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# Autohemotherapy (with UV-B-Radiation)

## Eigenblutbehandlung (mit UV-B-Bestrahlung)

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### ZUSAMMENFASSUNG

Bei Sportlern wurde eine Eigenblutbehandlung durch einen Arzt verordnet und durchgeführt, um einen „chronisch-infektiösen Zustand“ zu behandeln. Diese Behandlung bestand aus einer Blutabnahme von etwa 50ml, Gerinnungshemmung sowie UV-Bestrahlung des Blutes in der Spritze. Abschließend wurde das behandelte Blut wieder intravenös in den Blutkreislauf eingeführt. Aufgrund aktueller Diskussionen, was eigentlich laut Anti-Doping-Regulierungen erlaubt ist und was nicht, sind bisherige Erkenntnisse über diese Methode und die Interpretation der Regulierungen aus der Sicht eines Mediziners und Mitglieds von Anti-Doping-Organisationen sowie einem Komitee für Medizinische Ausnahmegenehmigungen (TUE) zusammengefasst. Eigenblutbehandlung mit UV-B-Bestrahlung verstößt gegen Anti-Doping Bestimmungen, die den Gebrauch oder die Wiedereinführung von Blut oder roten Blutkörperchen in den Blutkreislauf verbieten. Diese Bestimmungen sind in dem Olympischen Anti-Doping-Regelwerk von 1986 so wie seit 2004 auf der Verbotsliste der Welt-Anti-Doping-Agentur zu finden. Das TUE-Verfahren beschäftigt sich mit dem medizinischen Gebrauch solch verbotener Therapieverfahren. Den Gebrauch einer TUE zu gewähren, ist eher unwahrscheinlich, da es keine medizinische wissenschaftlich geprüfte Standardtherapie ist. Zudem gibt es etablierte alternative Behandlungsmöglichkeiten.

**Schlüsselwörter:** Blutdoping, olympische Anti-Doping Regulierung, Welt-Anti-Dopin Regulierung.

### THE CASE

With the German “Erfurt Case” many questions and concerns have risen. 28 athletes underwent a prescribed autohemotherapy, performed by a sports physician in Erfurt, Germany. The procedure consisted of a 50ml blood sample, anticoagulation, consecutive UV-B-radiation of blood in a syringe, followed by a reintroduction of the treated blood intravenously. The doctor claimed that it was a medical sound and indicated therapy for “infectious states”. All athletes refer to the doctor’s prescription due to his explanation that such medical treatments were allowed under current anti-doping rules for athletes. Neither the physician nor the athletes submitted a “therapeutic use exemption” to an anti-doping organization, but there have been several communications to the German Anti-Doping Agency. After the cases were revealed, discussions started whether this method is forbidden when the prohibited List of the World Anti-Doping Agency (WADA) states under M1: Enhancing Oxygen transport? Can it be doping when the aim of this treatment was only to heal?

### SUMMARY

Athletes underwent a prescribed autohemotherapy performed by a sports physician to treat “chronic infectious states”. This procedure consisted of a 50 ml blood sample, anticoagulants, consecutive UV-B-radiation of blood in a syringe, followed by a reintroduction of the treated blood intravenously. Due to latest discussions concerning what is actually allowed and what is forbidden according to Anti-Doping-regulations, the current knowledge regarding this method and the interpretation of these rules are summarized by a medical doctor and member of anti-doping and therapeutic use exemption (TUE) committees. Autohemotherapy with UV-B-radiation breaches the anti-doping regulations which forbid the use or reintroduction of blood and blood cells into the circulation. These regulations can be found in the Olympic Anti-Doping Code of 1986 as well as on the prohibited list of the World Anti-Doping Agency of 2004. The medical use of such forbidden therapies is subject of the TUE procedure. To grant the use of TUE in general is unlikely, because it is not a standard and scientifically proven medical therapy. Moreover there are existing therapeutic alternatives.

**Keywords:** blood doping; Olympic Anti-Doping Code; World Anti-Doping Code.

### AUTOHEMOTHERAPY WITH OR WITHOUT UV-RADIATION OF THE BLOOD

Reinjection of autologous blood was developed mainly by Ravaut and by Rosenow at the beginning of the 20th century (7,8). They introduced it for several medical conditions, psoriasis and chronic infections. Later the theory was developed that Autohemotherapy generates antibodies or an immunological reaction that supports healing processes (4,5). Some patients reacted systemically to the reinjection of blood with fever, rash which was considered as a therapy effect (4). This therapy seemed to have been to some extend popular until modern antibiotics and chemotherapy were developed. In the same time period, surgeons detected that uv-radiation

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lamps could be used during operations for disinfection with beneficial effects on local infections (6). There have been trials to radiate the blood to prevent infections, later on this method was used for various medical conditions (4,5).

After the 50's the technique was mainly applied in the German Democratic Republic and in the Soviet Union. Several studies were conducted which revealed that repetitive treatments had effects on blood fluidity and coagulation, mainly by influencing flexibility of erythrocyte membranes and their beneficial effects in some forms of allergies, atrial occlusive disease, venous and diabetes ulcers, even in small controlled trials (4,9).

This was used also in other more obscure therapies as Manfred v. Ardenne's "Sauerstoffmehrschritt-Therapie" [oxygen enhancing therapy]. However, autohemotherapy with UV-radiation of the blood found its way in many "alternative" and conventional medical practices. It is a therapy which is not covered by health insurance in Germany but has to be paid by the patients. In the last years were rumors that uv-radiation of blood inhibits the detection of erythropoietin-doping and quotes that the effect on blood fluidity promotes performance.

Despite the use of this method in some countries there have been no controlled studies published in the last 20 years in listed journals substantiating the postulated therapeutic effects of this method.

### THE BASAL RULES

The WADA code (10) and the related "International Standards", like the "WADA Prohibited List" (11-14), and technical documents comprise a set of regulations. They are binding for all athletes, all employees, freelancers and holders of honorary offices to Olympic Sports Organizations. The regulations are in a continuous line with the Olympic Anti-Doping Code (OMAC) of the IOC Medical Commission since 1986 when the ban on "blood doping" was established, which over time has been more and more clearly defined as the manipulation of blood with withdrawal and reincorporation into the circulatory system (14).

If the UV-method has no doping effect or does not intend any such effect, or if this is unknown, can it be doping?

The intention or lack of effect on oxygen transport (11-14) because only 50 ml of blood are treated does not constitute an excuse according to the WADA code, which regulate the responsibility of the athlete and that the intention or lack of knowledge do not constitute an exception:

*2.1.1 It is each Athlete's personal duty to ensure that no Prohibited Substance enters his or her body. Athletes are responsible for any Prohibited Substance or its Metabolites or Markers found to be present in their Samples. Accordingly, it is not necessary that intent, fault, negligence or knowing Use on the Athlete's part be demonstrated in order to establish an anti-doping violation under Article 2.1.*

*2.2.1 It is each Athlete's personal duty to ensure that no Prohibited Substance enters his or her body. Accordingly, it is not necessary that intent, fault, negligence or knowing Use on the Athlete's part be demonstrated in order to establish an anti-doping rule violation for Use of a Prohibited Substance or a Prohibited Method.*

Therefore, an athlete cannot claim not to be informed about a medication or procedure despite a medical doctor being involved. Neither athletes nor physicians can claim that a method or procedure was applied in purpose of doping (10).

*2.2.2 The success or failure of the Use or Attempted Use of a Prohibited Substance or Prohibited Method is not material. It is sufficient that the Prohibited Substance or Prohibited Method was Used or Attempted to be Used for an anti-doping rule violation to be committed.*

This applies also if another effect than that listed in the WADA prohibited list is claimed according to the WADA Code (10).

*4.3.3 WADA's determination of the Prohibited Substances and Prohibited Methods that will be included on the Prohibited List and the classification of substances into categories on the Prohibited List is final and shall not be subject to challenge by an Athlete or other Person based on an argument that the substance or method was not a masking agent or did not have the potential to enhance performance, represent a health risk or violate the spirit of sport.*

From this follows that in such a case, it need only be considered that the method or substance has been prohibited; all other questions can only be taken into account in determining the penalty. If a doctor assures his athletes that his methods are permitted, he also makes himself accountable to his patient-athletes for this assurance and bears special legal responsibility (3).

### IS THE METHOD OF UV-AUTOHEMOTHERAPY REALLY COVERED BY WADA LAW SINCE 2004?

The use of blood or blood components, whether produced with own blood or that of another person, was forbidden in the OMAC (2,3) and was termed "blood doping". This means that any blood withdrawal and reincorporation in the circulation counts as doping if red blood cells are involved. Consecutively it has been included in the WADA Prohibited List since 2004 (11) in section M1:

*M1. Enhancing Oxygen transport*

*a. Blood doping is the use of autologous, homologous or heterologous blood or red blood cell products of any origin, except for legitimate medical treatment.*

If blood products used which do not contain red blood cells (platelet-rich plasma) or products are obtained from blood, such as sera or proteins or immunoglobulins, these do not come under M1, but are judged depending on their use (14).

The wording of WADA's M1 was modified in the following years without changing the principle of the ban (11-14). In 2011, a further paragraph M.2.3 was added which addresses exactly the method used here: *3. Sequential withdrawal, manipulation and reinfusion of whole blood into the circulatory system is prohibited.* In 2012, a further specification was made: *reintroduction* rather than *reinfusion*. It follows from this that the method of autohemotherapy with or without UV-radiation with the required coagulation inhibitor, regardless of the method of reincorporation (infusion or injection) and quantity (even for only a few ml) has been a prohibited method under M1 since 2004 and since 2011 also under M2.3 (11-13). With the 2013 list, the popular term "blood doping" is omitted and the more precise term "blood manipulation" is used under M1 again. This does not constitute a break from the continuous line of regulations and decisions since 1986 (1, 2, 3, 12, 13, 14).

In 2002 the Court of Arbitration for Sport (CAS) ruled accordingly in a decision against Austrian cross-country skiers, who were convicted essentially due to autohemotherapy. Comparable to this case "prophylaxis of infections" and one athlete's neurodermitis were claimed to be medical reasons (2):

*The definition of blood doping pursuant to the Olympic Move-*

ment Antidoping Code (OMAC) includes the administration of the athlete's own blood. The definition of blood doping is met irrespective of the amount of blood withdrawn and re-injected and whether or not it is potentially harmful to athletes' health and/or capable of enhancing their performance (CAS decision, 2).

#### HOW AND WHEN CAN MEDICAL TREATMENT WITH BLOOD OR AUTOLOGOUS BLOOD BE PERMITTED?

If such methods are used for medical therapy, the athlete is still required to obtain a "therapeutic use exemption" (15). In acute illness – for example an accident which requires blood transfusion – it is mandatory to report this after the acute treatment (retroactive TUE).

In chronic diseases, all treatments must be reported and approved in advanced before the treatment begins. This would be mandatory as a conscientious duty of care in case of uncertainty on behalf of the doctor or other user (15). Against this backdrop, the UVB decision of the CAS in 2002 already set up the following principle for previous (or retroactive) approval (2):

1. The circumstances must be important (truly exceptional) and proven by the athlete,
2. There is no other therapeutic alternative under the given circumstances which would not violate the terms of doping.

This is also described in the WADA International Standard "Therapeutic Use Exemptions" (15):

4.1: A TUE will be granted only in strict accordance with the following criteria: a. The Athlete would experience a significant impairment to health if the Prohibited Substances or Prohibited Method were to be withheld in the course of treating an acute or chronic medical condition. ... c. There is no reasonable Therapeutic alternative to the Use of the otherwise Prohibited Substance or Prohibited Method.

In any case, according to the CAS ruling, the WADA Code and the Prohibited List, a prior or retroactive examination of the use by the physician must be checked by a responsible TUE Committee such an application could only be granted after an investigation authorization under the WADA Code (15). The final paragraph of the WADA Code, section 4.4 says in this respect (10):

The ... Administration of a Prohibited Substance or Prohibited Method (Article 2.8) consistent with the provisions of an applicable therapeutic use exemption and issued pursuant to the International Standard for Therapeutic Use Exemptions shall not be considered an anti-doping rule violation.

Autohemotherapy with or without UV radiation is basically a primary prohibited method, for which a TUE is absolutely mandatory (1,2,3). Because this method is considered not to be a standard medical therapy and there are therapeutic alternatives, a TUE is unlikely to be granted.

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