Joints of the upper extremity, in particular those of the hand and wrist, are rarely spared the negative effects of rheumatoid arthritis (RA). With increased use of biologic agents, splinting helps RA patients better manage their condition. Today, splinting is used on a short-term basis to manage symptoms. Splinting continues to be an effective tool and should be considered an integral part of a comprehensive treatment plan for arthritis patients. The fabrication of a custom-molded splint or the fitting of a prefabricated splint should be accompanied by patient education regarding the splint purpose and function, joint-protection techniques, and active/passive range-of-motion (ROM) exercises, when indicated. This article discusses several splints (custom and prefabricated) that have been most effective and appreciated by patients suffering from RA.

Wrist Splints
Considering the role of the wrist in daily function, it’s frequency of movement and the many articular surfaces involved, it is easy to appreciate the benefits to be gained by splinting an inflamed “active” wrist. Approximately 75% of individuals with RA have inflammatory involvement of the wrist joint.1

Figure 1. Prefabricated wrist splint.

Figure 2. Custom-molded gauntlet splint.
There are several, good quality, prefabricated wrist splints available on the market. These are constructed of fabric with an adjustable metal or plastic bar on the volar and/or dorsal surface of the wrist (Figure 1).

Proper fit, comfort and esthetics are of utmost importance in order to achieve splint-wearing compliance. A variety of styles, from different manufacturers, should be available for consideration during the fitting process.

Occasionally, a prefabricated wrist splint will not meet the needs of the client, and a custom-molded wrist splint will be fabricated. A custom-molded, gauntlet-style splint can be very helpful for some physically active clients with existing wrist-joint damage, limitation of wrist ROM and pain with movement (Figure 2). The gauntlet splint is worn during the day and permits clients to continue to function with very little discomfort. Some have been able to continue with physically demanding sports such as downhill skiing, tennis and cycling while wearing a gauntlet splint. Wearing wrist splints at night is generally only necessary when the client suffers from carpal tunnel symptoms, or for pain-management purposes.

A recent study of RA patients wearing prefabricated wrist splints reported a 32% reduction in visual analogue scale (VAS) pain scores.\(^2\) A well-supported and more comfortable wrist permits greater function in the otherwise uncompromised hand. Therefore, splinting of the wrist can be an effective component of treatment.

**Ulnar Deviation (Drift)**

Ulnar deviation (UD) is typical in patients with chronic synovitis at the metacarpophalangeal (MCP) joints due to the resulting expansion of the joint capsule, stretching of the surrounding ligaments, and attenuation of the extensor tendons. This results in an imbalance of power in the hand. The imbalance, compound-
ed by daily external forces typically in the ulnar direction, leads to an ulnar drift. Splinting can be effective in the treatment of this problem, while the most effective treatment is systemic management of the synovitis causing it.

However, some hand-based splints provide passive realignment of the affected structures, thereby correcting UD while the splint is being worn (Figure 3).\textsuperscript{3} Reduction of MCP movement, through splinting, may have the added benefit of reducing synovitis. In addition, client education, regarding proper joint positioning/alignment during activities of daily living (ADLs), can be reinforced by use of the UD splint. In my experience, splints used to correct or to prevent UD should be considered for short-term use on newly diagnosed RA patients, whose MCP inflammation has not yet come under adequate control through systemic management.

Night-time splinting is also an option for treatment of chronic MCP joint synovitis and/or UD. There is some indication that custom-molded hand and wrist resting splints, worn at night, can decrease hand pain, improving grip and pinch strength, and enhancing upper limb function (Figure 4).\textsuperscript{4} Prefabricated resting splints can also be considered for the inflamed “active” hand (Figure 5). For RA patients who have a number of active posterior interphalangeal (PIP) and/or MCP joints, night-time splinting should be considered early in the treatment process to assist with pain management. There is no clear evidence regarding the effectiveness of this splint in deformity prevention.

**PIP Splinting**

Chronic synovitis of the PIP/MCP joints can lead to characteristic swan neck and boutonniere deformities of the fingers. Reducible swan neck deformities can be easily treated with the fitting of plastic or metal oval-shaped finger orthoses. Orthoses commonly in use are Oval 8\textsuperscript{®} and Digisplints™ or Silver Ring™ Splints (Figure 6). These splints are lightweight, easy-to-wear and very effective in correcting PIP hyperextension and distal interphalangeal (DIP) flexion. They improve PIP joint stability and promote finger function.\textsuperscript{5} The fitting of these splints should be considered at the first sign of deformity and are generally very well accepted by the patient. Boutonniere deformities should also be splinted early in an attempt to reduce PIP joint inflammation and prevent further deformity. The same oval-shaped splints are used to treat this condition but need to be worn in a manner which blocks PIP joint flexion. As a result, these splints impede finger function and are often not considered practical for long-term wear. It should be noted, oval-shaped ring splints may not be appropriate for individuals who have frequent fluctuations in PIP joint inflammation.
Trigger Finger Splints

Tenosynovitis involving the flexor digitorum tendons often leads to a condition commonly referred to as "trigger finger." The increased volume of the inflamed flexor tendon inhibits its smooth excursion within the tendon sheath, and through the A1 pulley at the level of the MCP joint in the palm. A tendon nodule may or may not be present, but it is almost always tender upon palpation. With cases of advanced tenosynovitis, active triggering may no longer be present. However, a profound lack of active movement of the affected digit, with obvious swelling and a local increase in skin temperature, will likely exist. Continued use of the affected hand perpetuates the inflammation due to the friction created within the tendon sheath with active movement. Static splinting of the affected digit, with the MCP joint in approximately 15 degrees of flexion, gives the tendon an opportunity to rest and promotes a reduction in inflammation (Figures 7 & 8). Patients are instructed to wear the splint day and night for four to six weeks, and then gradually taper the wearing of the splint, as symptoms improve. The patient is also taught passive ROM exercises and told to ice the affected area. Trigger finger splints are easily fabricated and are an effective, non-invasive treatment option.

Conclusion

In summary, splinting RA patients’ hands and wrists can provide pain relief, support, joint protection, stability and reduced inflammation. Splints should be considered early on as part of a comprehensive treatment program, and can be instrumental in enhancing function for those living with RA.

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References: