

# UPMC SPORTS MEDICINE CONCUSSION PROGRAM

# GUIDELINES FOR POST-CONCUSSION REHAB

Micky Collins, Ph.D., Sean Learish, PT, Mark Lovell, Ph.D., et al. (updated 3/27//08)

Stage of Rehabilitation	Physical Therapy Program	Recommended Exercises
<p><b>Stage 1</b></p> <p><u>Target Heart Rate</u> : <b>30-40% of maximum exertion</b>                      *(Max HR- Rest. HR X .30)+Rest. HR  <u>Recommendations</u>: exercise in quiet area (treatment rooms recommended); no impact activities; balance and vestibular treatment by specialist (prn); limit head movement/ position change; limit concentration activities; 10-15 minutes of light cardio exercise.</p>	<p>-Very light aerobic conditioning</p> <p>-Sub-max isometric strengthening and gentle isotonic</p> <p>-ROM/ Stretching</p> <p>- low level balance activities</p>	<p>Stationary Bike; Seated Elliptical; UBE; Treadmill walking: (10-15 min)</p> <p>Quad sets; Ham sets; (UE) light hand weights; resistive band rowing; (LE) SLR's, Resistive bands ankle strengthening</p> <p>Cervical ROM exercise, Trap/LS stretching, Pec stretching, Hamstring stretching, Quad stretching, Calf stretching</p> <p>Romberg exercises (feet together, tandem stance, eyes open-closed); single leg balance</p>
<p><b>Stage 2</b></p> <p><u>Target Heart Rate</u> : <b>40-60% of maximum exertion</b>                      * (Max HR- Rest. HR X .40)+Rest. HR  <u>Recommendations</u>: exercise in gym areas recommended; use various exercise equipment; allow some positional changes and head movement; low level concentration activities (counting repetitions); 20-30 minutes of cardio exercise.                      (stage 1 exercises included, as appropriate)</p>	<p>-Light to Moderate aerobic conditioning</p> <p>-Light weight PRE's</p> <p>-stretching (active stretching initiated)</p> <p>-Moderate Balance activities; initiate activities with head position changes</p>	<p>Treadmill; Stationary Bike; Elliptical (upright or seated); UBE; (20-25 min)</p> <p>Light weight strength exercise (Nautilus style equipment); resistive band exercises (UE/LE); wall squats, lunges, step up/downs</p> <p>Any stage 1 stretching, active stretching as tolerated (Lunge walks, side to side groin stretching, walking hamstring stretch)</p> <p>Romberg exercises, VOR exercise (walking with eyes focused with head turns); Swiss ball exercises; single leg balance exercises</p>
<p><b>Stage 3</b></p> <p><u>Target Heart Rate</u>: <b>60-80% of maximum exertion</b>                      *(Max HR- Rest. HR X .65)+ Rest HR  <u>Recommendations</u>: any environment ok for exercise (indoor, outdoor); integrate strength, conditioning, and balance/proprioceptive exercise; can incorporate concentration challenges (counting exercises, MRS equipment/ visual games)                      (stage 1&amp;2 exercises included, as appropriate)</p>	<p>-Moderately aggressive aerobic exercise</p> <p>-All forms of strength exercise (80% max)</p> <p>-active stretching exercise</p> <p>-Impact activities running, plyometrics (no contact)</p> <p>-Challenging proprioceptive/ dynamic balance (integrated with strength and conditioning); challenging positional changes.</p>	<p>Treadmill (jogging); Stationary Bike; Elliptical (upright or seated); UBE (25-30min)</p> <p>Resistive weight training including free weights; MRS/ Functional Squat; Dynamic Strength activities</p> <p>Active stretching (Lunge walks, side to side groin stretching, walking hamstring stretch)</p> <p>Initiate agility drills (zig zag runs, side shuffle, ect...), Jumping on tramp/blocks.</p> <p>Higher level balance activities: ball toss on plyo floor, balance discs, trampoline; squats and lunges on BOSU ball</p>
<p><b>Stage 4 (Sport Performance Training)</b></p> <p><u>Target Heart Rate</u>: <b>80% of maximum exertion</b>                      *(Max HR- Rest. HR X .80)+ Rest HR  <u>Recommendations</u>: continue to avoid contact activity, but resume aggressive training in all environments</p>	<p>-Non-contact physical training</p> <p>-Aggressive strength exercise</p> <p>-Impact activities/ plyometrics</p> <p>-Sport Specific Performance Training</p>	<p>Program to be designed by Sport Performance Trainers</p> <p>Graded Treadmill testing                      Interval training                      Sport Specific drills/training</p>
<p><b>Stage 5 (Sport Performance Training)</b></p> <p><u>Target Heart Rate</u>: <b>Full exertion</b>  <u>Recommendations</u>: Initiate contact activities as appropriate to sport activity; full exertion activities for sport activities</p>	<p>-Resume full physical training activities with contact</p> <p>-Continue Aggressive strength/ conditioning exercise</p> <p>-Sport specific Activities</p>	<p>Program to be designed by Sport Performance Trainers</p> <p>Practice and game intensity training                      Sport specific activities</p>

\* Target Heart Rates calculated by Karvonen's equation : Max HR (220-Age) – Resting HR X Target Percentage + Resting HR