Can martial arts falling techniques prevent injuries?

Although falling techniques are taught to martial artists, athletes and paratroopers, a BMJ search of Highwire listed journals has discovered no mention of “falling correctly”, “safe falling”, etc. “Reducing the force of impact of a fall on people’s bones” is discussed. But the literature mentions no impact reduction techniques except for hip protectors. Exercise and muscle power in old age are recognized as helping regain balance after tripping, but not all falls are preventable. So perhaps safe falling should also be explored.

One finds discussion of types of fall, with no discussion of those who were trained in falling. Studies of reactions to slipping do not distinguish athletes and martial artists from other healthy subjects. Tai Chi is mentioned as appropriate exercise for the prevention of falls, but unlike the Japanese arts, Tai Chi does not teach falling.

Although correct falling is neglected in the medical literature, there is much semi-scientific literature by martial arts masters. An internet search for “falling” yields useful information. The ease with which martial artists take even very hard falls suggests the hypothesis that falling practice while relatively young can prevent injury from falls incurred later in life.

A Japanese study of 11 deaths and serious injuries in aikido from 1972–75, listed eight due to falling. Most of the victims were relative beginners, suggesting that those who practice over long periods are more protected. The study population is too small to warrant definitive conclusions, nor is it known how many such injuries may have gone unreported. The author admits that: “some universities were not particularly cooperative in supplying data. New students who had suffered injury or death had been submitted to excruciating training with many repetitive falls, suggesting that the injury protection benefits of martial arts skills must be balanced against risks accompanying the process of acquiring the skills. And literature searches reveal no biomechanical evidence that martial arts falls result in fewer peak forces on the body than do everyday falls. Martial arts tend to have rather specialized falling techniques. Aikido falls may not protect you in cases where judo falls will be effective. There seem to be no studies of the angles of falls most likely encountered in daily life, and what techniques would be generally most preventative. Martial arts practice can be so strenuous that it is unlikely that large numbers will take it up. There may be an upper limit to the age at which one can start practice, although anecdotally it is not unknown to begin in one’s late 50s, and at least one Japanese businessman started aikido at 70 and reached the black belt.

It is not known whether the teachers involved in the tragedies cited above had training in health sciences or injury prevention. Many martial arts teachers take extreme care for the safety of trainees, and some are health professionals. There is plenty of anecdotal evidence of martial artists coming out safely from quite dangerous falls. So although martial arts falling techniques may not be a solution for the general population, they may be so for a minority. It remains to be seen whether safe and enjoyable methods might be developed to teach selected falling techniques to the general population.

Acknowledgement

I thank K. Katz of Budo Ninjutsu for much helpful advice.

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References

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New trends in suicide in Japan

Suicide is the 10th leading cause of mortality in the world. It is just as common as road traffic deaths and a leading cause of death among the young. 2002 was the fifth consecutive year where there were more than 30,000 suicide deaths. The rate in Japan, 25 per 100 000, greatly exceeds that of the UK (7.4 per 100 000) and that of the US or Germany, 12 and 15.8, respectively. In 2002, 32 143 suicides were reported; this is an increase of 3.5% from 2001.

In Japan suicide victims are mostly young adults. Among those 15–24 and 40–54 it is the second leading cause of death and in 25–39 year age group it is the leading cause of death. The rate in the middle aged men (40–54 years) was five times higher than in women, perhaps because of the association between suicide, unemployment, and economic recession.

The suicide rate per 100 000 population in Japan increased from 1995 to 2000: 17.2 in 1995, 23.4 in 1996, 25.0 in 1999, and 24.1 in 2000 (source: Vital Statistics 2000). Suicide is a public health problem that requires an evidence based approach to prevention. The stigma associated with suicide and mental illness prompts the view that these are shameful or sinful conditions. This is also a barrier to treatment for persons with suicidal desires or who have attempted suicide in the past. Many suicides are preventable but as with other injuries, effective suicide prevention programs require commitment and resources.

Acknowledgement

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References


Further reflections on the seatbelt use and effectiveness issue

In a recent letter, Cummings and RivaR’s mistake my point regarding changes in estimated belt effectiveness in the mid-1980s using the comparison of front seat occupant pairs. They cite my statement, “What is not explained by the theory [about misclassification of seatbelt use by police] is the sudden gap in police reported use by the dead and survivors that appeared in the mid-1980s” as faulting them for not explaining why prevalence of seatbelt use changed from 1975 to 1998. How could anyone who uses the English language with a modicum of proficiency interpret “sudden” as 23 years and “gap in police reported use by the dead and survivors” as general prevalence of belt use?

Actually, a cursory look at the graph in Cummings paper that I critiqued indicates that the major reduction in risk ratios is apparently to on-road observations of belt use laws being debated and initially enacted in a few states. I noted that this debate could have changed police behavior in belt use classification in crashes, a point they ignored. I also pointed out that reductions in deaths related to on-road observations of belt use...
prevalence controlling for other factors do not support their claim of 65%–70% belt effectiveness when used, a point they ignored. Understanding the distinction between what they call differential and non-differential misclassification. In a 1976 paper, I indicated how a small systematic error by police in assessing belt use in crashes would result in large error in estimating belt effectiveness, a paper which Cummings dismissed as expressing “concern”. Cummings claims that his commentary on the quality of NASS investigators’ reports and police reports of belt use support the non-differential classification theory but that assumes that the NASS investigators possess the gold standard for assessing belt use. One of the major criteria for acceptance of research findings is plausibility. The risk ratios derived from post-1984 FARS and NASS data are not plausible given changes in belt use and death rates controlling for other factors. So what is the big deal if seatbelts are standard equipment and reduce injury? Excessive claims of belt effectiveness lead to overemphasis on increasing belt use to the neglect of other needed policies. Belt use in the US is near 70% and yet about 32,000 occupants of passenger cars, sport utility vehicles, and light trucks are dying each year in collisions. In recent US Congressional hearings on safety belt use, for example, spokespersons for the auto industry claimed that belt use is low in fatal sport utility vehicle rollovers, based on erroneous police reports in FARS, as if low belt use absolved the industry of making stable vehicles. If belt use were only 100%, many people would nevertheless die and be maimed in rollovers of vehicles that are unnecessarily unstable. Assessing belt use after the fact of a rollover is particularly problematic because crash forces in the body area where the belt touches the person are less severe in a laterally rotating vehicle than in more direct impacts with other vehicles and objects, so that belt marks on the torso may be less evident and damage to the belts is less likely. People die more from head injury when the roof crushes in, or they impact surfaces external to the vehicle if they are ejected. Police officers, and apparently NASS investigators too often assume that an ejected occupant was unbelted when, in fact, rotation of the vehicle results in occupant slippage out of belts in some cases, and belts becoming unlatched due to impact on the latches in others. In both rollovers and non-rollovers, crash investigators may assume non-use of belts simply because the occupant died. In a second letter, Koepsell et al also misrepresent what I wrote about these ill-considered use of imputation of missing values. They quote my statement, “. . . missing data on velocity changes in crashes were imputed partly from injury severity scores, again a cause imputed from an effect and then used as a control in the study, a true scientific ‘no-no’”. They construe that statement as saying that “Robertson argues that measures of crash outcome should not be imputed to impute values on a covariate which will later enter the main analysis as a predictor of crash outcome”. In fact, I would not publish a study if I had to rely on imputed data. In my opinion, such a study should not have been done or published, given that more than 40% of cases in NASS have missing values of delta-V and the seatbelt use assessment computer algorithm is supposed to diagnose serious injuries noted previously if someone imputed values on a variable in more than 40% of the cases of an evaluation of efficacy and safety of a drug, the study would not likely be published or taken seriously if it was. Why should any less be acceptable in the study of injury control measures?

As a previous reviewer of the substantial proportion of the research produced at the University of Washington’s Injury Prevention and Research Center by several of these same authors, it pains me to see them produce foolish papers and attempt to discredit a critic by distorting the criticism.

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Precautionary principle

I had a hard time digesting the preemptive strike doctrine of the Bush Administration until I read your editorial on the precautionary principle in a recent issue of Injury Prevention.1 Your piece helped me regain my sanity in the seemingly insane world. When it comes to the precautionary principle, we in the injury prevention field lag behind not only those in environmental health but also those in politics. Isn’t the war in Iraq an application of the precautionary principle? You did an admirable job in arguing against the time-honored notion of science preceding policy. The precautionary principle, if expanded to law, would give the benefit of doubt to the accuser instead of the accused. Thank you for penning such a thought provoking commentary!

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Accidental Injury: Biomechanics and Prevention. 2nd Ed.


Accidental Injury: Biomechanics and Prevention attempts to address the communication gap between engineering researchers studying the applied biomechanics of injury and medical personnel who diagnose and treat traumatic injury. This reference book is a compendium of chapters that review the state-of-the-art in applied biomechanics research and has been revised, updated, and expanded from its first edition in 1993. There is a chapter each on particular body regions as well as chapters on related topics such as “Anthropomorphic test devices” (chapter 4), “Instrumentation in experimental design” (chapter 2), and “Occupant restraint systems” (chapter 8). New chapters include “Injury risk assessment based on dummy responses” (chapter 5), “Airbag inflation-induced injury biomechanics” (chapter 9), and “Pediatric biomechanics” (chapter 21).

The two editors, Alan Nahum, MD and John Melvin, PhD are recognized leaders in trauma medicine and injury biomechanics. In this volume they have brought together many of the seminal researchers in the fields of biomechanics and human traumatic injury research. The author of each chapter is an internationally recognized expert in the field who builds on his/her direct experience with these topics to provide an exhaustive review. The target audience for this book includes physicians, attorneys, biomedical researchers, and mechanical, biomedical, and automotive engineers. Injury prevention professionals with limited engineering background may find the technical and theoretical aspects of the injury mechanisms contained in many of the chapters too detailed and complex and may find the language not accessible. Most of the chapters have little or no discussion of clinical, epidemiologic, or practical injury prevention applications of the research findings.

A few chapters deserve special mention for their relevance to this audience. “Occupant restraints systems” (chapter 8) provides a very readable discussion of the principles of physics that govern the performance of seatbelts and airbags and identifies many upcoming technological developments likely to be unstable. “Child passenger protection” by Kathleen Weber (chapter 21) quickly reviews some of the concepts discussed in more detail in chapter 8 and thoroughly describes how the principles apply to children. There is a valuable collection of line drawings clearly illustrating the different types of child restraint systems.

The value of this book for the above stated audiences is that it can provide direction in understanding decades of biomechanics research by identifying key references for each topic. It is for this reason that Akers’ book should be considered a crucial reference book for anyone involved in biomechanical research of traumatic injury. Many of these references are in engineering conference proceedings that would not appear in any traditional Medline literature search. Although not stated in the book, many of the references can be obtained through the Society of Automotive Engineers publications library at www.sae.org. For physicians who have relied on medical journals to remain current on this type of research, this book will open the gate-way to an extremely rich and robust parallel body of literature of which they may have previously been unaware. Due to the technical nature of many of the topics, the book may encourage joint study of a topic by both medical personnel and engineering researchers thereby enhancing their research.

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BOOK REVIEWS
Looking Beneath the Surface of Agricultural Safety and Health.


Agriculture is a very dangerous occupation and a complex industry. Health and safety initiatives must account for a wide spectrum of variables such as economic conditions; technology; minimal regulatory controls; the range in workers ages; and many issues influenced by culture, ethnicity, and tradition. Despite a significant increase in federal funding for agricultural health and safety since 1990, when compared with other occupations, the expected reduction in injuries has not occurred. Agricultural health and safety specialists are often perplexed and frustrated with the minimal impact of their efforts.

Dennis Murphy is a national authority on agricultural health and safety, with three decades’ experience in the field. This 100 page book is the result of a recent sabbatical at the National Institute for Occupational Safety and Health (NIOSH) which he used to trace the roots of the agricultural health and safety movement. He analyzes major influences on safety initiatives, and to suggest strategies for the future.

There are seven chapters, each having a broad introduction and a clearly stated summary. Amendment tables, figures and appendices highlight major points, and references are clearly and accurately cited. In the first three chapters the author argues that agricultural health and safety have been “compensation driven” rather than “evidence” or “theory driven” and provides the background for understanding both the opportunities and barriers created by the multidisciplinary nature of agricultural health and safety. Major programs, including the NIOSH-led National Initiative, are then described.

Chapter 4 provides an excellent overview of major challenges to agricultural safety and health. The author describes what he calls the “face safety paradox,” the incongruence between farm people’s safety knowledge, values, and practices. This paradox appears throughout the book, with suggestions on measures to understand and address it.

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There is analysis of why agricultural injury surveillance methods are plagued with problems and why, despite noble efforts to collect national level data, the true picture of agricultural injuries (especially non-fatal) eludes us. Chapters 5 and 6 address the strengths and weaknesses of applying behavioral and/or adult learning theories to agricultural safety and health interventions. The author implies that federal funds should be limited for injury surveillance as well as cognitive research to uncover reasons for behavior (except where policy and children are involved); arguing for greater emphasis on partnerships with agribusinesses and adoption of industry behavior based safety programs that integrate workers in problem identification and safety solutions. The last chapter summarizes the author’s review in a “spirit of constructive reflection”, providing nine suggestions and recommendations for action.

The review and analysis, with the author’s reflections and recommendations, are important because they represent the most analytic review of the agricultural health and safety movement since its inception in the early 1900s, and more importantly, since federal initiatives were undertaken in 1989. Given the author’s reputation in this area, his views on past successes and failures, and suggestions for the future, are likely to be read carefully by leaders in both the public and private sector.

While the book is a major contribution to the field, it has limitations, some of which the author points out. The author was immersed within NIOSH while conducting this research, so that the valuable experiences of other federal agencies (for example, US Department of Agriculture), other developed countries (for example, Sweden, Australia) with lower agricultural injury rates, and private sector endeavors (for example, tractor manufacturers’ ROPS rebates) are not sufficiently reflected in this “look beneath the surface.”

The past and potential impact of engineering and policy strategies are almost totally neglected. Further, the author’s review and recommendations primarily address traditional, modest sized family farms, without explaining why we should focus on their health and safety issues, knowing that they differ from the rapidly expanding industrialized production sites.

Dr Murphy’s 1992 text, Safety and Health for Production Agriculture is a primer for those new to agricultural health and safety; professionals currently working in agricultural health and safety should definitely read Looking Beneath the Surface. It helps us appreciate our roots, and to understand our comprehension as well as our frustrations as we strive to protect the adults and children who produce our food and fiber. This book challenges us to read the single national agenda and reshape the direction of major initiatives, including the NIOSH Ag Centers. Ideally, this book will stimulate discussions that lead to consensus and, ultimately, action among injury preventionists who deal with agricultural populations.

The Tipping Point: How Little Things Can Make a Difference.


The Tipping Point, first published as articles in the New Yorker and then in book form in 2000, offers a fascinating look at a concept well known to public health professionals—the epidemic. The book takes the concept a step further to examine social epidemics. In the age of AIDS and SARS, Malcolm Gladwell offers insights that might be of use in examining new epidemics, as we observe the social and health impact of epidemics on individuals, institutions, and economies. The book is never less than engaging and erudite, if occasionally a bit redundant.

Gladwell, a freelance journalist, has a gift for explaining the complex in clear, entertaining language. To illustrate his message he uses examples such as children’s shoes, shoes, direct mail marketing, and Paul Revere’s ride. With engaging wit and a nuanced perspective he analyzes exactly how and why the contagion caught and each issue became an epidemic. Public health professionals might take particular note of his views on the “epidemic” of smoking among teens and young adults.

The moment when epidemics change and reach their critical mass is called “the tipping point”, a point borrowed from epidemiology. Gladwell recognised that tipping points might happen anywhere and began to look for examples. “The best way to understand the dramatic transformation...or any number of mysterious forces that mark everyday life”, he writes “is to think of them as epidemics. Ideas and products and messages and behaviours spread just like viruses do.”

Though the book regularly refers to epidemics in the well known context, its message primarily relates to starting epidemics, not stopping them. Gladwell wants people to start “positive” epidemics of their own. He feels that the concept could work for those trying to create a change with limited resources, citing examples such as a breast cancer activist who wanted to spread knowledge and awareness of breast cancer and diabetes in a particular community, accomplishing this by presenting a kind of blueprint for the rise of any social epidemic.

Comprehending the tipping point and its role in social epidemics involves understanding three “rules”: the law of the few, the stickiness factor, and the power of context. Gladwell contends that creating an epidemic requires a few people, a complicated mechanism for those people to deliver the message. The “stickiness factor” or the change in the message that makes it more contagious or memorable can create a very powerful. Even small changes can make a difference in how a message sticks with us. Finally, the tipping point can occur in context or within the environment in which the message must thrive and spread. If the context in which a message is delivered isn’t working or tipping, change it to suit the potential contagion more effectively.

The message Gladwell imparts is essentially a positive one—in a confusing and often counterintuitive world, “tipping points are a reaffirmation of the potential for change and the power of intelligent action”. This is an idea in which all of us can take comfort.

Getting Research Findings into Practice. 2nd Ed.


This book is a response to the ongoing interest in the uptake of research findings. The editors have covered a broad spectrum of the issues related to translating research findings into clinical practice. The list of authors and contributors from around the world is both comprehensive and impressive.

The book starts out with basic information chapters that cover such topics as establishing criteria for the implementation of research evidence, sources of information on clinical effectiveness, and dissemination methods. Included in the information chapters is an overview of systematic reviews related to the implementation of research findings by healthcare personnel. For example, the authors provide summaries of the results of 41 systematic reviews, including almost 1500 studies.

Subsequent chapters related to implementing research findings into practice give several
examples from clinical practice (mainly from obstetrics), and discuss the challenges of implementation, how to use research results in the translation into practice, and an overview of the barriers and bridges to evidence based clinical practice. One chapter addresses the unique challenges of implementing research findings in developing countries.

There are some practical guidelines and tools. The two chapters on decision support and decision analysis, for example, provide both theoretical and practical information about how to conduct and apply decision analysis. The concept of opportunity costs and new options for encouraging implementation of results from economic evaluations are also addressed.

The chapter on evidence based policy making is the one most likely to be relevant to injury prevention researchers. It is also the only chapter to mention injury prevention strategies. The authors mention legislation as one policy that may arise from strong evidence. The author of this chapter, however, does not appear to support legislation as an element of policy. “Typically, therefore, legislation requires much stronger evidence before it can be introduced, particularly when paternalistic legislation designed to protect one group may harm others”. Citing the introduction of seatbelt legislation as one example of legislation, the author of this chapter points out that seatbelt legislation was not enacted until the evidence for the effectiveness of seatbelts was strong. No further mention of injury prevention initiatives ensues, in fact much of the rest of the policy chapter focuses on screening programs as policies.

While well written and essential reading for those in clinical practice, the book is of limited use to most injury prevention researchers. The examples are primarily related to how to get clinicians (mostly doctors) to change their practice to reflect current evidence. Although some of the tools and concepts (such as decision analysis) are broadly applicable, those who are searching for the best way to translate injury prevention research into evidence based practice will be disappointed. For multifaceted problems such as those typically encountered in injury prevention, both the evidence and the translation into practice are notably absent here.

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CORRECTION

We regret that due to an oversight the acknowledgements were omitted from the paper by Sorenson and Vettes published in the June issue (Sorenson SB, Vittes KA. Buying a handgun for someone else: firearm dealer willingness to sell. Inj Prev 2003;9:147–50). The acknowledgements are as follows:

The authors would like to thank Jeff Sinek of the Los Angeles office of Thelen, Reid and Priest LLP and Eric Gorovitz of the Coalition to Stop Gun Violence for their legal research, Eugene Volokh and Mark Chekal for their comments on previous drafts, and Anthony DiStefano for his help with data collection.

CalendA\r

19th International Traffic Medicine Conference 2003, Budapest, Hungary

Canadian Injury Prevention Conference 2003, Ottawa
23–25 November 2003. The meeting will build on the national conference held in 2000 and will focus on unintentional injury, violence, and suicide prevention. Organised jointly by Smartirisk, Safe Kids Canada and the Safe Communities Foundation, it aims to highlight the latest science and best practices in policy and programs; bridge the gap between research and practice by highlighting specific policy and practice recommendations stemming from Canadian research and targeted research needs identified through community practice; encourage networking and collaboration between different sectors to promote action and policy change; facilitate participation from stakeholders representing vulnerable populations; build momentum for sustained action from stakeholders at the municipal, regional, provincial and national levels; and further the activities of the Canadian Injury Research Network and the Canadian Institutes for Health Research in building capacity in injury research and knowledge translation fields. Details: www.safekidsCanada.com/CIPC/default.html


7th World Conference on Injury Prevention and Safety Promotion, Vienna
6–9 June 2004. The major objectives of the conference are strengthening violence and injury prevention as an aspect of national public health policy and programs; producing synergy of the combined efforts of various violence and injury prevention disciplines; exchanging the most recent experiences in research and practice; and facilitating participation of experts from low-income countries. Details: www.safety2004.info.

LACUNAE

Measured responses to improve safety

Even in serious matters there can be something to laugh at. Privacy International has sifted through 5000 nominations from 35 countries to find awardees for stupid mechanisms for increasing security. The Delta Terminal at JFK Airport in New York won an award for flagrant intrusion by forcing a woman to drink three bottles of her own breast milk for fear the bottles contained explosives or chemicals. London’s Heathrow Airport won an award for quarantining a quantity of “Gunpowder” green tea—the tea was released but the labels were confiscated and destroyed. Australians will be proud that the national $15 million (US$ 9m) campaign to educate Australians about terrorism won the Most Egregiously Stupid Award. The kit, including a fridge magnet, urged them to report anything suspicious while asking them to be “alert but not alarmed” (from the Sydney Morning Herald, April 2003; submitted by Ian Scott).