

What Is 3D Body-Weight Support?

Robotic body-weight support, or BWS, is a rehabilitation technology that safely offloads a portion of a patient's weight during therapy. By using dynamic body-weight support, the patient feels lighter which lets them attempt movements such as standing, walking, turning, climbing stairs that would otherwise be too difficult or too risky to practice. A “3D” robotic body-weight support system takes that idea further by supporting the patient in every direction across an open space, rather than along a single fixed path.

What is body-weight support?

When someone is recovering from a neurological injury such as a stroke, spinal cord injury, traumatic brain injury, or orthopedic injuries such as joint replacement or unstable fractures, relearning how to move is difficult and physically demanding, for both the patient and the clinician. Full body weight can be too much to manage safely, and the fear of falling often keeps patients from trying at all.

In a robotic BWS system, a harness is placed around the patient then attached to a robot which offloads a portion of their weight. If a clinician offloads 40 pounds, for example, the patient feels 40 pounds lighter throughout the activity. That reduction makes demanding movements achievable.

Adding the third dimension

Standard robotic body-weight support systems move along an overhead track so the patient can navigate the fixed track path.

A true three-dimensional system removes the fixed path altogether. The robot moves with the patient wherever they go — forward, backward, side to side, turning, and in circles — across a large open workspace. This is what makes it possible to rehearse the messy, multidirectional movements of everyday life: circling a table, reaching across a counter, or side-stepping an obstacle.

How a 3D BWS system works

A 3D body-weight support system, such as [ZeroG 3D](#) combines three capabilities that work together during a session:

1. Dynamic body-weight support

The system offloads a set portion of the patient's weight and holds it steady as the patient rises and lowers. Constant support through the most demanding phase of a movement — such as getting up off the floor — means the level of assistance never fluctuates mid-movement. Clinicians can adjust how much weight is offloaded to progress the challenge from one session to the next.

2. Three dimensional tracking

Omnidirectional tracking moves with the patient in any direction, supporting walking, turning, side-stepping, and complex multidirectional tasks across the workspace. Clinicians can shape the tracking to the session — locking it into a straight-line path, opening it to full 3D for free walking, or defining a custom path or box for task-specific work. ZeroG 3D tracks patients moving up to 5 mph in any direction, fast enough for full-effort gait, sport-specific drills, and high-intensity training.

3. Fall protection

Fall protection can engage by distance or by speed, configured for each patient and each activity. A clinician can set the allowable fall distance down to as little as an inch, or engage protection based on the speed of a fall like a seatbelt. The patient has the ability and confidence to focus on the movement itself, while clinicians can step back and let their patients attempt activities that wouldn't be safe with hands-on guarding alone.

What it makes possible in therapy

Bringing these capabilities together in an open workspace changes what a therapy session can look like:

- Patients can practice multidirectional movement — lateral agility drills and dynamic stepping in every plane — rather than only walking in a straight line.
- Clinicians can safely introduce reactive balance work, having patients navigate obstacles and practice recovery responses.
- Everyday tasks, from rising out of a chair to moving through a simulated home kitchen, can be rehearsed within continuous support.
- For pediatric patients, therapy can be structured as play, keeping young patients engaged while they move freely and explore their space.
- Because falls are always caught, patients gain the confidence to attempt tasks they would never otherwise risk.

Where it is used

Three-dimensional body-weight support is used in hospital rehabilitation units, outpatient clinics, children's hospitals, and specialized neurological and spinal cord injury centers — anywhere clinicians work on gait, balance, and functional independence with patients who benefit from safe, supported movement. In pediatric rehabilitation, three-dimensional tracking can be especially important in allowing unrestricted movements which helps facilitate the development of natural motor patterns.

ZeroG 3D at a glance

ZeroG 3D has been used in clinics since 2023. It builds upon Aretech's almost 20 years of experience in dynamic body-weight support and fall protection.

That foundation shows up in how the system works day to day: dynamic support that stays steady through a movement, omnidirectional tracking that follows the patient across an open workspace, and fall protection that can be tuned to each patient and activity. An optional ecosystem — including the Arcade 3D interactive games, an extended workspace, a second robot, and a range of harnesses — lets a clinic tailor the system to its program and grow it over time. Each system is built by hand in the USA and installed by Aretech's own crews from planning through final handoff.