The Road to Recovery:  
Locomotor Training for the Brain Injury Population

The Road Ahead  
Why is exercise important for patients with TBI?

* Increases expression of BDNF1
* Increases capacity to learn and remember1
* Protection against ischemia and neurotoxicity3,4
* Reduces depression2
* Inhibits BAX and BCl-2 proteins5

On the Road  
Therapeutic exercise versus task specific practice:

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| **Therapeutic Exercise** | **Task Specific Practice** |
| -NDT  -Bobath training  -PNF  -Muscular strengthening  -Range of motion  -Balance training  Only effective at producing the specific item practiced. Ex: Matyas et al found increases in strength after a strengthening program, but no improvements in gait outcomes7 | The literature is clear that when performing gait training in the rehab setting, it should be task-specific in nature6,7,8 This task practice should be9,10:  -Relevant to the patient’s goals and context  -Random practice  -Repetitive  -Massed practice  -Targeting whole task completion  -Overlaid with positive feedback  -High intensity |

Are We There Yet?  
Methods of Gait Training:

1. Body Weight- Supported Treadmill Training11,13,14,15
2. Conventional Over-ground Gait Training11,12
3. Rhythmic Auditory Stimulation16,17,18,19,20,21,22
4. Aquatic Gait Training25,262,27
5. Robotic Assisted Gait Training12,13,23,24

Destination  
Outcome Measures:

-For Current Ambulators: 10-meter walk test, 6-minute walk test, gait speed, step length, step width, Missouri Assisted Gait (MAG) scale28,29,30,31,32,33,15

-For those unable to ambulate: Functional independence measure, barthel index34,35