Injuries to the hand and fingers constitute 3–9% of all injuries in athletics (Rettig, 1998). Surgical repair of hand or finger injuries does not deter an athlete as much as does surgical intervention to an injured lower extremity, because the hand does not bear weight, and these injuries rarely remove the athlete from competition for long (Alexy & De Carlo, 1998). Return to play is often contingent on the effectiveness of the rehabilitation program and regaining function and mobility, but in the case of hand, and sometimes finger, surgeons might allow return to activity before the athlete fully regains strength or range of motion. The purpose of this article is to discuss five common injuries to the hand and fingers that might require surgery and to describe functional rehabilitation exercises to return the athlete to preinjury status.

**Key Points**

- Communicate with the athlete’s physician before initiating rehabilitation.
- Begin exercises with gentle range-of-motion movements.
- Use opposite hand or fingers to compare gains in range of motion, strength, and endurance.

**General Principals of Rehabilitation**

Before initiating rehabilitation after any surgery, it is imperative to review the operative report. This report will clearly indicate which structures sustained damage as a result of the injury, the extent of that trauma, and how they were repaired or reconstructed. Contraindications to an exercise program will become apparent from the report and should be discussed with the surgeon before the athlete initiates movement. Good communication with the surgeon is critical, because he or she was able to see firsthand the damage the injury caused and can tell you the amount of stress the repair will allow at any given phase of rehabilitation (Bryan & Kohnke, 1997).

All surgical-rehabilitation protocols begin with a protective phase during which edema, pain, and spasm are controlled. The purpose of this phase is also to encourage tissue healing and prevent fracture malunion, tendon rupture, or wound stretching (Michlovitz, 1999). This phase should include the use of compression wraps, elevation, and gentle retrograde massage to retard edema. After some surgical procedures the use of limited motion to facilitate normal movement and augment tendon gliding within the sheaths is allowed, but this will be physician prescribed. Most of these surgical repairs require the patient to wear a protective splinting device for 1–6 weeks. Care must be taken to ensure the cleanliness of the skin and wound under the splint, because skin necrosis and maceration commonly occur in the early phases of hand or wrist splinting (Hester & Blazer, 1999). This protective phase of rehabilitation is critical to proper healing and future full mobility of the
injured structure and lasts up to 4 weeks postsurgically (Michlovitz).

The second step of postsurgical rehabilitation is the active-motion phase, which begins as soon as the surgeon allows increased joint movement. Modalities including those involving hydrotherapy, heat, and muscle stimulation can promote normal tissue movement. Depending on the surgery, movement generally begins with passive, moving to active, and finally resistive motions. This phase can last up to 8 weeks after surgery (Michlovitz, 1999).

The final phase of rehabilitation includes strengthening and functional (sport-specific) movement and exercises. Generally, this phase begins between Weeks 4 and 8 and provides the athlete a functional means of exercise that is specific to his or her sport. Included in the strengthening and functional phase are resistance training and endurance and proprioception exercises designed to return the athlete to activity. It is important to keep the athlete's overall endurance and mental health in mind when rehabilitating any injury, and upper extremity injuries rarely deter from maintaining lower body strength or cardiovascular endurance. This article focuses on the strengthening and functional-rehabilitation phase of recovery for five specific postsurgical hand and finger injuries.

Gamekeeper's Thumb
(Ulnar Collateral–Ligament Sprain)

Gamekeeper's thumb, or skier's thumb, is caused by a forced hyperabduction of the thumb's metacarpophalangeal joint. Surgical procedures can involve simply repairing the torn ulnar collateral ligament (UCL) or fixing the avulsed bony segment to its proper anatomical location. On occasion, the UCL is disrupted to the point that the adductor aponeurosis wedges between the UCL and its distal insertion, forming a Stener lesion (Mastey, Weiss, & Akelman, 1997). In either case, the rehabilitation is similar (save for the potential metal fixation in the case of an avulsion).

One presurgical sign of this injury is the loss of the pinch grip as compared with that of the uninjured side. When considering rehabilitation, be sure to add skills that will challenge the athlete to regain the use of his or her pinch, such as picking up marbles with the thumb and forefinger (Figure 1). Hydrotherapy—use of a whirlpool or pool work—can facilitate active range of motion by using the natural buoyancy of water to assist movement. Use of a rice bucket is also advantageous to all planes of motion for the wrist, fingers, and thumb (Figure 2). A bucket as small as 1 gal, full of rice or beans, provides an excellent resistive medium for rehabilitation and strengthening. The athlete can grip a handful of rice, then release it, all while the hand is immersed in rice up through the wrist joint. Other resistive training exercises include using a grip dynamometer (Figure 3) and squeezing putty (Figure 4), both of which can build strength and endurance in the thumb and hand.

Figure 1 Marbles provide dexterity work for the fingers, as well as rebuild pinch proprioception and strength.

Figure 2 The rice bucket provides an excellent opportunity for resistive range-of-motion exercises for the fingers, hand, and wrist.