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Preventing falls in elderly people

We need to target interventions at people most likely to benefit from them

Papers p 676 and *Primary care* p 680

In 1960 Sheldon described the literature on falling as "meagre."[w1] Now so much has been published on the topic that it is difficult to make sense of the evidence and identify clear messages for policy and practice. We know that more than 30% of people aged 65 or older living in the community fall each year, many fall more than once, and the risk of falling increases with age.[1 2] Although only 3-10% of these falls result in serious injury, they have serious implications for healthcare resources. What do we know about how to prevent falls?

Over 60 randomised controlled trials of interventions to prevent falling have now been published. This issue contains a systematic review of interventions for the prevention of falling (p 680).[3] Chang et al searched up to 2002 and include 40 trials; a further six trials were identified after they had completed their analysis. A Cochrane review, updated in July 2003 (for which the author is a reviewer), contains 62 trials.[4] These two reviews reach broadly similar conclusions but differ in detail. As well as covering a different time period, the inclusion criteria and statistical methods used by Chang et al differ from those used in the Cochrane review, which could account for some of the variation in results.

Both reviews agree that multifactorial risk assessment and management programmes are effective, although it is not possible to say which components of the multifactorial interventions are the most effective, according to Chang et al. They also conclude that exercise programmes overall are effective. The Cochrane review, on the other hand, splits exercise programmes into individually targeted interventions and group interventions. It concludes that individualised, home based programmes of muscle strengthening, balance retraining, and walking, which target people at higher risk, are effective.[5 6 w2] However, community based group exercise interventions have not been shown to reduce the number of persons falling,[3] although they may of course produce other health and social benefits.

Chang et al report that environmental modification does not result in an appreciable reduction in the risk of falling. However, the Cochrane review contains additional evidence that shows that home assessment may be effective for people with a history of falls in the previous year, but this needs more research. Both reviews conclude that education alone is not beneficial.

The Cochrane review also examined interventions for targeting single risk factors. For example, the gradual withdrawal of psychotropic medication seemed effective.[6] However, many participants who had successfully reduced their consumption of psychotropic drugs in the trial returned later to prior medication patterns. This remains a challenge.

The review by Chang et al contains only one trial evaluating interventions to reduce falls in hospital,[w3] whereas the Cochrane review contains four small randomised controlled trials set in hospital rehabilitation or geriatric assessment wards. Evidence that these interventions were effective is lacking. Haines et al, in this issue, report on an intensive multicomponent trial in a subacute hospital setting that achieved a 30% reduction in falls (p 676).[7] This will add to that body of knowledge, but further good quality research is needed in other hospital settings.[8]

Overall, it has been possible to achieve only modest reductions, usually less than 35% in the number of people falling and in the number of falls, even in the somewhat artificial settings of randomised controlled trials. On the basis of these data, service providers should set conservative and achievable targets. As many of the possible interventions are labour intensive and expensive, we need to target effective interventions at people who are most likely to benefit.

Targeting effective interventions at people at higher risk so as to maximise the impact on the number of falls makes sense. Tinetti has proposed an algorithm based on evidence from randomised controlled trials and the epidemiological literature.[9] She recommends that people of 75 years or older, or over 70 if they are known to be at increased risk of falling, should be asked about falls and balance or gait difficulties, and observed getting into and out of a chair and walking. People with a history of two or more falls, or balance or gait difficulties, should be assessed for predisposing and precipitating factors, followed by interventions suggested by the results of that assessment. People without balance or gait related difficulties and a history of no more than one fall should be encouraged to participate in an exercise programme that includes balance and strength training. Oliver et al suggest a similar approach in hospital settings.[10]

The impact of falling on the quality of people's lives should not be forgotten in the current focus on risk management. Healthcare activities ought also to address psychological issues such as fear of falling and self imposed restriction of activity.[11 w4 w5] Healthcare professionals and carers should avoid placing unnecessary restrictions on older peoples' activity, whether imposed consciously or unconsciously.[12] We should reflect on the

Additional references w1-w5 are on bmj.com

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potential dangers associated with a risk management culture, and continue to encourage measures to promote autonomy and independence in older people.[12]

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Extending CONSORT to include cluster trials

Welcome extension will help to understand trials better and reduce bias

Papers p 702

Anyone who has tried to appraise a randomised controlled trial critically will be aware of the frustration that arises when a key piece of information is missing. To understand the results of a randomised controlled trial a reader must understand its design, conduct, analysis, and interpretation. That goal can be achieved only through complete transparency from authors. The original and revised CONSORT (consolidated standards of reporting trials) statements were designed to help authors improve reporting by using a checklist and flow diagram and have been well cited.[1] These have now been extended to include cluster trials (p 702).[2] Cluster trials randomise interventions to groups of patients rather than to individual patients and have their own problems. Using the extended CONSORT statement should help reduce bias and help readers to understand a cluster trial's conduct and to assess the validity of its results.

A website provided by the Medical Research Council gives guidelines for the design and analysis of cluster trials.[3] These trials are particularly useful in general practice where the cluster is the general practitioner or the practice.[4] For example, in the Diabetes Care from Diagnosis Trial, general practitioners were randomised to be trained in patient centred care or not.[5] All patients under the care of one general practitioner receive the same treatment and so cannot be considered to be independent items. One of the main reasons for conducting cluster trials is fear of contamination, whereby patients used as controls are exposed to the intervention. For example, it would be difficult for a general practitioner to switch from a patient centred approach to a more paternalistic approach between successive patients. Patients in one practice may discuss what their general practitioner has given them, and patients used as controls may demand the same treatment as those given the intervention.

The main problem associated with their design, conduct, analysis, and interpretation, compared with individually randomised trials, is that two different units of measurement—the cluster and the patient—are used. Each needs to be reported carefully. The key statistic is the intracluster correlation coefficient, which is the ratio of the between cluster variation of the outcome variable to the total variation. The startling fact is that even with apparently low values of the intracluster correlation coefficient, such as 0.05 (which is commonly found in general practice trials), when there are reasonable numbers of patients in each cluster (say 20), then the usual methods of analysis, which fail to take into account clustering, can seriously underestimate the standard error of treatment effects and so provide spuriously narrow confidence intervals. Compared with individually randomised trials cluster trials therefore are inefficient in terms of power for a given effect size and sample size. Other problems are that randomisation has to occur at the start of the trial, and blinding these trials is more difficult, thus increasing the potential for recruitment biases. Cluster leaders have to consent to the trial on behalf of the potential cluster members, which raises ethical issues. Several surveys have highlighted problems in all these areas in the past, although there is evidence that more recent trials are better reported, perhaps because of recent efforts by medical statisticians to make the research community aware of the difficulties of cluster randomised trials.[6 7]

The extension to cluster trials is timely since the number of trials reporting a cluster design has risen exponentially since 1997. That the revised statement should appear in the *BMJ* is fitting, since a recent review of cluster trials published since 1997 in the *Lancet*, *New England Journal of Medicine*, and the *BMJ*, showed that 24 of the 36 trials found had appeared in the *BMJ*.[7]

The checklist items relate to the content of the title, abstract, introduction, methods, results, and discussion. Similar to the statement for individually randomised trials the checklist includes 22 items, chosen to reflect

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