Acute Trauma Experience at Ski Resort Emergency Rooms

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Orthopedic problems constitute approximately 10 percent of office visits in family practice. Orthopedic patient visits are about evenly divided between chronic musculoskeletal problems (low back pain, arthritis, bursitis) and acute injuries (sprains, strains, fractures, and dislocations).[1] Residency education has traditionally included two months of training to prepare the family physician for this important part of practice. Typically, one month is spent on an inpatient orthopedic ward, with emphasis on management of complex surgical problems. A second elective month is usually spent in an orthopedist's office evaluating nonacute musculoskeletal problems. Acute orthopedic trauma experience is usually gained during an emergency room rotation, where it is unfortunately diluted by the emphasis placed on other medical and surgical emergencies. As a result of this traditional approach, family practice residency graduates often feel inadequately trained in orthopedics.[2]

In an attempt to fill this educational gap, a group of family physicians in Vail, Colorado, has developed an elective in acute orthopedics for third-year family practice residents. Residents spend one month during ski season (November through April) in emergency rooms at the base of Vail Mountain and Copper Mountain resorts. The majority of emergency room visits during these months are ski-trauma related, resulting in a high incidence of acute orthopedic injuries.

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The Curriculum

Each resident works under the direct supervision of the full-time staff family physicians at the medical facilities. Teaching emphasizes actual participation by the resident, including history-taking, physical examination, x-ray evaluation, reduction of fractures and dislocations, and cast application. To complement the emergency room experience, a "self-teaching manual" has been designed with case questions and reading assignments from a practical orthopedic textbook,[3] selected journal articles, and x-ray teaching files. The self-teaching assignments include review of the following 12 areas:

1. General orthopedic anatomy and examination
2. Orthopedic radiology
3. Orthopedic anesthesia
4. Casting techniques and appliances
5. Shoulder and upper arm injuries
6. Elbow, forearm, and wrist injuries
7. Hand and finger injuries
8. Knee injuries
9. Leg injuries
10. Ankle and foot injuries
11. Spine and pelvis injuries
12. Rehabilitation from acute injuries

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Table 1. Representative One-Month Elective Experience in Acute Orthopedics (March 1981)

Injuries Encountered	Number
Sprains/Strains	
Knee	
Surgical*	50
Nonsurgical**	40
Ankle	12
Wrist/hand/finger	4
Shoulder/elbow	2
Neck	2
Vertebral column below neck	2
Foot/toe	0
Fractures/dislocations	
Leg	
Tibia	23
Fibula	5
Tibia and fibula	21
Ankle	
Lateral malleolus	20
Medial malleolus	1
Bi- or trimalleolar	3
Shoulder dislocation	9
Humerus fracture	8
Clavicle	6
Vertebral column or pelvis	6
Radius/ulna	3
Hand/foot	3
Skull/facial bones	2
Ribs	2
Phalanges	1
Femur	1
Total (193 patients)	226

*Complete tear of collateral or cruciate ligament or acute hemarthrosis for which arthroscopy was recommended
**Ligamentous injuries treated by immobilization only

The Experience

Each resident is asked to keep a log of his or her patient encounters. This log helps design special review sessions covering orthopedic problems that the resident saw less frequently during the elective. Residents are also encouraged to keep the data to document their orthopedic experience for future hospital privilege applications.

Table 1 outlines a typical resident's experience in March 1981. During a four-week rotation the resident was involved in the evaluation and care of 193 patients with 226 acute orthopedic injuries. The distribution of injuries (relatively high incidence of knee, lower leg, ankle, and shoulder injuries) correlates well with general experience in ski trauma and with statistics reviewed elsewhere in the literature.[4] Though somewhat skewed by the single-sport origin of the injuries, the general principles of orthopedics learned by the resident can easily be extended to the orthopedic problems encountered in the more typical family practice setting.

Conclusion

The ski resort emergency room provides an excellent training site for family practice residents. In this setting, a curriculum that provides "hands-on" teaching, self-instruction, x-ray and case review sessions, and directed reading creates a high-volume and well-balanced elective experience. Graduates of the intense one-month elective indicate that they feel much better prepared for managing acute orthopedic trauma in their own practices. Observing family physicians and orthopedic surgeons working together also helps the resident develop judgment needed for establishing sound orthopedic referral patterns in future practice.[5]

The success at two Colorado ski resorts suggests that family practice residencies in other parts of the country should look to the mountains for developing elective experiences in acute orthopedics.

Acknowledgment

Dr. Michael J. Monahan compiled the data during his elective rotation in March 1981.

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