANALYSIS: Two authors extracted data on participants, interventions, follow-up, allocation concealment, and outcomes, and independently rated allocation concealment quality. MAIN RESULTS: Of 23 eligible trials identified, 22 had been completed and 17 provided results for relevant outcomes. Completed trials comparing interventions for problem drinking to no intervention reported reduced motor-vehicle crashes and related injuries, falls, suicide attempts, domestic violence, assaults and child abuse, alcohol-related injuries and injury emergency visits, hospitalizations and deaths. Reductions ranged from 27% to 65%. Because few trials were sufficiently large to assess effects on injuries, individual effect estimates were generally imprecise. We did not combine the results quantitatively because the interventions, patient populations, and outcomes were so diverse. The most commonly evaluated intervention was brief counseling in the clinical setting. This was studied in seven trials, in which injury-related deaths were reduced: relative risk (RR) 0.65; 95% confidence interval (CI) 0.21 to 2.00. However, this reduction may have been due to chance. The majority of trials of brief counseling also showed beneficial effects on diverse non-fatal injury outcomes. AUTHORS' CONCLUSIONS: Interventions for problem drinking appear to reduce injuries and their antecedents (e.g. falls, motor vehicle crashes, suicide attempts). Because injuries account for much of the morbidity and mortality from problem drinking, larger studies are warranted to evaluate the effect of treating problem drinking on injuries. ACTION WITH PROBLEM DRINKERS CAN CUT RISK OF INJURY: Drinking too much alcohol can be dangerous, and injuries (both intentional and unintentional) are one of the most important ways in which excess alcohol use can result in harm. Are there ways of working with people known to be "problem drinkers" that can reduce the number of these injuries? The reviewers found 17 studies of programs that reported whether working with problem drinkers reduced injuries. Several different approaches were evaluated, the most common being brief counseling by health workers. The evidence from these studies suggests that action with problem drinkers is effective in reducing both injuries and events that lead to injury (such as falls, motor vehicle crashes, and suicide attempts). However, more research is needed to calculate the level of effectiveness accurately and to determine which type of program works best

Elder RW, Lawrence B, Ferguson A, Naimi TS, Brewer RD, Chattopadhyay SK, et al. The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms. Am J Prev Med 2010;38(2):217-29.

Abstract: A systematic review of the literature to assess the effectiveness of alcohol tax policy interventions for reducing excessive alcohol consumption and related harms was conducted for the Guide to Community Preventive Services (Community Guide). Seventy-two papers or technical reports, which were published prior to July 2005, met specified quality criteria, and included evaluation outcomes relevant to public health (e.g., binge drinking, alcohol-related crash fatalities), were included in the final review. Nearly all studies, including those with different study designs, found that there was an inverse relationship between the tax or price of alcohol and indices of excessive drinking or alcohol-related health outcomes. Among studies restricted to underage populations, most found that increased taxes were also significantly associated with reduced consumption and alcohol-related harms. According to Community Guide rules of evidence, these results constitute strong evidence that raising alcohol excise taxes is an effective strategy for reducing excessive alcohol consumption and related harms. The impact of a poten-

tial tax increase is expected to be proportional to its magnitude and to be modified by such factors as disposable income and the demand elasticity for alcohol among various population groups. Published by Elsevier Inc

Jones L, Hughes K, Atkinson AM, Bellis MA. Reducing harm in drinking environments: a systematic review of effective approaches. [Review]. *Health & Place* 2011;17(2):508-18.

Abstract: Drinking environments, including bars, nightclubs and their surrounds are associated with high levels of acute alcohol-related harms. This systematic review examined the effectiveness of interventions implemented in drinking environments to reduce alcohol use and associated harms. The findings of the review were limited by the methodological shortcomings of the included studies. However, three studies indicated that multicomponent programmes combining community mobilisation, RBS training, house policies and stricter enforcement of licensing laws may be effective in reducing assaults, traffic crashes, and underage sales depending on the focus of the intervention. The effectiveness of other intervention approaches was limited. Future studies of interventions in drinking environments should focus on using appropriate and robust study designs.

Ker K, Chinnock P. Interventions in the alcohol server setting for preventing injuries. [Review] [72 refs][Update of *Cochrane Database Syst Rev*. 2006;(2):CD005244; PMID: 16625630]. *Cochrane Database of Systematic Reviews* (3):CD005244, 2008 2008;(3):CD005244.

Abstract: BACKGROUND: Injuries are a significant public health burden and alcohol intoxication is recognised as a risk factor for injuries. There is increasing attention on supply-side interventions, which aim to modify the environment and context within which alcohol is supplied and consumed. OBJECTIVES: To quantify the effectiveness of interventions implemented in the server setting for reducing injuries. SEARCH STRATEGY: We searched the Cochrane Injuries Group Specialised Register (September 2004), Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 3, 2004), MEDLINE (January 1966 to September 2004), EMBASE (1980 to 2004, wk 36), other specialised databases and reference lists of articles. We also contacted experts in the field. SELECTION CRITERIA: Randomised controlled trials (RCTs) and non-randomised controlled studies (NRS) of the effectiveness of interventions administered in the server setting which attempted to modify the conditions under which alcohol is served and consumed, to facilitate sensible alcohol consumption and reduce the occurrence of alcohol-related harm. DATA COLLECTION AND ANALYSIS: Two authors independently screened search results and assessed the full texts of potentially relevant studies for inclusion. Data were extracted and methodological quality was examined. Due to variability in the intervention types investigated, a pooled analysis was not appropriate. MAIN RESULTS: Twenty studies met the inclusion criteria. Overall methodological quality was poor. Five studies used an injury outcome measure; only one of these studies was randomised. The studies were grouped into broad categories according to intervention type. One NRS investigated server training and estimated a reduction of 23% in single vehicle night-time crashes in the experimental area (controlled for crashes in the control area). Another NRS examined the impact of a drink driving service, and reported a reduction in injury road crashes of 15% in the experimental area, with no change in the control; no difference was found for fatal crashes. One NRS investigating the impact of a policy intervention, reported that pre-intervention the serious assault rate in the experimental area was 52% higher than the rate in the control area. After intervention, the serious assault rate in the experimental area was 37% lower than in the control. The only RCT targeting the server setting environment with an injury outcome compared toughened glassware (experimental) to annealed glassware (control) on number of bar staff injuries; a greater number of injuries were detected in the experimental group (relative risk 1.72, 95% CI 1.15 to 2.59). A NRS investigating the impact of an intervention aiming to reduce crime experienced by drinking premises; found a lower rate of all crime in the experimental premises (rate ratio 4.6, 95% CI 1.7 to 12, P = 0.01), no difference was found for injury (rate ratio 1.1, 95% CI 0.1 to 10, P = 0.093). The effectiveness of the interventions on pa-

tron alcohol consumption is inconclusive. One randomised trial found a statistically significant reduction in observed severe aggression exhibited by patrons. There is some indication of improved server behaviour but it is difficult to predict what effect this might have on injury risk. AUTHORS' CONCLUSIONS: There is no reliable evidence that interventions in the alcohol server setting are effective in reducing injury. Compliance with interventions appears to be a problem; hence mandated interventions may be more likely to show an effect. Randomised controlled trials, with adequate allocation concealment and blinding are required to improve the evidence base. Further well conducted non-randomised trials are also needed, when random allocation is not feasible. [References: 72]

Mercer SL, Sleet DA, Elder RW, Cole KH, Shults RA, Nichols JL. Translating evidence into policy: lessons learned from the case of lowering the legal blood alcohol limit for drivers. *Ann Epidemiol* 2010;20(6):412-20.

Abstract: This case study examines the translation of evidence on the effectiveness of laws to reduce the blood alcohol concentration (BAC) of drivers into policy. It was reconstructed through discussions among individuals involved in the processes as well as a review of documentation and feedback on oral presentations. The Centers for Disease Control and Prevention collaborated extensively with federal and non-federal partners and stakeholders in conducting a rigorous systematic review, using the processes of the Guide to Community Preventive Services to evaluate the body of empirical evidence on 0.08% BAC laws. The timely dissemination of the findings and related policy recommendations-made by the independent Task Force on Community Preventive Services-to Congress very likely contributed to the inclusion of strong incentives to States to adopt 0.08 BAC laws by October 2003. Subsequent dissemination to partners and stakeholders informed decision-making about support for state legislative and policy action. This case study suggests the value of: clearly outlining the relationships between health problems, interventions and outcomes; systematically assessing and synthesizing the evidence; using a credible group and rigorous process to assess the evidence; having an impartial body make specific policy recommendations on the basis of the evidence; being ready to capitalize in briefly opening policy windows; engaging key partners and stakeholders throughout the production and dissemination of the evidence and recommendations; undertaking personalized, targeted and compelling dissemination of the evidence and recommendations; involving multiple stakeholders in encouraging uptake and adherence of policy recommendations; and addressing sustainability. These lessons learned may help others working to translate evidence into policy.

Shults RA, Elder RW, Nichols JL, Sleet DA, Compton R, Chattopadhyay SK, et al. Effectiveness of multicomponent programs with community mobilization for reducing alcohol-impaired driving. *Am J Prev Med* 2009;37(4):360-71.

Abstract: RECORD STATUS: This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn

AUTHOR'S OBJECTIVES: To assess the effectiveness and cost effectiveness of multicomponent programmes with community mobilisation for reducing alcohol-impaired driving

SEARCHING: MEDLINE, PsycINFO, Social SciSearch, NTIS, Transportation Research Information Services, Ei Compendex and EMBASE were searched for full English-language papers published in peer-reviewed journals, government reports or technical reports between January 1980 and June 2005. Bibliographic reference lists were checked and topic experts were contacted for further studies. Further details of the strategy were available online

VALIDITY ASSESSMENT: Methodological quality of the studies was assessed independently by two authors according to Community Guide standards. Study methodology was rated according to whether the study used a concurrent control group and assessed exposure and outcomes prospectively. Nine criteria were assessed and included: study population and intervention de-

criptions; sampling methodology; exposure and outcome measurement; data analysis; interpretation of results (follow-up, bias and confounding); and other factors. Studies that fulfilled all criteria or only failed to meet one criterion were rated good, those that failed to meet two to four criteria were rated fair and those that failed to meet five or more criteria were rated as limited.

Only studies rated good or fair were included in the review

DATA EXTRACTION: The number of alcohol-related motor vehicle crashes was extracted and used where possible to calculate effect sizes. Where studies included a comparison group, the difference in percentage change between intervention and comparison groups was calculated. For studies without a control group (such as time series or that used another regression-based design) the percentage change estimated from the study models was used. Where available effect measures were selected that compared alcohol-related crash outcomes to crash outcomes not related to alcohol (such as ratio of had-been drinking crashes to had-not-been-drinking crashes) over the same time period to help control for potential confounding factors (such as the long-term downward trend in total fatal crashes) and factors that influenced the total number of crashes (such as weather, economic conditions, vehicle miles travelled and safety characteristics of vehicles and roads). The authors stated that the review team extracted data and calculated effect sizes

RESULTS OF THE REVIEW: Six studies were included in the review; most population estimates for the included communities ranged from 20,000 to 100,000. Study designs included two time series with concurrent comparison groups, two before-and-after studies with concurrent comparison groups and two group randomised controlled trials. All of the studies were judged as having suitable study designs and to be of fair methodological quality. Two studies reported declines in fatal crashes of 9% and 42%. One study reported a reduction of 10% in injury crashes. Another study assessed crashes among young drivers aged 16 to 20 years and reported a decline of 45%. One study reported no change in the incidence of single-vehicle late-night and weekend crashes among young male drivers. The final study examined injury crashes among underage drivers and reported small net reductions. Percentage change in crashes could not be calculated as actual numbers were not reported

AUTHOR'S CONCLUSION: There was strong evidence that carefully planned well-executed multi-component programmes in conjunction with community mobilisation were effective in reducing alcohol-related crashes and costs

CRD COMMENTARY: This review answered a well-defined research question with clear but broadly defined inclusion criteria for study design, population and intervention. A number of electronic databases were searched for studies. As only English-language publications were eligible for inclusion, there was some risk of publication bias (as acknowledged by the authors). Multiple reviewers assessed methodological quality of the included studies with published criteria and extracted data to calculate effect sizes, which reduced risks of reviewer error and bias; it was unclear how many reviewers assessed studies for inclusion. The quality of the studies was assessed using relevant criteria considering the different study designs under review. Overall, the quality of the studies was judged as fair, but the authors acknowledged that a number of the individual studies had limitations that could affect data reliability. Studies tended to use designs considered to be in the lower levels of the study design hierarchy. Given the differences in study designs, populations, interventions and outcome measures, use of narrative synthesis methods appeared appropriate. However, given the methodological limitations of the included studies and the risk of missing data, the authors conclusions appeared to be overstated and may not be reliable

IMPLICATIONS OF THE REVIEW FOR PRACTICE AND RESEARCH: Practice: The authors stated that effective programmes included sobriety checkpoints, responsible beverage service training, efforts to limit access to alcohol (particularly among young people), public education campaigns and media advocacy efforts to gain the support of policymakers and the public. Planners needed to assess whether they had adequate resources and a supportive environment in which to implement an programme in order for it to be effective. Research: The authors stated that further large-scale community programmes and studies were required to assess whether community mobilisation increased the effectiveness of multicomponent programmes and if so how and to

what extent. Studies were required to assess how differences in community ethnicity and socioeconomic status affected the effectiveness of interventions and to what extent specific individual components included in the interventions contributed to the overall effectiveness

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Anderson O, Boshier PR, Hanna GB. Interventions designed to prevent healthcare bed-related injuries in patients. [Review][Update of Cochrane Database Syst Rev. 2011;(11):CD008931; PMID: 22071860]. Cochrane Database of Systematic Reviews 2012;1:CD008931.

Abstract: BACKGROUND: Every patient in residential healthcare has a bed. Falling out of bed is associated with preventable patient harm. Various interventions to prevent injury are available. Bed rails are the most common intervention designed to prevent patients falling out of bed; however, their effectiveness is uncertain and bed rail entrapment can also result in injuries. OBJECTIVES: To assess the effectiveness of interventions designed to prevent patient injuries and falls from their beds. SEARCH METHODS: We searched the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials 2010, Issue 2 (The Cochrane Library), MEDLINE (Ovid), EMBASE (Ovid), CINAHL (EBSCO), ISOI Web of Science and Web-based trials registers (all to December 2010) as well as reference lists. SELECTION CRITERIA: Randomised controlled trials of interventions designed to prevent patient injuries from their beds which were conducted in hospitals, nursing care facilities or rehabilitation units were eligible for inclusion. DATA COLLECTION AND ANALYSIS: Two review authors independently assessed the risk of bias and extracted data from the included studies. Authors contacted investigators to obtain missing information. MAIN RESULTS: Two studies met the inclusion criteria, involving a total of 22,106 participants. One study tested low height beds and the other tested bed exit alarms. Both studies used standard care for their control group and both studies were conducted in hospitals. No study investigating bed rails met the inclusion criteria. Due to the clinical heterogeneity of the interventions in the included studies pooling of data and meta-analysis was inappropriate, and so the results of the studies are described. A single cluster randomised trial of low height beds in 18 hospital wards, including 22,036 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls in the bedroom (rate ratio 0.69, 95% CI 0.35 to 1.34), all falls (rate ratio 1.26, 95% CI 0.83 to 1.90) or patient injuries due to all falls (rate ratio 1.35, 95% CI 0.68 to 2.68). One randomised controlled trial of bed exit alarms in one hospital geriatric ward, involving 70 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls out of bed (rate ratio 0.25, 95% CI 0.03 to 2.24), all falls (rate ratio 0.42, 95% CI 0.15 to 1.18) or patient injuries due to all falls (no injuries in either group). AUTHORS' CONCLUSIONS: The effectiveness of interventions designed to prevent patient injuries from their beds (including bed rails, low height beds and bed exit alarms) remains uncertain. The available evidence shows no significant increase or decrease in the rate of injuries with the use of low height beds and bed exit alarms. Limitations of the two included studies include lack of blinding and insufficient power. No randomised controlled trials of bed rails were identified. Future reports should fully describe the standard care received by the control group

DiGuseppi C, Goss CW, Higgins Julian PT. Interventions for promoting smoke alarm ownership and function. Cochrane Database of Systematic Reviews 2001;(2):CD002246.

Abstract: BACKGROUND: Globally, fire-related burns and smoke inhalation accounted for 238,000 deaths in 2000, a rate of 3.9 deaths/100,000, with children and young persons aged less than 44 years accounting for the highest proportion of deaths. Smoke alarm ownership has been associated with a reduced risk of residential fire death. OBJECTIVES: We evaluated interventions to promote residential smoke alarms, to assess their effect on the prevalence of owned and working smoke alarms, and the incidence of fires and burns and other fire-related injuries. SEARCH METHODS: We searched the Cochrane Injuries Group's specialised register, CENTRAL, MEDLINE, EMBASE, PsycINFO, CINAHL, ERIC, Dissertation Abstracts, IBSS, ISTP, FIREDOC, LRC, conference proceedings, published case studies, and bibliographies, and contacted investigators and relevant organisations to identify trials. Most of the searches were last updated in Septem-

ber 2007. SELECTION CRITERIA: Randomised or non-randomised controlled trials completed or published after 1969 evaluating interventions to promote residential smoke alarms. DATA COLLECTION AND ANALYSIS: Two authors independently extracted data and assessed trial quality. We performed meta-analysis of randomised controlled trials to combine odds ratios (OR) between intervention and control groups, using a random effects model. A chi-square test for heterogeneity used a significance level of 10%. Non-randomised trial results are described narratively. MAIN RESULTS: We identified 26 completed trials, of which 17 were randomised. Overall, counselling and educational interventions, with or without provision of free or discounted smoke alarms, modestly increased the likelihood of owning an alarm (OR = 1.21; 95% CI 0.89 to 1.64) and having an installed, functional alarm (OR = 1.33; 95% CI 0.98 to 1.80). Whether or not the intervention programme provided free or discounted smoke alarms in addition to education did not influence these results. The results were sensitive to trial quality, however. Counselling as part of primary care child health surveillance had somewhat greater effects on alarm ownership (OR = 1.96; 95% CI 1.03 to 3.72) and function (OR = 1.46; 95% CI 1.15 to 1.85), results that were generally supported by non-randomised trials evaluating similar interventions. Injury outcomes were reported in only one randomised controlled trial, which found no effect of a smoke alarm give-away programme on total injuries (rate ratio 1.3; 95% CI 0.9 to 1.9) or on hospitalizations and deaths (rate ratio 1.3; 95% CI 0.7 to 2.3), in contrast to the substantial reduction in serious injuries reported in a non-randomised trial that evaluated a similar give-away programme. Neither trial showed a beneficial effect on fires. Mass media and community education showed little benefit in multiple non-randomised trials. Two trials, one of which was randomised, showed that smoke alarm installation programmes increase the likelihood of having a working smoke alarm, and the non-randomised trial reported reductions in fire-related injuries. AUTHORS' CONCLUSIONS: This review found that programmes to promote smoke alarms have at most modest beneficial effects on smoke alarm ownership and function, and no demonstrated beneficial effect on fires or fire-related injuries. Counselling as part of child health surveillance has a somewhat greater effect on smoke alarm ownership and function, but its effects on injuries are unevaluated. Community smoke alarm give-away programmes have not been demonstrated to increase smoke alarm prevalence or to reduce fires or fire-related injuries. Community-based education programmes have not been shown to reduce burns or fire-related injuries. Community smoke alarm installation programmes may increase the prevalence of working alarms and reduce fire-related injuries, but these results require confirmation, and the cost-effectiveness of such programmes has not been evaluated. Efforts to promote smoke alarms through installation programmes should be evaluated by adequately designed randomised controlled trials measuring injury outcomes and cost-effectiveness. INTERVENTIONS FOR PROMOTING SMOKE ALARM OWNERSHIP AND FUNCTION: Many people are killed or injured by house fires each year. Fires detected with smoke alarms are associated with lower death rates. This review found that programmes to promote smoke alarms increased smoke alarm ownership and function modestly, if at all, and have not demonstrated a beneficial effect on fires or fire-related injuries. Counselling by health care workers, as part of child health care, may increase ownership and use of smoke alarms in homes but effects on injuries have not been examined. There is little evidence to support community-wide mass media or educational programmes or programmes to give away free smoke alarms as effective methods to promote smoke alarms or reduce injuries from fire. More research is needed to examine community-wide smoke alarm installation programmes

Ingram JC, Deave T, Towner E, Errington G, Kay B, Kendrick D. Identifying facilitators and barriers for home injury prevention interventions for pre-school children: a systematic review of the quantitative literature. [Review]. Health Educ Res 2012;27(2):258-68.

Abstract: Injuries are the leading cause of childhood death internationally; steep social gradients exist in mortality and morbidity. The majority of pre-school injuries occur in the home, but implementing research into practice for injury prevention has received little attention. This systematic review describes key facilitators and barriers when implementing injury prevention interventions. The review used articles included in a Cochrane systematic review of the effectiveness

of home safety education, with or without the provision of safety equipment. Each paper was screened to ensure that children under 5 years, intervention details and process measures and/or barriers and facilitators were included. Two authors independently reviewed each paper and extracted data. Themes were identified and framework analysis used in an iterative process. Ninety-nine papers were identified, 42 excluded and 57 included in the analysis. Seven facilitators and six barriers were identified. Facilitators related to the approach used, focused messages, minimal changes, deliverer characteristics, equipment accessibility, behaviour change and including incentives. The barriers included complex interventions, cultural, socio-economic, physical and behavioural barriers and deliverer constraints. Barriers and facilitators should be addressed when implementing injury prevention interventions and studies should explicitly explore factors that help or hinder the process

Kendrick D, Coupland C, Mulvaney C, Simpson J, Smith SJ, Sutton A, et al. Home safety education and provision of safety equipment for injury prevention. [Review] [170 refs]. Cochrane Database of Systematic Reviews (1):CD005014, 2007 2007;(1):CD005014.

Abstract: **BACKGROUND:** In industrialised countries injuries are the leading cause of childhood death and steep social gradients exist in child injury mortality and morbidity. The majority of injuries in pre-school children occur at home, but there is little meta-analytic evidence that child home safety interventions improve a range of safety practices or reduce injury rates and little evidence on their effect by social group. **OBJECTIVES:** We evaluated the effectiveness of home safety education, with or without the provision of low cost, discounted or free equipment in increasing home safety practices or reducing child injury rates and whether the effect varied by social group. **SEARCH STRATEGY:** We searched The Cochrane Library, MEDLINE, EMBASE, CINAHL, DARE, ASSIA, Psycinfo and Web of Science, plus a range of relevant web sites, conference proceedings and bibliographies. We contacted authors of included studies and surveyed a range of organisations. **SELECTION CRITERIA:** Randomised controlled trials (RCTs), non-randomised controlled trials and controlled before and after studies where home safety education with or without the provision of safety equipment was provided to those aged 19 years and under, which reported safety practices, possession of safety equipment or injury. **DATA COLLECTION AND ANALYSIS:** Two authors independently assessed study quality and extracted data. We attempted to obtain individual participant level data (IPD) for all included studies and summary data and IPD were simultaneously combined in meta-regressions by social and demographic variables. **MAIN RESULTS:** Eighty studies were included; 37 of which were included in at least one meta-analysis. Twenty-three (62%) were RCTs and 12 (32%) included in the meta-analysis provided IPD. Home safety education was effective in increasing the proportion of families with safe hot tap water temperatures (OR 1.35, 95% CI 1.01 to 1.80), functional smoke alarms (OR 1.85, 95% CI 1.24 to 2.75), storing medicines (OR 1.58, 95% CI 1.18 to 2.13) and cleaning products (OR 1.63, 95% CI 1.22 to 2.17) out of reach, syrup of ipecac (OR 3.34, 95% CI 1.50 to 7.44) and poison control centre numbers accessible (OR 3.66, 95% CI 1.84 to 7.27), fitted stair gates (1.26, 95% CI 1.05 to 1.51), socket covers on unused sockets (OR 3.73, 95% CI 1.48 to 9.39) and storing sharp objects out of reach (OR 1.52, 95% CI 1.01 to 2.29). There was a lack of evidence that interventions reduced rates of thermal injuries, poisoning or a range of injuries. There was no consistent evidence that interventions were less effective in families whose children were at greater risk of injury. **AUTHORS' CONCLUSIONS:** Home safety education provided most commonly as one-to-one, face-to-face education, in a clinical setting or at home, especially with the provision of safety equipment is effective in increasing a range of safety practices. There is a lack of evidence regarding its impact on child injury rates. There was no consistent evidence that home safety education, with or without the provision of safety equipment was less effective in those at greater risk of injury. [References: 170]

Kendrick D, Barlow J, Hampshire A, Polnay L, Stewart-Brown S. Parenting interventions for the prevention of unintentional injuries in childhood. [Review] [75 refs]. Cochrane Database of Systematic Reviews (4):CD006020, 2007 2007;(4):CD006020.

Abstract: BACKGROUND: Parent education and training programmes can improve maternal psychosocial health, child behavioural problems and parenting practices. This review assesses the effects of parenting interventions for reducing child injury. OBJECTIVES: To assess the effects of parenting interventions for preventing unintentional injury as well as increasing possession and use of safety equipment and parental safety practices. SEARCH STRATEGY: We searched CENTRAL, MEDLINE, EMBASE, Biological Abstracts, Psych INFO, Sociofile, Social Science Citation Index, CINAHL, Dissertation Abstracts, ERIC, DARE, ASSIA, Web of Science, SIGLE and ZETOC. We also handsearched abstracts from the World Conferences on Injury Prevention & Control and the journal Injury Prevention. The searches were conducted in May 2005. SELECTION CRITERIA: We included randomised controlled trials (RCTs), non-randomised controlled trials (non-RCTs) and controlled before and after studies (CBAs), which evaluated parenting interventions administered to parents of children aged 18 years and under, and reported outcome data on injuries (unintentional or unspecified intent), and possession and use of safety equipment or safety practices. Parenting interventions were defined as those with a specified protocol, manual or curriculum aimed at changing knowledge, attitudes or skills covering a range of parenting topics. DATA COLLECTION AND ANALYSIS: Studies were selected, data were extracted and quality appraised independently by two authors. Pooled relative risks (RR) were estimated using random effect models. MAIN RESULTS: Fifteen studies were included in the review: 11 RCTs (one included a CBA within the same study), one non-RCT, one study contained both randomised and non-randomised arms and two CBAs. Two provided solely educational interventions. Thirteen provided interventions comprising parenting education and other support services; 11 of which were home visiting programmes and two of which were paediatric practice-based interventions. Thirteen studies recruited families at risk of adverse child health outcomes. Nine RCTs were included in the primary meta-analysis, which indicated that intervention families had a significantly lower risk of injury (RR 0.82, 95% CI 0.71 to 0.95). Several studies found fewer home hazards, a home environment more conducive to child safety, or a greater number of safety practices in intervention families. AUTHORS' CONCLUSIONS: Parenting interventions, most commonly provided within the home using multi-faceted interventions may be effective in reducing child injury. The evidence relates mainly to interventions provided to families at risk of adverse child health outcomes. Further research is required to explore mechanisms by which these interventions reduce injury, the features of parenting interventions that are necessary or sufficient to reduce injury and the generalisability to different population groups. [References: 75]

Kendrick D, Barlow J, Hampshire A, Stewart-Brown S, Polnay L. Parenting interventions and the prevention of unintentional injuries in childhood: systematic review and meta-analysis. [Review] [49 refs]. Child: Care, Health & Development 2008;34(5):682-95.

Abstract: OBJECTIVES: To evaluate the effectiveness of parenting interventions in preventing unintentional injury and increasing parental safety practices. DATA SOURCES: A range of medical and social science electronic databases were searched. Abstracts from the first to seventh World conferences on injury prevention and control and the journal Injury Prevention were hand searched. REVIEW METHODS: Randomized controlled trials (RCTs), non-randomized controlled trials (non-RCTs) and controlled before and after studies, providing parenting interventions to parents of children aged 0-18 years and reporting injuries, safety equipment or safety practices were included. Studies were selected, data extracted and quality appraised independently by two reviewers. Pooled relative risks were estimated using random effect models. RESULTS: Fifteen studies (11 RCTs) were included, 11 of which were home visiting programmes and two of which were paediatric practice-based interventions. Thirteen studies recruited families at risk of adverse child health outcomes. Intervention arm families had a significantly lower

risk of injury (RR 0.82, 95% CI 0.71-0.95), as measured by self-report of medically or non-medically attended injury. Several studies found fewer home hazards, a home environment more conducive to child safety, or a greater number of safety practices in intervention arm families. CONCLUSIONS: Parenting interventions, most commonly provided within the home, using multi-faceted interventions appear to be effective in reducing unintentional child injury. Further research is required to explore the mechanisms by which parenting interventions reduce injury, the features of interventions that are necessary to reduce injury, and their generalizability to different population groups. [References: 49]

Kendrick D, Watson MC, Mulvaney CA, Smith SJ, Sutton AJ, Coupland CA, et al. Preventing childhood falls at home: meta-analysis and meta-regression. [Review] [52 refs]. *Am J Prev Med* 2008;35(4):370-9.

Abstract: BACKGROUND: Childhood falls are an important global public health problem, but evidence on their prevention has not been quantitatively synthesized. Despite social inequalities in childhood injury rates, there is a lack of evidence examining the effect of fall-prevention practices by social group. METHODS: 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. Included were 21 studies, 13 of which contributed to meta-analyses. RESULTS: Home-safety interventions increased stair-gate use (OR=1.26; 95% CI=1.05, 1.51), and there was some evidence of reduced baby-walker use (OR=0.66; 95% CI=0.43, 1.00), but little evidence of increased possession of window locks, screens, or windows with limited opening (OR=1.16, 95% CI=0.84, 1.59) or of nonslip bath mats or decals (OR=1.15; 95% CI=0.51, 2.62). Two studies reported nonsignificant effects on falls (baby-walker-related falls on flat ground [OR=1.35; 95% CI=0.64, 2.83] or down steps or stairs [OR=0.70; 95% CI=0.14, 3.49]) and medically attended falls (OR=0.78; 95% CI=0.61, 1.00). CONCLUSIONS: Home-safety education and the provision of safety equipment improved some fall-prevention practices, but the impact on fall-injury rates is unclear. There was some evidence that the effect of home-safety interventions varied by social group. [References: 52]

Kendrick D, Smith S, Sutton AJ, Mulvaney C, Watson M, Coupland C, et al. The effect of education and home safety equipment on childhood thermal injury prevention: meta-analysis and meta-regression. [Review] [50 refs]. *Inj Prev* 2009;15(3):197-204.

Abstract: OBJECTIVE: To evaluate whether home safety education and safety equipment provision increases thermal injury prevention practices or reduces thermal injury rates and whether the effect of interventions differs by social group. METHODS: 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. MAIN OUTCOME MEASURES: possession of functional smoke alarm, fitted fireguard and fire extinguisher; keeping hot drinks or food and keeping matches or lighters out of reach; having a safe hot water temperature and rate of medically attended thermal injuries. RESULTS: Home safety interventions were effective in increasing the proportion of families with a functional smoke alarm (odds ratio (OR) 1.83, 95% CI 1.22 to 2.74) and with a safe hot tap water temperature (OR 1.35, 95% CI 1.01 to 1.80). There was some evidence they increased possession of fitted fireguards (OR 1.39, 95% CI 1.00 to 1.94), but there was a lack of evidence that interventions reduced medically attended thermal injury rates (incident rate ratio (IRR) 1.12, 95% CI 0.81 to 1.56). There was no consistent evidence that the effectiveness of interventions varied by social group. CONCLUSIONS: Home safety education, especially with the provision of safety equipment, is effective in increasing some thermal injury prevention practices, but there is insufficient evidence to show whether this also reduces injury rates. [References: 50]

Kibayashi K, Shimada R, Nakao K. Accidental deaths occurring in bed: review of cases and proposal of preventive strategies. [Review]. Journal of Forensic Nursing 2011;7(3):130-6.

Abstract: The bed is thought to be a safe place, but poses a number of risks that can cause deaths. To identify the causes of accidental death in bed and propose strategies for the prevention of further accidents, we surveyed and analyzed the literature on accidental deaths in bed from Japan and abroad, as well as legal cases related to accidental death in bed in Japan. A search of the medical literature in Japan (1983-2007), abroad (1976-2007), and Japan's legal cases (1989-2007) located 39 cases. The vast majority of accidental deaths in bed occur among infants and elderly individuals with neurologic disorders. The main causes of death within these two groups are head injuries caused by falls from a bed and asphyxia caused by pressure to the neck when wedged against a bed rail. It is necessary to focus on prevention of falls from bed and prevention of asphyxia caused by bed rails in the case of infants and elderly individuals with neurologic disorders. Infants should be placed to sleep in beds designed for their ages and placed on their back. Elderly individuals need to sleep in beds with properly fitting bed rails to reduce wedging.

Pearson M, Garside R, Moxham T, Anderson R. Preventing unintentional injuries to children in the home: a systematic review of the effectiveness of programmes supplying and/or installing home safety equipment. [Review]. Health Promotion International 2011;26(3):376-92.

Abstract: In children under the age of five, the majority of unintentional injuries occur in the home, with higher levels of injury morbidity and mortality being found among those from more deprived backgrounds. This paper presents the findings of a systematic review about the effectiveness of programmes in decreasing unintentional injury rates to children (aged up to 15 years) in the home. The effectiveness of the provision of home safety equipment with or without installation, safety education or a home risk assessment is presented by outcome: injury rates, installation of smoke alarms and installation of other home safety equipment. Analysis of the statistically significant evidence suggests that few programmes reduce injury rates in children 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. The distribution of smoke alarms alone is insufficient for improving installation rates; programmes containing an education component showed more success. 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 also showed greater success in increasing smoke alarm installation rates. 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. Where stair gates are both supplied and installed, inequalities in rates of use may be reduced

Schwebel DC, Janice GM, Moore JG. Physical environment of the home and adolescent injury risk. International emergency nursing 2009;17(1):47-51.

Abstract: OBJECTIVES: The home environment is one of the most significant contextual factors that contributes to young children's unintentional injury risk, but there are very limited data concerning risks present in the homes of adolescents. This study was designed to offer descriptive data on aspects of the home physical environment that might contribute to adolescent injury risk in the United States. METHODS: A diverse sample of 42 adolescents ages 14-16 participated. Researchers completed an inspection of the adolescents' home, searching for various safety-related hazards. RESULTS: Homes tended to be safe in some domains (e.g., presence of smoke detectors), but had substantial risk in other domains. For example, over 90% of homes were without functioning carbon monoxide detectors; 29% had unlocked firearms present; 21% had

exposed electrical cords; and 31% had alcohol present and unlocked. CONCLUSIONS: Although residential environment risks are viewed to be most concerning for very young children, over 30% of fatal adolescent injuries occur in the home. Results suggest there are substantial risks to adolescent safety in the home environment

Smithson J, Garside R, Pearson M. Barriers to, and facilitators of, the prevention of unintentional injury in children in the home: a systematic review and synthesis of qualitative research. [Review]. *Inj Prev* 2011;17(2):119-26.

Abstract: BACKGROUND: This review considers barriers to, and facilitators of, success for interventions to reduce unintentional injury to children in the home through supply and/or installation of home safety equipment, and looks at risk assessments. METHODS: A systematic review of qualitative research. Bibliographic databases were searched for studies on interventions to reduce unintentional child injury in the home, or on related attitudes and behaviours. Studies were quality appraised, findings extracted, and a conceptual framework was developed to assess factors affecting the success of interventions. RESULTS: Nine peer-reviewed journal articles were included. Barriers and facilitators were highlighted at organisational, environmental and personal levels. Effective provision of safety equipment involves ongoing support with installation and maintenance. Take up and success of interventions depends on adjusting interventions according to practical limitations and parents' cultural expectations. A particular barrier was parents' inability to modify rented or shared accommodation. CONCLUSIONS: 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

Thach BT, Rutherford GW, Jr., Harris K. Deaths and injuries attributed to infant crib bumper pads. *J Pediatr* 274;151(3):271-4.

Abstract: OBJECTIVE: To document deaths attributed to bumper pads and injuries from their use that are potentially preventable. STUDY DESIGN: The US Consumer Product Safety Commission maintains files on cases voluntarily reported to them of deaths and injury related to commercial products. These cases represent an unknown fraction of total occurrences. We searched this database for deaths related to crib bumpers for the years 1985 to 2005. We also searched other Consumer Product Safety Commission databases for crib-related injuries that potentially might have been prevented by bumpers. Additionally, we examined 22 retail crib bumpers and described features that could be hazardous. RESULTS: Twenty-seven accidental deaths reported by medical examiners or coroners were attributed to bumper pads. The mechanism of death included suffocation and strangulation by bumper ties. Twenty-five nonfatal injuries were identified, and most consisted of minor contusions. All retail bumpers had hazardous properties. CONCLUSIONS: These findings suggest that crib and bassinet bumpers are dangerous. Their use prevents only minor injuries. Because bumpers can cause death, we conclude that they should not be used

Turner S, Arthur G, Lyons RA, Weightman AL, Mann MK, Jones SJ, et al. Modification of the home environment for the reduction of injuries. [Review][Update of Cochrane Database Syst Rev. 2006;(4):CD003600; PMID: 17054179]. *Cochrane Database of Systematic Reviews* (2):CD003600, 2011 2011;(2):CD003600.

Abstract: BACKGROUND: Injury in the home is common, accounting for approximately a third of all injuries. The majority of injuries to children under five and people aged 75 and older occur at home. Multifactorial injury prevention interventions have been shown to reduce injuries in the home. However, few studies have focused specifically on the impact of physical adaptations to the home environment and the effectiveness of such interventions needs to be ascertained. OBJECTIVES: To determine the effect of modifications to the home environment on the reduction of

injuries due to environmental hazards. **SEARCH STRATEGY:** We searched The Cochrane Library, MEDLINE, EMBASE and other specialised databases. We also scanned conference proceedings and reference lists. We contacted the first author of all included randomised controlled trials. The searches were last updated to the end of December 2009, and were not restricted by language or publication status. **SELECTION CRITERIA:** Randomised controlled trials. **DATA COLLECTION AND ANALYSIS:** Two authors screened all abstracts for relevance, outcome and design. Two authors independently assessed methodological quality and extracted data from each eligible study. We performed meta-analysis to combine effect measures, using a random-effects model. We assessed heterogeneity using an I^2 statistic and a Chi^2 test. **MAIN RESULTS:** We found 28 published studies and one unpublished study. Only two studies were sufficiently similar to allow pooling of data for statistical analyses. Studies were divided into three groups; children, older people and the general population/mixed age group. None of the studies focusing on children or older people demonstrated a reduction in injuries that were a direct result of environmental modification in the home. One study in older people demonstrated a reduction in falls and one a reduction in falls and injurious falls that may have been due to hazard reduction. One meta-analysis was performed which examined the effects on falls of multifactorial interventions consisting of home hazard assessment and modification, medication review, health and bone assessment and exercise (RR 1.09, 95% CI 0.97 to 1.23). **AUTHORS' CONCLUSIONS:** There is insufficient evidence to determine whether interventions focused on modifying environmental home hazards reduce injuries. Further interventions to reduce hazards in the home should be evaluated by adequately designed randomised controlled trials measuring injury outcomes. Recruitment of large study samples to measure effect must be a major consideration for future trials. Researchers should also consider using factorial designs to allow the evaluation of individual components of multifactorial interventions

Forgiftning

Beikircher M, Berenzi P, Mantovan F. [Prevention of accidental poisonings in the household with children under 6 years of age]. [German]. *Kinderkrankenschwester* 2012;31(5):190-3.

Abstract: BACKGROUND: Children under six years of age are most frequently involved in poisoning accidents at home. They are caused by medications, household cleaners and plants. Socio-economic factors have an influence on the risk of poisoning. Passive and active measures are useful for the prevention of poisoning. OBJECTIVE: This study shows the precautionary measures and their effectiveness in relation to the risks and the factors of poisoning accidents. METHODS: A literature review searched in relevant databases for studies that relate to the risk of poisoning on children under six years and that represent the effectiveness of prevention measures. RESULTS: Solely education of the parents is not enough, therefore it is combined with prevention programs, followed by home visits or with child resistant containers. The combination with home visits is effective because the parents get encouraged to make their household safe for children. The education has to be directly with the parents, because the measures can be customized. Short education programs with specific objectives, in written form, are more effective than longer ones. They contain informations about the correct storage and use of child resistant containers, and the behavior in case of emergency. This safety measures must be already implemented at the birth of the child. It's not clear if public education through mass media is effective. Nurses have to educate parents and to advise them to all dangers in the household. CONCLUSION: The education programs must be carried out individually with the parents. In families with several children, the implementation of passive prevention strategies is more effective. The nurse plays an important role in relation to the poisoning prevention

Gorospe EC, Gerstenberger SL. Atypical sources of childhood lead poisoning in the United States: a systematic review from 1966-2006. [Review] [49 refs]. *Clinical Toxicology: The Official Journal of the American Academy of Clinical Toxicology & European Association of Poisons Centres & Clinical Toxicologists* 2008;46(8):728-37.

Abstract: BACKGROUND: Lead poisoning from atypical sources, which excludes the well-established lead-based paint ingestions and exposure in occupational settings, are increasingly reported in medical literature. Our objective is to increase awareness on atypical sources of lead exposure and to formulate recommendations for their detection based on actual reported cases. METHODS: We systematically retrieved and reviewed reports on pediatric lead poisoning in the U.S. from atypical sources by searching Medline, Embase, CINAHL, Academic Search Premier, AltHealth, websites of state lead poisoning prevention programs, and the U.S. Consumer Product Safety Commission database for reports published from January 1966 to December 2006. RESULTS: We retrieved 28 published reports that met our inclusion criteria. Of these reports, 20 are case reports and 8 case series, documenting a total of 82 incidents of lead poisoning in children from atypical sources. CONCLUSION: There are varied sources of atypical lead exposure among U.S. children. The sources were grouped in the following categories based on their utility: fashion accessories, folk remedies, imported condiments & candies, pellets & bullets, and lastly, recreational & domestic items. Based on these findings, we have formulated a questionnaire that may assist in the identification of atypical lead sources in the home. [References: 49]

Hampson NB. Residential carbon monoxide poisoning from motor vehicles. *Am J Emerg Med* 2011;29(1):75-7.

Abstract: CONTEXT: Although morbidity and mortality from accidental carbon monoxide (CO) poisoning are high in the United States, identification of common but poorly recognized sources should help prevention efforts. OBJECTIVE: The study aimed to describe CO poisoning of home occupants due to a vehicle left running in an attached garage. DESIGN: News stories reporting

incidents of US CO poisoning were collected daily from March 2007 to September 2009 via a news.Google.com search and data extracted. PATIENTS: Patients were individuals reported in the media to have been poisoned with CO in their home by a vehicle running in the attached garage. MAIN OUTCOME MEASURES: Main outcome measures were frequency of occurrence, geographic distribution, patient demographics, and mortality. RESULTS: Of 837 CO poisoning incidents reported in US news media over 2 and a half years, 59 (8%) were the result of a vehicle left running in the garage. The elderly were disproportionately affected, with incidents most common in states with larger elderly populations and 29% of cases with age specified occurring in individuals older than 80 years. Among those older than 80 years, 15 of 17 were found dead at the scene. CONCLUSIONS: Residential CO poisoning from a vehicle running in the garage is common, disproportionately affects the elderly, has a high mortality rate, and should be preventable with a residential CO alarm.

Kendrick D, Smith S, Sutton A, Watson M, Coupland C, Mulvaney C, et al. Effect of education and safety equipment on poisoning-prevention practices and poisoning: systematic review, meta-analysis and meta-regression. [Review] [47 refs]. Arch Dis Child 2008;93(7):599-608.

Abstract: 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. DATA SOURCES: Medline, Embase, Cinahl, ASSIA, Psycinfo, Web of Science, plus other electronic sources and hand searching of conference abstracts and reference lists. Authors of included studies were asked to supply individual participant data. Review METHODS: Randomised controlled trials, non-randomised controlled trials and controlled before-and-after studies, with participants aged ≤ 19 years, providing home safety education with or without free or subsidised safety equipment and reporting poison-prevention practices or poisoning incidents were included. Pooled odds ratios and pooled rate ratios were estimated, and meta-regression estimated intervention effects by child age, gender and social variables. RESULTS: Home safety interventions increased safe storage of medicines (OR 1.57, 95% CI 1.22 to 2.02) and cleaning products (OR 1.63, 95% CI 1.22 to 2.17), the possession of syrup of ipecac (OR 3.34, 95% CI 1.50 to 7.41), and having poison control centre numbers accessible (OR 3.67, 95% CI 1.84 to 7.33). There was a lack of evidence on poisoning rates (rate ratio 1.03, 95% CI 0.78 to 1.36) and no consistent evidence that intervention effects differed by child age, gender or social group. CONCLUSIONS: Home safety education and the provision of safety equipment improve poison-prevention practices, but the impact on poisoning rates is unclear. Such interventions are unlikely to widen inequalities in childhood poisoning-prevention practices. [References: 47]

Yeoh B, Woolfenden S, Lanphear B, Ridley GF, Livingstone N. Household interventions for preventing domestic lead exposure in children. [Review][Update of Cochrane Database Syst Rev. 2008;(2):CD006047; PMID: 18425934]. Cochrane Database of Systematic Reviews 2012;4:CD006047.

Abstract: BACKGROUND: Lead poisoning is associated with physical, cognitive and neurobehavioural impairment in children and trials have tested many household interventions to prevent lead exposure. This is an update of the original review by the same authors first published in 2008. OBJECTIVES: To determine the effectiveness of household interventions in preventing or reducing lead exposure in children as measured by reductions in blood lead levels and/or improvements in cognitive development. SEARCH METHODS: We identified trials through electronic searches of CENTRAL (The Cochrane Library, 2010, Issue 2), MEDLINE (1948 to April Week 1 2012), EMBASE (1980 to 2012 Week 2), CINAHL (1937 to 20 Jan 2012), PsycINFO (1887 to Dec week 2 2011), ERIC (1966 to 17 Jan 2012), Sociological Abstracts (1952 to 20 January 2012), Science Citation Index (1970 to 20 Jan 2012), ZETOC (20 Jan 2012), LILACS (20 Jan 2012), Dissertation Abstracts (late 1960s to Jan 2012), ClinicalTrials.gov (20 Jan 2012), Current Controlled Trials (Jan 2012), Australian New Zealand Clinical Trials Registry (Jan 2012) and the

National Research Register Archive. We also contacted experts to find unpublished studies. SELECTION CRITERIA: Randomised and quasi-randomised controlled trials of household educational or environmental interventions to prevent lead exposure in children where at least one standardised outcome measure was reported. DATA COLLECTION AND ANALYSIS: Two authors independently reviewed all eligible studies for inclusion, assessed risk of bias and extracted data. We contacted trialists to obtain missing information. MAIN RESULTS: We included 14 studies (involving 2656 children). All studies reported blood lead level outcomes and none reported on cognitive or neurobehavioural outcomes. We put studies into subgroups according to their intervention type. We performed meta-analysis of both continuous and dichotomous data for subgroups where appropriate. Educational interventions were not effective in reducing blood lead levels (continuous: mean difference (MD) 0.02, 95% confidence interval (CI) -0.09 to 0.12, $I(2) = 0$ (log transformed); dichotomous ≥ 10 microg/dL (≥ 0.48 micromol/L): relative risk (RR) 1.02, 95% CI 0.79 to 1.30, $I(2) = 0$; dichotomous ≥ 15 microg/dL (≥ 0.72 micromol/L): RR 0.60, 95% CI 0.33 to 1.09, $I(2) = 0$). Meta-analysis for the dust control subgroup also found no evidence of effectiveness (continuous: MD -0.15, 95% CI -0.42 to 0.11, $I(2) = 0.9$ (log transformed); dichotomous ≥ 10 microg/dL (≥ 0.48 micromol/L): RR 0.93, 95% CI 0.73 to 1.18, $I(2) = 0$; dichotomous ≥ 15 microg/dL (≥ 0.72 micromol/L): RR 0.86, 95% CI 0.35 to 2.07, $I(2) = 0.56$). When meta-analysis for the dust control subgroup was adjusted for clustering, no statistical significant benefit was incurred. The studies using soil abatement (removal and replacement) and combination intervention groups were not able to be meta-analysed due to substantial differences between studies. AUTHORS' CONCLUSIONS: Based on current knowledge, household educational or dust control interventions are ineffective in reducing blood lead levels in children as a population health measure. There is currently insufficient evidence to draw conclusions about the effectiveness of soil abatement or combination interventions. Further trials are required to establish the most effective intervention for prevention of lead exposure. Key elements of these trials should include strategies to reduce multiple sources of lead exposure simultaneously using empirical dust clearance levels. It is also necessary for trials to be carried out in developing countries and in differing socioeconomic groups in developed countries

Sport/trening

Aaltonen S, Karjalainen H, Heinonen A, Parkkari J, Kujala UM. Prevention of sports injuries: systematic review of randomized controlled trials. [Review] [52 refs]. Arch Intern Med 2007;167(15):1585-92.

Abstract: Increased participation in sports has led to more sports injuries. Evidence-based methods to prevent sports injuries are needed. A systematic review was conducted of the effects of randomized controlled interventions to prevent sports injuries. A systematic search was performed of various databases and the reference lists of articles and reviews. Two reviewers independently extracted the data and assessed the methodological quality of the included trials. Thirty-two trials (24,931 participants) met the inclusion criteria. We found evidence of the preventive effect of 3 types of injury prevention interventions. 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 > or =50% in 4 comparisons). All 7 studies investigating external joint supports (10,300 participants) showed a tendency to prevent ankle, wrist, or knee injuries (risk reduction > or =50% in 5 studies). All 6 multi-intervention training programs (2809 participants) were effective in preventing sports injuries (risk reduction > or =50% in 5 studies). Various interventions may prevent sports injuries. A decreased risk of sports injuries was associated with the use of insoles, external joint supports, and multi-intervention training programs. More high-quality randomized controlled trials in different sports and populations are needed. [References: 52]

Abernethy L, Bleakley C. Strategies to prevent injury in adolescent sport: a systematic review. [Review] [50 refs]. Br J Sports Med 2007;41(10):627-38.

Abstract: This systematic review set out to identify randomised controlled trials and controlled intervention studies that evaluated the effectiveness of preventive strategies in adolescent sport and to draw conclusions on the strength of the evidence. A literature search in seven databases (Medline, SportDiscus, EMBASE, CINAHL, PEDro, Cochrane Review and DARE) was carried out using four keywords: adolescent, sport, injury and prevention (expanded to capture any relevant literature). Assessment of 154 papers found 12 studies eligible for inclusion. It can be concluded that injury prevention strategies that focus on preseason conditioning, functional training, education, balance and sport-specific skills, which should be continued throughout the sporting season, are effective. The evidence for the effectiveness of protective equipment in injury prevention is inconclusive and requires further assessment. [References: 50]

Ackery A, Hagel BE, Provvidenza C, Tator CH. An international review of head and spinal cord injuries in alpine skiing and snowboarding. [Review] [51 refs]. Inj Prev 2007;13(6):368-75.

Abstract: BACKGROUND: Alpine skiing and snowboarding are popular winter activities worldwide, enjoyed by participants of all ages and skill levels. There is some evidence that the incidence of traumatic brain injury (TBI) and spinal cord injury (SCI) in these activities may be increasing. These injuries can cause death or severe debilitation, both physically and emotionally, and also result in enormous financial burden to society. Indeed, TBI is the leading cause of death and catastrophic injury in the skiing and snowboarding population. Furthermore, there are severe limitations to therapeutic interventions to restore neurological function after TBI and SCI, and thus the emphasis must be on prevention. OBJECTIVES: (1) To examine the worldwide epidemiology of TBI and SCI in skiing and snowboarding; (2) to describe and examine the effectiveness of prevention strategies to reduce the incidence of TBI and SCI in skiing and snowboarding. SEARCH STRATEGY: Searches were performed on a variety of databases to identify articles relevant to catastrophic central nervous system injury in skiing and snowboarding. The databases included PubMed, Medline, EMBASE, CDSR, ACP Journal Club, DARE, CCTR, SportDiscus, CINAHL,

and Advanced Google searches. SELECTION CRITERIA AND DATA COLLECTION: After initial prescreening, articles included in the review required epidemiological data on SCI, TBI, or both. Articles had to be directly associated with the topic of skiing and/or snowboarding and published between January 1990 and December 2004. RESULTS: 24 relevant articles, from 10 different countries, were identified. They indicate that the incidence of TBI and SCI in skiing and snowboarding is increasing. The increases coincide with the development and acceptance of acrobatic and high-speed activities on the mountains. There is evidence that helmets reduce the risk of head injury by 22-60%. Head injuries are the most common cause of death among skiers and snowboarders, and young male snowboarders are especially at risk of death from head injury. CONCLUSIONS: There should be enhanced promotion of injury prevention that includes the use of helmets and emphasizes the skier's and snowboarder's responsibility code. [References: 51]

Asplund C, Bettcher S, Borchers J. Facial protection and head injuries in ice hockey: a systematic review. [Review]. Br J Sports Med 2009;43(13):993-9.

Abstract: OBJECTIVE: To summarise the best available evidence to determine if facial protection reduces head injury in ice hockey. DATA SOURCES: MEDLINE and Cochrane databases through January 2009. REVIEW METHODS: Utilising terms: "head injuries," "craniocerebral trauma [MeSH]", "head injuries, closed [MeSH]", "head injuries, penetrating [MeSH]", "face mask", "face shield", "visor" and "hockey", 24 articles were identified through our systematic literature search. Of these, six studies met the inclusion criteria. Three independent reviewers reviewed the articles. The study results and generated conclusions were extracted and agreed upon. RESULTS: Studies reviewed suggest that facial protection reduces overall head injuries in ice hockey. Facial protection showed a statistically significant ($p < 0.05$) reduction in the number and type of facial injuries. In studies evaluating full facial protection (FFP) versus half facial protection (HFP), FFP offered a significantly higher level of protection against facial injuries and lacerations than HFP (relative risk (RR) 2.31, CI 1.53 to 3.48). There was no significant difference in the rate of concussion (RR 0.97, CI 0.61 to 1.54) or neck injury (CI 0.43 to 3.16) between full and partial protection. In those who sustained concussion players with FFP returned to practice or games sooner than players with partial facial protection (PFP) (1.7 sessions, CI 1.32 to 2.18). CONCLUSIONS: There is good evidence that FFP reduces the number and risk of overall head and facial injuries in ice hockey compared with PFP and no facial protection. PFP, while not as protective as FFP, appears to offer more risk reduction than no protection

Benson BW, Hamilton GM, Meeuwisse WH, McCrory P, Dvorak J. Is protective equipment useful in preventing concussion? A systematic review of the literature. [Review] [91 refs]. Br J Sports Med 2009;43:Suppl-67.

Abstract: OBJECTIVE: To determine if there is evidence that equipment use reduces sport concussion risk and/or severity. DATA SOURCES: 12 electronic databases were searched using a combination of Medical Subject Headings and text words to identify relevant articles. REVIEW METHODS: Specific inclusion and exclusion criteria were used to select studies for review. Data extracted included design, study population, exposure/outcome measures and results. The quality of evidence was assessed based on epidemiologic criteria regarding internal and external validity (ie, strength of design, sample size/power calculation, selection bias, misclassification bias, control of potential confounding and effect modification). RESULTS: In total, 51 studies were selected for review. A comparison between studies was difficult due to the variability in research designs, definition of concussion, mouthguard/helmet/headgear/face shield types, measurements used to assess exposure and outcomes, and variety of sports assessed. The majority of studies were observational, with 23 analytical epidemiologic designs related to the subject area. Selection bias was a concern in the reviewed studies, as was the lack of measurement and control for potentially confounding variables. CONCLUSIONS: There is evidence that helmet use reduces head injury risk in skiing, snowboarding and bicycling, but the effect on concussion

risk is inconclusive. No strong evidence exists for the use of mouthguards or face shields to reduce concussion risk. Evidence is provided to suggest that full facial protection in ice hockey may reduce concussion severity, as measured by time loss from competition. [References: 91]

Cusimano MD, Nassiri F, Chang Y. The effectiveness of interventions to reduce neurological injuries in rugby union: a systematic review. [Review]. *Neurosurgery* 1418;67(5):1404-18.

Abstract: BACKGROUND: Rugby is characterized by high-speed collisions among the players that predispose them to injuries, particularly to the head, neck, and spine. OBJECTIVE: To evaluate the effectiveness of current neurological injury prevention strategies in rugby union. METHODS: Systematic review in May 2010. We assessed the quality and content of studies that evaluated injury prevention strategies for rugby players and reported on neurological outcomes. We searched OVID Medline, OVID HealthStar, CINAHL, Sport Discus, PubMed, Scholar's Portal Physical Education Index, Web of Science, and the Cochrane Controlled Clinical Trials Register (CENTRAL) and conducted a manual search of the cited literature lists of each included study. RESULTS: Ten articles are included in the review, with 2 of these assessing both headgear and mouthguards. Four studies reported insignificant reductions in neurological injury with the use of headgear. The results of 4 studies on the effectiveness of mouthguards in preventing neurological injury were inconclusive. Four studies reported significant reductions in neurological injury after the implementation of nationwide multifaceted injury prevention strategies with a focus on education. CONCLUSION: There is limited evidence to support the effectiveness of mouthguards and headgear in reducing neurological injuries; however, system-wide, mandatory interventions are useful in reducing neurological injuries in rugby

Cusimano MD, Kwok J. The effectiveness of helmet wear in skiers and snowboarders: a systematic review. [Review]. *Br J Sports Med* 2010;44(11):781-6.

Abstract: OBJECTIVE: To summarise the best available evidence to determine the impact of helmet use on head injuries, neck injuries and cervical spine injuries in skiers and snowboarders. DATA SOURCES: Relevant publications were identified through electronic searches of MEDLINE, PubMed, EMBASE, CINAHL and the Cochrane Library databases (1966-2009) in addition to manual reference checks of all included articles. REVIEW METHODS: 45 articles were identified through our systematic literature search. Of these, 10 studies met the inclusion criteria after two levels of screening. Two independent reviewers critically appraised the studies. Data were extracted on the primary outcomes of interest: head injury, neck injury and cervical spine injury. Studies were assessed for quality by the criteria of Downs and Black. RESULTS: Studies reviewed indicate that helmet wear reduces the risk of head injuries in skiing and snowboarding. Four case-control studies reported a reduction in the risk of head injury with helmet use ranging from 15% to 60%. Another cohort study found a significantly lower incidence of head injuries involving loss of consciousness in helmet users ($p < 0.05$). The five remaining studies suggested a major protective effect of helmets by indicating that none or few of the head-injured and deceased participants wore a helmet. CONCLUSIONS: There is strong evidence to support the protective value of helmets in reducing the risk of head injuries in skiing and snowboarding. There is no good evidence to support the claim that the use of helmets leads to an increase risk of cervical spine injuries or neck injuries

Dizon JM, Reyes JJ. A systematic review on the effectiveness of external ankle supports in the prevention of inversion ankle sprains among elite and recreational players. [Review] [34 refs]. *Journal of Science & Medicine in Sport* 2010;13(3):309-17.

Abstract: Epidemiological studies have shown that 10-28% of all sports injuries are ankle sprains, leading to the longest absence from athletic activity compared to other types of injuries. This study was conducted to evaluate the effectiveness of external ankle supports in the prevention of inversion ankle sprains and identify which type of ankle support was superior to the oth-

er. A search strategy was developed, using the keywords, ankle supports, ankle brace, ankle tapes, ankle sprains and athletes, to identify available literature in the databases (MEDLINE, PubMed, CINAHL, EMBASE, etc.), libraries and unpublished papers. Trials which consider adolescents and adults, elite and recreational players as participants were the study of choice. External ankle supports comprise ankle tape, brace or orthosis applied to the ankle to prevent ankle sprains. The main outcome measures were frequency of ankle sprains. Two reviewers assessed the quality of the studies included using the Joanna Briggs Institute (JBI Appraisal tool). Whenever possible, results were statistically pooled and interpreted. A 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. The main significant finding was the reduction of ankle sprain by 69% (OR 0.31, 95% CI 0.18-0.51) with the use of ankle brace and reduction of ankle sprain by 71% (OR 0.29, 95% CI 0.14-0.57) with the use of ankle tape among previously injured athletes. No type of ankle support was found to be superior than the other. 2009 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved. [References: 34]

Emery CA, Hagel B, Decloe M, Carly M. Risk factors for injury and severe injury in youth ice hockey: a systematic review of the literature. [Review] [37 refs]. *Inj Prev* 2010;16(2):113-8.

Abstract: OBJECTIVE: To identify risk factors for injury in youth ice hockey (ie, body checking, age, player position, player experience and level of play). STUDY DESIGN: Systematic review and meta-analysis. METHODS: A systematic review of the literature, including a meta-analysis component was completed. Ten electronic databases and the American Society for Testing and Materials Safety in Ice Hockey series (volumes 1-4) were systematically searched with strict inclusion and exclusion criteria to identify articles examining risk factors for injury in youth ice hockey. RESULTS: Participation in games, compared with practices, was associated with an increased risk of injury in all studies examined. Age, level of play and player position produced inconsistent findings. Body checking was identified as a significant risk factor for all injuries (summary rate ratio: 2.45; 95% CI 1.7 to 3.6) and concussion (summary odds ratio: 1.71; 95% CI 1.2 to 2.44). CONCLUSIONS: Findings regarding most risk factors for injury remain inconclusive; however, body checking was found to be associated with an increased risk of injury. Policy implications regarding delaying body checking to older age groups and to only the most elite levels requires further rigorous investigation. [References: 37]

Franettovich M, Chapman A, Blanch P, Vicenzino B. A physiological and psychological basis for anti-pronation taping from a critical review of the literature. [Review] [66 refs]. *Sports Med* 2008;38(8):617-31.

Abstract: Anti-pronation taping is a treatment technique commonly used by clinicians in the management of lower extremity musculoskeletal pain and injury. The clinical efficacy of anti-pronation tape is described anecdotally and has some support through clinical trials for some foot conditions. However, the mechanism(s) underlying its clinical efficacy is unknown, but are broadly categorized under mechanical, neurophysiological and psychological hypotheses. This article explores these hypotheses and contributes to the understanding of the technique. A computer database search was conducted to identify relevant experimental studies using an a priori defined search strategy. Data were extracted from reviewed articles and wherever possible mean differences between baseline and taped condition and the 95% confidence interval, as well as percentage change scores and effect size statistics were calculated. Articles were organized pertaining to the hypothetical mechanism investigated and presented accordingly into biomechanical, neurophysiological or psychological paradigms. Overall, the research to date has focused predominantly on the mechanical paradigm with far fewer papers being found for the neurophysiological and psychological paradigms. The literature provides evidence that anti-pronation tape has a biomechanical effect, which has been demonstrated by increases in navicular height and medial longitudinal arch height, reductions in tibial internal rotation and calcaneal eversion and alteration of plantar pressure patterns, under both static (i.e. standing) and

dynamic (i.e. walking, jogging, running) conditions. The reduction in pronation was dependent on the surrogate measure of pronation used, but generally ranged from as little as 5% increase in longitudinal arch height during jogging to as much as a 33% change in calcaneal eversion during walking. Preliminary evidence from few studies suggests that anti-pronation tape has a neurophysiological effect as it has been shown to reduce the activity of several muscles of the leg during dynamic tasks such as walking, hopping, cutting, back pedalling and drop jumps. Data were difficult to extract from these papers, but it would appear from a small study that the reduction is in the order of about 45% for tibialis posterior. To date, there has been limited investigation of the psychological effects of anti-pronation tape. A main issue, as with most placebo or sham interventions for physical therapy research, is that of an appropriate comparator in this regard. Consequently, these effects are currently not well understood. This article reports of evidence in support of anti-pronation tape exerting a biomechanical effect. As its name suggests, it does reduce pronation. There is emerging evidence of a neurophysiological effect, which is generally one of reduction in muscle activity, but caution is urged in over-interpreting a few studies on small sample sizes. Further research is required in this paradigm before sports medicine practitioners can utilize these findings in day-to-day clinical practice. Due to insufficient evidence, this article was unable to draw any conclusions as to the psychological effects of the tape, but the article does prompt the need for further exploration into the possible role of placebo in the clinical effects of anti-pronation taping. [References: 66]

Handoll Helen HG, Rowe BH, Quinn KM, de BR. Interventions for preventing ankle ligament injuries. Cochrane Database of Systematic Reviews 2011;(5):CD000018.

Abstract: This article has no abstract

Hunter J. The epidemiology of injury in skateboarding. Medicine & Sport Science 2012;58:142-57.

Abstract: The purpose of this report is to review the available literature to provide an epidemiological overview of skateboarding injuries, as well as to suggest possible areas for future research. A literature search was performed with the databases of PubMed, Sport Discus, Google and Google Scholar using the search terms 'skateboard', 'skateboarding', 'injury' and 'injuries', with all articles published in refereed journals in the English language being considered. An ancestry approach was also used. Articles from non-juried journals were also infrequently included to provide anecdotal information on the sport. Comparison of study results was compromised by the diversity of different study populations and variability of injury definitions across studies. The majority of injuries affect young males although conflicting arguments arise over the issues of age and experience in relation to injury severity. Most injuries are acutely suffered, and the most commonly affected body part was the wrist and forearm, with lower leg and ankle injuries also common. The incidence was relatively high but reports on severity differed. Clear conclusions could not be drawn on environmental location and risk factors. Most injuries tend to occur from a loss of balance leading to a fall, in more recent times due to a failed trick. Research on injury prevention is not conclusive although protective equipment and skatepark use are recommended. Further research using more rigorous study designs is required to gain a clearer picture of the incidence and determinants of injury, and to identify risk factors and viable injury countermeasures.

Kim S, Lee SK. Snowboard wrist guards--use, efficacy, and design. A systematic review. [Review]. Bulletin of the NYU Hospital for Joint Diseases 2011;69(2):149-57.

Abstract: The popularity of snowboarding has brought awareness to injuries sustained during the sport. Wrist injuries are among the most common injuries, and there is an interest in using protective equipment to prevent these injuries. The purpose of this study was to review the literature on wrist guard use, injury prevention, the biomechanical effects of wrist guards, and the

various types of wrist guards commercially available for consumers. A literature search was done using MEDLINE[REGISTERED] Ovid (1950 to January 2009), MEDLINE[REGISTERED] PubMed[REGISTERED] (1966 to January 2009), and EMBASE[REGISTERED] (1980 to January 2009) for studies on snowboard injuries and wrist guards. References from the studies found were also reviewed. Two randomized controlled studies (Level I), one meta-analysis (Level II), eight prospective case control studies (Level II), one cross-sectional study, and four biomechanical-cadaveric studies were found from the literature search. Based on the review of this literature, wrist injuries are among the most common injury type, and wrist guard use may provide a protective effect in preventing them. There is no consensus as to what type or design of wrist guard is the most effective and which wrist guards are available for use by the consumer

Klugl M, Shrier I, McBain K, Shultz R, Meeuwisse WH, Garza D, et al. The prevention of sport injury: an analysis of 12,000 published manuscripts. [Review]. Clin J Sport Med 2010;20(6):407-12.

Abstract: OBJECTIVE: To identify the nature and extent of research in sport injury prevention with respect to 3 main categories: (1) training, (2) equipment, and (3) rules and regulations. DATA SOURCES: We searched PubMed, CINAHL, Web of Science, Embase, and SPORTDiscus to retrieve all sports injury prevention publications. Articles were categorized according to the translating research into injury prevention practice model. RESULTS: We retrieved 11 859 articles published since 1938. Fifty-six percent (n = 6641) of publications were nonresearch (review articles and editorials). Publications documenting incidence (n = 1354) and etiology (n = 2558) were the most common original research articles (33% of total). Articles reporting preventive measures (n = 708) and efficacy (n = 460) were less common (10% of the total), and those investigating implementation (n = 162) and effectiveness (n = 32) were rare (1% of total). Six hundred seventy-seven studies focused on equipment and devices to protect against injury, whereas 551 investigated various forms of physical training related to injury prevention. Surprisingly, publications studying changes in rules and regulations aimed at increasing safety and reducing injuries were rare (<1%; n = 63) with a peak of only 20 articles over the most recent 5-year period and an average of 10 articles over the preceding 5-year blocks of time. CONCLUSIONS: Only 492 of 11 859 publications actually assessed the effectiveness of sports injury prevention interventions or their implementation. Research in the area of regulatory change is underrepresented and might represent one of the greatest opportunities to prevent injury

Knapik JJ, Marshall SW, Lee RB, Darakjy SS, Jones SB, Mitchener TA, et al. Mouthguards in sport activities : history, physical properties and injury prevention effectiveness. [Review] [176 refs]. Sports Med 2007;37(2):117-44.

Abstract: Three systematic reviews were conducted on: (i) the history of mouthguard use in sports; (ii) mouthguard material and construction; and (iii) the effectiveness of mouthguards in preventing orofacial injuries and concussions. Retrieval databases and bibliographies were explored to find studies using specific key words for each topic. The first recorded use of mouthguards was by boxers, and in the 1920s professional boxing became the first sport to require mouthguards. Advocacy by the American Dental Association led to the mandating of mouthguards for US high school football in the 1962 season. Currently, the US National Collegiate Athletic Association requires mouthguards for four sports (ice hockey, lacrosse, field hockey and football). However, the American Dental Association recommends the use of mouthguards in 29 sports/exercise activities. Mouthguard properties measured in various studies included shock-absorbing capability, hardness, stiffness (indicative of protective capability), tensile strength, tear strength (indicative of durability) and water absorption. Materials used for mouthguards included: (i) polyvinylacetate-polyethylene or ethylene vinyl acetate (EVA) copolymer; (ii) polyvinylchloride; (iii) latex rubber; (iv) acrylic resin; and (v) polyurethane. Latex rubber was a popular material used in early mouthguards but it has lower shock absorbency, lower hardness and less tear and tensile strength than EVA or polyurethane. Among the more modern materials,

none seems to stand out as superior to another since the characteristics of all the modern materials can be manipulated to provide a range of favourable characteristics. Impact studies have shown that compared with no mouthguard, mouthguards composed of many types of materials reduce the number of fractured teeth and head acceleration. In mouthguard design, consideration must be given to the nature of the collision (hard or soft objects) and characteristics of the mouth (e.g. brittle incisors, more rugged occlusal surfaces of molars, soft gingiva). Laminates with different shock absorbing and stress distributing (stiffness) capability may be one way to accommodate these factors. Studies comparing mouthguard users with nonusers have examined different sports, employed a variety of study designs and used widely-varying injury case definitions. Prior to the 1980s, most studies exhibited relatively low methodological quality. Despite these issues, meta-analyses indicated that the risk of an orofacial sports injury was 1.6-1.9 times higher when a mouthguard was not worn. However, the evidence that mouthguards protect against concussion was inconsistent, and no conclusion regarding the effectiveness of mouthguards in preventing concussion can be drawn at present. Mouthguards should continue to be used in sport activities where there is significant risk of orofacial injury. [References: 176]

Mascarenhas AK. Mouthguards Reduce Orofacial Injury During Sport Activities, but may not Reduce Concussion. The Journal of Evidencebased Dental Practice 2012;12(2):90-1.

Abstract: ARTICLE TITLE AND BIBLIOGRAPHIC INFORMATION: Mouthguards in sport activities: history, physical properties and injury prevention effectiveness. Knapik JJ, Stephen W, Marshall SW, Lee RB, Darakjy SS, Jones SB, et[NON-BREAKING SPACE]al. Sports Med 2007;37(2):117-44. REVIEWER: Ana Karina Mascarenhas, BDS, MPH, DrPH PURPOSE/QUESTION: To assess the effectiveness of mouthguards in preventing orofacial injuries and concussion SOURCE OF FUNDING: Authors report no funding supported this review TYPE OF STUDY/DESIGN: Systematic review with meta-analysis of data LEVEL OF EVIDENCE: Level 2: Limited-quality, patient-oriented evidence STRENGTH OF RECOMMENDATION GRADE: Grade B: Inconsistent or limited-quality patient-oriented evidence.

Russell K, Hagel B, Francescutti LH. The effect of wrist guards on wrist and arm injuries among snowboarders: a systematic review. [Review] [27 refs]. Clin J Sport Med 2007;17(2):145-50.

Abstract: OBJECTIVE: To systematically review studies that examined the effectiveness of wrist guards in preventing wrist injuries among snowboarders. DATA SOURCE: MEDLINE (1966-March 2005), EMBASE (1988-March 2005), Cochrane (2005 Issue 1), Sport Discus (1975-March 2005) were searched using variations of the term "snowboard." PubMed was searched for the year 2005 to capture any recently published studies not yet indexed in MEDLINE. The reference lists of included studies and conference proceedings were also searched. STUDY SELECTION: Studies were included if the number of wrist injuries between wrist guarded and unguarded snowboarders could be ascertained. Randomized controlled trials (RCTs), cohort studies, and case-control studies were included. Six studies were included. DATA EXTRACTION: Information regarding study design, patient characteristics, wrist guard characteristics, data source (for cohort and case-control studies), and results (type and severity of injury, compliance, and adverse events) were extracted. Data were extracted by one reviewer and checked by a second reviewer. DATA SYNTHESIS: Data from RCTs and cohort studies were expressed as relative risks with odds ratios presented for case-control studies. The risk of wrist injury (RR: 0.23; 95% CI: 0.13, 0.41), wrist fracture (RR: 0.29; 95% CI: 0.10, 0.87), and wrist sprain (RR: 0.17; 95% CI: 0.07, 0.41) was significantly reduced with the use of wrist guards. Among the case-control studies, wrist guards significantly lowered the odds of sustaining a wrist injury (OR: 0.46; 95% CI: 0.35, 0.62). In an RCT, the risk ratio suggested wrist guards protect the shoulder (RR: 0.22; 95% CI: 0.01, 4.60). Nonexperimental data suggested the possibility that wrist guards may increase the risk of finger and elbow-shoulder injuries. CONCLUSIONS: Wrist guards reduce the risk of wrist injuries among snowboarders. For every 50 snowboarders who wore a wrist guard, one wrist

injury will be averted. Future research should focus on determining the optimal type of wrist guard and if they increase the risk of other upper extremity injuries. [References: 27]

Russell K, Christie J, Hagel BE. The effect of helmets on the risk of head and neck injuries among skiers and snowboarders: a meta-analysis. CMAJ Canadian Medical Association Journal 2010;182(4):333-40.

Abstract: BACKGROUND: The prevention of head injuries in alpine activities has focused on helmets. However, no systematic review has examined the effect of helmets on head and neck injuries among skiers and snowboarders. METHODS: We searched electronic databases, conference proceedings and reference lists using a combination of the key words "head injury or head trauma," "helmet" and "skiing or snowboarding." We included studies that used a control group; compared skiers or snowboarders with and without helmets; and measured at least one objectively quantified outcome (e.g., head injury, and neck or cervical injury). RESULTS: We included 10 case-control, 1 case-control/case-crossover and 1 cohort study in our analysis. The pooled odds ratio (OR) indicated that skiers and snowboarders with a helmet were significantly less likely than those without a helmet to have a head injury (OR 0.65, 95% confidence interval [CI] 0.55-0.79). The result was similar for studies that used controls without an injury (OR 0.61, 95% CI 0.36-0.92), those that used controls with an injury other than a head or neck injury (OR 0.63, 95% CI 0.52-0.80) and studies that included children under the age of 13 years (OR 0.41, 95% CI 0.27-0.59). Helmets were not associated with an increased risk of neck injury (OR 0.89, 95% CI 0.72-1.09). INTERPRETATION: Our findings show that helmets reduce the risk of head injury among skiers and snowboarders with no evidence of an increased risk of neck injury

Fall

Al-Aama T. Falls in the elderly: spectrum and prevention. Can Fam Physician 2011;57(7):771-6.

Abstract: OBJECTIVE: To provide family physicians with a practical, evidence-based approach to fall prevention in the elderly. SOURCES OF INFORMATION: MEDLINE was searched using terms relevant to falls among the elderly in the community and in institutions. Relevant English-language papers published from 1980 to July 2010 were reviewed. Relevant geriatric society guidelines were reviewed as well. MAIN MESSAGE: Falls are a common and serious health problem with devastating consequences. Several risk factors have been identified in the literature. Falls can be prevented through several evidence-based interventions, which can be either single or multicomponent interventions. Identifying at-risk patients is the most important part of management, as applying preventive measures in this vulnerable population can have a profound effect on public health. CONCLUSION: Family physicians have a pivotal role in screening older patients for risk of falls, and applying preventive strategies for patients at risk

Balzer K, Bremer M, Schramm S, Luhmann D, Raspe H. Falls prevention for the elderly. GMS Health Technology Assessment 2012;8:Doc01.

Abstract: BACKGROUND: An ageing population, a growing prevalence of chronic diseases and limited financial resources for health care underpin the importance of prevention of disabling health disorders and care dependency in the elderly. A wide variety of measures is generally available for the prevention of falls and fall-related injuries. The spectrum ranges from diagnostic procedures for identifying individuals at risk of falling to complex interventions for the removal or reduction of identified risk factors. However, the clinical and economic effectiveness of the majority of recommended strategies for fall prevention is unclear. Against this background, the literature analyses in this HTA report aim to support decision-making for effective and efficient fall prevention. RESEARCH QUESTIONS: The pivotal research question addresses the effectiveness of single interventions and complex programmes for the prevention of falls and fall-related injuries. The target population are the elderly (> 60 years), living in their own housing or in long term care facilities. Further research questions refer to the cost-effectiveness of fall prevention measures, and their ethical, social and legal implications. METHODS: Systematic literature searches were performed in 31 databases covering the publication period from January 2003 to January 2010. While the effectiveness of interventions is solely assessed on the basis of randomised controlled trials (RCT), the assessment of the effectiveness of diagnostic procedures also considers prospective accuracy studies. In order to clarify social, ethical and legal aspects all studies deemed relevant with regard to content were taken into consideration, irrespective of their study design. Study selection and critical appraisal were conducted by two independent assessors. Due to clinical heterogeneity of the studies no meta-analyses were performed. RESULTS: Out of 12,000 references retrieved by literature searches, 184 meet the inclusion criteria. However, to a variable degree the validity of their results must be rated as compromised due to different biasing factors. In summary, it appears that the performance of tests or the application of parameters to identify individuals at risk of falling yields little or no clinically relevant information. Positive effects of exercise interventions may be expected in relatively young and healthy seniors, while studies indicate opposite effects in the fragile elderly. For this specific vulnerable population the modification of the housing environment shows protective effects. A low number of studies, low quality of studies or inconsistent results lead to the conclusion that the effectiveness of the following interventions has to be rated unclear yet: correction of vision disorders, modification of psychotropic medication, vitamin D supplementation, nutritional supplements, psychological interventions, education of nursing personnel, multiple and multifactorial programs as well as the application of hip protectors. For the context of the German health care system the economic evaluations of fall prevention retrieved by the literature searches yield very few useful results. Cost-effectiveness calculations of fall prevention are mostly based

on weak effectiveness data as well as on epidemiological and cost data from foreign health care systems. Ethical analysis demonstrates ambivalent views of the target population concerning fall risk and the necessity of fall prevention. The willingness to take up preventive measures depends on a variety of personal factors, the quality of information, guidance and decision-making, the prevention program itself and social support. THE ANALYSIS OF PAPERS REGARDING LEGAL ISSUES SHOWS THREE MAIN CHALLENGES: the uncertainty of which standard of care has to be expected with regard to fall prevention, the necessity to consider the specific conditions of every single case when measures for fall prevention are applied, and the difficulty to balance the rights to autonomous decision making and physical integrity. DISCUSSION AND CONCLUSIONS: The assessment of clinical effectiveness of interventions for fall prevention is complicated by inherent methodological problems (esp. absence of blinding) and meaningful clinical heterogeneity of available studies. Therefore meta-analyses are not appropriate, and single study results are difficult to interpret. Both problems also impair the informative value of economic analyses. With this background it has to be stated that current recommendations regarding fall prevention in the elderly are not fully supported by scientific evidence. In particular, for the generation of new recommendations the dependency of probable effects on specific characteristics of the target populations or care settings should be taken into consideration. This also applies to the variable factors influencing the willingness of the target population to take up and pursue preventive measures. In the planning of future studies equal weight should be placed on methodological rigour (freedom from biases) and transferability of results into routine care. Economic analyses require input of German data, either in form of a "piggy back study" or in form of a modelling study that reflects the structures of the German health care system and is based on German epidemiological and cost data

Campbell AJ, Robertson MC. Rethinking individual and community fall prevention strategies: a meta-regression comparing single and multifactorial interventions. Age & Ageing 2007;36(6):656-62.

Abstract: BACKGROUND: Guidelines recommend that fall prevention programmes for older people include multifactorial interventions. OBJECTIVE: We aimed to determine if randomised controlled trial evidence supports interventions with multiple components over single strategies in community based fall prevention. METHODS: We searched the literature for trials of interventions aimed at preventing falls. We included trials if they met the following criteria: (i) participants were randomly allocated to intervention and control groups, (ii) all participants were aged 65 years or older, (iii) the majority lived independently in the community, (iv) fall events were recorded prospectively using a diary or calendar during the entire trial and monitored at least monthly, (v) follow up was for 12 months or longer, (vi) at least 70% of participants completed the trial, (vii) all falls during the trial for at least 50 participants were included in the analysis, and (viii) a relative rate ratio with 95% CI comparing the number of falls in the intervention and control groups was reported. We calculated a pooled rate ratio separately for trials testing multifactorial and single interventions and compared their overall efficacy using meta-regression. RESULTS: Meta-regression showed that single interventions were as effective in reducing falls as interventions with multiple components (pooled rate ratios 0.77, 95% CI 0.67-0.89 and 0.78, 0.68-0.89 respectively). CONCLUSION: Multifactorial fall prevention interventions are effective for individual patients. However, for community programmes for populations at risk, targeted single interventions are as effective as multifactorial interventions, may be more acceptable and cost effective

Carpenter CR. Evidence-based emergency medicine/systematic review abstract. Preventing falls in community-dwelling older adults. Ann Emerg Med 2010;55(3):296-8.

Chase CA, Mann K, Wasek S, Arbesman M. Systematic review of the effect of home modification and fall prevention programs on falls and the performance of community-dwelling older adults. Am J Occup Ther 2012;66(3):284-91.

Abstract: This systematic review explored the impact of fall prevention programs and home modifications on falls and the performance of community-dwelling older adults. It was conducted as part of the American Occupational Therapy Association's Evidence-Based Practice Project. Thirty-three articles were analyzed and synthesized. The strongest results were found for multifactorial programs that included home evaluations and home modifications, physical activity or exercise, education, vision and medication checks, or assistive technology to prevent falls. Positive outcomes included a decreased rate of functional decline, a decrease in fear of falling, and an increase in physical factors such as balance and strength. The strength of the evidence for physical activity and home modification programs provided individually was moderate. Implications for practice, education, and research are also discussed.

Choi M, Hector M. Effectiveness of intervention programs in preventing falls: a systematic review of recent 10 years and meta-analysis. [Review]. Journal of the American Medical Directors Association 2012;13(2):188-21.

Abstract: OBJECTIVE: To examine the reported effectiveness of fall-prevention programs for older adults by reviewing randomized controlled trials from 2000 to 2009. DESIGN: Systematic review and meta-analysis of randomized controlled trials. DATA SOURCES: A systematic literature search of articles was conducted using 5 electronic databases (Medline, PubMed, PsycINFO, CINAHL, and RefWorks), including articles describing interventions designed to prevent falls, in English with full text availability, from 2000 through 2009. REVIEW METHODS: Of a potential 227 studies, we identified 17 randomized controlled trials with a duration of intervention of at least 5 months of follow-up. Inclusion and exclusion criteria were used to assess the methodological qualities of the studies. We excluded unidentified study design, quasi-experimental studies, and/or studies that were nonspecific regarding inclusion criteria. DATA EXTRACTION: Primary outcome measures were number of falls and fall rate. Methodological quality assessment included internal and external validity, reporting, and power. Data were extracted independently by 2 investigators and analyzed using a random-effects model. We analyzed the effectiveness of these fall intervention programs using their risk ratios (RR) in 2 single-intervention versus 15 multifactorial intervention trials, 3 nursing homes versus 14 community randomized controlled trials, and 8 Model 1 (initial intervention with subsequent follow up) versus 9 Model II (ongoing intervention throughout the follow-up) studies. RESULTS: The combined RR for the number of falls among 17 studies was 0.855 (z [NON-BREAKING SPACE]= -2.168; p [NON-BREAKING SPACE]= .030; 95% CI[NON-BREAKING SPACE]= 0.742-0.985; Q [NON-BREAKING SPACE]= 196.204, df [NON-BREAKING SPACE]= 16, P [NON-BREAKING SPACE]= .000, $I(2)$ [NON-BREAKING SPACE]= 91.845), demonstrating that fall-prevention programs across the studies were effective by reducing fall rates by 14%, but with substantial heterogeneity. Subgroup analysis indicated that there was a significant fall reduction of 14% in multifactorial intervention (RR [NON-BREAKING SPACE]= 0.856, z [NON-BREAKING SPACE]= -2.039, P [NON-BREAKING SPACE]= .041) with no variation between multifactorial and single-intervention groups (Q [NON-BREAKING SPACE]= 0.002, P [NON-BREAKING SPACE]= .961), 55% in the nursing home setting (RR [NON-BREAKING SPACE]= 0.453, z [NON-BREAKING SPACE]= -9.366, P [NON-BREAKING SPACE]= .000) with significant variation between nursing home and community groups (Q [NON-BREAKING SPACE]= 62.788, P [NON-BREAKING SPACE]= .000), and no significant effect was gained by dividing studies into either in Model I or II. Sensitivity analysis found homogeneity (Q [NON-BREAKING SPACE]= 18.582, df [NON-BREAKING SPACE]= 12, P [NON-BREAKING SPACE]= .099, $I(2)$ [NON-BREAKING SPACE]= 35.423) across studies with a 9% overall fall reduction (RR [NON-BREAKING SPACE]= 0.906, 95% CI[NON-BREAKING SPACE]= 0.853-0.963, z [NON-BREAKING SPACE]= -3.179, P [NON-BREAKING SPACE]= .001), including a fall-reduction rate of 10% in multifactorial intervention (RR [NON-BREAKING SPACE]= 0.904, z [NON-BREAKING SPACE]= -3.036, P [NON-BREAKING SPACE]= .002), 9% in community (RR [NON-BREAKING SPACE]= 0.909, z [NON-BREAKING SPACE]= -3.179, P [NON-BREAKING SPACE]= .001), and 12% in Model I (RR [NON-BREAKING SPACE]= 0.876, z [NON-BREAKING SPACE]= -

3.534, P[NON-BREAKING SPACE]= .000) with no variations among all the groups. Meta regression suggested that the model fit explained 68.6% of the relevant variance. **CONCLUSIONS:** The meta-sensitivity analysis indicates that randomized controlled trials of fall-prevention programs conducted within the past 10 years (2000-2009) are effective in overall reduction of fall rates of 9% with a reduction of fall rates of 10% in multifactorial interventions, 9% in community settings, and 12% in Model I interventions (initial intervention efforts and then subsequent follow-up).

Choi YS, Lawler E, Boenecke CA, Ponatoski ER, Zimring CM. Developing a multi-systemic fall prevention model, incorporating the physical environment, the care process and technology: a systematic review. [Review]. J Adv Nurs 2011;67(12):2501-24.

Abstract: **AIMS:** This paper reports a review that assessed the effectiveness and characteristics of fall prevention interventions implemented in hospitals. A multi-systemic fall prevention model that establishes a practical framework was developed from the evidence. **BACKGROUND:** Falls occur through complex interactions between patient-related and environmental risk factors, suggesting a need for multifaceted fall prevention approaches that address both factors. **DATA SOURCES:** We searched Medline, CINAHL, PsycInfo and the Web of Science databases for references published between January 1990 and June 2009 and scrutinized secondary references from acquired papers. **REVIEW METHODS:** Due to the heterogeneity of interventions and populations, we conducted a quantitative systematic review without a meta-analysis and used a narrative summary to report findings. **RESULTS:** From the review, three distinct characteristics of fall prevention interventions emerged: (1) the physical environment, (2) the care process and culture and (3) technology. While clinically significant evidence shows the efficacy of environment-related interventions in reducing falls and fall-related injuries, the literature identified few hospitals that had introduced environment-related interventions in their multifaceted fall intervention strategies. **CONCLUSION:** Using the multi-systemic fall prevention model, hospitals should promote a practical strategy that benefits from the collective effects of the physical environment, the care process and culture and technology to prevent falls and fall-related injuries. By doing so, they can more effectively address the various risk factors for falling and therefore, prevent falls. Studies that test the proposed model need to be conducted to establish the efficacy of the model in practice.

Clemson L, Mackenzie L, Ballinger C, Close JC, Cumming RG. Environmental interventions to prevent falls in community-dwelling older people: a meta-analysis of randomized trials. Journal of Aging & Health 2008;20(8):954-71.

Abstract: **Objective.** This study seeks to determine the efficacy of environmental interventions in reducing falls in community-dwelling older people. **Method.** A systematic review and meta-analysis of randomized trials was performed. **Results.** Pooled analysis of six trials (N = 3,298) demonstrated a 21% reduction in falls risk (relative risk [RR] = 0.79; 0.65 to 0.97). Heterogeneity was attributable to the large treatment effect of one trial. Analysis of a subgroup of studies with participants at high risk of falls (four trials, n = 570) demonstrated a clinically significant 39% reduction of falls (RR = 0.61; 0.47 to 0.79), an absolute risk difference of 26% for a number needed to treat four people. **Discussion.** 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. The highest effects are associated with interventions that are conducted with high-risk groups

Costello E, Edelstein J. Update on falls prevention for community-dwelling older adults: review of single and multifactorial intervention programs. J Rehabil Res Dev 2008;45(8):1135-52.

Abstract: **RECORD STATUS:** This is a critical abstract of a systematic review that meets the crite-

ria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn

AUTHOR'S OBJECTIVES: To assess the effectiveness of fall prevention programmes for community-dwelling older adults aged 60 years or over

SEARCHING: MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), CINAHL, ERIC, Science Citation Index and ProQuest were searched between 1996 and 2007. Search terms were reported. Reference lists of retrieved papers were reviewed

VALIDITY ASSESSMENT: The quality of the RCTs included in this review was assessed using the Sackett's criteria for level of evidence. Two reviewers independently assessed the quality of the included trials and resolved discrepancies by consensus

DATA EXTRACTION: Two reviewers extracted incidence of falls, number of fallers and rate of falls data

RESULTS OF THE REVIEW: Twelve RCTs of multifactorial intervention programmes (n=4,271) and 10 RCTs of single intervention programmes (n=2,495) met the inclusion criteria. Six studies assessed interventions that employed a health and fall risk factor assessment with appropriate health practitioner referral as part of multifactorial programmes. Three studies demonstrated a significant decrease in falls in the intervention group compared to the control group. The other studies reported a decrease in falls in the intervention group that was not statistically significant compared to controls. Four of nine studies that assessed the effects of polypharmacy demonstrated a significant decrease in the number of falls or fallers in the intervention group; five studies showed no effect. Four of the seven studies that evaluated the effect of vision assessment and correction demonstrated lower falls or rate of falls in the intervention group; three studies found no effect. Four of the nine studies that assessed home visit and/or home modifications together with education as part of the multifactorial intervention programme demonstrated a reduction in falls in the treatment group; five studies found no effect. Three of the five programmes that used exercise and/or balance training as part of multifactorial programme demonstrated positive results. Nine out of the 10 studies demonstrated a positive effect of exercise on fall-related outcomes; one study did not find an effect. Two of the four studies that used home hazard assessment with modifications as a separate intervention demonstrated a significant reduction in falls, but reductions were specific to a subgroup of individuals at high risk for falling or a previous history of fall

AUTHOR'S CONCLUSION: Multifactorial falls prevention programmes appeared to be most effective for older adults

CRD COMMENTARY: This review addressed a broad but well-defined question in terms of participants, interventions, outcomes and study design. The search included appropriate electronic databases, but no apparent attempts were made to retrieve unpublished trials and it was possible that not all relevant data was included. Attempts were made to minimise bias and errors during the review process by using two or more reviewers to select trials, extract data and assess quality of included trials. Validity was assessed with a validated tool, but no details of how each quality component was assessed were reported. There were a number of limitations in most of the studies included in the review; the authors highlighted these clearly and where possible addressed them or discussed their implications. There was heterogeneity across the studies and a narrative synthesis was appropriate. The conclusions appear broadly reliable

IMPLICATIONS OF THE REVIEW FOR PRACTICE AND RESEARCH: Practice: The authors stated that medication and vision assessment with appropriate health practitioner referral should be included as part of a falls screening examination. Exercise alone was effective in reducing the number of falls and should include a comprehensive programme combining strengthening, balance and/or endurance training for a minimum of 12 weeks. Additional benefits of home hazard assessment with modifications may be possible if an occupational therapist or a physiotherapist conducted the assessment. Research: The authors did not state any implications for research

Ganz DA, Bao Y, Shekelle PG, Rubenstein LZ. Will my patient fall?. [Review] [51 refs]. JAMA 2007;297(1):77-86.

Abstract: CONTEXT: Effective multifactorial interventions reduce the frequent falling rate of older patients by 30% to 40%. However, clinical consensus suggests reserving these interventions for high-risk patients. Limiting fall prevention programs to high-risk patients implies that clinicians must recognize features that predict future falls. OBJECTIVE: To identify the prognostic value of risk factors for future falls among older patients. DATA SOURCES AND STUDY SELECTION: Search of MEDLINE (1966-September 2004), CINAHL (1982-September 2004), and authors' own files to identify prospective cohort studies of risk factors for falls that performed a multivariate analysis of such factors. DATA EXTRACTION: Two reviewers independently determined inclusion of articles and assessed study quality. Disagreements were resolved by consensus. Included studies were those identifying the prognostic value of risk factors for future falls among community-dwelling persons 65 years and older. Clinically identifiable risk factors were identified across 6 domains: orthostatic hypotension, visual impairment, impairment of gait or balance, medication use, limitations in basic or instrumental activities of daily living, and cognitive impairment. DATA SYNTHESIS: Eighteen studies met inclusion criteria and provided a multivariate analysis including at least 1 of the risk factor domains. The estimated pretest probability of falling at least once in any given year for individuals 65 years and older was 27% (95% confidence interval, 19%-36%). Patients who have fallen in the past year are more likely to fall again [likelihood ratio range, 2.3-2.8]. The most consistent predictors of future falls are clinically detected abnormalities of gait or balance (likelihood ratio range, 1.7-2.4). Visual impairment, medication variables, decreased activities of daily living, and impaired cognition did not consistently predict falls across studies. Orthostatic hypotension did not predict falls after controlling for other factors. CONCLUSIONS: Screening for risk of falling during the clinical examination begins with determining if the patient has fallen in the past year. For patients who have not previously fallen, screening consists of an assessment of gait and balance. Patients who have fallen or who have a gait or balance problem are at higher risk of future falls. [References: 51]

Gates S, Fisher JD, Cooke MW, Carter YH, Lamb SE. Multifactorial assessment and targeted intervention for preventing falls and injuries among older people in community and emergency care settings: systematic review and meta-analysis. [Review] [16 refs]. BMJ 2008;336(7636):130-3.

Abstract: OBJECTIVE: To evaluate the effectiveness of multifactorial assessment and intervention programmes to prevent falls and injuries among older adults recruited to trials in primary care, community, or emergency care settings. DESIGN: Systematic review of randomised and quasi-randomised controlled trials, and meta-analysis. DATA SOURCES: Six electronic databases (Medline, Embase, CENTRAL, CINAHL, PsycINFO, Social Science Citation Index) to 22 March 2007, reference lists of included studies, and previous reviews. REVIEW METHODS: Eligible studies were randomised or quasi-randomised trials that evaluated interventions to prevent falls that were based in emergency departments, primary care, or the community that assessed multiple risk factors for falling and provided or arranged for treatments to address these risk factors. DATA EXTRACTION: Outcomes were number of fallers, fall related injuries, fall rate, death, admission to hospital, contacts with health services, move to institutional care, physical activity, and quality of life. Methodological quality assessment included allocation concealment, blinding, losses and exclusions, intention to treat analysis, and reliability of outcome measurement. RESULTS: 19 studies, of variable methodological quality, were included. The combined risk ratio for the number of fallers during follow-up among 18 trials was 0.91 (95% confidence interval 0.82 to 1.02) and for fall related injuries (eight trials) was 0.90 (0.68 to 1.20). No differences were found in admissions to hospital, emergency department attendance, death, or move to institutional care. Subgroup analyses found no evidence of different effects between interventions in different locations, populations selected for high risk of falls or unselected, and multidisciplinary teams including a doctor, but interventions that actively provide treatments may be more effective than those that provide only knowledge and referral. CONCLUSIONS: Evidence that

multifactorial fall prevention programmes in primary care, community, or emergency care settings are effective in reducing the number of fallers or fall related injuries is limited. Data were insufficient to assess fall and injury rates. [References: 16]

Gillespie LD, Robertson MC, Gillespie WJ, Lamb SE, Gates S, Cumming RG, et al. Interventions for preventing falls in older people living in the community. [Review] [264 refs]. Cochrane Database of Systematic Reviews (2):CD007146, 2009 2009;(2):CD007146.

Abstract: BACKGROUND: Approximately 30% of people over 65 years of age living in the community fall each year. OBJECTIVES: To assess the effects of interventions to reduce the incidence of falls in older people living in the community. SEARCH STRATEGY: We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register, CENTRAL (The Cochrane Library 2008, Issue 2), MEDLINE, EMBASE, CINAHL, and Current Controlled Trials (all to May 2008). SELECTION CRITERIA: Randomised trials of interventions to reduce falls in community-dwelling older people. Primary outcomes were rate of falls and risk of falling. DATA COLLECTION AND ANALYSIS: Two review authors independently assessed trial quality and extracted data. Data were pooled where appropriate. MAIN RESULTS: We included 111 trials (55,303 participants). Multiple-component group exercise reduced rate of falls and risk of falling (rate ratio (RaR) 0.78, 95%CI 0.71 to 0.86; risk ratio (RR) 0.83, 95%CI 0.72 to 0.97), as did Tai Chi (RaR 0.63, 95%CI 0.52 to 0.78; RR 0.65, 95%CI 0.51 to 0.82), and individually prescribed multiple-component home-based exercise (RaR 0.66, 95%CI 0.53 to 0.82; RR 0.77, 95%CI 0.61 to 0.97). Assessment and multifactorial intervention reduced rate of falls (RaR 0.75, 95%CI 0.65 to 0.86), but not risk of falling. Overall, vitamin D did not reduce falls (RaR 0.95, 95%CI 0.80 to 1.14; RR 0.96, 95%CI 0.92 to 1.01), but may do so in people with lower vitamin D levels. Overall, home safety interventions did not reduce falls (RaR 0.90, 95%CI 0.79 to 1.03); RR 0.89, 95%CI 0.80 to 1.00), but were effective in people with severe visual impairment, and in others at higher risk of falling. An anti-slip shoe device reduced rate of falls in icy conditions (RaR 0.42, 95%CI 0.22 to 0.78). Gradual withdrawal of psychotropic medication reduced rate of falls (RaR 0.34, 95%CI 0.16 to 0.73), but not risk of falling. A prescribing modification programme for primary care physicians significantly reduced risk of falling (RR 0.61, 95%CI 0.41 to 0.91). Pacemakers reduced rate of falls in people with carotid sinus hypersensitivity (RaR 0.42, 95%CI 0.23 to 0.75). First eye cataract surgery reduced rate of falls (RaR 0.66, 95%CI 0.45 to 0.95). There is some evidence that falls prevention strategies can be cost saving. AUTHORS' CONCLUSIONS: Exercise interventions reduce risk and rate of falls. Research is needed to confirm the contexts in which multifactorial assessment and intervention, home safety interventions, vitamin D supplementation, and other interventions are effective. [References: 264]

Gillespie LD, Gillespie WJ, Robertson MC, Lamb SE, Cumming RG, Rowe BH. Interventions for preventing falls in elderly people. Cochrane Database of Systematic Reviews 2009;(2):CD000340.

Abstract: This article has no abstract

Gillespie WJ, Gillespie LD, Parker MJ. Hip protectors for preventing hip fractures in older people. [Review][Update of Cochrane Database Syst Rev. 2005;(3):CD001255; PMID: 16034859]. Cochrane Database of Systematic Reviews (10):CD001255, 2010 2010;(10):CD001255.

Abstract: BACKGROUND: Hip fracture in older people usually results from a fall on the hip. Hip protectors have been advocated as a means to reduce the risk of hip fracture. OBJECTIVES: To determine if external hip protectors reduce the incidence of hip fractures in older people following a fall. SEARCH STRATEGY: We searched the Cochrane Bone, Joint and Muscle Trauma Group Specialised Register (January 2010), The Cochrane Library 2010, Issue 2, MEDLINE (1950 to November 2009), MEDLINE in-process (30 December 2009), EMBASE (1988 to 2009 week 52), CINAHL (1982 to February 2009), BioMed Central (January 2010) and reference lists of relevant

articles. SELECTION CRITERIA: All randomised or quasi-randomised controlled trials comparing the use of hip protectors with an unprotected control group. DATA COLLECTION AND ANALYSIS: Two authors independently assessed risk of bias and extracted data. We sought additional information from trialists. Data were pooled using fixed-effect or random-effects models as appropriate. MAIN RESULTS: Pooling of data from 13 studies (11,573 participants) conducted in nursing or residential care settings found a marginally significant reduction in hip fracture risk (risk ratio (RR) 0.81, 95% confidence interval (CI) 0.66 to 0.99); statistical significance was lost following exclusion of five studies (3757 participants) assessed at high risk of bias (RR 0.93, 95% CI 0.74 to 1.18). Pooling of data from three trials (5135 community-dwelling participants) showed no evidence of reduction in hip fracture risk (RR 1.14, 95% CI 0.83 to 1.57). There was no evidence of a statistically significant effect on incidence of pelvic or other fractures, or on rate of falls. No important adverse effects of the hip protectors were reported but adherence, particularly in the long term, was poor. AUTHORS' CONCLUSIONS: The effectiveness of the provision of hip protectors in reducing the incidence of hip fracture in older people is still not clearly established, although they may reduce the rate of hip fractures if made available to frail older people in nursing care. It remains unknown from studies identified to date if these findings apply to all types of hip protectors. Some cluster-randomised trials have been associated with high risk of bias. Poor acceptance and adherence by older people offered hip protectors have been key factors contributing to the continuing uncertainty

Goodwin V, Jones-Hughes T, Thompson-Coon J, Boddy K, Stein K. Implementing the evidence for preventing falls among community-dwelling older people: a systematic review. [Review]. Journal of Safety Research 2011;42(6):443-51.

Abstract: PROBLEM AND OBJECTIVE: The translation of the evidence-base for preventing falls among community-dwelling older people into practice has been limited. This study systematically reviewed and synthesised the effectiveness of methods to implement falls prevention programmes with this population. METHODS: Articles published between 1980 and May 2010 that evaluated the effects of an implementation strategy. No design restrictions were imposed. A narrative synthesis was undertaken. RESULTS: 15 studies were identified. Interventions that involved the active training of healthcare professionals improved implementation. The evidence around changing the way people who fall are managed within primary care practices, and, lay-person, peer or community delivered models was mixed. IMPACT ON INDUSTRY: Translating the evidence-base into practice involves changing the attitudes and behaviours of older people, healthcare professionals and organisations. However, there is a need for further evaluation on how this can be best achieved.

Healey F, Oliver D, Milne A, Connelly JB. The effect of bedrails on falls and injury: a systematic review of clinical studies. [Review] [89 refs]. Age & Ageing 2008;37(4):368-78.

Abstract: BACKGROUND: around one-fourth of all falls in healthcare settings are falls from bed. The role of bedrails in falls prevention is controversial, with a prevailing orthodoxy that bedrails are harmful and ineffective. OBJECTIVE: to summarise and critically evaluate evidence on the effect of bedrails on falls and injury DESIGN: systematic literature review using the principles of QuoRoM guidance. Setting and SUBJECTS: adult healthcare settings Review METHODS: using the keyword, bedrail, and synonyms, databases were searched from 1980 to June 2007 for direct injury from bedrails or where falls, injury from falls, or any other effects were related to bedrail use. RESULTS: 472 papers were located; 24 met the criteria. Three bedrail reduction studies identified significant increases in falls or multiple falls, and one found that despite a significant decrease in falls in the discontinue-bedrails group, this group remained significantly more likely to fall than the continue-bedrails group; one case-control study found patients who had their bedrails raised significantly less likely to fall; one retrospective survey identified a significantly lower rate of injury and head injury in falls with bedrails up. Twelve papers described direct injury from bedrails. DISCUSSION: it is difficult to perform conventional clinical trials of an in-

tervention already embedded in practice, and all included studies had methodological limitations. However, this review concludes that serious direct injury from bedrails is usually related to use of outmoded designs and incorrect assembly rather than being inherent, and bedrails do not appear to increase the risk of falls or injury from falls. [References: 89]

McClure RJ, Turner C, Peel N, Spinks A, Eakin E, Hughes K. Population-based interventions for the prevention of fall-related injuries in older people. Cochrane Database of Systematic Reviews 2005;(1):CD004441.

Abstract: **BACKGROUND:** Fall-related injuries are a significant cause of morbidity and mortality in older populations. Summary information about countermeasures that successfully address the risk factors for fall-related injuries in research settings has been widely disseminated. However, less available is evidence-based information about successful roll out of these countermeasures in public health programmes in the wider community. Population-based interventions in the form of multi-strategy, multi-focused programmes are hypothesised to result in a reduction in population-wide injury rates. This review tests this hypothesis with regard to fall-related injuries among older people. **OBJECTIVES:** To assess the effectiveness of population-based interventions, defined as coordinated, community-wide, multi-strategy initiatives, for reducing fall-related injuries among older people. **SEARCH METHODS:** We searched the Cochrane Injuries Group Specialised Register, CENTRAL (The Cochrane Library), MEDLINE, EMBASE, National Research Register, AgeInfo, PsycInfo and Web of Knowledge. We also searched the internet, carried out handsearches of selected journals and checked the reference lists of relevant papers to identify any further studies. The latest search was conducted in May 2007. **SELECTION CRITERIA:** Studies were independently screened for inclusion by two review authors. Included studies were those that reported changes in medically treated fall-related injuries among older people following the implementation of a controlled population-based intervention. **DATA COLLECTION AND ANALYSIS:** Data were independently extracted by two review authors. Meta-analysis was not appropriate due to the heterogeneity of the included studies. **MAIN RESULTS:** Out of 35 identified studies, six met the criteria for inclusion. There were no randomised controlled trials. Significant decreases or downward trends in fall-related injuries were reported in each of the included studies, with the relative reduction in fall-related injuries ranging from 6% to 33%. **AUTHORS' CONCLUSIONS:** Despite methodological limitations of the evaluation studies reviewed, the consistency of reported reductions in fall-related injuries across all programmes support the preliminary claim that the population-based approach to the prevention of fall-related injury is effective and can form the basis of public health practice. Randomised, multiple community trials of population-based interventions are indicated to increase the level of evidence in support of the population-based approach. Research is also required to elucidate the barriers and facilitators in population-based interventions that influence the extent to which population programmes are effective. **POPULATION-BASED PROGRAMMES FOR THE PREVENTION OF FALL-RELATED INJURIES IN OLDER PEOPLE:** Injuries caused by falls are common in older people and can cause serious medical problems. Older people who live in institutions, such as assisted care facilities and nursing homes, and people over 80 years old are particularly likely to fall and injure themselves. Serious injuries include bone fracture, a head injury or tears to the skin (lacerations) that often require hospital treatment. Hip fractures almost always require hospitalisation and many community-dwelling individuals do not recover their ability to walk or carry out daily activities of living, which impacts greatly on their ability to live independently and their quality of life. Population (epidemiological) studies show that hip fractures are the most serious fall-related injury in older people, with 15% dying in hospital and a third not surviving beyond one year afterwards. A number of countries have prepared guidelines to prevent falls in the elderly. Effective interventions are available to prevent falls and include increased physical activity and hip protectors. Strategies targeted at fall prevention include regulation, education, environmental change and population or community-based coordinated programmes. A population-based intervention programme shares ownership of the injury problem with the whole community, experts and community members. Joint responsibility is taken for determining priorities and

appropriate interventions are widely promoted. The review authors could not find any randomised controlled trials on prevention of injuries from falls that involved whole communities. Six evaluation studies (prospective, controlled community trials) with well-matched control communities consistently reported reductions in fall-related injuries across the programmes used. This provides support for a population-based approach as a basis of public health practice. The relative reduction in fall-related injuries ranging from 6% to 75%, in studies conducted in Australia, Denmark, Norway, Taiwan and Sweden over up to eight years. Three of the studies were based on the World Health Organization Safe Communities model of safety and injury prevention. Limitations were the exact nature of the population-based intervention used, how it could be generalised to other communities and trial methodologies

Menant JC, Steele JR, Menz HB, Munro BJ, Lord SR. Optimizing footwear for older people at risk of falls. [Review] [104 refs]. *Journal of Rehabilitation Research & Development* 2008;45(8):1167-81.

Abstract: Footwear influences balance and the subsequent risk of slips, trips, and falls by altering somatosensory feedback to the foot and ankle and modifying frictional conditions at the shoe/floor interface. Walking indoors barefoot or in socks and walking indoors or outdoors in high-heel shoes have been shown to increase the risk of falls in older people. Other footwear characteristics such as heel collar height, sole hardness, and tread and heel geometry also influence measures of balance and gait. Because many older people wear suboptimal shoes, maximizing safe shoe use may offer an effective fall prevention strategy. Based on findings of a systematic literature review, older people should wear shoes with low heels and firm slip-resistant soles both inside and outside the home. Future research should investigate the potential benefits of tread sole shoes for preventing slips and whether shoes with high collars or flared soles can enhance balance when challenging tasks are undertaken. [References: 104]

Michael YL, Whitlock EP, Lin JS, Fu R, O'Connor EA, Gold R, et al. Primary care-relevant interventions to prevent falling in older adults: a systematic evidence review for the U.S. Preventive Services Task Force. [Review]. *Ann Intern Med* 2010;153(12):815-25.

Abstract: **BACKGROUND:** Falls among older adults are both prevalent and preventable. **PURPOSE:** To describe the benefits and harms of interventions that could be used by primary care practitioners to prevent falling among community-dwelling older adults. **DATA SOURCES:** The reviewers evaluated trials from a good-quality systematic review published in 2003 and searched MEDLINE, the Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and CINAHL from the end of that review's search date to February 2010 to identify additional English-language trials. **STUDY SELECTION:** Two reviewers independently screened 3423 abstracts and 638 articles to identify randomized, controlled trials (RCTs) of primary care-relevant interventions among community-dwelling older adults that reported falls or fallers as an outcome. Trials were independently critically appraised to include only good- or fair-quality trials; discrepancies were resolved by a third reviewer. **DATA EXTRACTION:** One reviewer abstracted data from 61 articles into standardized evidence tables that were verified by a second reviewer. **DATA SYNTHESIS:** Overall, the included evidence was of fair quality. In 16 RCTs evaluating exercise or physical therapy, interventions reduced falling (risk ratio, 0.87 [95% CI, 0.81 to 0.94]). In 9 RCTs of vitamin D supplementation, interventions reduced falling (risk ratio, 0.83 [CI, 0.77 to 0.89]). 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]). Limited evidence suggested that serious clinical harms were no more common for older adults in intervention groups than for those in control groups. **Limitations:** Interventions and methods of fall ascertainment were heterogeneous. Data on potential harms of interventions were scant and often not reported. **CONCLUSION:** Primary care-relevant interventions exist that can reduce fall-

ing among community-dwelling older adults. PRIMARY FUNDING SOURCE: Agency for Health-care Research and Quality

Petridou ET, Manti EG, Ntinapogias AG, Negri E, Szczerbinska K. What works better for community-dwelling older people at risk to fall?: a meta-analysis of multifactorial versus physical exercise-alone interventions. Journal of Aging & Health 2009;21(5):713-29.

Abstract: OBJECTIVE: To compare and quantify the effectiveness of multifactorial versus exercise-alone interventions in reducing recurrent falls among community-dwelling older people. METHOD: A meta-analysis of recently published studies on fall prevention interventions was conducted. Measure of the overall effectiveness was the combined risk ratio for recurrent falls, whereas heterogeneity was explored via metaregression analyses. RESULTS: Ten of the 52 identified studies met the preset criteria and were included in the analysis. The exercise-alone interventions were about 5 times more effective compared to multifactorial ones. Short-term interventions, smaller samples, and younger age related to better outcomes. DISCUSSION: From cost-efficiency and public health perspectives, exercise-alone interventions can be considered valuable, as they are more likely to be implemented in countries with less resources. Further qualitative research is needed, however, to explore determinants of willingness to participate and comply with interventions aiming to prevent recurrent falls among older people

Scott V, Votova K, Scanlan A, Close J. Multifactorial and functional mobility assessment tools for fall risk among older adults in community, home-support, long-term and acute care settings. Age Ageing 2007;36(2):130-9.

Abstract: RECORD STATUS: This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn

AUTHOR'S OBJECTIVES: To assess the value and the reliability of fall-risk assessment tools in the elderly population within the community, home support, acute and long-term care settings

STUDY SELECTION - SPECIFIC INTERVENTIONS: Studies evaluating fall-risk assessment tools were eligible for inclusion. A total of 38 different tools were evaluated: 11 multifactorial assessment tools and 27 functional mobility assessment tools

STUDY SELECTION - PARTICIPANTS: Adults aged 65 years or older from the community, supportive housing, acute and long-term care settings were eligible for inclusion. Further characteristics of the included patients were not specified

STUDY SELECTION - OUTCOMES: Eligible studies had to evaluate the incidence of single or recurrent falls, fall-related injury, or gait and balance as a primary outcome

STUDY SELECTION - STUDY DESIGNS: Only prospective studies were considered for inclusion

SEARCHING: MEDLINE, EBSCOhost Academic Search Premier, Psychology and Behavioural Sciences Collection, Nursing and Allied Health Collection, Health Business Elite, Biomedical Reference Collection, DARE and the Cochrane Controlled Trials Register were searched from January 1980 to July 2004; the search terms were reported. Only published studies in the English language were considered for inclusion. The references of relevant articles and reviews were checked for additional studies

VALIDITY ASSESSMENT: The authors did not state that they assessed validity

STUDY SELECTION - HOW WERE DECISIONS ON THE RELEVANCE OF PRIMARY STUDIES

MADE?: Two reviewers independently selected studies for inclusion, with any disagreements resolved through discussion with a third reviewer

DATA EXTRACTION: The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction

METHODS OF SYNTHESIS - HOW WERE THE STUDIES COMBINED?: The studies were described narratively and the data were tabulated

METHODS OF SYNTHESIS - HOW WERE DIFFERENCES BETWEEN STUDIES INVESTI-

GATED?: Differences in study interventions and outcomes were discussed in the text and presented in more detail in the tables

RESULTS OF THE REVIEW: Thirty-four studies were included in the review. Fourteen studies evaluated 23 tools in the community setting. The sensitivity of the tool ranged from 14 to 94% and the specificity from 38 to 100%. Eleven of the 14 studies reported on the time taken to complete the test; this ranged from 10 seconds to 20 minutes. Four studies examined 4 tools in the supportive housing setting. The sensitivity of the tool ranged from 72 to 80% and the specificity from 43 to 57%. Three studies reported on the time taken to complete the test; this ranged from 10 to 60 minutes. Twelve studies examined 8 different tools in the acute care setting. The sensitivity of the tool ranged from 66 to 93% and the specificity from 25 to 88%. There was 74 to 99% agreement between the raters (8 studies). Eight studies reported on the time taken to complete the test; this ranged from 1 to 15 minutes. Six studies examined 10 different tools in the long-term care setting. The sensitivity of the tool ranged from 43 to 91% and the specificity from 39 to 82%. There was 56 to 98% agreement between the raters (4 studies). Seven studies reported on the time taken to complete the test; this ranged from 10 seconds to 15 minutes

AUTHOR'S CONCLUSION: Reliable tools to evaluate the risk of falling among the elderly are available, but few have been tested in more than one setting

CRD COMMENTARY: This review addressed a well-defined question in terms of the interventions and outcomes while it used a broad definition of study design and study participants. Several relevant databases were searched and efforts were made to find further published studies. It is not clear whether specific attempts were made to locate unpublished studies. Only studies in English were considered for inclusion, which might have resulted in language bias. Publication bias was not assessed. It was not stated if the data extraction was performed in duplicate, therefore reviewer error and bias might have been introduced. No quality assessment of the included studies was reported; the potential impact of methodological flaws in the primary studies upon the reliability of the review findings cannot, therefore, be assessed. The inclusion of many relatively small case series represents a major limitation of the evidence available for this review. The authors' conclusions appear reasonable but should be interpreted with caution in view of the potential methodological and reporting weaknesses of the review

IMPLICATIONS OF THE REVIEW FOR PRACTICE AND RESEARCH: Practice: The authors stated that no tool can be currently recommended to establish the risk of falling among the elderly. Research: The authors stated that additional studies are needed to establish the role of multifactorial tools or functional mobility assessment tools

Udell JE, Drahota A, Dean TP, Sander R, Mackenzie H. [Interventions for preventing falls in older people: an overview of Cochrane Reviews](#). Cochrane Database of Systematic Reviews 2011;(4):CD009074.

Abstract: This is the protocol for a review and there is no abstract. The objectives are as follows: Our overall aim is to provide an overview of interventions for preventing falls in older people by summarising the evidence from multiple Cochrane intervention reviews that evaluate the effects (primarily, rate of falls and number of fallers) of these interventions in different populations of older people, such as those defined by setting or by specific medical conditions. Fall prevention interventions will include those in the following categories: supervised or unsupervised exercises; medication; surgery; management of urinary incontinence; fluid or nutrition therapy; psychological; environment and assistive technologies; social environment; knowledge/education interventions and any other interventions that do not fall into one of these categories (Lamb 2007). Interventions tested may belong to one category ('single' intervention), or more than one category ('multiple' and 'multifactorial' interventions)

Whitehead SH, Nyman SR, Broaders F, Skelton DA, Todd CJ. [The quality of English-language websites offering falls-prevention advice to older members of the public and their families](#). Health Informatics Journal 2012;18(1):50-65.

Abstract: Falls among older people are a major public health issue. Increasing numbers of older people are accessing the internet for health-related information, including information on falls risk and prevention. However, we are aware of no study that has assessed the quality of such websites. Using techniques for conducting systematic literature reviews, we evaluated English-language websites offering falls-related advice to members of the public. Forty-two websites were identified using popular search engines; these were assessed using evidence-based guidelines and codes of conduct on coverage of falls-related information, credibility and senior friendliness. Overall, scores were poor for coverage of falls information and credibility, although they were higher for senior friendliness. Few of the websites had been recently updated and none provided individually-tailored advice. We conclude that websites have fallen short of their potential to provide accessible, evidence-based information on the risks of falls and their prevention

Annet

Abelson-Mitchell N. Epidemiology and prevention of head injuries: literature review. [Review] [34 refs]. J Clin Nurs 2008;17(1):46-57.

Abstract: AIM AND OBJECTIVES: To identify evidence-based reports on the epidemiology of head injuries to develop guidelines for primary prevention activities by public health nurses. BACKGROUND: Head injury is a major cause of morbidity, mortality, disability and lost years of productive life in the population under 40-45 years of age. Prevention strategies such as legislation on car seat belts, drink driving and health and safety at work have led to reductions in its incidence. As well as the personal repercussions for those injured and their families, there are resource implications for healthcare provision. There is a potential role for public health nurses in reducing this burden. METHODS: A search of MEDLINE, PubMed, Science Direct, BNI and CINAHL was carried out for the period 1990-2005 using the keywords: head injury, brain injury, traumatic brain injury, head trauma, incidence, prevalence, epidemiology and prevention of head injuries. RESULTS: Comparison of the data is difficult because of the use of different definitions of injury, criteria for severity, geographical bases and timeframes. Those at greatest risk seem to be young men and older people. The former are more implicated in traffic and work accidents and in physical violence, while older people are more susceptible to traffic accidents as pedestrians and to falls. The incidence in lower socio-economic groups is greater. CONCLUSIONS: The evidence-base for the primary prevention of head injury is weak. Standardized definitions and classification systems need to be used in future epidemiological studies to permit comparisons across studies. RELEVANCE TO CLINICAL PRACTICE: There is a role for public health nurses in developing primary prevention campaigns in schools and local communities. Key target groups are young men and older people and campaigns need to tackle the particular issues relevant to these groups. [References: 34]

Beus JM, Payne SC, Bergman ME, Arthur W. Safety climate and injuries: an examination of theoretical and empirical relationships. J Appl Psychol 2010;95(4):713-27.

Abstract: Our purpose in this study was to meta-analytically address several theoretical and empirical issues regarding the relationships between safety climate and injuries. First, we distinguished between extant safety climate-->injury and injury-->safety climate relationships for both organizational and psychological safety climates. Second, we examined several potential moderators of these relationships. Meta-analyses revealed that injuries were more predictive of organizational safety climate than safety climate was predictive of injuries. Additionally, the injury-->safety climate relationship was stronger for organizational climate than for psychological climate. Moderator analyses revealed that the degree of content contamination in safety climate measures inflated effects, whereas measurement deficiency attenuated effects. Additionally, moderator analyses showed that as the time period over which injuries were assessed lengthened, the safety climate-->injury relationship was attenuated. Supplemental meta-analyses of specific safety climate dimensions also revealed that perceived management commitment to safety is the most robust predictor of occupational injuries. Contrary to expectations, the operationalization of injuries did not meaningfully moderate safety climate-injury relationships. Implications and recommendations for future research and practice are discussed

Boyd JJ, Agazzi G, Svajda D, Morgan AJ, Ferrandis S, Norris RL. Venomous snakebite in mountainous terrain: prevention and management. [Review] [66 refs]. Wilderness & Environmental Medicine 2007;18(3):190-202.

Abstract: The prevention and management of venomous snakebite in the world's mountains present unique challenges. This paper presents a series of practical, clinically sound recommen-

dations for management of venomous snakebite in a mountain environment. The authors performed an extensive review of current literature using search engines and manual searches. They then fused the abundant knowledge of snakebite with the realities of remote first aid and mountain rescue to develop recommendations. A summary is provided of the world's most troublesome mountain snakes and the mechanisms of toxicity from their bites. Preventive measures are described. Expected symptoms and signs are reviewed in lay and medical terms. A review of currently recommended first-aid measures and advanced medical management for physicians, paramedics, and other clinicians is included. Venomous snakebites in mountainous environments present unique challenges for management. This paper offers practical recommendations for managing such cases and summarizes the approach to first aid and advanced management in 2 algorithms. [References: 66]

Brewer S, King E, Amick BC, Delclos G, Spear J, Irvin E, et al. A systematic review of injury/illness prevention and loss control programs (IPCs). 2007.

Abstract: RECORD STATUS: This is a systematic review that meets the criteria for inclusion on DARE. If you would like us to consider prioritising the writing of a critical abstract for this review please e-mail CRD-DARE@york.ac.uk quoting the Accession Number of this record. Please note that priority is given to fast track requests from the UK National Health Service

Cothren CC, Moore EE, Hedegaard HB, Meng K. Epidemiology of urban trauma deaths: a comprehensive reassessment 10 years later. World J Surg 2007;31(7):1507-11.

Abstract: BACKGROUND: We conducted a comprehensive analysis of the epidemiology of trauma deaths in our urban county during a one-year period a decade ago. In the interim we have implemented a statewide trauma system, initiated a number of injury-prevention programs, and have had a major public effort to reduce drug traffic and related gangs. Consequently, we have reassessed the regional trauma mortality to ascertain the impact of these measures and to search for new injury patterns. METHODS: Trauma deaths occurring within our urban county from January 1 through December 31, 2002 were reviewed for mechanism, demographics, and cause of fatal injury; cases were identified using death certificates from the Colorado Department of Public Health. We compared these data to the trauma fatalities occurring during 1992. RESULTS: During the 2002 study period, there were 420 injury-related deaths. Most of the patients were men (296 patients, 70%), with a mean age of 47.3 years (median age, 42 years). The three predominant mechanisms of fatal injury were transport-related (180 patients, 43%), intentional (99 patients, 24%), and falls (86 patients, 20%). Comparison between 1992 and 2002 showed significant increases in the percentage of transport-related and fall-related deaths, and a significant reduction in intentional fatal injuries. There was also a shift in the percentage of deaths occurring in the first 24 h to delayed times. The death rate per capita in Denver County declined from 0.081 in 1992 to 0.060 in 2002. CONCLUSIONS: Along with a decrease in the per capita death rate, the major mechanisms of patient's deaths changed substantively over the decade 1992-2002; there was a shift from intentional injuries to transport-related deaths as the predominant etiology of trauma related deaths. Recognition of such injury patterns will direct future injury-prevention efforts and coordination of citywide trauma care

Duperrex O, Blackhall K, Burri M, Jeannot E. Education of children and adolescents for the prevention of dog bite injuries. [Review] [60 refs]. Cochrane Database of Systematic Reviews (2):CD004726, 2009 2009;(2):CD004726.

Abstract: BACKGROUND: Dog bites can have dramatic consequences for children and adolescents. Educating young people on how to interact with dogs could contribute to reducing dog bite injuries. OBJECTIVES: To determine the effectiveness of educational interventions that target children and adolescents in reducing dog bite injuries and their consequences. SEARCH STRATEGY: We searched the following databases: The Cochrane Injuries Group's Specialised

Register, CENTRAL (The Cochrane Library Issue 3, 2008), CAB Abstracts, Zetoc, SIGLE, MEDLINE, EMBASE, ERIC, PsycInfo, SPECTR, CINAHL, National Research Register, LILACs, African Healthline, Science Citation Index, Social Science Citation Index, CurrentClinicalTrials.Gov, Centrewatch, Controlledtrials.com, Vetgate and the WHO database. We checked the bibliographies of relevant reviews and trials and also contacted experts in the field. The searches were carried out to 18 July 2008. SELECTION CRITERIA: We included randomised controlled trials and controlled before-after studies that evaluated the effectiveness of educational interventions, in populations under 20 years old, for preventing dog bites. DATA COLLECTION AND ANALYSIS: Two review authors selected eligible studies based on information from the title and abstract. Two review authors decided on the inclusion of eligible trials and extracted data from the trial reports. We contacted authors of eligible studies to obtain more information. MAIN RESULTS: Two studies met the inclusion criteria. No study looked at our main outcome: dog bite rates. The included studies were randomised controlled trials conducted in kindergarten and primary schools. Their methodology was of moderate quality. One study showed that the intervention group showed less 'inappropriate behaviour' when observed in the presence of a dog after a 30-minute educational intervention. Another study showed an increase in knowledge and in caution after an information programme. AUTHORS' CONCLUSIONS: There is no direct evidence that educational programmes can reduce dog bite rates in children and adolescents. Educating children who are less than 10 years old in school settings could improve their knowledge, attitude and behaviour towards dogs. Educating children and adolescents in settings other than schools should also be evaluated. There is a need for high quality studies that measure dog bite rates as an outcome. To date, evidence does not suggest that educating children and adolescents is effective as a unique public health strategy to reduce dog bite injuries and their consequences. [References: 60]

El Dib RP, Mathew JL, Martins Regina HG. Interventions to promote the wearing of hearing protection. Cochrane Database of Systematic Reviews 2012;(4):CD005234.

Abstract: BACKGROUND: This is an update of a Cochrane Review first published in The Cochrane Library in Issue 2, 2006 and previously updated in 2009. Noise-induced hearing loss can be prevented by eliminating or lowering noise exposure levels. Where the source of the noise cannot be eliminated, workers have to rely on hearing protection equipment. Several trials have been conducted to study the effectiveness of interventions to influence the wearing of hearing protection. OBJECTIVES: To evaluate the effectiveness of interventions to enhance the wearing of hearing protection among persons regularly exposed to high noise levels. SEARCH METHODS: We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 1); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ICTRP and additional sources for published and unpublished trials. The date of the most recent search was 8 April 2011. SELECTION CRITERIA: We included studies if they had a randomised design, if they were among noise exposed (> 80 dB(A)) persons, if they included an intervention to promote the wearing of hearing protection (compared to another intervention or no intervention), and if the outcome measured was the amount of use of hearing protection or a proxy measure thereof. DATA COLLECTION AND ANALYSIS: Two authors selected relevant trials, assessed risk of bias and extracted data. MAIN RESULTS: Seven studies, involving 4670 participants, were included. A computer-based intervention lasting 30 minutes, tailored to the risk of an individual worker, was not found to be more effective than a video providing general information among workers, around 80% of whom already used hearing protection. A four-year school-based hearing loss prevention programme found that the intervention group was twice as likely to wear some kind of hearing protection as the control group that received a baseline hearing test and two additional tests at years two and three. We conducted two meta-analyses for the comparisons 'tailored strategy (the use of communication or other types of interventions that are specific to an individual or a group and aim to change behaviour) versus non-tailored strategy' and 'tailored strategy versus a commercial video on the use of hearing protection' to look at mean percentage use of hearing protective devices (HPDs), that showed improvement in the mean use

of HPDs for the tailored group. A meta-analysis of the comparison 'mixed interventions' (classroom instruction, distribution of HPDs, mailings, noise level assessments and audiometric testing) versus control (audiometric testing alone) also showed improvement in self reported use of HPDs when shooting firearms. Tailored education showed an improvement in HPD use of 8.3% versus targeted education (6.1%).

AUTHORS' CONCLUSIONS: The evidence found in this review shows that some interventions improve the mean use of hearing protection devices compared to non-intervention. Future trials should have standard outcomes and interventions to allow the combining of results in meta-analysis.

THE EFFECTIVENESS OF INTERVENTIONS TO PROMOTE THE WEARING OF HEARING PROTECTION TO REDUCE EXPOSURE TO NOISE AMONG WORKERS: Hearing loss due to noise exposure in the workplace is one of the most common occupational diseases. The condition is permanent and there is no effective treatment. Where the source of the noise cannot be eliminated, however, hearing loss can be minimised by the use of hearing protection devices (e.g. earplugs or earmuffs). The effectiveness of these devices depends on the fit and quality as well as regular use by workers. This systematic review aimed to evaluate the effectiveness of interventions to influence workers to wear hearing protection to decrease their exposure to noise. Seven studies were included in the review including a total of 4670 participants. The evidence shows that tailored interventions (the use of communication or other types of interventions that are specific to an individual or a group and aim to change behaviour) improve the mean use of hearing protective devices versus non-intervention. Individually tailored education was more effective in improving HPD use compared with target education programmes which address shared worker characteristics. Mixed interventions (education, mailing, distribution of HPDs, noise assessments and audiometric testing) were also more effective in improving HPD use compared with hearing testing alone. Long-lasting school based interventions may increase the use of hearing protection substantially, however more research is needed.

Gupta S, Carmichael C, Simpson C, Clarke MJ, Allen C, Gao Y, et al. [Electric fans for reducing adverse health impacts in heatwaves](#). Cochrane Database of Systematic Reviews 2012;(7):CD009888.

Abstract: **BACKGROUND:** Heatwaves are hot weather events, which breach regional or national thresholds, that last for several days. They are likely to occur with increasing frequency in some parts of the world. The potential consequences were illustrated in Europe in August 2003 when there were an estimated 30,000 excess deaths due to a heatwave. Electric fans might be used with the intention of reducing the adverse health effects of a heatwave. Fans do not cool the ambient air but can be used to draw in cooler air from outside when placed at an open window. The aim of the fans would be to increase heat loss by increasing the efficiency of all normal methods of heat loss, but particularly by evaporation and convection methods. However, it should be noted that increased sweating can lead to dehydration and electrolyte imbalances if these fluids and electrolytes are not replaced quickly enough. Research has also identified important gaps in knowledge about the use of fans, which might lead to their inappropriate use. **OBJECTIVES:** To determine whether the use of electric fans contributes to, or impedes, heat loss at high ambient temperatures during a heatwave, and to contribute to the evidence base for the public health impacts of heatwaves. **SEARCH METHODS:** We sought unpublished and published studies that had been published in any language. The review team were able to assess studies reported in English, Chinese, Dutch, French and German; and reports in other languages would have been translated into English as necessary. We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, CINAHL, the Indian biomedical literature (IndMED and MedIND) and databases of Chinese literature (Chinese Journal Net and Digital Periodical of WanFang Data). The most recent electronic searches were done in April 2012. We also checked the reference lists of relevant articles and the websites of relevant national and international organisations, and consulted with researchers and policy makers with experience in strategies to manage heatwaves to identify additional studies. The titles and abstracts from each search were checked independently by two review authors. The full text articles that we retrieved were

checked independently by at least two authors for their relevance and for references to potentially eligible studies. **SELECTION CRITERIA:** Randomised trials and other experimental designs, such as interrupted time series and controlled before-and-after studies, comparing the use of electric fans with no fans during a heatwave were eligible for this review. The electric fans could be hand-held (battery operated), portable or mounted on the wall or ceiling, or in a window. We sought interventions delivered to anyone for whom a heatwave was likely to have serious adverse health impacts. This would include people of all ages but with a particular focus on some groups (for example older people). Populations from high-, middle- and low-income countries were eligible for the review. **DATA COLLECTION AND ANALYSIS:** If we had identified eligible studies, they would have been assessed independently by at least two review authors and data would have been extracted on the characteristics of the study, its participants and interventions, as well as the effects on health outcomes. The primary outcomes were mortality, hospital admission and other contacts with healthcare services. **MAIN RESULTS:** We did not identify any eligible studies despite the extensive searching and correspondence with several experts in this topic area. We identified retrospective, observational studies, usually with a case-control design, that investigated the association between the use of electric fans and health outcomes, including death. The results of these studies were mixed. Some studies found that the use of fans was associated with better health outcomes, others found the reverse. **AUTHORS' CONCLUSIONS:** The evidence we identified does not resolve uncertainties about the health effects of electric fans during heatwaves. Therefore, this review does not support or refute the use of electric fans during a heatwave. People making decisions about electric fans should consider the current state of the evidence base, and they might also wish to make themselves aware of local policy or guidelines when making a choice about whether or not to use or supply electric fans. The main implication of this review is that high quality research is needed to resolve the long standing and ongoing uncertainty about the benefits and harms of using electric fans during a heatwave, for example randomised trials comparing the health effects in people with electric fans to those in people without them. **ELECTRIC FANS FOR REDUCING THE HEALTH EFFECTS OF HEATWAVES:** Heatwaves are set to become more common and their effects can be devastating. For example, up to 30,000 people may have died because of the heatwave that occurred in Europe during August 2003. One way to try to get relief from the heat is to use an electric fan, but whether this will do more good or harm is uncertain. A fan might help to increase heat loss if the temperature is below 35 °C and the fan is not directly aimed at the person, but, when temperatures are above 35 °C, the fan might actually contribute to heat gain. Excess sweating can also lead to dehydration and other health problems. It is important, therefore, to know about the potential benefits and harms of electric fans when choosing whether to use one. This applies if the decision is about your own use of a fan, but it is also relevant to broader public health decisions, such as whether to give electric fans to groups of people during a heatwave. This is particularly important for people who are considered more vulnerable to the effects of heat, such as older adults who are less able to cool down through sweating or increasing the flow of blood to their skin. This Cochrane Review tried to provide some of the answers that would help decision makers. We looked for high quality research that had compared groups of people using fans with groups who didn't use them during a heatwave. However, we didn't find any research that met our requirements. We did find some studies which used designs that are less reliable for answering this sort of question, and these had mixed results. Some suggested that fans might reduce health problems, while others suggested that the fans might make things worse. Therefore, the research that has been done to date does not resolve uncertainties about the health effects of electric fans during heatwaves. People who have to make decisions should consider the current evidence, alongside local policies and guidelines when making their choices. They may wish to help resolve the continuing uncertainty by conducting the type of high quality research that would provide the reliable evidence needed to determine the benefits and harms of using electric fans during a heatwave

Hankin A, Hertz M, Simon T. Impacts of metal detector use in schools: insights from 15 years of research. [Review]. J Sch Health 2011;81(2):100-6.

Abstract: BACKGROUND: Multiple approaches exist, both in theory and in practice, to reduce young people's risk of violent victimization when they are in school. Among these approaches, a growing number of school districts are choosing to install metal detectors. We sought to review the literature available on the impacts of metal detectors on school violence and perceptions about school violence. METHODS: We conducted an extensive literature search, including databases for the medical, public health, sociology, and political science literature. Of 128 papers that met our search criteria, 7 studies met inclusion criteria for the literature review. RESULTS: Each of the papers reviewed utilized data that originated from self-report surveys. Four of the studies consisted of secondary analyses of national databases, with the other 3 utilizing local surveys. The studies varied as to the outcome, ranging from student/staff perceptions of safety at school to student self-reports of weapon carrying and/or victimization, and showed mixed results. Several studies suggested potential detrimental effects of metal detectors on student perceptions of safety. One study showed a significant beneficial effect, linking metal detector use to a decrease in the likelihood that students reported carrying a weapon while in school (7.8% vs 13.8%), without a change in weapon carrying in other settings or a decline in participation in physical fights. CONCLUSION: There is insufficient data in the literature to determine whether the presence of metal detectors in schools reduces the risk of violent behavior among students, and some research suggests that the presence of metal detectors may detrimentally impact student perceptions of safety. Copyright Published 2011. This article is a US Government work and is in the public domain in the USA

Hansen A, Bi P, Nitschke M, Pisaniello D, Newbury J, Kitson A. Older persons and heat-susceptibility: the role of health promotion in a changing climate. Health Promotion Journal of Australia 2011;22:Spec-20.

Abstract: ISSUE ADDRESSED: Many studies world wide have provided evidence that older persons are a sub-population at increased risk of heat-related morbidity and mortality. This article gives an overview of the current state of knowledge of risk factors and provides commentary on the role of health promotion in the prevention of a climate change-related increase in elderly heat casualties. METHODS: A search of peer-reviewed medical and epidemiological literature and community health websites was conducted in order to gain an in-depth understanding of heat-susceptibility in the elderly and preventive strategies. Key search words included: elderly, aged, older, heat, thermoregulation, heat wave, mortality, heat effects, dehydration, heat-related illness, adaptation, adaptive capacity. RESULTS: The reasons underlying reduced heat tolerance in this group are multi-faceted, comprising physiological, social and behavioural limitations, with comorbidities and polypharmacy being contributing factors. Additionally, some older persons may be unable or reluctant to undertake adaptations necessary to maintain thermal homeostasis due to diminished awareness of the heat, lowered thirst sensation, mobility or cognitive impairments, a lowered perception of risk, or economic concerns. CONCLUSION: With older persons in poor health being particularly vulnerable to heat, preventive messages need to promote protective behaviours and help build resilience as temperatures rise

Johnston BD, Bennett E, Pilkey D, Wirtz SJ, Quan L. Collaborative process improvement to enhance injury prevention in child death review. Inj Prev 2011;17:Suppl-6.

Abstract: OBJECTIVE: To increase the number and quality of injury prevention recommendations made by Washington State (USA) child death review teams. DESIGN: Before and after study design involving four intervention teams and 21 comparison teams. METHODS: Intervention teams received injury prevention training, collaborative process improvement coaching, and access to web based prevention resources. An equal number of randomly selected child death review case reports filed with the state before the intervention by the intervention and comparison teams were included in the baseline sample. All reports submitted by the intervention and comparison teams after the intervention were included in the follow-up sample. Reports were

scored on the completeness of prevention related data elements and on the quality of written prevention recommendations. RESULTS: Data completion for prevention relevant items increased in intervention teams from 73% at baseline to 88% at follow-up. In comparison teams, this measure fell from 77% to 56% over the same period. The quality of written recommendations produced by intervention teams increased from 4.3 (95% CI 3.4 to 5.1) to 7.6 (95% CI 6.7 to 8.5), while comparison teams showed no significant change (4.0 (95% CI 2.5 to 5.3) to 3.7 (95% CI 2.2 to 5.2)). Specifically, improvements were noted in the identification of evidence based best practices and the development of clear, actionable written recommendations. CONCLUSION: Injury prevention recommendations are generated in the systematic local review of child deaths. This process can be analysed, measured, supported, and improved

Lowe D, Ebi KL, Forsberg B. Heatwave early warning systems and adaptation advice to reduce human health consequences of heatwaves. [Review]. International Journal of Environmental Research & Public Health [Electronic Resource] 2011;8(12):4623-48.

Abstract: INTRODUCTION: With climate change, there has been an increase in the frequency, intensity and duration of heatwave events. In response to the devastating mortality and morbidity of recent heatwave events, many countries have introduced heatwave early warning systems (HEWS). HEWS are designed to reduce the avoidable human health consequences of heatwaves through timely notification of prevention measures to vulnerable populations. OBJECTIVE: To identify the key characteristics of HEWS in European countries to help inform modification of current, and development of, new systems and plans. METHODS: We searched the internet to identify HEWS policy or government documents for 33 European countries and requested information from relevant organizations. We translated the HEWS documents and extracted details on the trigger indicators, thresholds for action, notification strategies, message intermediaries, communication and dissemination strategies, prevention strategies recommended and specified target audiences. FINDINGS AND CONCLUSIONS: Twelve European countries have HEWS. Although there are many similarities among the HEWS, there also are differences in key characteristics that could inform improvements in heatwave early warning plans

National Institute for Health and Clinical Excellence. Strategies to prevent unintentional injuries among under-15s. 2010.

Abstract: RECORD STATUS: This is a bibliographic record of a published health technology assessment. No evaluation of the quality of this assessment has been made for the HTA database

Pearson M, Hunt H, Garside R, Moxham T, Peters J, Anderson R. Preventing unintentional injuries to children under 15 years in the outdoors: a systematic review of the effectiveness of educational programs. [Review]. Inj Prev 2012;18(2):113-23.

Abstract: INTRODUCTION: Unintentional injuries to children in the outdoors have a significant impact on child mortality, development and healthcare costs. This paper presents the findings of a systematic review about the effectiveness of programs that provided information, advice or education about the prevention of unintentional injuries to children under 15 years during outdoor play and leisure. METHODS: A structured search strategy was conducted in a range of databases. All report titles and abstracts were screened using pre-defined criteria. Included reports were quality appraised using a modified Graphical Appraisal Tool for Epidemiological studies (GATE) tool. All quality appraisals and data extraction were checked by a second reviewer. If not provided in the original reports, ORs and mean differences were calculated, where sufficient data were available. RESULTS: Twenty-three studies met the inclusion criteria. There was a paucity of robust study designs. The majority of studies only reported a short-term follow-up of intermediate outcome measures. Only two studies measured injury rates; both reported a reduction, but both studies also had considerable methodological weaknesses. The five studies that measured the use of protective equipment reported mixed results, although there is some evi-

dence that suggests that more extensive educational programs (such as health fairs and media campaigns) increase their use. The 20 studies that measured behaviour, attitude or knowledge outcomes reported highly mixed results. DISCUSSION: Methodological weaknesses of the included studies limit support for a particular course of action. To better inform policy and practice, future research should (1) use robust study designs and (2) not rely on short-term proxy outcome measures

Shah A, Blackhall K, Ker K, Patel D. Educational interventions for the prevention of eye injuries. [Review] [24 refs]. Cochrane Database of Systematic Reviews (4):CD006527, 2009
2009;(4):CD006527.

Abstract: BACKGROUND: Ocular injury is a preventable cause of blindness, yet it remains a significant disabling health problem that affects all age groups. Injuries may occur in the home, in the workplace, during recreational activities or as a result of road crashes. Types of injuries vary from closed globe (contusion or lamellar laceration) to an open globe injury, which includes penetration and even perforation of the globe. To date, the main strategy to prevent these injuries has been to educate people to identify high-risk situations and to take correct action to avoid danger. OBJECTIVES: To assess the evidence for the effectiveness of educational interventions for the prevention of eye injuries. SEARCH STRATEGY: We searched the Cochrane Injuries and the Cochrane Eyes & Vision Group Specialised Registers, CENTRAL (The Cochrane Library 2008, Issue 3), MEDLINE, EMBASE, Current Controlled Trials metaRegister (now includes National Research Register), AgeInfo, HMIC Health Management Information Consortium, WHOLIS (World Health Organization Library Information System), LILACS (Latin American and Caribbean Health Sciences), MEDCARIB (Caribbean Health Sciences Literature), ISI Web of Science: (Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI) Conference Proceedings Citation Index-Science (CPCI-S)), ERIC, ZETOC and SPORTdiscus. We also checked reference lists of relevant papers and contacted study authors in an effort to identify published, unpublished and ongoing trials. Searches were last updated in August 2008. SELECTION CRITERIA: We included any randomised controlled trials (RCTs) and controlled before-and-after studies which evaluated any educational intervention aimed at preventing eye injuries. DATA COLLECTION AND ANALYSIS: Four authors independently screened the electronic search results and data extracted. Three authors entered data into RevMan 5. As we judged there to be substantial heterogeneity between participants and interventions, we did not pool the studies' results, but have reviewed the results narratively. MAIN RESULTS: We included two RCTs and three controlled before-and-after studies in this review. One study reported eye injuries as an outcome and four studies reported change in behaviour or knowledge. AUTHORS' CONCLUSIONS: The included studies do not provide reliable evidence that educational interventions are effective in preventing eye injuries. There is a need for well-conducted RCTs with adequate allocation concealment and masking (blinding). Studies should have a longer follow-up time and more studies need to be conducted in low and middle-income countries. [References: 24]

Skegg K, Herbison P. Effect of restricting access to a suicide jumping site. Australian & New Zealand Journal of Psychiatry 2009;43(6):498-502.

Abstract: OBJECTIVE: The road to a headland that had become a suicide jumping hotspot was temporarily closed because of construction work. This created an opportunity to assess whether loss of vehicular access would lead to a reduction in suicides and emergency police callouts for threatened suicide at the site. METHOD: Deaths at the headland were ascertained for a 10 year period before road closure and for 2 years following closure using records from the local police inquest officer, the coroner's pathologist and Marine Search and Rescue. Police provided a list of police callouts for threatened suicide at the site for a 4 year period before closure and for 2 years following closure. Simple rates were compared and incident rate ratios were calculated where possible. RESULTS: There were 13 deaths at the headland involving suicide or open verdicts in the 10 years before access was restricted, and none in the 2 years following road closure. This

difference was statistically significant (incident rate difference = 1.3 deaths per year, 95% confidence interval (CI) = 0.6-2.0). No jumping suicides occurred elsewhere in the police district following the road closure. Police callouts for threatened suicide also fell significantly, from 19.3 per year in the 4 years prior to road closure to 9.5 per year for the following 2 years (incident rate ratio = 2.0, 95% CI = 1.2-3.5). CONCLUSIONS: Preventing vehicular access to a suicide jumping hotspot was an effective means of suicide prevention at the site. There was no evidence of substitution to other jumping sites

Spinks A, Turner C, Nixon J, McClure RJ. The 'WHO Safe Communities' model for the prevention of injury in whole populations. [Review] [39 refs]. Cochrane Database of Systematic Reviews (3):CD004445, 2009 2009;(3):CD004445.

Abstract: BACKGROUND: The World Health Organization (WHO) 'safe communities' approach to injury prevention has been embraced around the world as a model for co-ordinating community efforts to enhance safety and reduce injury. Approximately 150 communities throughout the world have formal 'Safe Communities' designation. It is of public health interest to determine to what degree the model is successful, and whether it reduces injury rates. This Cochrane Review is an update of a previous published version. OBJECTIVES: To determine the effectiveness of the WHO Safe Communities model to prevent injury in whole populations. SEARCH STRATEGY: Our search included CENTRAL, MEDLINE and EMBASE, PsycINFO, ISI Web of Science: Social Sciences Citation Index (SSCI) and ZETOC. We handsearched selected journals and contacted key people from each WHO Safe Community. The last search was December 2008. SELECTION CRITERIA: Two authors independently screened studies for inclusion. Included studies were those conducted within a WHO Safe Community that reported changes in population injury rates within the community compared to a control community. DATA COLLECTION AND ANALYSIS: Two authors independently extracted data. Meta-analysis was not appropriate due to the heterogeneity of the included studies. MAIN RESULTS: We included evaluations for 21 communities from five countries in two geographical regions in the world: Austria, Sweden and Norway, and Australia and New Zealand. Although positive results were reported for some communities, there was no consistent relationship between being a WHO designated Safe Community and subsequent changes in observed injury rates. AUTHORS' CONCLUSIONS: There is marked inconsistency in the results of the studies included in this systematic review. While the frequency of injury in some study communities did reduce following their designation as a WHO Safe Community, there remains insufficient evidence from which to draw definitive conclusions regarding the effectiveness of the model. The lack of consistency in results may be due to the heterogeneity of the approaches to implementing the model, varying efficacy of activities and strategies, varying intensity of implementation and methodological limitations in evaluations. While all communities included in the review fulfilled the WHO Safe Community criteria, these criteria were too general to prescribe a standardised programme of activity or evaluation methodology. Adequate documentation describing how various Safe Communities implemented the model was limited, making it unclear which factors affected success. Where a reduction in injury rates was not reported, lack of information makes it difficult to distinguish whether this was due to problems with the model or with the way in which it was implemented. [References: 39]

Thompson DC, Rivara F. Pool fencing for preventing drowning of children. Cochrane Database of Systematic Reviews 1998;(1):CD001047.

Abstract: BACKGROUND: In most industrialized countries, drowning ranks second or third behind motor vehicles and fires as a cause of unintentional injury deaths to children under the age of 15. Death rates from drowning are highest in children less than five years old. Pool fencing is a passive environmental intervention designed to reduce unintended access to swimming pools and thus prevent drowning in the preschool age group. Because of the magnitude of the problem and the potential effectiveness of fencing, we decided to evaluate the effect of pool fencing as a drowning prevention strategy for young children. OBJECTIVES: To determine if pool fencing

prevents drowning in children (under 14 years of age). **SEARCH METHODS:** We searched the Cochrane Injuries Group's Specialised Register, CENTRAL, MEDLINE, EMBASE, National Research Register, Zetoc and other specialist databases. We searched reference lists of relevant articles and contacted relevant organisations and experts. The searches were last updated in October 2006. **SELECTION CRITERIA:** In order to be selected, a study had to be designed to evaluate pool fencing in a defined population and provide relevant and interpretable data that objectively measured the risk of drowning or near-drowning or provided rates of these outcomes in fenced and unfenced pools. **DATA COLLECTION AND ANALYSIS:** Data were extracted by two authors using a standard abstract form. Odds ratios (OR) with 95% confidence intervals (CI), and incidence rates, were calculated for drowning and near-drowning. **MAIN RESULTS:** Three case-control studies met the selection criteria. The results of these studies indicate that pool fencing significantly reduces the risk of drowning. The OR for the risk of drowning or near drowning in a fenced pool compared to an unfenced pool is 0.27 (95% CI 0.16 to 0.47). Isolation fencing (enclosing pool only) is superior to perimeter fencing (enclosing property and pool); the OR for the risk of drowning in a pool with isolation fencing compared to a pool with three-sided fencing is 0.17 (95% CI 0.07 to 0.44). **AUTHORS' CONCLUSIONS:** Pool fences should have a dynamic and secure gate and should isolate the pool from the house (that is, four-sided fencing). Legislation should require isolation fencing with secure, self-latching gates for all pools, public, semi-public and private. Legislation should require fencing of both newly constructed and existing pools and include enforcement provisions, in order to be effective. **FENCING WHICH COMPLETELY ENCLOSES ALL SIDES OF A SWIMMING POOL AND ISOLATES IT FROM THE HOME IS EFFECTIVE IN PREVENTING DROWNING OF YOUNG CHILDREN:** In most industrialized countries, drowning is one of the top killers of children, especially young children. Medical care offers little to help drowning victims, and thus survival must rely on prevention of the drowning. The review found no trials of pool fencing. However evidence from other studies found that pool fencing that adequately prevents children reaching the pool unsupervised can prevent about three-quarters of all child drownings in pools. Fencing which completely encircles the pool and isolates it from the house is much more effective than methods where children can still gain access to the pool through the house

Turner C, Spinks A, McClure RJ, Nixon J. Community-based interventions for the prevention of burns and scalds in children. Cochrane Database of Systematic Reviews 2004;(2):CD004335.

Abstract: **BACKGROUND:** Burns and scalds are a significant cause of morbidity and mortality in children. Successful counter-measures to prevent burn and scald-related injury have been identified. However, evidence indicating the successful roll-out of these counter-measures into the wider community is lacking. Community-based interventions in the form of multi-strategy, multi-focused programmes are hypothesised to result in a reduction in population-wide injury rates. This review tests this hypothesis with regards to burn and scald injury in children. **OBJECTIVES:** To assess the effects of community-based interventions, defined as coordinated, multi-strategy initiatives, for reducing burns and scalds in children aged 14 years and under. **SEARCH METHODS:** We searched the Cochrane Injuries Group's specialised register, CENTRAL, MEDLINE, EMBASE, CINAHL, PsycINFO, National Research Register and the Web of Knowledge. We also handsearched selected journals and checked the reference lists of selected publications. The searches were last updated in May 2007. **SELECTION CRITERIA:** Included studies were those that reported changes in medically attended burn and scald-related injury rates in a paediatric population (aged 14 years and under), following the implementation of a controlled community-based intervention. **DATA COLLECTION AND ANALYSIS:** Two authors independently assess studies for eligibility and extracted data. Due to heterogeneity between the included studies, a pooled analysis was not appropriate. **MAIN RESULTS:** Of 39 identified studies, four met the criteria for inclusion. Two of the included studies reported a significant decrease in paediatric burn and scald injury in the intervention compared with the control communities. The failure of the other two studies to show a positive result may have been due to limited time-frame for the in-

intervention and/or failure to adequately implement the counter-measures in the communities. **AUTHORS' CONCLUSIONS:** There are a very limited number of research studies allowing conclusions to be drawn about the effectiveness of community-based injury prevention programmes to prevent burns and scalds in children. There is a pressing need to evaluate high-quality community-based intervention programmes based on efficacious counter-measures to reduce burns and scalds in children. It is important that a framework for considering the problem of burns and scalds in children from a prevention perspective be articulated, and that an evidence-based suite of interventions be combined to create programme guidelines suitable for implementation in communities throughout the world. **INSUFFICIENT EVIDENCE SO FAR TO SUPPORT THE COMMUNITY APPROACH TO BURNS AND SCALDS PREVENTION:** Multi-strategy, community-based interventions are widely promoted for reducing injury rates. The efficacy of this approach is difficult to assess and there have been few research studies of good quality. The current review sought to review studies evaluating the success of community-based programmes specifically intended to reduce burn and scald injury in children. Only four studies were identified that met the inclusion criteria and two of these found a reduction in rates of burns and scalding. More high-quality research studies are needed in this area, therefore, to support the continued use of the community approach

Wisse RP, Bijlsma WR, Stilma JS. Ocular firework trauma: a systematic review on incidence, severity, outcome and prevention. [Review]. *Br J Ophthalmol* 2010;94(12):1586-91.

Abstract: **AIM:** To provide a systematic review on ocular firework trauma with emphasis on incidence and patient demographics, the extent of ocular trauma and visual function loss, and firework regulation effects on injury rates. **METHODS:** A literature search was performed using predetermined inclusion and exclusion criteria. Demographic characteristics of ocular firework casualties were obtained and incidence rates of sustained trauma and vision loss calculated. **RESULTS:** Twenty-six relevant articles were suitable for calculation of trauma incidence and patient demographics, of which 17 articles could be used for calculating trauma severity and vision loss. Victims were male (77%), young (82%) and often bystander (47%). Most of the trauma was mild and temporary. Penetrating eye trauma, globe contusions and burns accounted for 18.2%, with a 3.9% enucleation rate. Mean visual acuity was >10/20 in 56.8%, with severe vision loss (<10/200) in 16.4%. Countries using restrictive firework legislation show 87% less eye trauma ($p < 0.005$). **CONCLUSIONS:** One in six ocular firework traumas show severe vision loss, mostly in young males. Bystanders are as frequently injured. Firework traumas are a preventable cause of severe ocular injury and blindness because countries using restrictive firework legislation have remarkable lower trauma incidence rates

Vedlegg 1

Søkestrategier

Database: Cochrane reviews - 2012-08-09

ID	Search	Hits
#1	MeSH descriptor Accidents explode all trees	4206
#2	MeSH descriptor Safety, this term only	2821
#3	MeSH descriptor Safety Management, this term only	159
#4	MeSH descriptor Risk Reduction Behavior, this term only	695
#5	MeSH descriptor Health Promotion, this term only	2831
#6	MeSH descriptor Preventive Health Services, this term only	413
#7	(#2 OR #3 OR #4 OR #5 OR #6)	6672
#8	(#1 AND #7)	3029
#9	MeSH descriptor Accident Prevention, this term only	118
#10	MeSH descriptor Wounds and Injuries explode all trees with qualifier: PC	2338
#11	MeSH descriptor Fires explode all trees with qualifier: PC	25
#12	MeSH descriptor Poisoning explode all trees with qualifier: PC	234
#13	((accident* or burn or burned or burns or burning or chok* or drown* or fall* or fire* or injur* or poison* or trauma*) NEAR/3 (prevent* or safe*))	4180
#14	(#8 OR #9 OR #10 OR #11 OR #12 OR #13), from 2007 to 2012	2579
#15	(#14)	364

Database(s): Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

#	Searches	Results
1	accidents/ or accidental falls/ or accidents, home/ or accidents, occupational/ or accidents, traffic/ or drowning/ or near drowning/	75347
2	safety/ or safety management/	46111
3	risk reduction behavior/	5698
4	Health Promotion/	46755
5	Preventive Health Services/	10010
6	or/2-5	105742
7	1 and 6	4884
8	Accident Prevention/	8089
9	exp "Wounds and Injuries"/pc [Prevention & Control]	42800
10	exp Fires/pc [Prevention & Control]	1739
11	exp Poisoning/pc [Prevention & Control]	12109
12	((accident* or burn or burned or burns or burning or chok* or drown* or fall* or fire* or injur* or poison* or trauma*) adj3 (prevent* or safe*)).tw.	24457
13	or/7-12	82685
14	limit 13 to yr="2007 -Current"	23633
15	(meta-analy* or metaanaly*).mp. or (Medline or PubMed or search* or (systematic adj2 (review or overview))).tw.	260257
16	14 and 15	1004

Database: PubMed (Ahead of print) – 2012-08-10

Search	Query	Items found
#5	Search (#3) AND #4 Filters: Publication date from 2007/01/01 to 2012/12/31	18
#4	Search publisher[sb] Filters: Publication date from 2007/01/01 to 2012/12/31	188642
#3	Search (#1) AND #2 Filters: Publication date from 2007/01/01 to 2012/12/31	2059
#2	Search meta-analy* OR metaanaly* OR Medline OR PubMed OR search* OR systematic review OR systematic overview Filters: Publication date from 2007/01/01 to 2012/12/31	510808
#1	Search (accident* prevent* OR prevent* accident* OR burn* prevent* OR prevent* burn* OR prevent* chok* OR chok* prevent* OR prevent* drown* OR drown* prevent* OR prevent fall* OR fall* prevent* OR prevent* fire* OR fire* prevent* OR prevent* injur* OR injur* prevent* OR prevent* poison* OR poison* prevent* OR prevent* trauma* OR trauma* prevent*) Filters: Publication date from 2007/01/01 to 2012/12/31	10041

Database: CRD – 2012-8-10

1	((accident* or burn or burned or burns or burning or chok* or drown* or fall* or fire* or injur* or poison* or trauma*) NEAR3 (prevent* or safe*))	416
2	* IN DARE, HTA FROM 2007 TO 2012	21258
3	#1 AND #2	147