• In treating balance impairments with training programs, including T'ai chi, progressive drills, and computerized balance devices, the specific demands of compensatory stepping or grasping reactions that are found to cause difficulty (e.g., lateral weight transfer, rapid foot or arm movement, crossover steps) should be addressed. These skills can be addressed through unpredictable exercise conditions, such as the use of dense foam or having an outside perturbation such as a partner pushing or pulling the patient off balance. Cautious progression toward uniped motions is indicated, especially because this position is experienced by most older persons before falling.

• When training balance control, stepping and grasping reactions are not just strategies of last resort. These strategies can be initiated very early, well before the center of mass is near the stability limits of the base of support. One goal of balance training may be to reduce the incidence of stepping and grasping strategies as posture stability and balance are increasingly challenged. Display 20-8 provides examples of progressive uniped balance tasks. The goal of the exercise would be to balance on one limb, with the progressive self-induced perturbations (e.g., arm movements), without using a grasping or stepping strategy to prevent a fall.

• For anteroposterior perturbations, the fixed-support ankle strategy (i.e., ankle muscular response to arrest the motion of the center of mass) may provide an early defense against destabilization, followed by a stepping or grasping strategy. When using an anteroposterior destabilizing force (e.g., uniped with sagittal arm movements), expect the ankles to provide the stabilizing force to maintain postural stability.

• A fixed-support hip strategy (i.e., hip muscular response to arrest the motion of the center of mass) may be limited to a special task condition that precludes the option of stepping or grasping. Use of a fixed-support hip strategy would be inappropriate under normal conditions.

• Lateral destabilization complicates the control of compensatory stepping because of anatomic or physiologic restrictions on the lateral lower extremity movement and the associated prolonged uniped balance demand. Aging appears to be associated with increased difficulty in controlling lateral postural stability, which may be of specific relevance to the problem of lateral falls associated with hip fractures. Exercises designed to provide frontal-plane destabilizing forces (e.g., uniped with frontal-plane arm movements) would especially be indicated in the aging population. Side-stepping strategies for recovery to prevent a fall are important skills for this population to learn.

• Assistive devices can aid the individual in balance control before developing functional balance control through a comprehensive training program. Use of a cane in the nondominant hand has reduced the rate of falls by up to fourfold. Cutaneous information from fingertip contact, through a cane, and from a stable surface is more powerful than vision in stabilizing sway in stance.