

Subject Index

A

- Accidents
 - injury patterns
 - effects of equipment, 125
 - skiing related, 125
- Acoustic transducer design
 - knee motion measurement, 77, 81 (fig.), 82 (table)
- Age factors
 - alpine skiing injuries, 144
- Alcohol risk factor, 257, 261 (table)
- Alpine skiing
 - injuries, 125, 152
 - age factors, 144
 - epidemiological study, 164, 166–168 (tables)
 - femoral shaft fractures, 152
- Anterior cruciate ligament
 - follow-up, 116–120 (tables)
 - injuries, 112
- Artificial leg for boot testing, 200
- ASTM
 - STP 1102*, 4
- Athletic injuries
 - alpine skiers, 144
- Automated system
 - to determine knee flexibility, 57
- Axial moment
 - knee flexibility, 11, 45 (table)
 - knee ligamentous injuries, 35

B

- Behavior
 - alpine skiers, 144
 - downhill skiing, 241, 249, 257
- Binding tests
 - alpine skiers, 144
- Binding adjustment
 - health education for injury prevention, 241, 249, 257, 260 (table)
- Biomechanics
 - knee flexibility, 57
- Boots, ski
 - factor in injuries, overview, 5
 - infrared thermography, 208
 - pain threshold, 179

- pressure, 179, 186, 190–192 (tables)
- shaft design, 20
- testing, 179, 186
 - artificial leg, 200
 - thermography, 208

C

- Camera, thermovision, 209 (fig.)
- Canada—skiing injury statistics, 158
- Cantilever plate
 - in dynamometer design, 94, 103 (table)
- Carving forces—turning snow ski, 217
- Combination moments
 - knee flexibility, 48–49 (tables)
- Consumer Product Safety Commission (CPSC), 133
- CPSC—*see* Consumer Product Safety Commission
- Cross-country ski injuries, 133

D

- Danish skiers—*injury risk*, 145
- Design
 - boots, 179, 186, 208
 - boots—shaft design, 200
 - ski equipment, 11
 - turning snow ski, 217
- Displacements
 - boots, 77, 186
- Distribution, pressure
 - boots, 179, 186, 190–192 (tables)
- DOF—*see* Five degree of freedom, Six-degree-of-freedom
- Downhill ski injuries, 133, 158, 160–162 (tables)
- Downhill skiing
 - health education, 241, 249, 257
- Dynamic equilibrium
 - design of turning snow ski, 217
- Dynamometer—design, 94–96, 106–109 (tables)

E

- Epidemiology, 125, 152, 164, 166–168 (tables)

Equipment

- influence on ski injuries, 125
- product-related ski injuries, 133

Equipment design—skis, 217

Error analysis, 77, 89 (table)

F**Femoral shaft fractures**

- alpine skiing injuries, 152, 155–156 (tables)

Femur fracture, 152

Five degrees of freedom

- knee flexibility, 57

Flexibility—*see also* Knee flexibility

- knee, 57

Foot protection—ski boot design, 208

Force measurement, 94

Fractures—femoral shaft

- alpine skiing, 152

G**Gender differences**

- boot testing—pain threshold, 179
- downhill and cross-country ski injuries, 133, 135–139 (tables)

Goniometer

- testing knee flexibility, 11, 14–15 (figs.), 22 (table)

H**Head injuries**

- alpine skiers, 144, 170

Health education

- downhill skiing, 241, 249, 257
- Netherlands, 257

Human knee—*see* Knee

I

Infrared thermography

- ski boot testing, 208

Injuries, knee

- isometric exercise, 112
- prevention, 57
- skiing accidents, 11, 12 (fig.)

Injury data

- alpine skiing, 152, 164, 166–168 (tables)
- comparisons—Sweden/US/Canada/New Zealand, 158
- downhill versus cross-country analyses, 133

Injury patterns, 125, 152, 158, 160 (table)

Injury prevention

- health education, 241, 249, 257

Injury rate comparisons, 158, 160 (table), 164, 166–168 (tables)

Injury risk

- epidemiology, 164, 166–168 (tables)
- Netherlands—health education, 257
- Norwegian/Swedish/Danish skiers, 145

Instruction—skiing, 144, 257

Intervention—health education, 241, 249, 257

Isometric exercises, 112

J

Joint motions

- measurement, 78

K

Knee flexibility, 11, 18 (fig.), 22 (table), 24 (table), 57

Knee flexibility—axial moments, 45 (table)

Knee flexibility—combination moments, 48–49 (table)

Knee flexibility—varus/valgus/axial moments, 35, 42 (table)

Knee injuries—skiing

- alpine skiers, 144
- ligamentous, 35, 112
- overview, 4
- severity, 133

Knee motion measurement, 57, 77

L

Lateral ligament compartment

- follow-up, 116–120 (tables)
- injuries, 112

Ligamentous knee injuries, 35, 112

Load mechanisms leading to injury, 35, 57

M

Mechanical modeling

- turning snow ski, 217

Medial collateral ligament

- follow-up, 116–120 (tables)
- injuries, 112

Model—turning snow ski, 217

Moment components—measurement, 95

Motion measurement

- five-degree-of-freedom, 57
- six-degree-of-freedom, 77

Muscle strength—ski injuries, 158

N

Nationalities

- alpine ski injuries, 144

National Electronic Surveillance System, 133

NEISS—*see* National Electronic Surveillance System

- Netherlands—health education, 257
 New Zealand—skiing injury statistics, 158
 Norwegian skiers—injury risk, 145, 158
- O**
- Optimal design
 dynamometer, 94
- P**
- Pain threshold—ski boots
 sex-related differences, 179
 Pressure distribution
 ski boots, 179, 186, 190–192 (tables)
 shaft design, 200, 202–203 (figs.)
 Prevention of injury
 health education, 241, 249, 257
 Product-related ski injuries, 133
 Prosthesis measurements
 artificial leg for ski boot testing, 200
- Q**
- Quad lift
 effect on injury patterns, 125
- R**
- Radiographic studies—ski boots, 208
 Rehabilitation—knee injuries, 112
 Release bindings, 144, 249, 257
 Risk factors for ski injury, 257
 Rotations, knee
 measurement, 35, 57, 77
- S**
- Safety
 alpine skiing injuries, 144
 ski boot pain threshold, 179
 statistics, 158
 turning snow ski, 217
 Safety education, 241
 Scandinavian skiers
 injuries, 144, 148–149 (tables)
 Sear panel element, 94
 Severity of ski injuries, 133
 Sex-related differences
 pain threshold—ski boots, 179
 Shaft design—ski boots, 200
 Six-degree-of-freedom (DOF)
 acoustic transducer design, 77
 dynamometer design, 94–96, 98 (fig.)
 motion measurement, 77
 Ski bindings, 241
 Ski boot testing, 179, 186, 200, 208
 Ski design, 217
- Ski lessons, 257
 Ski safety—equipment design
 boots
 artificial leg for testing, 200
 displacement and pressure, 186
 pain threshold, 179
 shaft design, 200
 knee flexibility, 11
 overview, 6
 pressure, 179, 186
 shaft design, 200
 turning snow ski, 217
 Skidding forces—turning snow ski, 217
 Skiing, 217
 Skiing injuries
 alpine injury patterns, 125, 144
 cross-country, 133
 downhill, 133, 158, 160 (table), 241, 249, 257
 education, 241, 249, 257
 head, 170
 knee, 35, 77, 112, 115 (table)
 overview, 3
 risk factors, 257
 severity, 133
 six-degree-of-freedom
 acoustic transducer design, 77
 dynamometer design, 94
 statistics, 115, 125, 158, 160 (table)
 Sweden—registration, 170, 171 (table)
 Waterville valley, 125
 Skiing instruction, 144, 249
 Skiing mechanics, 217
 Skiing performance, 186
 Skiing safety
 alpine skiing injuries, 144
 education, 241, 249, 257
 risk factors, 257
 ski boot pain threshold, 179
 ski boot thermography testing, 200
 ski injury statistics, 158
 turning snow ski design, 217
 Skiing Safety and Ski Trauma Conferences, 158
 Skiing trauma, 144, 158, 217
 Skis—turning snow ski design, 217
 Soft tissue motion, 77
 Sports injury—causes, 114 (table), 144
 Sports mechanics, 217
 Statistics
 alpine injuries, 125, 152
 downhill versus cross country ski injuries, 133
 ski injuries, 158
 Waterville valley, 125

Strain-gage dynamometers—*see*
Dynamometers
Sweden—skiing injuries
registration, 170, 171 (table)
statistics, 145, 158

T

Telemetric studies—ski boots, 208
Temperature distribution—ski boots, 209
Testing
ski boots, 179, 186, 190–192 (tables)
artificial leg, 200
thermography, 208
Thermography, infrared
ski boot testing, 208
Thermovision camera, 209 (fig.)
Trauma
skiing injuries, 144, 158, 170
turning snow ski design model, 217

Triaxial goniometer, 11
Turning snow ski—design model, 217

U

United States—skiing injury statistics, 158
Uncoupled dynamometer—design, 94

V

Varus/valgus moment
knee flexibility, 11, 42 (table)
knee ligamentous injuries, 35

W

Waterville valley
alpine injury patterns, 125