



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 not prohibited as a method if the injected substance is not prohibited and if the volume does not exceed 50 mL. given at intervals no less than 6 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. Where an IV infusion is deemed to be a critical life-saving intervention, or as part of essential post-operative care, a retroactive TUE should be approved with relevant clinical details.

- 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.

Some examples include:

- Acute interventions including emergency resuscitation or acute anaphylaxis.
- Drug and fluid supply in situations of volume replacement when other routes of administration are not available (e.g. intractable vomiting)
- Blood replacement as a consequence of significant acute or chronic blood loss
- Parenteral nutrition where indicated in extreme clinical cases
Central Venous Pressure Measurement eg post-operatively
In surgical procedures involving IV administration of blood or drugs.
Radiological investigations involving IV infusions will have clear clinical indications and do not require TUE approval.

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 of any type as defined previously.

- B. route

Intravenous

- C. frequency

Dependant on the diagnosis, and on the particular clinical situation.

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- 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 not prohibited provided the injected substance is permitted and the volume does not exceed 50ml.

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.

The TUE process as applied to IV infusion will most often be retroactive and reference to the International Standard for Therapeutic Use Exemption provides the pre-requisites for such approvals. These involve essential acute medical intervention and exceptional circumstances where there was insufficient opportunity for the TUE application to be made or for a TUEC to respond prior to doping control.

8. Any appropriate cautionary matters

This Medical Information is intended to clarify the reasons for the inclusion of IV infusion as a Method on the Prohibited List and to provide specific clinical examples to assist TUECs in their consideration of TUE applications for this form of intervention.

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. This may follow the normal application process in cases where the intervention may be planned or pre-meditated (such as in a surgical procedure) or a retrospective application in the case of any documented emergency situation.

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.

In summary: in order to grant a TUE for IV infusion, the following pre-requisites are necessary:

1. A clear, confirmed medical diagnosis of illness or injury in a specific athlete.
2. No permitted alternative treatment available
3. No capacity for this treatment to enhance performance
4. Treatment by qualified medical personnel in an appropriate medical setting
5. Adequate medical records of the treatment available for inspection

9. References

1. WADA, The Prohibited List 2005, 2006, 2007, 2008 and 2009, including the Explanatory note to the List 2009
2. Vandebos F., et al: 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
Medicine and Science in Sports and Exercise 0195-9131/01/3308-1367

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14. Mudambo SM, Reynolds N
Body fluid shifts 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.