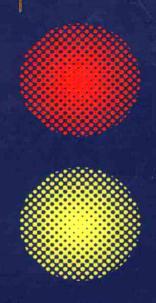


现代交通医学

MODERN TRAFFIC MEDICINE

王正国 主编



THE REAL PROPERTY.

现代交通医学

MINERAL PROPERTY.

KARA KAK

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现代交通医学

MEDICINE

ODERN TRAFFIC

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主编(王正国院士)简介

王正国,男,1935年12月生于安徽合肥市。中国工程院院士,著名战创伤专家,我国冲击伤、创伤弹道学、交通医学研究的主要创始人之一,国家重点学科"野战外科学"学术带头人和第一位博士生导师。致力于战创伤基础理论和应用基础研究50余年,主持完成"973"项目在内的多项国家和军队重大科研项目,取得一批国际先进以至领先的重要科研成果,获国家科技进步一等奖1项、二等奖4项、三等奖4项、国家发明三等奖1项,军队及重庆市科技奖励数十项。以第一作者发表论文260余篇,主编专著30部;培养博士50余名,博士后12名。获何梁何利基金医学科学技术奖,狄贝克国际军医奖,陈嘉庚医学科学奖,国际交通医学重大成就奖,光华工程科技奖,重庆市科技突出贡献奖,吴阶平医学奖。现任国际交通医学学会候任主席,国家道路交通管理工程技术研究中心道路交通事故预防学术委员会名誉主任,中国人民解放军交通医学研究所名誉所长,《中华创伤杂志》(中、英文版)总编辑。先后被前南斯拉夫军事医学科学院,清华大学,北京大学,第二、第四军医大学,四川大学华西医学中心等聘为客座教授或高级学术顾问。



周继红简介

周继红,男,1964年8月出生于四川省西昌市。医学博士,教授,第三军医大学大坪医院野战外科研究所研究员,中国人民解放军交通医学研究所所长。主要从事创(战)伤外科学和交通医学研究。主要研究方向包括创(战)伤和交通伤数据库与流行病学、创(战)伤机制与早期急救治疗、创伤救治质量与评估研究等。担任中华医学会创伤学分会常务副主任委员、中华预防医学会伤害预防与控制分会副主任委员、中华医学会创伤学分会交通伤与创伤数据库学组组长、中国医院协会医疗技术应用专业委员会委员等学术任职。先后参加2项"973"项目、1项"973前期"项目、1项"863"项目、多项科技部重大课题、卫生部行业科研专项项目等研究,承担多项国家自

然基金和军队重大专项课题、重庆市重大课题等的研究。发表论文 200 多篇,参编专著 25 部,国军标 1 个。先后获国家科技进步二等奖 1 项,获省部级二等奖 9 项,获通用汽车中国科技成就奖二等奖。



尹志勇简介

尹志勇, 男, 1963 年 1 月出生。第三军医大学野战外科研究所研究员、博导。分别于 1983 年、1986 年、1996 年在重庆大学生物医学工程专业获工学学士、硕士和博士学位。1997 年第三军医大学临床医学博士后, 1999 年英国 Dundee 大学高级访问学者。多年来主要从事生物医学工程、交通医学工程方面的研究工作。在信号检测与处理、人体冲击/撞击损伤机理与防护研究等方面积累了较多的经验。近年来, 组建车辆/生物碰撞安全实验室, 2009 年被批准为市首批示范重点实验室。组建八益交通事故司法鉴定中心并获认证资质, 对重庆市和山西等地近期发生的 400 余起特大/重大交通事故进

行鉴定,为政府部门处理交通事故提供客观依据。率先开展基于有视频的典型交通事故的"真人"碰撞生物力学研究,并应邀前往日本名古屋大学讲学。承担国家"973"前期专项课题、国家自然科学基金面上项目、军队攻关课题、重庆市院士基金等。近期以第一作者或通讯作者发表论文20余篇(SCI收录4篇),以主要完成人获国家科技进步二等奖2项、军队科技进步一等奖1项、军队科技进步三等奖2项、省级科技成果二等奖3项、国际发明博览会银奖1项,新获发明专利授权3项、实用新型专利授权2项、软件著作权1项。培养博士研究生3名、硕士研究生3名,协助培养博士后2名。现任中国人民解放军交通医学研究所副所长、重点实验室主任、鉴定中心主任、中华创伤学会交通伤与创伤评分学组副组长等职。

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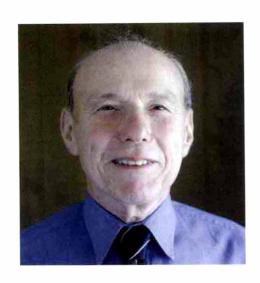
交通医学是研究交通伤害发生规律和防治的学科。全书含正 文 37 章和 7 篇特邀论著,约 200 余万字。50 多位国内作者均为长 期从事交通医学和交通安全工作的专家;7 篇特邀论著由本领域国 际知名的专家亲自撰写。本书全面系统地介绍交通医学的发展史、 交通伤流行病学、交通安全中的危险因素、交通伤的发生机制、伤情 评估、医疗救治、司法鉴定、安全防护、预防策略及交通安全法律法 规等内容;特邀专家分别就美国、欧洲、瑞典、日本、韩国、新加坡等 地的道路交通安全状况做了评述。该书材料新颖,内容丰富,可读 性强,是国内外现今最全面论述交通医学的专著,既可作为临床医 师、法医和相关专业研究人员的工具书,也可供道路交通相关管理 部门人员参考。

ABSTRACT

Traffic medicine is an important discipline for researching the happening regulations and prevention of traffic injuries. There are more than 2 million words in this book including 37 chapters and 7 specially invited articles. All the authors are the experts of traffic medicine and traffic safety, and the 7 articles are written by the internationally renowned experts of this field. This book systematically introduced the history of traffic medicine, epidemiology of traffic injury, risk factors of traffic safety, mechanisms of traffic injury, injury assessment, medical treatment, medicolegal identification of road traffic injuries, safety protection of road users, safety strategy for the road traffic crash prevention, administration and relative regulations on traffic safety in different countries, etc. The invited experts introduced the status of the road traffic safety in the United States of America, Europe, the Kingdom of Sweden, Japan, the Republic of Korea and the Republic of Singapore, respectively. This book with novel materials and rich contents is readable, and now it is the most comprehensive monograph describing traffic medicine at home and abroad. It can be used as reference book for clinicians, legal medical experts and researchers in the relevant speciality as well as the reference of staff in relative management departments of road traffic.

PREFACE 1





Modern Traffic Medicine addresses a problem of deep concern to everyone who lives in a motorized society. About 3,000 people are killed on the world's roads daily, almost 200 in China, almost 100 in the USA. The deaths happen mainly one at a time, and so do not attract the attention of dramatic events such as airplane crashes or hotel fires. Yet every one of the traffic deaths leaves a family devastated, every bit as much as if the death had occurred in connection with a more newsworthy event. Injuries, in many cases of the highest severity leading to permanent impairment, far exceed deaths.

Unlike deaths from other sources such as disease or natural disasters, victims of traffic crashes are overwhelmingly young. Without the crash they would likely have enjoyed a life of normal duration in normal health. If you see a young person in a wheelchair from which he cannot rise unassistedly, it is very likely that a traffic crash was responsible.

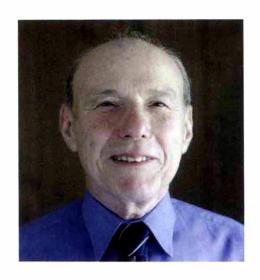
Traffic Medicine is a term that encompasses all those disciplines, techniques, methods, and policies aimed at reducing the harm traffic crashes inflict on human beings. It includes also ways to enable those with reduced capabilities due to aging, illness or other causes to drive safely (and walk safely adjacent to traffic), and also the knowledge and policies to prohibit from driving those no longer able to drive with adequate safety. The disciplines contributing to traffic medicine include psychology, sociology, statistics, engineering, biomechanics, law, policing, policy analysis, pharmacology, gerontology, as well as surgery, and much more.

China has reduced its traffic deaths from an all-time high of 109,381 in 2002 to 67,759 in 2009. This 38% drop in a seven-year period is an impressive traffic safety achievement, especially as the number of vehicles increased so dramatically during the same seven years. It took the United States of America 37 years to achieve a similar percent drop from its highest fatality total. However, the present Chinese death toll, and the vastly greater number of injuries accompanying it, remains a major public health challenge.

Modern Traffic Medicine provides the knowledge base necessary to further substantially reduce harm from traffic. The book provides a wealth of information from distinguished contributors to many of the disciplines that are included in traffic medicine. The book contains detailed and informative articles by authors from countries that have achieved the greatest progress in traffic safety. These guide the way to selecting the approaches and policies likely to be most effective.

Modern Traffic Medicine will help China prevent deaths, reduce suffering, and enhance mobility. All who seek to diminish the enormous harm that accompanies the benefits of increased motorized transportation in China should read Modern Traffic Medicine.

序



《现代交通医学》一书探讨了生活在机动化社会的每个人所深切关注的问题。全世界每天有大概 3 000 人死于道路交通事故,中国近 200 人,美国近 100 人。由于交通事故大多一次只有一人死亡,因此比不上坠机或旅馆火灾等重大事件吸引眼球。然而,每一例交通死亡都会毁坏一个家庭,这并不比其他任何重大事件带来的伤害少。而很多危重伤员的损伤往往是永久性的,这更甚于死亡。

与疾病或自然灾害导致的死亡不同,交通事故的受害者几乎都是年轻人。不出交通意外的话,他们本可以享受健康正常的生活。如果你看到一个年轻人坐在轮椅上,没法自己站起来,那多半是交通事故惹的祸。

"交通医学"是一个术语,它包含了所有旨在减少因交通事故对人造成伤害的学科、技术、方法和政策。它也包括解决因年龄、疾病或其他因素而降低行车安全(和与交通相关的道路安全)能力的方法,同样还包括了用于禁止无法充分安全行驶驾驶行为的知识和政策。促进交通医学发展的学科包括心理学、社会学、统计学、工程学、生物力学、法学、治安、政策分析、药理学、老年医学以及外科手术,等等。

中国的交通死亡人数一直在减少,由 2002 年的最高纪录 109 381 例到 2009 年的 67 759 例,7 年中减少了 38%。这是一项在交通安全问题上令人印象深刻的成就,特别是在同一时间运载工具的数量显著增长的情况下。美国从这样高的死亡率上,下降相似的百分比数花了 37 年。然而,目前中国的死亡总数以及随之造成的伤害仍是一个危害公共健康的严峻挑战。

《现代交通医学》为进一步大幅度减少交通伤害提供了必备的知识基础。许多在交通医学涵盖的 多学科作出杰出贡献的科学家为本书提供了大量信息。一些特邀作者也撰写了内容详细,数据翔实的 文章,他们所在的国家在实现交通安全方面取得了长足的进步。这些都有助于选择最有效的方法和政 策,来改善交通安全。

《现代交通医学》将有助于中国减少交通伤亡,提高流动性。中国机动车辆的增加有利有弊,建议所有有志于减少交通事故危害的人们都读读这部书。

Leonard Evans 美国工程院院士 国际交通医学学会名誉主席 科学服务协会主席

前言

道路交通伤害是一个全球性的公共卫生问题。WHO估计,全世界每年至少有120万人死于车轮之下,受伤者多达3000~5000万人。1990年道路交通伤害在全球疾病与伤害负担排序中占第9位,预计到2020年将提高到第3位。目前,全球每天因道路交通事故死亡3000多人,其中85%发生在发展中国家。

2004年4月7日,以道路交通安全为主题的世界卫生日在巴黎拉开帷幕,口号是"道路安全,防患未然"(Road safety is no accident)。WHO强调,道路交通事故和伤害是可以预防的,因此呼吁各国政府和社会各界对道路交通安全给予更多的关注,动员各方面的力量,协调一致,为减少交通事故和伤害而共同努力。

近年来,我国政府对道路交通安全加大了组织管理、督导和经费投入,使不断增长的交通事故得到 了遏制,效果十分明显。

1997年8月,天津科学技术出版社出版了我国第一部《交通医学》专著(王正国主编,132.2万字),至今已有13年了。在这期间,国内外在交通医学方面取得了巨大进步,先后召开过多次国际和国内学术会议,出版过专集和大量论文。WHO根据2008年178个国家道路安全现状的资料,发布了大约1000页的全球道路安全现状报告,本书中尽可能采用了上述相关的内容和信息,努力反映交通医学领域中的新进展。

与1997年出版的《交通医学》相比,本书增加了许多新的章节,如驾驶人的健康状况,酒精、药物与驾驶安全,老年、疾病与道路交通安全,少年儿童、青年与交通安全,交通心理学,交通伤损害控制手术,交通伤康复,道路交通事故的深度调查与分析,交通伤的法医学鉴定,以及各国交通安全的管理和相应法规等。特别要提到的是以往两届国际交通医学学会主席,美国 L. Evans 院士和荷兰 W. Brouwer 教授以及其他几位国际知名的专家也参加了本书的撰写,从而显著提高了本书的学术水平和影响。

在这里,我对为本书出版作出重要贡献的两位副主编周继红教授、尹志勇教授以及所有撰稿专家和主编助理肖凯先生等表示衷心的感谢。同时,重庆出版集团的领导和编辑为本书的出版付出了辛勤的劳动,并提供了许多优惠的条件;主编所在单位的领导,特别是第三军医大学大坪医院周林院所长给予了大力支持,在此也一并表示谢意。我希望并深信,本书的出版在推动我国交通医学发展方面将会起到积极的作用。

王正国 2011 年 1 月于重庆

PREFACE 2

Road traffic injury is a global public health issue. According to WHO estimation, the death toll from road traffic crashes was at least 1,200,000 persons and the injured toll 30,000,000 to 50,000,000 persons worldwide each year. In 1990, road traffic injury ranked the top ninth among all the global diseases and injuries. It is predicted that it will rise to the third by 2020. Currently, more than 3,000 people die from road traffic accidents worldwide each day, of which 85% occurred in developing countries.

On April 7, 2004, the World Health Day with the theme as road traffic safety was open in Paris. The slogan is "Road safety is no accident". WHO stresses that road traffic accidents and injuries can be prevented, and therefore appeals to all governments and societies to pay more attention to road traffic safety, mobilize all round efforts, and coordinate each other to reduce traffic accidents and injuries.

In recent years, Chinese government has strengthened the management, supervision and funds investment on traffic safety in attempt at retarding the increase of road traffic accidents. The outcome is evident.

Thirteen years has been passed since *Traffic Medicine*, the first monograph on this subject in China published in August 1997 by the Tianjin Science and Technology Press (edited by Wang Zhengguo, with 1.32 million words). During this period, domestic and international traffic medicines have achieved tremendous progress. Several international and domestic academic conferences have been held, many monographs and papers have been come out. Based on 178 nations' road traffic safety data, WHO has published a report consisting of 1,000 pages or so on global road safety situation. Our endeavor is trying to reflect the latest progress in the field of traffic medicine in this book by adopting above-mentioned contents and information.

Compared with *Traffic Medicine* published in 1997, several new chapters are added to this book, including health evaluation on drivers, alcohol and drugs in traffic safety, old ages and disease in traffic safety, children and teenagers in traffic safety, traffic psychology, damage control operation for traffic injury, traffic injury rehabilitation, investigation and analysis of traffic accidents, medicolegal expertise for traffic injury, as well as the administration, laws and regulations on traffic safety of many countries. I would like especially to mention that the academic level and influence of the new edition of book will certainly be greatly improved owing to the outstanding contributions for the book by Academicians L. Evans & A. King from USA, Professor W. Brouwer from the Netherlands, the former Chairman of International Traffic Medicine Association, and several other international well-known experts.

Here, I'd like to express my sincere thanks to two vice editor-in-chief of the monograph, Professor Zhou Jihong and Yin Zhiyong, all the contributors, and the assistant editor-in-chief Mr. Xiao Kai. And also I

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express my gratitude to the leader and editors in Chongqing Publishing Group for their hard work and assistance, and the president of Daping Hospital, Professor Zhou Lin for the support. I hope and firmly believe that the publication of the book will conduce to the development of traffic medicine in China.

Academician of Chinese Academy of Engineering

Thenggus Wang

M.D.

A Short History of the International Traffic Medicine Association (ITMA)

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The organization that is now the International Traffic Medicine Association was born in San Remo, Italy, in December 1960. This occurred at the first meeting of the Italian Traffic Medicine Association, an organization formed two years earlier. Although those representatives were mainly from Italy, professionals from ten other countries were also present. The conference chair was the President of the Italian Association, Prof. Cesare Gerin. He invited the foreign guests to lunch on 10 December 1960, when he proposed the creation of an international organization. Those present agreed to form such an organization with Prof. Gerin as its founding President. Other officers and board members were selected from the foreign guests present, and an inaugural meeting was planned.

This inaugural meeting took place in Rome in 1963, where it was agreed that the name of the new organization would be the International Association for Accident and Traffic Medicine (IAATM).

The earliest pioneers in what was called traffic medicine were mainly physicians. From its founding, IAATM's focus included preventing crashes, and reducing deaths and injuries when they occurred. This required the involvement of experts from many fields, including members of the WHO and other organs of the UN. Thus many disciplines were involved even though the majority of members were from the medical profession.

IAATM has always been richly international, holding its World Congresses at venues covering much of the world (Table 1). Printed proceedings including the texts of the technical papers presented were produced for some of the Congresses. These are available from the library of the University of Michigan Transportation Research Institute in Ann Arbor, Michigan, USA.

Table 1 IAATM and ITMA World Congresses

No.	Dates	Location	Conference President ¹	Proceedings produiced?
1	1963, April 25-30	Rome, Italy	Prof. Cesare Gerin	Yes
2	1966, August 9-12	Stockholm, Sweden	Prof. Helge Wulff	Yes
3	1969, May 29-June 4	New York, USA	Dr. Milton Helpern	Yes
4	1972, Sept. 11-15	Paris, France	Dr. Louis Roche	
5	1975, Sept.	London, UK	Prof. A. Keith Mant	
6	1977, Jan 31 - Feb 4	Melbourne, Australia ²	Dr. Gordon Trinca	Yes
7	1978, July 10-14	Ann Arbor, Michigan, USA	Dr. Norman E. McSwain	Yes
8	1980, June 10-13	Aarhus, Denmark	Prof. Jorgen B. Dalgaard	Yes

No.	Dates	Location	Conference President	Proceedings produiced?
9	1983, Sept.	Mexico City, Mexico	Dr. Ricardo Campos Huutich	
10	1985, May 27-31	Tokyo, Japan	Dr. Shinhachi Nishikawa	Yes
11	1988, May 24-28	Dubrovnik, Yugoslavia	Prof. Ivo Jelcic	Yes
12	1992, June 23-25	Helsinki, Finland	Dr. Jarmo Pikkarainen	
13	1994, May 16-20	São Paulo, Brazil	Dr. Moise Seid	
14	1995, August 20-23	Singapore	Prof. Chao Tzee Cheng	
15	1997, Sept. 27-30	Ankara, Turkey	Prof. Ridvan Ege	
16	1999, May 24-27	Chongqing, China	Prof. Zheng-guo Wang	Abstracts. only
17	2000, May 22-26	Stockholm, Sweden	Dr. Kurt Johansson	
18	2002, Sept. 22-25	Cairo, Egypt ³	Dr. Abdel Hay Mashhour	
19	2003, Sept. 14-17	Budapest, Hungary	Prof. György A. Nemes	
20	2006, October 18-20	Melbourne, Australia	Dr. Morris Odell	
21	2009, April 26-29	The Hague, the Netherlands	Dr. Wiebo Brouwer	
22	2011, May 13-16	Chongqing, China	Prof. Zheng-guo Wang	

¹ The person organizing and chairing the World Congress was normally designated Congress President. In some cases other titles, such as Congress Organizer, were used.

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In addition there were two special international conferences held in collaboration with other international organizations including the WHO with special reference to the issue of "First Aid" in Oslo, Norway 1979 and another "International Conference on Traffic Safety—The Vulnerable Road User", New Delhi, India, 27-30 January 1991.

IAATM never had the resources to support an office in a permanent location. All work was voluntary. Accordingly, records tended to move with the changing Presidents or other officers who had offered to take care of such matters. There are 11 Presidents in the organization during 50 years—typically a new one every 4 or 5 years (Table 2).

Table 2 Presidents of IAATM and ITMA

No.	From	То	President	Country
1	December 1960	August 1966	Prof. Cesare Gerin	Italy
2	August1966	June 1969	Dr. Milton Helpern	USA
3	June 1969	September 1972	Prof. André Sicard	France
4	September 1972	September 1983	Prof. A. Keith Mant	UK
5	September 1983	May 1985	Dr. Rune Andréasson	Sweden
6	May 1985	May 1988	Prof. Hans-Joachim Wagner	West Germany
7	May 1988	August 1995*	Prof. Jarmo Pikkarainen	Finland
8	August 1995	May 2000	Prof. Ridvan Ege	Turkey
9	May 2000	October 2004	Dr. Leonard Evans	USA
10	October 2004	April 2009	Dr. Wiebo Brouwer	the Netherlands
11	April 2009		Dr. Lars Englund	Sweden

^{*}Became incapacitated in summer of 1995 office and died on October 7, 1995.

² Devoted to seat belt and restraint systems.

³ First World Congress with new name International Traffic Medicine Association (ITMA).