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Technical Abstract:

Aerobic Capacity and Power Responses to a Cross-Training Program
Incorporating the Precor EFX Elliptical Trainer

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Synopsis: This case study examined effects of a six-month cross-training program on VO₂max and fractional utilization of VO₂ at ventilatory threshold in an injured, trained, female distance runner.

Assumption: A general assumption is that injured athletes experience decrements in aerobic fitness capacity during periods of injury and rehabilitation.

Situation: The subject suffered a recurrent vertical stress fracture of the posterior tibia and was advised to refrain from running for 20 weeks.

Protocol: Exercise testing was performed pre-injury, during and after rehabilitation utilizing the Cosmed K4B2 gas exchange system. During the rehab program, a major portion of the cross training was performed on the Precor EFX machine (approximately two-thirds), while pool running and cycling comprised the remainder of the aerobic training. After 20 weeks, running was gradually re-introduced as cross training was reduced. The program also incorporated medical management, physical therapy, biomechanics, resistance training with a special emphasis on core strengthening and nutrition.

Results: Pre-injury VO₂max was 68ml/kg/min by the modified Astrand protocol; ventilatory threshold VO₂ was 51ml/kg/min during the inclining test and 55ml/kg/min during the level test (the vLT test). Threshold pace pre-injury was 6:40 minutes/mile. Post-rehab VO₂max was 76ml/kg/min using the modified Astrand protocol and ventilatory threshold VO₂ was 64ml/kg/min during the inclining test and 66ml/kg/min during the level test (the vLT test). Threshold pace post-rehab was 6:18 minutes/mile.

Conclusion: This case demonstrates the potential for improving running-specific fitness without exacerbation of an overuse injury during the rehabilitation period by adopting a sophisticated cross-training program.

About Emily Cooper, MD: Dr. Cooper is the medical director of Prevention Solutions and is certified in Advanced Cardiac Life Support (ACLS), a member of the American College of Sports Medicine (ACSM), Washington Academy of Family Practice, and American College of Preventive Medicine. She is board-certified in family practice and sports medicine.

About Seattle Performance Medicine: Performance Medicine is the most technologically advanced physical performance testing medical clinic in the U.S. Our Exercise Testing and Medical Coaching services are premium level programs that offer our clients the best in medical care and fitness evaluation.