1. Medical Condition

Intravenous Infusion

Since 2005, intravenous (IV) infusions have been included in the WADA list of prohibited substances and methods under Section M2. Prohibited Methods, Chemical and Physical Manipulation and are prohibited both in- and out-of-competition.

The current wording (2010) in the Prohibited List states that "***Intravenous infusions are prohibited except for those legitimately received in the course of hospital admissions or clinical investigations***." (1)

A major justification for the inclusion of IV infusions on the WADA list has been the intent of some athletes to manipulate their haematocrit or haemoglobin levels in an effort to circumvent the "No Start" rules implemented by some IF's for reasons of athlete health and safety. In addition, it is recognised that IV infusion could provide a potential route for the administration of prohibited substances. Also in events governed by weight categories, athletes may be encouraged to undertake significant, accelerated weight loss to qualify for competition and then use IV infusion to rapidly rehydrate. This practice invokes issues of athlete health and safety.

By definition, an IV infusion is the supply of fluids or other liquid substrates through a vein. It is achieved by inserting a specialized needle into a vein and infusing fluids at a predetermined rate from a reservoir usually situated above the level of the body. By comparison, an intravenous injection is the supply of a considerably smaller volume of fluid or medication by means of a simple syringe. Injections with a simple syringe are permitted if the injected substance is not prohibited, the volume does not exceed 50 mL, and the intravenous injections are given at intervals equal or greater than six hours.

2. Diagnosis

- A. medical history

A **precise** description of the specific medical indication for the IV infusion must accompany the TUE application. This should include a clear description of the substance to be infused, the rate of infusion and any other relevant clinical information authorized by the medical specialist responsible for the intervention. Note that if an intervention is part of a clinical investigation or hospital admission, there is no requirement for an advance or retrospective TUE. The athlete is nevertheless strongly advised to keep and have a record of the hospital visit available.

- B. diagnostic criteria

See above.

- C. relevant medical information

See above.

3. Medical best practice treatment

Legitimate medical indications for IV infusions are well documented and are most commonly associated with medical emergencies and in-patient care.

In situations where the clinical criteria for the use of i.v. infusions is in a situations other than "hospital admissions or clinical investigations", then the attending physician in collaboration with at least one other independent colleague, must ensure that:

1. A clear, well-justified diagnosis has been established.
2. No permitted alternative treatment exists.
3. There is no capacity for this treatment to enhance performance other than to return the athlete to a normal state of health.
4. The treatment is administered by qualified medical personnel in an appropriate medical setting.
5. Adequate medical records of the treatment are maintained"

IV infusion in sport is commonly linked with rehydration after exhaustive effort, and this situation is arguably the major cause of debate for sports physicians. It must be clearly stated however that the use of IV fluid replacement following exercise to correct mild rehydration is neither clinically indicated nor substantiated by the TUE process. There is a well-established body of scientific opinion to confirm that oral rehydration is the preferred therapeutic choice, deemed by some authorities as being even more effective than the parenteral option. (Ref: 3,4,7,8,9,10,11,12,13,14,15,16,17)

- A. name of prohibited Method

Intravenous Infusion when not part of clinical investigation or hospital admission.

- B. route

Intravenous

- C. frequency

Dependant on the diagnosis, and on the particular clinical situation. Injections with a simple syringe are permitted if the injected substance is

not prohibited, the volume does not exceed 50 mL, and the intravenous injections are given at intervals equal or greater than six hours.

- D. recommended duration

Completely dependent on diagnosis and on the particular clinical situation, but usually involving a single intervention of relatively short duration.

4. Other non-prohibited alternative treatments

- Oral Rehydration
- Injections via a syringe are permitted provided the injected substance is not prohibited, the volume does not exceed 50mL, and the intravenous injections are given at intervals equal to or greater than six hours.

5. Consequences to health if treatment withheld

These will be dependent on the clinical situation. However in cases of medical emergency the obvious possible consequence of withholding treatment could be death.

6. Treatment monitoring

Strictly under the control of the treating doctor

7. Duration of therapy and recommended review process

Dependent on the clinical diagnosis, but usually involving a single intervention of relatively short duration.

8. Any appropriate cautionary matters

It is the responsibility of the supervising physician to evaluate the medical legitimacy of the clinical indication for any TUE application involving the use of IV infusion.At all times the welfare of the patient must remain the priority. TUECs are required to apply sound clinical judgment to their interpretation of the International Standard, mindful of the inappropriate use of IV infusion in non-emergency situations where alternative permitted alternatives exist.

9. References

1. WADA, The Prohibited List 2005, 2006, 2007, 2008 and 2009, including the Explanatory note to the List 2009

2. Vandenbos F., et all: Relevance and complications of intravenous infusion at the emergency unit at Nice University Hospital.
J.of Infection 46 (3): 173-6, 2006

3. Arbitral Award, CAS 2002/A/389-393

4. Arbitral Award, CAS2006/A/1102 & 1146

5. Garnier A: Memo, Intravenous infusion issue, 2004?

6. ASOIF Medical Consultative Group: Minutes of the meeting 7th May 2006

7. Canadian Academy of Sports Medicine: A brief overview about intravenous hydration in athletics, Casa DJ, Maresh Cm, Armstrong LE et al Intravenous versus oral rehydration during a brief period: responses to subsequent exercise in the heat.
Med Sci Sports Exercise 2000 Jan; 32(1): 124-133

8. Webster S, Rutt R, Weltmann, A
Physiological effects of a weight loss regimen practiced by college wrestler

9. Naghii, MR
The Significance of Water in Sport and Weight Control
Nutrition and Health, 2000, Vol. 14, pp. 127-132

10. Sawka, MN
Physiological consequences of hypohydration: exercise performance and thermoregulation

Medicine and Science in Sport and Exercise 0195-9131/92/2406 Vol. 24, No, 6
11. Maresh CM, Herrera-Soto JA, Armstrong LE, et al.
Perceptual responses in the heat after intravenous versus oral rehydration
Med Sci Sport Exercise. 2001 jun; 33(6) 1039-1045

12. Castellani JW, Maresh CM, Armstrong LE, et al
Endocrine responses during exercise-heat stress: effects of prior isotonic and hypotonic intravenous rehydration.
European J Appl Physiol Occup Physiol. 1998 Feb; 77(3): 242-248.

13. Kraemer WJ, Fry AC, Rubin MR, Triplett-McBride T, et al
Physiology and performance responses to tournament wrestling
Medecine and Science in Sports and Exercise 0195-9131/01/3308-1367

14. Mudambo SM, Reynolds N
Body fluid shits in soldiers after a jogging/walking exercise in the heat
Central African Journal of Medicine 2001 Sept-Oct; 47(99-10), 220-225

15. Landers DM, Arent SM, Lutz RS
Affect and cognitive performance in high school wrestlers undergoing rapid weight loss
Journal of Sport and Exercise Psychology 2001, 23, 307-316.

16. Riebe D, Maresh CM, Armstrong LE, Kenefick RW, et al
Effects of oral and intravenous rehydration on ratings of perceived exertion and thirst
Med Sci Sports Exerc. 1997 Jan (1): 117-124

17. Noakes TD, Walsh RM, Hawley JA, Dennis SC
Impaired high-intensity cycling performance time t low levels of dehydration
International Journal of Sports Medicine 15 (1994) 392-398.