

GolfSportsMedicine

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Statistics

- There are 2 million new people/year entering golf- registering handicaps
- 2 million people/year leaving the game
- The National Golf Foundation research shows that one of the reasons people leave is due to golf injures

Golf Injuries

- Golf injuries are attributed to:
 - Overuse injuries
 - Repetitive faulty swing mechanics
 - Fitness/conditioning level
 - Forcing the body into positions it cannot naturally achieve
 - Improperly fitted equipment

The Fallacy of the Ideal Swing

- Coil creates speed
- Who is the ideal swing patterned after
- Tour players are dysfunctional humans with tight lower bodies and extremely flexible upper torsos
- The golf swing should instead be based on the physical attributes of the player (form=function)

Evolution Of The Golf Swing

The Classic Golf Swing

- Club shafts could not be stressed or they would break

- Wore suit coats- made swing more restricted
- Hips and shoulders turn almost equally
- Rise up on the lead toe
- Back swing of club is reduced....less stress on the low back

Evolution Of The Golf Swing

The Modern Swing

- Based on economy of motion and “coil”
- Weight shift has become the main focus
- Large shoulder turn and minimal hip turn
- A “back bend” follow-through torques the low back
- The “x-factor”

The Swing Phases

- SET UP/ADDRESS
- BACKSWING
- TOP/TRANSITION
- FORWARD SWING/ACCELERATION
- IMPACT
- EARLY FOLLOW THROUGH/LATE FOLLOW THROUGH

Set Up

Back Swing Club on Plane
 Weight Transfer-Back Swing
 Impact

What Should We Aspire to Achieve? Common Factors Among Elite Golfers

- SETUP: Correct body posture, spine angle, grip balance
- SPINE ANGLE: Consistent throughout the swing
- SWING PLANE: The club swings on the plane established at set-up in the backswing and returns to impact inside or on that same plane
- PELVIS: Is slightly rotated toward the target at impact

Common Factors Among Elite Golfers

- BALANCE & WEIGHT TRANSFER: Balance throughout the swing and weight transfer to the posted leg during backswing and transfers to the forward swing and follow through
- EQUIPMENT ANALYSIS: Golf clubs that meet the many variables suited to the individual golfer

Common Factors / 6 phases

- The Largest recruitment of common factors that occur during the 6 phases the better the golf shot, hence a greater percent of likelihood of achieving squareness of club face and centerdness of hit at impact.

Common Factors

Back Swing on Target Line

Common Factor

Common Factors

Downswing-From Inside The Target Line

Common Factors

At Impact-Pelvis Slightly Rotates Toward Target Not Out Toward Ball In The Down Swing

Common Factors

Spine Angles - Constant

Common Factors

Spine Angles - Constant

X-Factor

X-Factor Controversy

- Not Among the Common Factors in the Elite Golfer
- Concept of creating torque by increasing shoulder rotation while maintaining a fixed hip rotation at the top of the backswing
- Increases risk of injury to low back
- Studies by Cheetham & Mottram (2001) XFactor **DOES NOT** increase club head speed or distance in professional nor amateurs

SPORTEXCELGOLF

The Golf Exam and Methods for Correction and Treatment

A collaborative effort of sports medicine and golf instruction professionals that uses the knowledge of golf biomechanics and clinical resources to achieve successful outcomes.

SportExce/Golf Team

- The Collaborative Team Approach All Trained in Golf SportsMedicine
 - Sports Medicine Physician
 - Physical Therapist
 - Spinal Rehabilitation Expert
 - Exercise Conditioning Trainer
 - Professional Golf Instructor
 - Expert Golf Equipment Analyst

Physician

Richard J. Emerson, D.O.

Orthopedics and Sports Medicine

Team Physician, Emeritus Phoenix Suns (NBA)

Golf Physical Therapist

Golf Professional

Kerry Graham, LPGA Professional

Director of SportExcel Golf

SportExce/Golf Mission

- Key assumption
 - The majority of amateur golfers have flexibility, strength, and conditioning limitations
- These limitations prevent the achievement of the ‘**six common factors**’ necessary for an efficient, repeatable golf swing

Swing Analysis

SWING DYNAMICS

- Shoulders (Upper Torso Rotation)
- Hip Rotation
- Spine Side Bending (Right or Left)
- Spine Bending (Forward or Backward)
- X-Factor
- Weight Transfer (% on Right Side)
- Hip Side Bending (Right or Left)
- Hip Bending (Forward or Backward)

Ball Flight Monitor

Virtual Recreation of Golf Swing

Set Up Position

Swing Plane on Takeaway

Swing Plane to Top of Backswing

Swing Plane on Downswing

Swing Plane through Impact

View Detailed Swing Positions

- With just a click, view the body and swings from varied perspectives.
- View still or in motion.

Backswing from Front

Backswing from Top

Top of Backswing from Bottom Analyzing the Backswing Position in Therapy Setting Most Common Golf Injuries

Professional Golfers

- Hand and Wrist
- Back
- Elbow
- Shoulder/neck
- Knee

Amateur Golfers

- Back
- Hand and Wrist
- Elbow
- Shoulder/neck
- Knee

McCarroll et. al 1990
McCarroll et. al 1982
McCarroll et.al 1982

Junior Golfer Injury Survey

R. Emerson et. al. JGAA

- 1992/93 Golf Season
- 258 Junior Golfers
- 76 females
- 182 males

Injuries Among Surveyed Jr. Golfers

R. Emerson et. al. JGAA

- The two problem areas for both male and female Junior Golfers are the lower back and wrist
- Wrist injuries: males 23%, females 28%
- **Low back injuries: males 33%, females 34%**

- It is thought that through proper conditioning and stroke mechanics many of these injuries can be minimized or even prevented
- 10 year planned follow-up study

Junior Golfer Exercise Habits

R. Emerson et. al. JGAA

- 19% of the males surveyed lift weights
- 22% of the females surveyed lift weights
- 52% of the males surveyed stretch regularly
- 16% stretch for greater than 5 minutes
- 58% of the females surveyed stretch regularly
- 20% stretch for greater than 5 minutes

Tiger Factor

Tiger Factor - Conditioning

High School Golf Team

Year Round Program

Swing Analysis

High School Golf Team

Year Round Program

Strength Training and Conditioning

High School Golf Team

Year Round Program

Flexibility

Spine

- 70% of golfers at all levels experience back pain which hampers golf performance
- Common Culprits
 - Amateurs:** Faulty swing mechanics, poor conditioning and ill fitted clubs
 - Elite:** overuse injury and conditioning issues

- Jobe & Yocum (1988) Indicate the fitness level of the individual dictates the risk of low back pain
 - Low activity individuals have reduced strength of trunk muscles increasing risk of LBP

Repetitive Stress – Spine Reverse Weight Shift and Stress on Spine

SportExcel Back Protocol SportExcel Back Evaluation

- Physician Evaluation
 - Establish diagnosis
- Swing Analysis
 - Spine angles
 - Weight transfer
- Biomechanical, Flexibility, Strength
 - Assessment

Improper Hip And Knee Flexion Treatment Options

- **The SportExcel Model-** Biomechanical evaluation and treatment through guided therapeutic exercise for injuries due to overuse and mechanical mechanisms
- MEDX computerized spine rehabilitation
- RS neuromuscular stimulator
- Bioscan

MED-X

Golf

Hand & Wrist Injuries

- Second and Third most common injury in Pro and Amateurs

- Overuse Tendinitis
- Swing or Grip Fault
- Direct Impact - Club Head and Ground

Golf

Hand & Wrist Injuries

Golf

Hand & Wrist Injuries

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Hand & Wrist Injuries

Golf

Hand & Wrist

Golf Warm-Up Drill

Hand and Wrist Injury Treatment

- Video analysis – correct fault
- Equipment modification
- COX-2 Inhibitors
- Injections
- Casting and bracing
- Rest, ice
- Surgery - rare

SportExcel Wrist/Hand Protocol

Swing Plane

laid off producing stress on wrist &
elbow

Golf Elbow Injuries

Elbow Pain

- **Golfer's Elbow** (*medical epicondylitis*)
 - *Found in the medial epicondyle of the dominant arm
 - *Result of flexor tendon overuse
 - *Associated Ulnar Nerve symptoms
- **Tennis Elbow** (*lateral epicondylitis*) in golfers
 - *Commonly seen
 - *Found in the left arm (lead arm) in right handed golfers
 - *Result of sudden trauma or extensor tendon overuse

Elbow Pain Causes

- **Swing Fault**
 - Improper grip
 - Prolonged wrist cock at impact
- **Grip and Shaft Diameter**
 - Stiffness and vibration
- **Lack of proper club fitting**

Elbow Pain Treatment

- Video Analysis – correct swing fault
- Equipment Modification
- Increase forearm muscle power
- Injection
- Extra corporeal Shock Wave Therapy (ESWT)

SportExcel Elbow Protocol

Golf Shoulder Injuries

- * Pro Golfer – 2K Revolutions/week
- Elite Swimmers – 16K Revolutions/week
- Not true overhead sport; results from excessive shoulder rotation and overuse
- Fourth most common injury – 10% of injury in professional and recreational golfers

Golf Shoulder injuries

- Senior Tour 7.7% of total injuries

- Swing of older golfer (>35 y/o) places stress upon the AC joint where injury first to occur
- Ill positioning of the arm can cause spur formation under AC joint, impingement of the rotator cuff from spurs and bursal side partial tearing resulting in decreased flexibility and tissue resiliency

Jobe & Pink (1996)

Golf Shoulder Injuries

- Golfers <35 y/o demonstrated hyperlaxity of shoulder ligaments leading to rotator cuff tendonitis and posterior capsulitis

Jobe & Pink (1996)

Lead Shoulder Injury Through Swing Phases

Left Shoulder/Neck Protocol

(Right Handed Golfer)

- * Right shoulder problems in right handed golfer are unrelated to golf swing but may have been an impact injury

Internal Impingement

- Top of Back Swing
 - Impinge - Rotator cuff between anterior labrum and humeral head anteriorly

Internal Impingement

- Top of Follow Through
 - Impinge - Rotator Cuff Between Post Labrum and humeral head posteriorly

Internal Impingement On Humeral Head

Non Surgical Treatment

- Shortening the end point of the backswing 10%
- Strengthen shoulder girdle muscles
- Improve flexibility

Surgical Treatment - Anterior & Posterior Impingement

- Subacromioplasty, spur removal, A/C Joint, Bursectomy, Debride Labrum and Cuff
- Modify Swing
- Increase Strength/Flex

Arthritis and Tendinitis in the Golfer

- COX-2 Inhibitors
- Bracing
 - Breg Counter Force Brace for Knee
- Surgical clean out debris and inflammation
- Hyalgan series of injections
- RS neuromuscular stimulation at home for atrophic muscles

RS Neuromuscular Device Anti-Inflammatory Medicine COX-2 Inhibitors

- Celebrex (Celecoxib)
- Vioxx (Rofecoxib)
- Bextra (Valdecoxib)

COX-2 Advantage

The COX enzyme stimulates prostaglandin causing pain and inflammation. Traditional NSAID's block COX-1 and COX-2 receptor sites. The COX-1 receptor produces "housekeeping" prostaglandin that protect the stomach and decrease platelet aggregation. COX-2 inhibitors will not block COX-1 receptor.

Onset of Pain Relief

- Celecoxib (Celebrex) 35min vs. Vicodin 31min
- Rofecoxib (Vioxx) 40min
- Valdecoxib (Bextra) 28-34min
- Begin Two Days Prior to Surgery and Continue Post-Op (1 Week) – Decreases Use of Narcotics

Platelet and CV Effects of COX-2 Specific Inhibitors

Summary

- COX-2 specific inhibitors spare platelets
- COX-2 specific inhibitors do NOT decrease CV risk
 - CLASS trial: no difference in MI rate with Celecoxib, diclofenac, or ibuprofen
- Pts with CV risk need low dose aspirin

Ulcer Complication Rates

Ulcer complication rates are reduced with COX-2 specific inhibitors vs. conventional NSAIDs

Hypertension

- Celecoxib (Celebrex) no dose related increases in incidence of hypertension

Risks

- Caution and appropriate monitoring when used in:
 - Pre-existing renal impairment
 - Heart disease
 - Liver disease
 - Advanced age
- Avoid use when serum creatinine > or = 2.5 mg/dl

VIOXX

- Potential Contribution to Fluid Retention, Hypertension, MI, and Stroke is Being Evaluated
- Avoid Prolonged Use of 50 mg.

Cardiovascular Adverse Events

- No significant difference was noted in the incidence of CV events (stroke or MI) between Celecoxib (Celebrex) and conventional NSAIDs
- Risk for MI/stroke in over 21 million pts on Celebrex is 0.00068%

Renal Risks

- All NSAIDs and COX-2 inhibitors need to be monitored

COX-1

- Avoid Using – To Many Side Effects

Degenerative Arthritis

Counter Force Arthritis Brace

HYALGAN Injection

HYALGAN

Safety of Hyaluronates: Summary

- Hyaluronan therapy has an excellent safety profile for treatment of OA of the knee
- Given possible serious adverse events associated with NSAID therapy, hyaluronans provide a therapeutic alternative to NSAIDs
- Clinical and preclinical evidence for qualitative differences between HYALGAN and Synvisc with regard to immunogenicity, which may form the basis of SAIRs seen with Synvisc

Golf

Mind vs.. Body

“Fatigue makes coward of us all.”

Vince Lombardi

“My mind is blank and my body is loose as a goose.”

Sam Snead

Following His Win on the 18th Hole in Response to How He Handles the Pressure

*“I just keep on breathing, focus on my target, and watch the ball
take off”*

David Toms
PGA Championship, August 2001

May the course be with you