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Oleka, Chimsom T, Anderson, Travis , Ackerman, Kathryn E , Elliott-Sale, Kirsty J , Kraus, Emily , Casey, Ellen , Stellingwerff, Trent , Donaldson, Amber T, Finnoff, Jonathan T, Post, Eric G  and Adams, William M  (2024) An update to terminology describing abnormal uterine bleeding in female athletes: facilitating cross-disciplinary health care. *British Journal of Sports Medicine*, 58 (21). pp. 1237-1239. ISSN 0306-3674

DOI: <https://doi.org/10.1136/bjsports-2024-108261>

Publisher: BMJ

Version: Accepted Version

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Additional Information: This article has been accepted for publication in *British Journal of Sports Medicine*, 2024, following peer review, and the Version of Record can be accessed online at <http://dx.doi.org/10.1136/bjsports-2024-108261> © Authors (or their employer(s)).

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1 **Editorial Title:** An Update to Terminology Describing Abnormal Uterine Bleeding in Female Athletes:
2 Facilitating Cross-Disciplinary Health Care

3 **Authors:** Chimsom T. Oleka^{1,13}, Travis Anderson^{2,3}, Kathryn E. Ackerman^{4,13}, Kirsty J. Elliott-Sale⁶,
4 Emily Kraus^{5,13}, Ellen Casey^{7,13}, Trent Stellingwerff^{8,9}, Amber T. Donaldson^{2,3,13}, Jonathan T.
5 Finnoff^{2,3,10}, Eric G. Post^{2,3}, William M. Adams^{2,3,11,12}

6
7 ¹Department of Obstetrics and Gynecology, INOVA Fairfax Hospital, Falls Church, VA, USA

8 ²Department of Sports Medicine, United States Olympic & Paralympic Committee, Colorado Springs,
9 CO, USA

10 ³United States Coalition for the Prevention of Illness and Injury in Sport, Colorado Springs, CO, USA

11 ⁴Wu Tsai Female Athlete Program, Boston Children's Hospital; Neuroendocrine Unit, Massachusetts
12 General Hospital, Harvard Medical School, Boston, MA, USA

13 ⁵Stanford Female Athlete Science and Translational Research (FASTR) Program, Department of
14 Orthopaedic Surgery, Stanford, CA, USA

15 ⁶Department of Sport and Exercise Sciences, Manchester Metropolitan University Institute of Sport,
16 Manchester, UK

17 ⁷Hospital for Special Surgery, New York, NY, USA

18 ⁸Canadian Sport Institute - Pacific, Victoria, British Columbia, Canada

19 ⁹Exercise Science, Physical & Health Education, University of Victoria, British Columbia, Canada

20 ¹⁰Department of Physical Medicine and Rehabilitation, University of Colorado School of Medicine,
21 Denver, CO, USA

22 ¹¹Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, NC, USA

23 ¹²School of Health, Exercise and Sport Sciences, Loughborough University, Leicestershire, UK

24 ¹³United States Olympic and Paralympic Committee Women's Health Task Force, Colorado Springs, CO

25

26 **Corresponding Author:** Chimsom T. Oleka, MD, FACOG Division of Pediatric and Adolescent
27 Gynecology, Department of Obstetrics & Gynecology INOVA Fairfax Hospital, 3300 Gallows Road,
28 Falls Church, VA 22042, USA

29 email: chimsom.oleka@inova.org

30

31 **Acknowledgments:** This work is the author's own and not that of the United States Olympic &
32 Paralympic Committee or any of its members or affiliates.

33 **Text Word Count:** 978

34 **Tables (#):** 1

35 **Figures (#):** 0

36 **References (#):** 7

37 Female athlete health, performance, and well-being are best supported by a comprehensive team
38 of medical providers and sports scientists that may include physicians from various specialties, allied
39 health providers, exercise and sports scientists, mental health professionals, and dietitians. Understanding
40 and consistently utilizing contemporary terminology in research and clinical practice is critical to ensure
41 precise communication and facilitate effective cross-disciplinary health care. This editorial aims to
42 highlight current standardized terminology for describing abnormal menstrual bleeding in order to
43 promote consistency in terminology across sports and exercise science and medicine (SESM).

44 While there has been a recent increase in female athlete research, including studies investigating
45 the influence of the menstrual cycle on athletic performance and health (1), there is a clear absence of
46 standardized menstrual cycle language and classification due to the persistent use of outdated abnormal
47 uterine bleeding (AUB) nomenclature. Indeed, previous research and clinical investigation and
48 management of AUB among non-pregnant women of reproductive age was hindered by inconsistently
49 applied nomenclature and lack of standardized categorization of potential etiologies (2–5). This ambiguity
50 poses several problems, including the inability to homogeneously classify research participants
51 experiencing AUB, difficulty comparing studies, and significantly undermining the investigative leverage
52 of meta-analyses due to increased risk of inaccurate conclusions, as well as clinical implications (e.g.,
53 ambiguous diagnoses, less precise clinical care and management, and confusing communication across
54 the medical team). Such concerns led to the development of a universally accepted nomenclature and
55 classification system within the gynecological and obstetrics medical field ~20 years ago that is practical
56 and appropriate for research, education, and clinical needs. However, within the past 10 years,
57 publications across various medical and applied and basic science journals from fields such as sports
58 medicine, psychology, public health, and others have used outdated terms with little adoption of updated
59 language.

60 **Abnormal Uterine Bleeding (AUB) Nomenclature**

61 Recognizing the international need for AUB classification harmonization, the International
62 Federation of Gynecology and Obstetrics (FIGO) developed a system to define normal and abnormal
63 bleeding symptoms. It recommended classifications for the causes of AUB, reaching international
64 consensus in 2011 and updating in 2018 to facilitate research, education, and clinical care (6,7). This
65 terminology has been helpful in evolving collaborative research and applying evidence-based results to
66 clinical practice (6). Readers are directed to Figure 1 in Munro et al. (7) for such definitions. Several key
67 points from the classification system are highly relevant to sports medicine clinicians and SESM
68 researchers.

69 Firstly, AUB was deemed a suitable overarching term for the symptom of disturbed menstrual
70 bleeding, not restricted to just abnormally heavy menstrual bleeding but including bleeding that was
71 abnormal in timing. The previous terminology was either discarded or replaced with the recognition of

72 disparate usage and inconsistent meaning for the clinical, academic, and general communities (6). See
73 Table 1 for updated terminology and definitions.

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INSERT TABLE 1 ABOUT HERE

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77 Secondly, the following general sources of bleeding were considered in the approved FIGO
78 classification system: 1) Primary disorders of the endometrium that most often manifest as disturbances
79 of local endometrial hemostasis but may also include other entities such as altered vasculogenesis or local
80 inflammatory response abnormalities; 2) Endometrial polyps; 3) Leiomyomas (fibroids); 4)
81 Adenomyosis; 5) Disorders of ovulatory function; 6) Systemic disorders of hemostasis known as
82 coagulopathies; 7) Malignant and premalignant conditions; 8) Iatrogenic causes including gonadal steroid
83 administration; 9) Other local lesions or systemic conditions that may be rare causes of AUB (e.g.,
84 arteriovenous malformations and myometrial hypertrophy) or those that can sometimes cause abnormal
85 bleeding (e.g., endometriosis). Importantly, these FIGO classification systems relate solely to assessing
86 and managing non-gestational AUB. In addition, there are other causes of genital, urinary, or
87 gastrointestinal tract bleeding that do not originate from the uterus (6).

88 It was envisioned that the most straightforward components of the classification system would be
89 used in primary medical care, and sub-classifications would be most relevant in specialist clinical and
90 research settings.(6) The classification system of AUB causes in the reproductive years is comprised of
91 nine main categories that are arranged according to the acronym PALM-COEIN (pronounced “pahm-
92 koin”): polyp; adenomyosis; leiomyoma; malignancy and hyperplasia (PALM); coagulopathy; ovulatory
93 dysfunction; endometrial; iatrogenic; and not otherwise classified (COEIN). Generally, the PALM group
94 consists of discrete (structural) components that can be visually measured using imaging techniques or
95 histopathology (6). In contrast, the COEIN group is associated with entities not characterized by imaging
96 or histopathology, falling into the non-structural category (6). The system was constructed with the
97 understanding that there could be one or more contributors to the presenting AUB.

98 **Relevance of Standardized Terminology for Sports and Exercise Science and Medicine**

99 We posit that using standardized terminology for abnormal menstrual bleeding is crucial in
100 SESM to enhance cross-disciplinary communication and care. This would benefit female athletes by
101 ensuring precise diagnoses and better management through a collaborative healthcare team. We also
102 believe that adopting the FIGO classification system for AUB in SESM research may potentially improve
103 consistency and comparison across studies, enable the collection of common data elements, and advance
104 scientific understanding and collaboration, ultimately leading to improved athlete health and performance.

105 Although efforts are being made, unfortunately, this change in terminology has not yet permeated
106 the SESM literature (1,8,9). Thus, researchers and clinicians outside of Obstetrics and Gynecology tend to

107 use previously accepted language when describing menstrual cycle disturbances (e.g., oligomenorrhea). If
108 researchers wish to enhance further cross-discipline collaboration, readership, and application of their
109 work related to menstrual cycle health, we suggest including the PALM-COEIN categorization (e.g.,
110 abnormal uterine bleeding with ovulatory dysfunction or AUB-O; Table 1) in addition to more familiar
111 terminology that would otherwise be used. Future consensus statements on female athlete health and well-
112 being may also consider adopting this classification system when reporting AUB. We, therefore,
113 encourage all sports medicine providers to become familiar with these terms to better facilitate athlete
114 screening, improve appropriate referrals to gynecology, and enhance overall female athlete care via cross-
115 discipline collaboration and communication.

116

117 **Statements**

118 *Equity, Diversity, and Inclusion Statement:* The authors of this editorial represent a diverse genders,
119 countries, ethnicities, and sports medicine and sports science disciplines.

120 *Conflict of Interest Statement:* KEA receives research funding from the Joe and Clara Tsai Foundation as
121 part of the Wu Tsai Human Performance Alliance and from Nike. She receives speaker and writer
122 honoraria from Gatorade Sports Science Institute, Hologic, Springer, and UptoDate. She is a deputy editor
123 of the British Journal of Sports Medicine and an associate editor of the British Journal of Sports
124 Medicine's Injury Prevention and Health Protection Edition. KJE-S has received funding/honoraria from
125 Arsenal Football Club, The UK Sports Institute, the European Club Association, Gatorade Sport Science
126 Institute, Hologic, Science in Sport, and the UK Ministry of Defence to support female athletes. TS has
127 received funding/honoraria from the Wu Tsai Human Performance Alliance, Ineos, Science in Sport (Sis)
128 Own The Podium, Gatorade Sport Science Institute and Lululemon Athletica to support research,
129 including projects on female participants. JTF receives royalties from UptoDate and Demos Publishing.
130 WMA serves on the advisory board for My Normative, where he receives stock options as compensation
131 for his efforts. WMA is a member of the Sport Advisory Council for the Wu Tsai Human Performance
132 Alliance. WMA also receives royalties from Springer Nature. EK receives research funding from the Joe
133 and Clara Tsai Foundation as part of the Wu Tsai Human Performance Alliance. None of the above
134 honoraria and funds have a direct competing interest with the content of this editorial. OTC, TA, EC,
135 ATD, EGP, and EC have nothing to disclose.

136 *Contributorship:* CTO was responsible for the initial draft of this editorial. TA was responsible for the
137 editorial conceptualization. All authors were responsible for the editorial critical review, editing, and
138 approval. Guarantor is CTO.

139 *Acknowledgments:* This work is the authors' own and not that of the United States Olympic & Paralympic
140 Committee or any of its members or affiliates.

141 *Funding:* The authors have not declared a specific grant for this research from any funding agency in the
142 public, commercial or non-profit sectors

- 143 *Ethical approval:* Not required.
- 144 *Data Sharing:* No data to share.
- 145 *Provenance and Peer Review:* Not commissioned; externally peer-reviewed.
- 146 *Patient Involvement:* Patients were not involved in this editorial.
- 147

149 Table 1. Sports Medicine Relevant Changes to Abnormal Uterine Bleeding Terminology

Previous Terminology	Action	Replacement Terminology	Description
Amenorrhea	Retained	-	Primary Amenorrhea: Failure of onset of menstruation by the age of 15 years. Evaluations for primary amenorrhea should also occur after age 14 without secondary sex characteristics or if there is no menarche 3 years after the onset of secondary sex characteristics. Secondary Amenorrhea: Absence of menstrual periods for more than 3-6 months [^] in an individual who has had at least one spontaneous menses.
Luteal Phase Defect	Specified	AUB-E	Abnormal bleeding due to inadequate levels of progesterone secretion.
Anovulation (without amenorrhea)	Specified	AUB-O	Abnormal uterine bleeding due to ovulatory dysfunction.
Menorrhagia	Replaced	Heavy Menstrual Bleeding (HMB)	Excessive bleeding from the uterine corpus that may interfere with the physical, emotional, social, and material qualities of life.
Metrorrhagia	Replaced	Intermenstrual Bleeding (IMB)	Bleeding from the uterine corpus that occurs randomly or predictably outside of cyclic or scheduled menses.
Dysfunctional menstrual bleeding	Replaced	Chronic AUB	Bleeding from the uterine corpus that is abnormal in duration, volume, frequency, and/or regularity that has been present for greater than or equal to 6 months.
Dysfunctional menstrual bleeding	Replaced	Acute AUB	Abnormal, typically heavy, bleeding from the uterine corpus that requires immediate intervention to prevent further blood loss.
Oligomenorrhea	Replaced	AUB-infrequent	Menstrual cycle lengths more than 38 days.
Polymenorrhea	Replaced	AUB-frequent	Menstrual cycle lengths of fewer than 24 days.
Dysfunctional uterine bleeding	Discarded	-	-

150 [^]Munro et al. (10) specify 180 days.

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