ROWING INJURY PREVENTION

I. ON THE WATER: These injuries are relatively infrequent and can be classified into three major categories:

A. TRAUMATIC: This can be prevented by proper safety procedures already covered under safety guidelines (Crashes, crabs, capsizes...).

B. TECHNIQUE AND EQUIPMENT:
1. Excessive Reach: Upper thoracic/shoulder girdle strains and sprains
2. "Shooting the Slide": Improper coordination of catching and initiating the leg drive without stabilizing the lower back.
3. Excessive rounding of the back at the finish with relaxation of the low back, dumping the lumbar spine into the bottom of the boat at the finish.
4. Excessive wrist action in feathering the oar leading to lateral epicondylitis (aka. golfer's elbow). In scullers a similar condition called DeQuervain's Syndrome may affect the extensor tendons of the thumb. Improper handle size contributes as well.
5. Ischeal Teberosit bursitis affect the bursal sitting pads in the buttocks and may be the result of an improperly sized or shaped seat.
6. Blisters... probably the single most ubiquitous problem in rowers. Proper first aid measures should be undertaken once they develop so as to prevent infection and to promote healing. Protective taping of the hands during the healing phase is frequently of benefit. The causes of blister formation include:
   a) Initiating a new rowing program with hands which are relatively soft with little callous.
   b) Excessive callous build-up which results in friction points with callouses frequently torn from underlying tissue.
   c) Oversized handles on the person's oar or sculls. This results in inability to grasp the oar or scull with sufficient strength to prevent slippage when the power is applied.
   d) Cocking of the wrist during squaring the blade for the catch. When the power is applied the wrist flattens and drags the palm and fingers around the handle with a resultant friction which promotes blister formation.
7. Equipment can also have an effect:
   a) Oar handles too large for the individual (particularly lightweight women and juniors) may lead to excessive blister formation, lateral epicondylitis (aka. forearm tendonitis) or DeQuervain's Syndrome.
   b) Oar loading: Rowing with too long of oars with inappropriate inboard to outboard ratio may create too large an overload to the rower with resultant overuse and fatigue type injuries.

C. OVERUSE INJURIES: The majority of injuries seen on-the-water; these usually involve the "...itis": tendonitis, bursitis, myositis, etc. and are due to overuse. Early identification is the key factor in all of these. If treated in the initial phases they will usually be self limiting and resolved relatively quickly with the residual. Rest and ice massage are treatments of choice in the early phases, followed with passive range of motion exercises and eventually back into the range of motion against resistance.
1. General: Overuse injuries generally begin during one of two phases:
a) Initiation of a new phase of training for which the athlete is not adequately prepared (ie. beginning of fall workouts, winter off-the-water, spring two-a-day workouts). The best prevention here is to allow for a gradual adaptation or transition of the athlete's body to the new intensity.

b) Prolonged high intensity training with insufficient rest between workouts. The work period provides stress to the system with cellular trauma frequently being induced. The actual training adaptation occurs during the rest between workouts, without sufficient rest intervals the cellular micro trauma will eventually result in overt traumatic damage (eg. stress fractures). Warning signs to look for with potential overtraining include: An elevated resting heart rate relative to the day before; declining performances in the face of continuing training; constant fatigue, frequently associated with an inability to sleep. Frequently the individual athlete will not be aware of this problem since it is often of a gradual onset. It is important for the coach to keep track of appropriate signals when training the crew for a prolonged period of time.

2. Specific overuse injuries:

a) Rib stress fractures/ Intercostal strains. This is an injury which has its highest prevalence in the sport of rowing. Few other sports claim this particular injury. Little is known about the actual cause but one theory is that the compression of the chest by the bending of the thighs against the chest during the recovery when the athlete is taking a maximum inspiration places an abnormally high degree of stress into the rib cage. Repeated use of heavy bench pulls as part of the off-the-water training can reproduce the same types of stresses if done while holding the breath. The resultant stresses manifest themselves into either a strain of the intersected muscles, stress fractures of the rib itself, or a straining phenomenon of the rib/cartilage junction or rib/vertebral joint. The best prevention for this particular problem is for stabilization of the rib cage via development of the latissimus dorsi, Serratus anterior and shoulder girdle musculature.

b) Low Back Pain/ Generally these problems which develop on the water are of the sprain or strain variety. These are frequently seen in people just returning to rowing after a period of time off, with intense training while the athlete is in a fatigued state, rowing under conditions where there is a heavy load on the athlete (eg. rowing an eight by pairs, at the start of a race...).

Prevention of low back pain on the water is a multifactorial approach: sufficient flexibility (low back, hip extensors and hamstrings), strength and muscle endurance (again of the back extensors, rotators, abdominals and oblique muscles) as well as proper posture in the boat all play parts in the overall health of the low back. While none of us are training to be weight lifters, this is one area that lifting weights can be extremely beneficial. Specific lifts with free weights can have a large carry-over effect in teaching the proper connection between the leg drive and the handle as well as strengthening the low back extensors. Proper posture relies upon the art of the specific coach. Flexibility should be dealt with on a daily basis by each athlete.

Most back problems that develop in rowing are a result of off-the-water activities. These again can be subgrouped:

i. Moving equipment, taking boats on and off racks, placing boats in and out of the water. This is particularly true of boats being taken from the water when there is significant water IN the boat, and when the rower
is usually wet, cold and tired. Care should be taken to empty as much water as possible from the boat prior to lifting it as well as having a sufficient number of people available to move the boat. The best prevention with these maneuvers is to insure that proper lifting positions are maintained throughout.

ii. Land training which has been improperly designed and for which improper technique is utilized. It is important that imbalances which may exist in an individual rower are addressed with specific exercises (e.g. weak arms vs. legs, back relative to legs). It is even more important that the athlete receive proper instruction in how a particular exercise should be accomplished. Just as in a boat, technique is of the utmost importance. Leads should not be increased to the point where technique is compromised or injury will be a likely result.

c. Upper Back Injury/ This is usually the result of over-reaching in an attempt to "get long" at the catch, and/or a lack of upper body strength. The best prevention is proper technique without attempting to compensate for a lack of stature. The secondary preventative measure (particularly in women) is to concentrate a significant portion of the workout off-the-water to develop upper body strength.

d. Forearm Tendonitis/ Already discussed

II. OFF THE WATER
a. Moving equipment/ Already discussed

b. In the weight room/ Improper technique with inappropriate loads accounts for a wide variety of problems:
   1. Low back
   2. Shoulder (rotator cuff) tendinitises... especially seen with the heavy upright row and hang cleans. Very important to work the external rotators.

c. Road work (Running cross country and stairs)
   1. Shin Splints from running DOWN stairs; improper foot biomechanics—change shoes, consider orthotics, change running surfaces.
   2. Plantar fascitis, improper footwear
   3. Knee problems. Most frequently chondromalacia patella, improper tracking of the patella leading to abnormal wear patterns at the patella groove.

III. Insufficient Warm-up
The warmup, either pre-race or for the workout should be sufficient to raise the body core temperature 1 to 2 degrees. That equates to getting a good hard sweat going. If the delay between warm-up and event start is more than 3 to 10 minutes (depending on temperature, wind and clothing) then any warm-up engaged in will be lost. Cold muscles, tendons and ligaments are stiffer, less elastic and more prone to injury. The warm-up should go through a progressively increasing range of motion and intensity. In hot conditions the duration may be short, in colder conditions it will take longer. The best warm-up activity is that which is most specific to the event, rowing.
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