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www.BraceLab.com
Support@BraceLab.com

WHY GAIT QUALITY MATTERS IN ANKLE RECOVERY

by Jerry Ditz, DPT, Dip. Osteopractic, Cert. SMT, Cert. DN

Clinicians may spend significant time deciding between immobilization options like a walking boot or an ankle brace when an ankle injury occurs. Such a decision is critical — but it's only half of the equation. Once the type of immobilization has been selected, the next clinical priority is to preserve as normal a gait as possible. This can be challenging because pain and limited weight bearing often cause patients to limp or compensate in ways that lead to hip, knee, or back pain.

Consider crutches. More than a temporary walking aid, crutches, when used correctly, are the bridge between immobilization and full recovery. They allow patients to unload weight on their ankle to reduce pain, keeping gait safe and symmetrical. Unfortunately, too often crutches are handed out without proper instruction, allowing patients to develop faulty mechanics that slow their healing.



Why Normal Gait Matters

Abnormal gait patterns are more than a cosmetic issue. Compensations such as hopping, excessive toe-out, or uneven step length changes loading patterns throughout the body. Walking boots, for example, are known to create limb-length discrepancies and alter kinetics, which can contribute to secondary pain in the low back, hips, or knees.

Technologies That Support Proper Gait Training

1. Biofeedback Insoles and Mats

Patients are notoriously poor at estimating partial weight bearing. Pressure-sensing insoles and mats provide real-time feedback of a beep, vibration, or visual cue when the patient exceeds the prescribed load. In controlled studies, this improved patients' ability to stay within weight-bearing targets compared to instruction alone.

2. Smart/Instrumented Crutches

Embedding sensors directly into crutches is an emerging technology. These devices measure ground reaction forces and gait patterns, providing data to the clinician as well as patient feedback. Early trials show they can detect and help correct common gait error patterns when using crutches.

3. The Mirror Method: A Low-Tech Solution for Toe-Out

Technology does not need be digital. For patients who compensate with excessive toe-out after ankle injury, a full-length mirror can be a powerful training tool.

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Research shows that frontal-plane mirror feedback can change gait patterns and influence gait adaptation and pattern retention. Mirrors have also been used successfully in running retraining for patellofemoral pain, making them a practical, low-cost clinic option.

Clinic Setup

- **Mirror placement:** Position a full-length mirror slightly anterior lateral to the patient so they can see both feet and knees.
- **Floor markers:** Place two strips of tape on the floor:
  1. **Neutral "12 o'clock" line** – straight ahead, representing ideal foot alignment.
  2. **Baseline toe-out line** – showing where the patient's foot naturally falls before correction.

Step-by-Step Process

1. **Baseline observation**
   - Have the patient walk 10–15 steps without crutches at a natural pace.
   - Observe the degree of toe-out, compensation, and record pain level.
2. **Introduce the visual cue**
   - Instruct the patient to focus on kneecap-to-second toe alignment while looking in the mirror.
   - Verbal cue: "Line your kneecap with your second toe, pointing toward the 12 o'clock tape."
3. **Practice with guidance**
   - Patient repeats walking while adjusting foot placement
   - Therapist intervenes only if deviation is excessive, reinforcing patient self-correction.
4. **Progressive reduction of feedback (fading cues)**
   - Encourage the patient to feel alignment rather than rely solely on the mirror.
   - First remove the baseline tape, leaving the neutral line.
   - Gradually withdraw the mirror to eliminate external cues.
   - If the patient is unable to maintain proper alignment or has a noticeable limp, provide crutches.
5. **Integration with crutches**
   - Begin with partial weight-bearing (3-point gait pattern).
   - Emphasize a smooth step-through sequence while maintaining foot alignment.
   - Progress to full weight-bearing as pain allows.

Conclusion

Once the use of a brace vs. a boot is decided, clinicians must ensure patients maintain a safe, functional gait during recovery. If a patient is unable to walk with a normal gait, crutches should be provided. Crutches should be viewed as a tool to normalize gait. Proper instruction is essential to maximize the benefit of crutches.

Whether using advanced biofeedback systems, smart crutches, or something as simple as a mirror, the goal is the same: to unload gait to reduce pain, protect the healing ankle, and preserve normal gait. By focusing not only on the immobilization device but also on how patients walk within it, clinicians can prevent secondary complications and help patients return to function faster.

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