



Safety in Ice Hockey



Castaldi/Hoerner, editors



STP 1050

STP 1050

Safety in Ice Hockey

C. R. Castaldi and Earl F. Hoerner, editors



ASTM
1916 Race Street
Philadelphia, PA 19103

ASTM Publication Code Number (PCN): 04-01050-47
ISBN: 0-8031-1274-2

Copyright © by AMERICAN SOCIETY FOR TESTING AND MATERIALS 1989

NOTE

The Society is not responsible, as a body,
for the statements and opinions
advanced in this publication.

Peer Review Policy

Each paper published in this volume was evaluated by three peer reviewers. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM Committee on Publications.

The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of these peer reviewers. The ASTM Committee on Publications acknowledges with appreciation their dedication and contribution of time and effort on behalf of ASTM.

Foreword

The symposium on Safety in Ice Hockey was held on 27 Oct. 1987, in Montreal, Quebec, Canada. The event was sponsored by ASTM Committee F-8 on Sports Equipment and Facilities and by its Subcommittee F08.15 on Hockey; it was also cosponsored by the Hockey Equipment Certification Council. Robin Burns, I-TECH Sports Products, Inc., presided as chairman of the symposium, and C. R. Castaldi, University of Connecticut Health Center, and Earl F. Hoerner, Neuromuscular Diagnostic Service, served as editors of this publication.

Contents

Overview	1
-----------------	---

EPIDEMIOLOGY

The Critical Role of Epidemiological Studies in Assessing the Frequency and Causative Factors in Sports-Related Injuries—KENNETH S. CLARKE	9
Injury Rates in Amateur, College, and Professional Hockey—C. R. CASTALDI, L. SPARACIO, A. S. WOOD, AND J. BERNARD	14
Epidemiology of Eye Injuries in Hockey—TOM PASHBY	29

RULES, OFFICIATING, AND RISK FACTORS

Rule Changes: Their Effect on Safety in Ice Hockey—M. RUDOLPH	35
The Effect of Rules and Officiating on the Occurrence and Prevention of Injuries—RICHARD PARAYRE	37
Assumption of Risk—Hockey Injuries—C. J. ABRAHAM, MALCOLM NEWMAN, STANLEY SHULMAN, AND JAMES PUGH	44
Eye and Face Injuries in High School Hockey: Cutting Down the Risks—FRANK A. MASTRANGELO	52
A Proposal for the Use of the Half Face, Clear Plastic Visor for National Collegiate Athletic Association Hockey—S. WALSH	55
The Ice Hockey Face Guard: Health Care Costs and Ethics—PAUL F. VINGER, JUDITH D. BENTKOVER, ROBERT SULLIVAN, AND JESSE G. KALIN	58
The Quebec Sports Safety Board—Its Functions, Powers, Structures, and Activities—GUY REGNIER	63

BODY AND KNEE INJURIES

Cervical Spine Fractures: Mechanisms, Neck Loads, and Methods of Prevention —PATRICK J. BISHOP AND RICHARD P. WELLS	71
Effects of Body-Checking in the Pee-Wee (12 and 13 Years Old) Division in the Province of Quebec —GUY REGNIER, ROGER BOILEAU, GASTON MARCOTTE, RAYMOND DESHARNAIS, RENE LAROCHE, DANY BERNARD, MICHEL-ANDRE ROY, PIERRE TRUDEL, AND DANIEL BOULANGER	84
Development of a Knee Injury Protective Brace for Ice Hockey Players —YELVERTON TEGNER, BENGT ODELGARD, AND GUY JOHNSON	104

PLAYING EQUIPMENT

Safety Factors in the Modern Ice Hockey Skate Blade —G. COUTURE	117
Kinematic Analysis of the Talocrural and Subtalar Joints During the Hockey Skating Stride —T. B. HOSHIZAKI, G. KIRCHNER, AND K. HALL	141
Ice Hockey Protective Equipment—Its Value, Capabilities, and Limitations —EARL F. HOERNER	150
The Dynamic Role Played by the Ice Hockey Stick —EARL F. HOERNER	154
Research and Development of Hockey Protective Equipment—A Historical Perspective —L. CLEMENT AND D. JONES	164

PLAYING FACILITIES

Design of Hockey Rinks and the Development of Standards —M. KEATING AND R. NORRIS	187
Natural Ice Facilities —ARTHUR H. MITTELSTAEDT, JR.	202

HEAD AND FACE PROTECTION

The Canadian Standards Association and the Evolution of Head and Face Protection in Canadian Hockey —JAMES L. DIXON	207
The Development of Head, Face, and Neck Protectors for Ice Hockey Players —BENGT ODELGARD	220
Impact of Full Face and Visor Type Hockey Face Guards —TERRANCE A. SMITH AND PATRICK J. BISHOP	235

Development of an Impact Testing Method for Protective Helmets— G. I. JOHNSON	240
---	-----

The ASTM F 1045-87 Standard Performance Specification for Ice Hockey Helmets— C. A. MOREHOUSE	262
--	-----

INDEXES

Author Index	277
---------------------	-----

Subject Index	279
----------------------	-----

ISBN 0-8031-1274-2