Equine athletic activities can be some of the most exhilarating events in all of sports. Secretariat’s immortal Triple Crown campaign, the athleticism of jumping, the precision of dressage and the epic duel of Affirmed and Alydar in the 1978 Belmont (I was fortunate enough to witness this in person as a teenage railbird) come to mind as the best our industry offers. Unfortunately, equine orthopedic injury can occur in all types of equestrian activities. Injuries range from minor requiring minimal to no treatment or rest, to those that are career ending and/or life threatening. As an equine orthopedic surgeon I am routinely asked about our ability to deal with orthopedic injury. Most people are genuinely surprised at the types of injuries that are routinely treated and what can be expected after surgery. As one looks back in the evolution of equine orthopedic surgery advances in anesthetic techniques, the application of arthroscopic surgery, the use of plates and screws for fracture repair, and the development of specific implants for horses, have been watershed events. In order to understand this better it is important to reflect on the history of equine orthopedic surgery and realize that like human orthopedic surgery we are constantly advancing. These advances, coupled with the dissemination of knowledge regarding appropriate splinting of injuries and prompt referral for treatment have led to greater success in treating equine orthopedic patients.

Veterinary Specialization

In the 1960’s and 70’s techniques in equine anesthetic techniques, fluid therapy, internal medicine and surgery began to advance. The driving force behind these advances was the need for specialty training programs (specialty colleges) aimed at developing specialists in various fields of veterinary medicine. At present 20 specialty colleges are recognized by the American Veterinary Medical Association (AVMA) covering many different disciplines. Specialty colleges include anesthesiology, dermatology, internal medicine, neurology and surgery. In the United States in order to promote yourself as a specialist you must be certified by examination by one of these colleges. In the surgical field, 4 years of advanced training in an approved program by board certified specialists, publication of a manuscript in a referred journal, documentation of performance of specific surgical procedures and passing a certification examination are required prior to receiving board certification. All in all the process of developing specialty colleges with specific requirements has advanced veterinary medicine as a whole.

Anesthesia

Presently equine anesthesia is a commonplace and safe event. Horses are anesthetized on a daily basis for diagnostic procedures, colic surgery, laceration repair, and upper airway disorders, as well as elective and emergency orthopedic surgery. While equine health professionals and owners never take a cavalier attitude regarding anesthesia the complication rate related to anesthesia is actually very low. As a result of improved equine anesthetic safety equine surgery has become more accepted by clients. Complicated procedures requiring longer surgical times followed by smoother recovery periods are the direct result of safer anesthesia for horses.

Arthroscopic Surgery
Arthroscopic surgery is routine and now the state of the art for equine joint surgery. Arthroscopy first came on the scene in human surgery in the early 20th century thanks to the innovations of Swiss and Japanese physicians. It was widely forgotten until the 1970’s when it gained wide acceptance in Western surgical practice, particularly for knee surgery in humans. The development of arthroscopic surgery in the horse was pioneered by Dr. Wayne McIlwraith at Colorado State University, among others. During the 1980’s he and a whole generation of equine surgeons developed expertise in arthroscopic techniques with such success that today arthroscopic surgery is commonplace for horses of all activities with high rates of return to function. While the carpus, fetlock, hock and stifle are the joints most commonly operated on, the pastern, coffin joint and shoulder are also accessible arthroscopically. Arthroscopic surgery offers tremendous advantages compared to previously performed arthrotomies (open incision into a joint to remove a fragment). The minimally invasive nature of arthroscopy requires smaller incisions, usually requiring one or two sutures to close, thereby greatly reducing the risk of intra-operative infection. Another benefit of arthroscopic surgery is the improved outcome for athletic activity because of better access to damaged areas and virtual absence of scar tissue secondary to surgery. The use of the arthroscope improves joint examination and reduces surgical times allowing multiple joint procedures to be performed safely in one session. Arthroscopic surgery is performed to remove bone fragments from trauma or osteochondrosis, as an adjunct to fracture repair, for diagnostic purposes and in the treatment of infected joints. Depending on the nature of the problem return to athletic function can be up to 90% and with generally significantly reduced lay off times. Post operative comfort is usually excellent requiring minimal use of analgesics.

Application of Plates and Screws

The large size, occasional fractious nature of horses as well as the requirement to be standing and the risk of laminitis in the opposite limb due to pain put tremendous pressure on equine orthopedic surgeons to reconstruct fractured bones in horse for immediate and maximum comfort. In general fractures come in 2 categories. The first consists of stable fractures that require compression on the fracture with bone screws but no or minimal risk of limb instability, these include metacarpal condylar fractures and third carpal slab fractures. The second category consists of fractures that prevent weight bearing and are often inherently unstable or carry a high risk to become unstable; these include complete metacarpal, radial, olecranon and femoral fractures. The important distinction of these categories of fractures is that the former generally require only bone screws to compress the fractures, while the latter require bone plates to counteract forces that would make the leg unstable, cause discomfort and prevent proper bone healing and alignment. The plates and screws used to repair fractures today are generally designed for human patients and have been adapted to use in the horses. In addition there are some specific implants that are manufactured specifically for horse. Implants come in titanium and stainless steel. Although titanium implants are often used in humans they are weaker and less effective than stainless steel, making stainless steel the best, as well as most cost effective choice for repair of equine fractures. Bone screws are used to compress fracture fragments together or hold plates on bones. Bone plates are used to counteract forces that would tend to disrupt the fracture, improve comfort and allow bone healing under stable and comfortable conditions. Recently a new type of plate has started to be used in horse. The Locking Compression Plate or
LCP uses screws that lock into the plate as well as into the bone to provide a very stable environment for bone healing. Casts are sometimes applied after fracture repair in the horse but are not always necessary or appropriate. The use of a cast alone for equine fracture management is not generally indicated because of problems with cast sores, discomfort and secondary laminitis on the weight bearing limb.

**Continuing Education**

Each year many conferences are held to discuss equine medicine, surgery and welfare. These venues as well as professional journals are the main source for the dissemination of new knowledge regarding equine fracture management. Each year in Columbus, Ohio the AO-ASIF course is held to instruct veterinarians (chiefly surgical residents) of state of the art methods of fracture repair. This year is the 37th edition of this course in the United States. This is the longest running course on AO-ASIF (including for physicians) in the United States. Meetings such as the American College of Veterinary Surgeons and the Annual Meeting of the American Association of Equine Practitioners are also used to disseminate information regarding equine orthopedics. The willingness of veterinarians to share their knowledge and listen to their colleagues has led to great advancements in equine orthopedic surgery specifically and horse health in general.

Equine orthopedic surgical advances are the result of a multidiscipline approach to horse welfare spearheaded by specialty colleges of the AVMA, and supported by state and national equine organizations such as the American Association of Equine Practitioners. The application of research funded by organizations such as the American Quarter Horse Association and the Grayson-Jockey Club Foundation supports the advancement of new knowledge. The utilization of equipment first developed for surgery in humans such as the arthroscope and plate / screw systems by innovative equine surgeons applies the knowledge gained through research. The emergence of private companies to develop and supply equipment and implants for use specifically in horses allows equine surgeons the opportunity apply this knowledge and skill for their patients. Many techniques used today would be not recognized by equine surgeons 30 years ago and advances in equine orthopedic surgery continue in a deliberate fashion to provide the best in welfare for patients and quality and value for clients.