CLAIMS

1. A method for enhancing physical performance comprising performing a remote ischemic preconditioning regimen on a healthy subject prior to a maximal physical activity.

2. The method of claim 1, wherein the remote ischemic preconditioning regimen is performed within 24 hours of the physical activity.

3. The method of claim 1, wherein the remote ischemic preconditioning regimen is performed within 2 hours of the physical activity.

4. The method of claim 1, wherein the remote ischemic preconditioning regimen is performed within 20 minutes of the physical activity.

5. The method of any one of claims 1-4, wherein the remote ischemic preconditioning regimen comprises 1, 2, 3, 4, or 5 cycles of supra-systolic pressure and reperfusion.

6. The method of any one of claims 1-4, wherein the remote ischemic preconditioning regimen comprises at least four cycles of supra-systolic pressure and reperfusion.

7. The method of any one of claims 1-6, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute up to 20 minutes of supra-systolic pressure.

8. The method of any one of claims 1-6, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute, about 2 minutes, about 3 minutes, about 4 minutes, or about 5 minutes of supra-systolic pressure.

9. The method of any one of claims 1-8, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute up to 20 minutes of reperfusion.

10. The method of any one of claims 1-8, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute, about 2 minutes, about 3 minutes, about 4 minutes, or about 5 minutes of reperfusion.

11. The method of any one of claims 1-6, wherein the remote ischemic preconditioning regimen comprises cycles of 5 minutes of supra-systolic pressure and 5 minutes of reperfusion.

12. The method of any one of claims 3-11, wherein the supra-systolic pressure is a pressure that is at least 15 mmHg above systolic pressure.

13. The method of any one of claims 1-12, wherein the remote ischemic preconditioning regimen is performed on an upper limb.

14. The method of any one of claims 1-12, wherein the remote ischemic preconditioning regimen is performed on a lower limb.

15. The method of any one of claims 1-14, wherein the healthy subject does not experience an increase in lactate production as a result of the maximal physical activity.

16. The method of any one of claims 1-15, wherein the healthy subject is human.

17. The method of any one of claims 1-16, wherein the method causes about a 1.5% improvement in maximal physical activity.

18. A method for enhancing physical performance comprising

performing a remote ischemic preconditioning regimen on a subject having a cardiovascular condition prior to a physical activity in order to enhance performance of the physical activity.

19. The method of claim 18, wherein the cardiovascular condition is angina.

20. The method of any one of claims 18 and 19, wherein the remote ischemic preconditioning regimen comprises 2, 3, 4, or 5 cycles of supra-systolic pressure and reperfusion.

21. The method of any one of claims 18-20, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute up to 20 minutes of supra-systolic pressure.

22. The method of any one of claims 18-20, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute, about 2 minutes, about 3 minutes, about 4 minutes, or about 5 minutes of supra-systolic pressure.

23. The method of any one of claims 18-22, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute up to 20 minutes of reperfusion.

24. The method of any one of claims 18-22, wherein the remote ischemic preconditioning regiment comprises cycles comprising about 1 minute, about 2 minutes, about 3 minutes, about 4 minutes, or about 5 minutes of reperfusion.

25. The method of any one of claims 18-20, wherein the remote ischemic preconditioning regimen comprises cycles of 5 minutes of supra-systolic pressure and 5 minutes of reperfusion.

26. The method of any one of claims 18-20, wherein the remote ischemic preconditioning regimen comprises 4 cycles of 5 minutes of supra-systolic pressure and 5 minutes of reperfusion.

27. The method of any one of claims 18-26, wherein the supra-systolic pressure is a pressure that is at least 15 mmHg above systolic pressure.

28. The method of any one of claims 18-27, wherein the remote ischemic preconditioning regimen is performed on an upper limb.

29. The method of any one of claims 18-28, wherein the remote ischemic preconditioning regimen is performed on a lower limb.

30. A system comprising

a cuff configured to retract about a remote location of a subject;

an actuator connected to the cuff and that, when actuated, causes the cuff to contract about the remote location of the subject to reduce blood flow there through; and

a controller that controls the actuator to operate according to a treatment protocol that includes one or a plurality of sequentially actuated treatment cycles,

each treatment cycle comprising

cuff actuation, during which the actuator contracts the cuff about the remote location of the subject to a pressure above systolic pressure to occlude blood flow through the remote location;

an ischemic duration, during which the actuator maintains the cuff contracted about the remote location at a set point above systolic pressure to occlude blood flow through the remote location, the ischemic duration lasting for a period of time ranging from about 1 minute to 20 minutes;

cuff release, during which the actuator releases the cuff to allow blood flow through the remote location; and

a reperfusion duration, during which the cuff is maintained in an at least partially relaxed state to allow blood flow through the remote location, the reperfusion duration lasting for a period of time ranging from about 1 minute to 20 minutes,

wherein the system, when in use, is comprised in a water-resistant housing.

31. The system of claim 30, wherein the system is comprised within a garment.

32. The system of claim 31, wherein the garment is athletic apparel.

33. The system of claim 30, 31 or 32, wherein the system comprises a strap, harness or belt.

34. The system of claim 30, 31, 32 or 33, wherein the controller is a remote controller.

35. Use of a device comprising a contractable cuff for enhancing physical performance, comprising using the device to perform a remote ischemic preconditioning regimen on a healthy subject prior to a maximal physical activity by the subject.

36. Use of a device comprising a contractable cuff for enhancing physical activity, comprising using the device to perform a remote ischemic preconditioning regimen on a subject having a cardiovascular condition prior to a physical activity in order to enhance performance of the physical activity by the subject.

37. The use of a device according to claims 35 or 36, wherein the device is a manual device.

38. The use of a device according to claims 35 or 36, wherein the device is an automatic device.

39. The use of a device according to any one of claims 35-38, wherein the contractable cuff is an inflatable cuff.

40. The use of a device according to any one of claims 35-39, wherein the device comprises a strap, harness or belt.

41. The use of a device according to any one of claims 35-36 and 38-40, wherein the device comprises an actuator and a controller.

42. The use of a device according to any one of claims 35-36 and 38-41, wherein the device comprises

a cuff configured to retract about a remote location of a subject;

an actuator connected to the cuff and that, when actuated, causes the cuff to contract about the remote location of the subject to reduce blood flow there through; and

a controller that controls the actuator.

43. The use of a device according to claims 41 or 42, wherein the controller is a remote controller.

44. The use of a device according to claim 41, 42 or 43, wherein the controller controls the actuator to operate according to a treatment protocol that includes one or a plurality of sequentially actuated treatment cycles, each treatment cycle comprising

cuff actuation, during which the actuator contracts the cuff about the remote location of the subject to a pressure above systolic pressure to occlude blood flow through the remote location;

an ischemic duration, during which the actuator maintains the cuff contracted about the remote location at a set point above systolic pressure to occlude blood flow through the remote location;

cuff release, during which the actuator releases the cuff to allow blood flow through the remote location; and

a reperfusion duration, during which the cuff is maintained in an at least partially relaxed state to allow blood flow through the remote location.

45. The use of a device according to claim 44, wherein the ischemic duration lasts for about 1 minute up to 20 minutes.

46. The use of a device according to claim 44 or 45, wherein the reperfusion duration lasts for about 1 minute up to 20 minutes.

47. The use of a device according to any on of claims 36-46, wherein the remote location is a limb.

48. A garment comprising

a cuff configured to retract about a remote location of a subject,

wherein the garment is an athletic garment.

49. The garment of claim 48, wherein the garment comprises two or more cuffs, each configured to retract about a remote location of a subject.

50. The garment of claims 48 or 49, wherein the garment is a swimsuit.

51. The garment of claims 48 or 49, wherein the garment is a running suit.

52. The garment of claims 48-50 or 51, wherein the cuff is located on an inner surface of the garment.

53. The garment of claims 48-50 or 51, wherein the cuff is located between layers of the garment.

54. The garment of claims 48-52 or 53, wherein the remote location is a limb.

55. The garment of claim 54, wherein the limb is an upper limb.

56. The garment of claims 54 or 55, wherein the limb is a lower limb.

57. The garment of claims 48-55 or 56, further comprising an actuator connected to the cuff, that when actuated causes the cuff to contract about the remote location of the subject.

58. The garment of claim 48-56 or 57, further comprising a controller that controls the actuator.

59. The garment of claim 58, wherein the controller controls the actuator to operate according to a treatment protocol that includes one or a plurality of sequentially actuated treatment cycles, each treatment cycle comprising

cuff actuation, during which the actuator contracts the cuff about the remote location of the subject to a pressure above systolic pressure to occlude blood flow through the remote location;

an ischemic duration, during which the actuator maintains the cuff contracted about the remote location at a set point above systolic pressure to occlude blood flow through the remote location, the ischemic duration lasting for a period of time ranging from about 1 minute to 20 minutes;

cuff release, during which the actuator releases the cuff to allow blood flow through the remote location; and

a reperfusion duration, during which the cuff is maintained in an at least partially relaxed state to allow blood flow through the remote location, the reperfusion duration lasting for a period of time ranging from about 1 minute to 20 minutes.

Claims

1. A method for enhancing the competitive athletic performance of an athlete in maximal physical activity, the method comprising

performing a remote ischemic preconditioning regimen on the athlete;

and then, within 24 hours after said regimen;

performing the competitive athletic maximal physical activity.

2. The method of claim 1, wherein the remote ischemic preconditioning regimen is performed within 2 hours of the physical activity.

3. The method of claim 1, wherein the remote ischemic preconditioning regimen is performed within 20 minutes of the physical activity.

4. The method of claim 1 to 3, wherein the remote ischemic preconditioning regimen comprises 1, 2, 3, 4, or 5 cycles of supra-systolic pressure and reperfusion.

5. The method of claim 1 to 3, wherein the remote ischemic preconditioning regimen comprises at least four cycles of supra-systolic pressure and reperfusion.

6. The method of any one of the preceding claims, wherein the remote ischemic preconditioning regimen comprises cycles which include a period of supra-systolic pressure which has a duration of between 1 and 20 minutes.

7. The method of any one of the preceding claims, wherein the remote ischemic preconditioning regimen includes a period of reperfusion which has a duration of between 1 and 20 minutes.

8. The method of any one of the preceding claims, wherein the remote ischemic preconditioning regimen comprises cycles of 5 minutes of supra-systolic pressure and 5 minutes of reperfusion.

9. The method of any one of the preceding claims, wherein the supra-systolic pressure is a pressure that is at least 15 mmHg above systolic pressure.

10. The method of any one of the preceding claims, wherein the remote ischemic preconditioning regimen is performed on an upper limb.

11. The method of any one of claims 1-9, wherein the remote ischemic preconditioning regimen is performed on a lower limb.

12. Use of a device comprising a contractable cuff to perform a remote ischemic preconditioning regimen in a method comprising

performing a remote ischemic preconditioning regimen on the athlete;

and then, within 24 hours after said regimen;

performing the competitive athletic maximal physical activity.

13. Use as claimed in claim 12 wherein the device comprises

a cuff configured to retract about a remote location of a subject;

an actuator connected to the cuff and that, when actuated, causes the cuff to contract about the remote location of the subject to reduce blood flow therethrough; and

a controller that controls the actuator.

14. Use as claimed in claim 13, wherein the controller controls the actuator to operate according to a treatment protocol that includes one or a plurality of sequentially actuated treatment cycles, each treatment cycle comprising

cuff actuation, during which the actuator contracts the cuff about the remote location of the subject to a pressure above systolic pressure to occlude blood flow through the remote location;

an ischemic duration, during which the actuator maintains the cuff contracted about the remote location at a set point above systolic pressure to occlude blood flow through the remote location;

cuff release, during which the actuator releases the cuff to allow blood flow through the remote location; and

a reperfusion duration, during which the cuff is maintained in an at least partially relaxed state to allow blood flow through the remote location.

15. Use as claimed in any one of claims 12 to 14, wherein the cuff configured to retract about a remote location of a subject is comprised within an athletic garment.

16. Use as claimed in claim 15, wherein the garment comprises two or more cuffs, each configured to retract about a remote location of a subject.