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 ukemi reveals 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 causes of death. Most of the victims were relatively beginners, suggesting that those who practice over long periods are more protected. The literature mentions no ‘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.

Acknowledgement
I thank Dr. Kato of Budo Ninjutsu for much helpful advice.

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References

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 death 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 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.

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References
prevalence controlling for other factors do not
support their claim of 65% to 70% belt effective-
ness when used, a point they ignored.

I understand the distinction between what
they call differential and non-differential
miscalculation. 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 express-
ing "concern". Cummings claims that his
computer analysis 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
crash rates and controlling for other factors.

So what is the big deal if seatbelts are
standard equipment and reduce injury? Ex-
cessive 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 seatbelt and airbag policies, for
example, spokespersons for the auto industry
claimed that seat 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
100%, many people would nevertheless die
and be maimed in rollovers of vehicles that are
unacceptably 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 belt is less likely. People die
more from head injury when the roof crushes in,
or it impacts surfaces external to the vehicle
if they are ejected. Police officers, and
apparently NASS investigators, too often
assume that an ejected occupant was un-
belted 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 investiga-
tors may assume non-use of belts simply
because the occupant died.

In a second letter, Koepsell et al also
misrepresent what I wrote about their 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 "Roberts argues that measures of crash
outcome should not be used 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
we should not have non-occupant or 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
developmental design" (chapter 2), and “Occu-
pant restraint systems” (chapter 8). New
chapters include "Injury risk: Based on
dummy responses" (chapter 5), "Airbag-injury-induced injury biomechan-
ics" (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 bio-
mechanics and human traumatic injury re-
search. The author of each chapter is an inter-
nationally 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 there are 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 that is useful for synop-
sis 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 perfor-
ance of seatbelts and airbags and identifies
many upcoming technological developments
highly 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 these
principles apply to children. There is a
valuable collection of line drawings clearly
illustrating the different types of child re-
straint systems.

The value of this book for the above stated
audiences is that it can provide direction in
understanding decades of biomechanics re-
search by identifying key references for each
topic. It is for this reason that Academic
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 Auto
motive 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 medi-
cal personnel and engineering researchers
thereby enhancing their researches.
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 worker 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 that the expected reduction in injuries has not occurred.

Dennis Murphy is a national authority on agricultural health and safety, with three decades' experience in the field. This 100 page book, written as a 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, 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. Ample tables, figures and appendices highlight major points, and references are clearly and accurately cited. In the first three chapters the author argues that agricultural safety and health has been "compassion 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 Agricultural Health and Safety 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 "false safety paradox," the incongruence between farm people's safety knowledge, values, and practices. This paradox appears throughout the book, with suggestions on multiple ways to understand and address it through evaluative research during progressive stages of program development and implementation. There is an 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 sectors.

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 manufacturer's 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—a primer for those new to agricultural health and safety; profession- als currently working in agricultural health and safety and who should definitely read Looking Beneath the Surface. It is a book we can all appreciate our roots, and to understand our compassion as well as our frustrations as we strive to protect the adults and children who produce our food and fiber. The author challenges us to move to 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 former science writer, 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. With engaging wit and a nuanced perspective he analyses 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 changes...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 who accomplishes 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 is much easier than creating a trend and it requires a few 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.

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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 Vittes published in the June issue (Sorenson SB, Vittes JKA. Buying a handgun for someone else: firearm dealer willingness to sell. Inj Prev 2003;9:147–50). The acknowledgements are as follows:

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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).