



Intravenous Infusions

1. Introduction

Intravenous (IV) infusions have been included on the WADA List of Prohibited Substances and Methods under section M2. Prohibited Methods, Chemical and Physical Manipulation since 2005. They are prohibited both in- and out-of-competition.

The current wording in the Prohibited List states that **“Intravenous infusions and/or injections of more than 50 mL per 6 hour period are prohibited except for those legitimately received in the course of hospital admissions or clinical investigations” (1).**

IV infusions are included on the Prohibited List given the intent of some athletes to manipulate their plasma volume levels in order to mask the use of a prohibited substance and/or to distort the values in the Athlete Biological Passport. In events governed by weight categories, athletes may be encouraged to undertake significant, accelerated weight loss to qualify for a 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 via the insertion of a specialized needle into a vein and infusing fluids at a predetermined rate from a reservoir usually situated above the level of the body. An intravenous injection is the supply of fluid or medication by means of a syringe with a standard or butterfly needle, directly into a vein. Infusions or injections are permitted if the infused/injected substance is not on the Prohibited List, the volume of intravenous fluid administered does not exceed 50 mL per 6-hour period.

If a prohibited substance is administered via intravenous or injection, a TUE is necessary for this substance regardless of whether the infusion is less than 50 mL.

2. Diagnosis

A. Medical history

A **precise** description of the clinical situation and 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 from the treating physician.

Note that if an intervention is part of a clinical investigation or hospital admission, there is no requirement for either an advance or retroactive TUE. The athlete is nevertheless strongly advised to obtain and maintain and keep a copy of the medical records.

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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 either medical emergencies (retroactive TUE) or in-patient care.

When the clinical criteria for the use of IV infusions are in a situation other than "hospital admissions or clinical investigations," then good medical practice must ensure that:

1. A clear, well-justified diagnosis has been established.
2. No permitted alternative treatment exists.
3. This treatment will not 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

The use of IV infusions 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 that the use of IV fluid replacement following exercise to correct mild rehydration is not clinically indicated nor substantiated by the medical literature. 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, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16)

A. Name of Prohibited Method

Intravenous Infusion or injection of >50 mL per 6 hour period when not part of clinical investigation or hospital admission.

B. 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 or oral delivery of medication.

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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

Continuous evaluation by treating doctor until the patient is stabilized.

7. TUE validity and recommended review process

The duration of the TUE is usually for a short time period surrounding the initial medical intervention. Longer usage of an intravenous would typically occur in a hospital setting.

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. Oral rehydration is usually highly effective, yet there may be cases such as documented hyponatremia where hypertonic saline by IV is more effective than oral treatments. (17)

At all times the welfare of the patient must remain the priority. TUECs should 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 Prohibited List, WADA website
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. ASOIF Medical Consultative Group: Minutes of the meeting 7th May 2006
6. 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.
Medicine and Science in Sports and Exercise 2000 Jan; 32(1): 124-133
7. Webster S, Rutt R, Weltmann, A

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Physiological effects of a weight loss regimen practiced by college wrestler

8. Naghii, MR
The Significance of Water in Sport and Weight Control
Nutrition and Health, 2000, Vol. 14, pp. 127-132
9. Sawka, MN
Physiological consequences of hypohydration: exercise performance and thermoregulation
Medicine and Science in Sports and Exercise 0195-9131/92/2406 Vol. 24, No, 6
10. Maresh CM, Herrera-Soto JA, Armstrong LE, et al.
Perceptual responses in the heat after intravenous versus oral rehydration
Medicine and Science in Sports and Exercise. 2001 jun; 33(6) 1039-1045
11. 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.
12. 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
13. 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
14. 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.
15. Riebe D, Maresh CM, Armstrong LE, Kenefick RW, et al
Effects of oral and intravenous rehydration on ratings of perceived exertion and thirst
Medicine and Science in Sports and Exercise 1997 Jan (1): 117-124
16. Noakes TD, Walsh RM, Hawley JA, Dennis SC
Impaired high-intensity cycling performance time at low levels of dehydration
International Journal of Sports Medicine 15 (1994) 392-398.
17. Rogers, Ian R.; Hook, Ginger. Stuempfle; Kristin J; Hoffman Martin D.; Hew-Butler, Tamara,
An Intervention Study of Oral Versus Intravenous Hypertonic Saline Administration in Ultramarathon Runners with Exercise-Associated Hyponatremia: A Preliminary Randomized Trial
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