like throwing and striking) is not conclusive. Biomechanics research over decades has tried to clarify the kinetic sources of complex 3-D motions. Distal musculature is simply too small and weak to create the large angular accelerations just before release in throwing, so passive dynamics (transfer of force or power across joints) clearly contributes to multisegment motion. What is controversial is whether the slowing proximal segment speeds up the distal segment or the acceleration of the distal segment slows the proximal segment (Feltner, 1989; Hirashima et al., 2008; Hong et al., 2001; Naito and Maruyama, 2008; Phillips, Roberts, and Huang, 1983; Putnam, 1991). The most recent work supports the theory of proximal to distal transfer of torques across joints (Hirashima et al., 2008; Naito and Maruyama, 2008) as the mechanism of passive dynamics of high-speed movements. Currently biomechanics research is not in a position to provide clear guidance for coaches trying to improve coordination in throwing and other sequentially coordinated skills.

QMD Demonstration 6.2

Observe the video clips of tennis ground strokes in QMD Demonstration 6.2 in the web resource at www.HumanKinetics.com/QualitativeDiagnosisOfHumanMovement. Use a gestalt observational strategy to get an overall feel for the movement and identify the most obvious movement weaknesses and strengths. If you are not familiar with tennis, you may need to review the critical features of ground strokes. Observe the performances again and check to see if any preceding actions contributed to the weakness you observed. Compare your results to another student's diagnosis.

PRACTICAL APPLICATIONS

Deciding on Focus

One of your best infielders is having trouble creating speed on her overarm throw. Fast batters and long throws to first base will be problems unless you can improve the speed of release. This player has good technique on the major critical features of the overarm throw. This leads you to believe that improvement will be difficult and will require improved coordination or conditioning. (See chapter 9 for the critical features of the overarm throw.) How do you decide if conditioning or throwing technique should be the focus of intervention?

Maximizing Improvement

Another rationale for prioritizing intervention is to select intervention that can be expected to maximize improvement (Hay and Reid, 1982, 1988). In 1988 Hay and Reid proposed that diagnosing performance is a two-step process of excluding faults that appear to be effects of other faults and prioritizing the faults that are left based on the improvement that can be expected in the time available. On the surface this seems like a logical approach to selecting corrections. The problem, however, is that it is not clear how to judge which correction leads to the most improvement and what time frame should be used.

Prioritizing to maximize improvement is probably a good approach, but research is needed to determine what factors are most significant in both short-term and long-term improvement. One technique change could create a lot of initial improvement but in the long run make it difficult to achieve advanced levels of performance. On