Concept Review Follow Up

- Handlebar swivel mechanism
  -if handlebars are tilted to a steep angle the handlebars are not swiveling in the same plane as a real bike
  Solution: Pivoting handlebars proved to be an undesirable feature causing too much instability. If used, swivel point will be placed above the hinge angle adjustment.

- Handlebar swivel mechanism
  -need a stop that prevents handlebars from swiveling too far
  Solution: Pivoting handlebars proved to be an undesirable feature causing too much instability. If used, pivot mechanism will have tabs/hard stops.

- Tilt mechanism for handlebars
  –find one-handed device to adjust the tilt
  Solution: Rotary hinge with cable release manufactured by Adjustable Locking Tech.

- Friction pedal exerciser
  -life span of pedal mechanism (make it interchangeable)
  Solution: Company (Carex) claims pedal exerciser has a lifetime warranty.

- Base support legs
  -Legs are a trip hazard to PT, standing platform suggested
  Solution: Anti-fatigue mat to have cut out around back support legs.

- Hand/foot restraint that can be easily disengaged
  - Velcro gloves
  - Velcro strap mount
  - Button release

  Solution: Rubber pedal straps on foot, patient able to pull foot out if necessary. Hand straps to be attached to handlebar by Velcro to enable rip-away.

- Protecting steel from corrosion
  Solution: Powder coating/paint/rust preventative coating.

- Door Knob - torsion spring concept
  -Forces needed
  -Non-linear?
  Solution: Concept was determined to be unfeasible as load bearing requirement meant Torsion Springs would be too long.

- Research possibility of using a coil over shock that is pre-compressed as our spring mechanism.
  -Allows it to be easily replaced
  Solution: Manual preload adjustment of coil over shock was determined to be undesirable to customer.

- Create a "hybrid" (combination) of concepts that we have already created.
  Solution: The combination of Torsion Spring and Pulley system was determined to be unfeasible as load bearing requirement meant Torsion Springs would be too long.

- Shock Concept
  -Install bushing/bearing at bottom of worm gear to help support and reduce wear at piston end.
  -Force needed to adjust spring compression.
  Solution: Manual preload adjustment was determined to be undesirable to customer.

- Pulley Concept
  -Dual Winch to eliminate pulling at angle.
  Solution: Manual preload adjustment was determined to be undesirable to customer. Two electrical winches would exceed budget constraints. Single winch concept involving pulleys was proven to be feasible.

- Feedback System
  -Pick a sensor and begin design of high risk audio concept.
  Solution: Inclinometer sensor chosen. Preliminary piece by simulations begun.

- Feedback System
  -Test bike angle range on current PT patients.
  Solution: It was determined that modeling range of tilt would be more accurate than using angle sensor on patients using current non-tilting stationary bike. Design will accommodate an overestimated tilt range. Calibration of tilt angles will be done during testing of final built concept.