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The composition of anabolic steroids from the illicit market is largely unknown

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As Ammatuna and Nijziel note (1), obtaining an accurate and comprehensive drug history is crucial in the treatment of patients presenting with symptoms that can potentially be attributed to the use of anabolic steroids, including renal disorders.

Most people who use anabolic steroids obtain these drugs from the illicit market (2). Here, many products are manufactured in 'underground laboratories' operating outside the formal parameters of the production of licensed medicinal products (3). In the United Kingdom, investigations by the Medicines and Healthcare products Regulatory Agency (MHRA) have highlighted the issue of adulterated drugs on the UK illicit market, including anabolic agents, leading to drug seizures, arrests and illicit online retailers being shut down (4). In a number of cases, drug testing and analysis has identified that drugs claiming to contain anabolic steroids contain a different amount of pharmacologically active substance than declared on the label, a different active substance or no active substance whatsoever (3). Due to poor manufacturing, products might also be accidentally contaminated with toxic chemicals and injectable products might be unsterile, resulting in local or systemic infections (2). In addition, many people who use anabolic steroids take a variety of off-the-shelf products marketed as dietary or nutritional supplements that are

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2 increasingly being found to contain pharmacologically active substances, such as appetite
3 suppressants, sildenafil (used for erectile dysfunction) and stimulants, that have not been
4 listed on the package (2). The fact that in most cases, anabolic steroid users remain
5 unaware of their intake of specific active substances, means that many case reports
6 regarding patients' use of these drugs suffer from an over-reliance on self-reported drug
7 use (5).

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13 Healthcare professionals who come into contact with patients using anabolic steroids
14 should be aware of these issues. Where possible, and when resources are available, drug
15 vials, tablets and/or biological samples should be collected and submitted to drug analysis
16 to identify the pharmacologically active substance, along with any contamination. These
17 data will add considerably to information retrieved from the patients' drug histories (1),
18 improving both diagnosis and prognosis. Furthermore, collecting data on the contents of
19 these products will contribute to our understanding of the causal relationship between
20 anabolic steroids and specific health harms in case reports pertaining to patients' usage of
21 these drugs (6).

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34 The authors declare no conflicts of interest.

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38
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40 None.

41 42 43 44 **References**

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