

How I manage heavy menstrual bleeding

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Summary

Heavy menstrual bleeding (HMB) is a common clinical problem; population-based studies estimate that approximately 10–35% of women report this symptom during their lifetime, while about 5% of women consult a physician for evaluation of HMB. Patients with HMB account for 15% of all referrals to gynaecologists and are frequently seen by haematologists in bleeding disorder clinics as well. Heavy menstrual bleeding can be caused by a wide variety of local and systemic factors, so a careful clinical and laboratory evaluation is often necessary to determine the aetiology and guide appropriate management. This review discusses the definition, causes and clinical outcomes of HMB. It outlines a diagnostic approach and focuses on medical (as opposed to surgical) treatments. Throughout, areas of controversy and opportunities for further research are highlighted.

Keywords: bleeding disorders, heavy menstrual bleeding, iron deficiency, women's health, consultative haematology.

Definition and clinical outcomes of heavy menstrual bleeding (HMB)

The menstrual cycle is regulated by a complex endocrine feedback system. Heaviness of flow depends on hormone levels, vasoconstriction and muscular contraction in the uterus, and on haemostatic function. 'Normal menstruation' represents a spectrum, with a frequency between 24 and 38 d, regularity (i.e., cycle to cycle variation) between 2 and 20 d, duration between 4.5 and 8 d, and volume of blood loss between 5 and 80 ml per cycle (Fraser *et al*, 2007). Menses tend to be most irregular in the first 5–7 years after menarche and in the last 10 years before menopause, when anovulatory cycles are most likely to occur (Fraser *et al*, 2007). Every woman's experience of menstruation is different, making a judgement of what constitutes 'abnormal' menstrual bleeding difficult for clinicians and patients.

Caring for women with HMB is complicated by vague and subjective terms for abnormal uterine bleeding. 'Menorrhagia' and 'dysfunctional uterine bleeding' are particularly confusing. These terms are used variably by clinicians, are poorly understood by women, and are not tied to any objective measures (Fraser *et al*, 2007). The International Federation of Gynecology and Obstetrics (FIGO) Classification of Causes of Abnormal Uterine Bleeding dispenses with the terms 'menorrhagia' and 'dysfunctional uterine bleeding,' and replaces them with 'abnormal uterine bleeding' (AUB), which describes bleeding that is abnormally heavy and/or abnormal in timing. Within the description of AUB, FIGO includes the term 'heavy menstrual bleeding' (HMB) for bleeding above the 95th percentile of the normal population (Munro *et al*, 2011). The FIGO terminology is objective and clear, so it is very helpful when designing therapeutic trials or registries of HMB. However, in the clinical setting, a functional definition which holds meaning for both health care practitioners and patients can be even more useful. In the 2007 National Institute of Clinical Excellence (NICE) Clinical Guidelines, HMB is defined as 'excessive menstrual blood loss which interferes with a woman's physical, social, emotional and/or material quality of life' (NICE, 2007). This operational definition is both practical and patient-centred.

HMB carries high morbidity, including medical complications, school and work absenteeism, decreased quality of life, and increased healthcare costs (Cote *et al*, 2002; James *et al*, 2006; Chan *et al*, 2009). As women with HMB move through the health care system, they are more likely than matched controls to be hospitalized, visit an emergency room, and be seen in the outpatient setting (Milman *et al*, 1998). Over 60% of women with HMB undergo surgical treatment as initial therapy, and in the United States these women account for 300 000 hysterectomies annually (Lalonde, 1994; Jensen *et al*, 2012). Frank iron deficiency develops in the majority of women with HMB (Hallberg *et al*, 1966; Milman *et al*, 1998). A recent study of adolescents with HMB demonstrated that 87.5% had ferritin levels ≤ 40 $\mu\text{g/l}$, and 29.2% had ferritin levels ≤ 15 $\mu\text{g/l}$ (Wang *et al*, 2012). Not surprisingly, HMB has been shown consistently to affect patients' health-related quality of life (HRQL). Fatigue severity scores are significantly higher in young women with HMB as compared to healthy controls, and HMB is associated with low HRQL scores in females with bleeding disorders, such as von

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Willebrand Disease (VWD) (Kadir *et al*, 1998a; Rae *et al*, 2012; Wang *et al*, 2012).

Causes of heavy menstrual bleeding

A classification system for AUB has been developed by FIGO (Munro *et al*, 2011) (Table I). It divides the causes of AUB into four categories defined by visually detectable structural anomalies (malignancy and hyperplasia, polyps, adenomyosis and leiomyoma), four categories unrelated to structural anomalies (coagulopathy and other haemostatic defects, ovulatory dysfunction, endometrial and iatrogenic causes), and one category of unclassified causes (e.g., chronic endometritis, arteriovenous malformations and myometrial hypertrophy).

Up to 20% of women with HMB have an underlying bleeding disorder (Edlund *et al*, 1996; Kadir *et al*, 1998b; Dilley *et al*, 2001; Goodman-Gruen & Hollenbach, 2001; Woo *et al*, 2002; Philipp *et al*, 2003; El-Hemaidi *et al*, 2007; Nichols *et al*, 2008). Defects of platelet function (which can be difficult to diagnose due to complex laboratory testing and a lack of standardized diagnostic criteria) and factor deficiencies (including haemophilia carrier status with factor VIII (FVIII) levels in the mild haemophilia range) can be present. Conversely, HMB is a very common symptom in women with established bleeding disorders (Berry & DeLeon, 1996; Nichols *et al*, 2008; Chi *et al*, 2010; Miller *et al*, 2011; Rae *et al*, 2012). In a survey by the United States Centers for Disease Control and Prevention (CDC), 84% of women with VWD reported HMB (Kirtava *et al*, 2004). HMB is also a well recognized symptom in women with factor deficiencies, platelet disorders and congenital disorders of the vessel wall (e.g., hereditary haemorrhagic telangiectasia and Ehlers-Danlos syndrome). HMB has not been reported in women with factor XII, prekallikrein, or high-molecular-weight kininogen deficiency, as none of these disorders are associated with a bleeding phenotype.

Diagnostic approach to heavy menstrual bleeding

For many women with mild bleeding disorders, such as VWD and defects of platelet function, HMB can be the first clue to

Table I. International Federation of Gynecology and Obstetrics classification of causes of abnormal uterine bleeding.

Related to visually objective structural anomalies

Polyp
Adenomyosis
Leiomyoma
Malignancy and hyperplasia

Unrelated to structural anomalies

Coagulopathy
Ovulatory dysfunction
Endometrial
Iatrogenic

Entities not yet classified

the haemostatic defect. Identifying this defect can guide treatment of HMB and inform women of their bleeding risks with other haemostatic challenges, such as childbirth or surgery (Ragni *et al*, 1999). If a primarily non-haematologic cause of HMB is discovered, haematologists can still play a role in management, as they can suggest treatments to minimize blood loss.

History

The first step in the diagnostic workup is to assess whether menstrual blood loss is, indeed, heavy. Researchers measure blood loss commonly by collecting subjects' sanitary napkins/tampons and performing either alkaline haematin analysis or spectrophotometric analysis of the haemoglobin content (King, 1947; Hallberg & Nilsson, 1964; Wolf *et al*, 1984; Zander *et al*, 1984; Gannon *et al*, 1996). These techniques are not practical in the clinical setting, so many groups have attempted to use charts or questionnaires to assess blood loss objectively. These tools have met with varied success. For example, the pictorial blood assessment chart was found to correlate well with an alkaline haematin gold standard in initial development studies, but performed inconsistently in external validation studies (Higham *et al*, 1990; Reid *et al*, 2000; Wyatt *et al*, 2001; Zakherah *et al*, 2011). Several questionnaires attempt to assess blood loss as well as HRQL, using patient reported outcome measures (PROMs). A structured review by the University of Oxford concluded that there is minimal evidence to support the use of any currently available disease-specific PROM for women with HMB without fibroids (Gibbons *et al*, 2010). The EQ-5D and the SF-36, two generic measures of HRQL, may be of some use in this regard.

The development of clinically useful, validated PROMs and bleeding scores for women with HMB is a high-priority for research. Until further progress in this area has been made, the practicing clinician must rely on an individualized clinical assessment to investigate HMB. It is important to discuss objective factors, such as menstrual cycle length, variability, duration of flow and volume of flow. Holding to the functional definition of HMB, it is also important to determine the impact of a woman's blood loss on her well-being. We ask women how their menses interfere with their social life (including work and school absenteeism, ability to carry out basic and instrumental activities of daily living, ability to engage in sexual activity), their emotional life (including symptoms of depression and distress), and their health-seeking behaviour (including interactions with other healthcare professionals).

We have encountered women in our practice who are very distressed by their menstrual bleeding, but clearly have objectively non-heavy flow. This is reflected in a population-based study in which 25% of women with normal periods considered their blood loss excessive, whereas 40% of women with HMB (>80 ml) described their periods as non-heavy (Hallberg *et al*, 1966). In another study, only one-third of women

who considered their periods heavy actually had HMB (>80 ml) (Warner *et al*, 2004). In these circumstances, we discuss population-based definitions of 'normal' bleeding with the patient, dissuade her from potentially unnecessary treatment (e.g., hysterectomy) and discuss other strategies to improve her quality of life.

Despite the subjective nature of blood loss self-reporting, and the occasional disconnect between perceived distress and amount of blood loss, there is evidence that the subjective judgement of the volume of blood loss is useful; A 2004 study surveyed 226 women referred to gynaecology clinics who had putatively heavy periods (Warner *et al*, 2004). These women filled out a symptom questionnaire and consented to measurement of their blood loss. Only 34% of women had a blood loss volume of >80 ml, but the volume was associated with subjective heaviness of periods. Factors such as serum ferritin level, the passage of clots, and changing rate of sanitary protection (i.e., pads, tampons) during full flow predicted a loss of >80 ml accurately (sensitivity, 60%; specificity, 86%) (Warner *et al*, 2004). Based on published data and our own clinical experience, we ask women several questions to identify HMB objectively: rate of change of sanitary protection during peak flow days; need to change sanitary protection overnight; the presence and size of clots that are passed; the occurrence of a 'flooding' sensation during menstrual flow; and the existence of iron deficiency. Women with HMB may change their sanitary protection more than hourly, pass clots over 1 inch in diameter, and often have iron deficiency (Warner *et al*, 2004). Related symptoms such as pain, heaviness, mood changes and fatigue are also useful to explore (Santer *et al*, 2007).

Once menstrual symptoms have been explored fully, we move on to exploring the underlying cause of HMB. Certain features of the menstrual cycle (e.g., regular and cyclic breast tenderness, bloating, pelvic discomfort, mood changes and thin vaginal discharge) suggest ovulation. When these are absent, anovulatory cycles should be suspected. Bleeding between periods, post-coital bleeding, dyspareunia, vaginal discharge and pelvic pain are often related to a structural lesion (e.g., polyp, submucosal leiomyoma, neoplasia), while heavy bleeding during regular cyclic periods suggests a haemostatic defect or adenomyosis. Headaches, breast discharge, changes in hair growth/pattern, acne, and hyper- or hypometabolic changes may indicate an endocrine cause (e.g., thyroid disease, polycystic ovary syndrome, prolactinoma, some ovarian tumours).

Haematologists have unique expertise in identifying a haemostatic defect underlying HMB. Clues include a family history as well as a personal history of bleeding (spontaneously, and in response to bleeding challenges like surgery, trauma, dental procedures and childbirth). Descriptions of challenge-related bleeding should include the site, severity and frequency, as well as any treatments given. Spontaneous bleeding includes bruising, internal bleeding, and bleeding from the mucosa of the gastrointestinal, genitourinary and

respiratory tracts, oral cavity and nose. Spontaneous bleeding that is lengthy, unprovoked or requires medical/surgical intervention is suggestive of an underlying bleeding disorder. A history of general medical conditions, including thyroid, liver, kidney or bone marrow disease, may suggest an acquired bleeding disorder. Finally, a thorough history should enquire about the use of antiplatelet drugs, anticoagulants, hormones or naturopathic preparations that can affect haemostasis.

Physical examination

The physical examination focuses on clues of an underlying bleeding disorder. Signs of primary haemostatic disorders include petechiae, purpura, ecchymoses and gum bleeding, while signs of secondary haemostatic disorders include intramuscular and intra-articular bleeding. Dermal or mucosal telangiectasias suggest an underlying vascular wall abnormality. In women whose history suggests a congenital or inherited bleeding disorder, the physical examination can expand to encompass their systemic manifestations.

Laboratory testing

If it has not been done recently by the referring physician, a pregnancy test must be obtained. The causes of HMB are very different in pregnant women. We also recommend a complete blood count to assess for anaemia and quantitative platelet disorders, a blood film to explore qualitative platelet disorders, and a serum ferritin to investigate iron deficiency anaemia.

Testing for a haemostatic defect is essential if a woman has had consistently heavy menses since menarche and has a family history of bleeding or a personal history of bleeding with other haemostatic challenges (Kouides, 2008). A prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen and thrombin time should be obtained to investigate factor deficiencies. If these are normal, we do not pursue factor levels. However, given the high prevalence of VWD in women with HMB, initial laboratory investigation should also include VWD testing (von Willebrand factor antigen [VWF:Ag], ristocetin cofactor activity [VWF:RCO], FVIII, and multimer testing if indicated), performed and interpreted according to the most recent National Heart, Lung and Blood Institute guidelines (Nichols *et al*, 2008). VWF levels are affected by the menstrual cycle; high levels of oestrogen can cause an increase in plasma levels of VWF and mask low baseline values. The optimal time to draw samples for VWD testing is on days 1–4 of the menstrual cycle, when oestrogen is lowest. Ideally, testing should be repeated twice. A recent systematic review suggested that VWD testing can be done while the patient remains on combined oral contraceptives (Dumont *et al*, 2013). We perform platelet function testing routinely on women with HMB as well. As they are neither sensitive nor specific for disorders of platelet function, we do not recommend that women with HMB undergo

testing with the template bleeding time or the platelet function analyser (PFA-100). A more useful way to test for platelet disorders is to perform platelet aggregation and ATP release testing, preferably in a large referral centre with experience in this area.

Management

Women with HMB present a challenge to primary care physicians; there is little guidance on how extensive their initial diagnostic workup should be, which treatments should be used first-line, and when (and if) referral to a specialist should be considered. Algorithms to guide primary care physicians and specialists on how to investigate and manage HMB efficiently are proposed. (Figs 1 and 2).

Acute treatment of heavy menstrual bleeding

The goals of acute treatment of HMB are to staunch heavy blood flow and maintain haemodynamic stability. The initial gynaecological intervention in an unstable patient is intrauterine tamponade using either an intrauterine balloon or gauze packing. The latter can be infused with thrombin in sterile saline, to encourage clotting. Tamponade should be performed only by gynaecologists or emergency physicians trained in this procedure, and should be left in place for no longer than 24 h. Depending on the cause and severity of bleeding, uterine curettage, uterine artery embolization or hysterectomy may be considered also. It should be underscored that the last two options do not preserve fertility.

The initial pharmacological intervention is high dose intravenous (IV) oestrogen. This stops bleeding in most women within five hours of the first dose (DeVore *et al*,

1982) and promotes rapid regrowth of friable endometrium. It can be used in combination with gynaecological procedures, but may be a sufficient stand-alone therapy in many women. We use a 25 mg dose of conjugated equine oestrogen (Premarin) in 5 ml isotonic saline, injected intravenously over 2 min. This dose can be repeated at 5–6 h if bleeding continues. IV oestrogen can cause nausea and vomiting, so co-administration of an anti-emetic is important. Another serious side effect is venous thrombosis, and a case of fatal pulmonary embolism has been reported (Zreik *et al*, 1999), so patients who receive IV oestrogen must be monitored closely for venous thrombosis in hospital. They must be counselled on the signs and symptoms as well, so they can seek urgent medical care if they experience a thrombotic event after discharge. We recommend that IV oestrogen be used sparingly, to minimize the risk of adverse effects. If bleeding does not cease within 8 h, oestrogen should be stopped and other treatments pursued. After bleeding ceases with IV oestrogen, patients can be transitioned to a course of oral oestrogen, best initiated and monitored by a gynaecologist. High dose oral contraceptives (e.g., with combined oestrogen and progestin), and high dose oral progestins can be used also to control HMB, once patients are haemodynamically stable. Progestins may be a safer option than oestrogens or combined oral contraceptives in women with thrombophilia, though this question is a focus of ongoing research (Lethaby *et al*, 2008). Antifibrinolytic agents are a useful non-hormonal option for the acute management of HMB. We recommend tranexamic acid 10 mg/kg, given intravenously every 8 h, or 1–1.5 g orally every 8 h until bleeding ceases. Acute side effects of tranexamic acid include nausea, dizziness and diarrhoea. In women who are known to have a specific haemostatic defect, targeted treatment

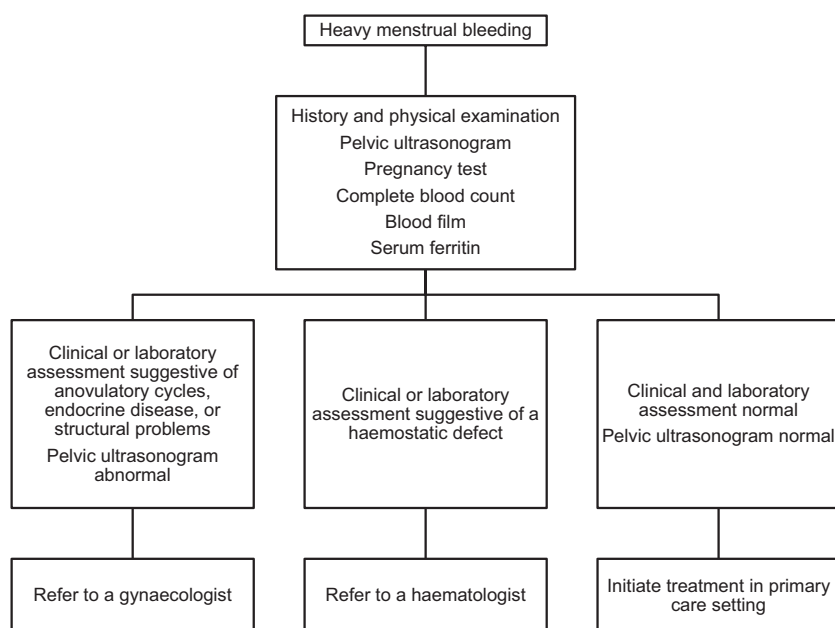


Fig 1. Proposed algorithm for the investigation of heavy menstrual bleeding.

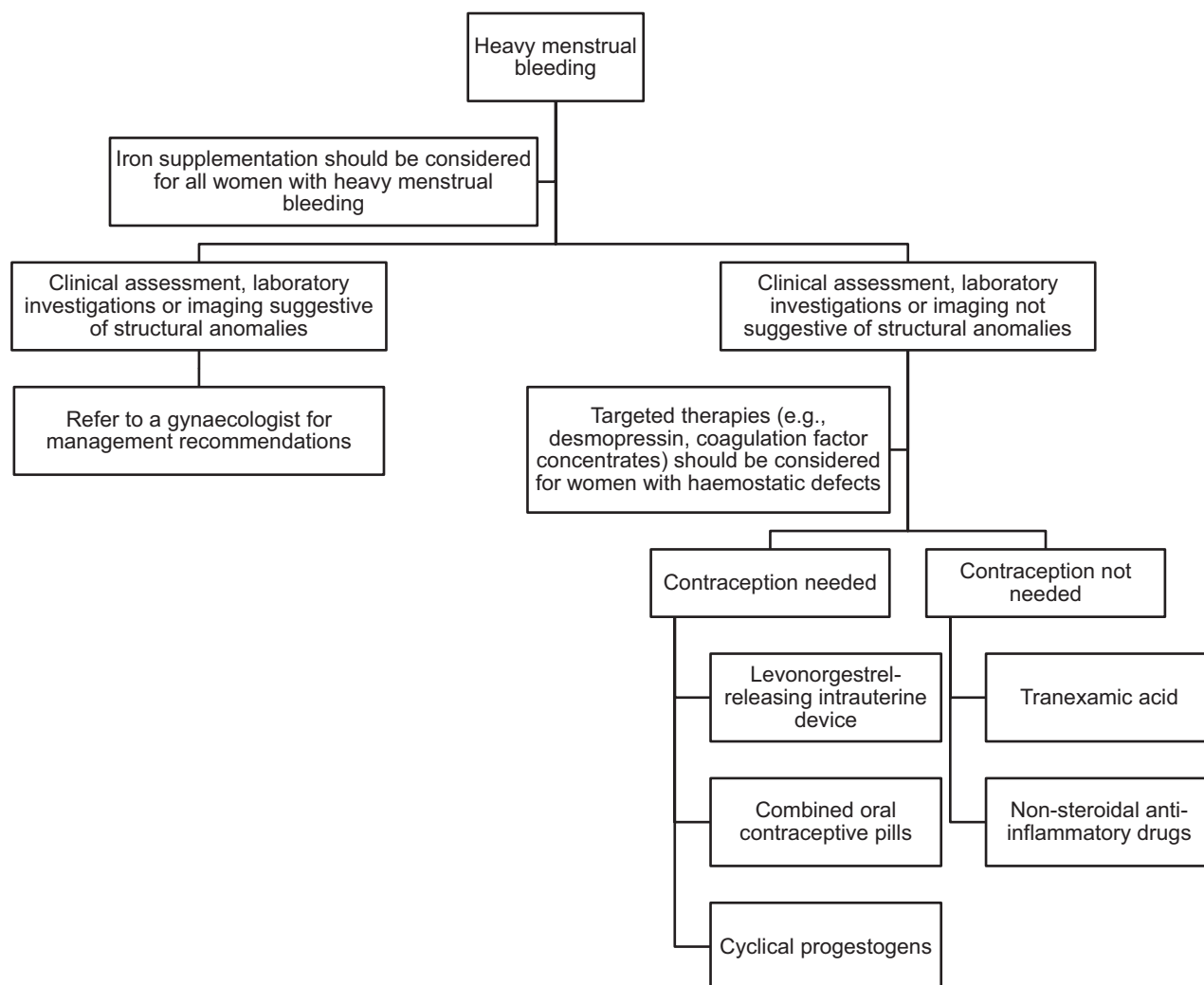


Fig 2. Proposed algorithm for the treatment of heavy menstrual bleeding.

should be given for acute bleeding. This includes desmopressin, factor concentrate, or blood products, as needed.

Long term treatment of heavy menstrual bleeding

The goal of long term treatment of HMB is to improve quality of life by preventing excessive bleeding, treating associated menstrual symptoms (e.g., pain, irregular cycles), and replenishing iron stores. Concerns about preservation of fertility, side effects of treatment and underlying haematological or gynaecological disorders must be discussed fully. Before first line treatments for HMB are pursued, it is important to rule out structural gynaecologic abnormalities that can limit their effectiveness (Table I). We recommend that all women with unexplained HMB undergo pelvic ultrasonography to rule out polyps, adenomyosis and leiomyoma, as well as a routine periodic health examination, with screening for gynaecological malignancy if indicated. We also recommend that they undergo basic laboratory investigations to rule out a

haemostatic defect (see 'Diagnostic approach' above). Once major gynaecological and haematological disorders are excluded, one of the following first-line pharmacological therapies should be administered:

- 1 Combined oral contraceptive pills (COCs)
- 2 A levonorgestrel-releasing intrauterine device (LNG-IUD)
- 3 Tranexamic acid
- 4 Non-steroidal anti-inflammatory drugs (NSAIDs)
- 5 Cyclical progestogens

Choice of initial treatment must be dictated by the individual woman's values and preferences, her other menstrual symptoms (e.g., irregular menstrual cycles, menstrual pain) and her tolerance for the pros and cons of each treatment option (Fig 2).

COCs are offered frequently to women with HMB who do not want to conceive immediately, and who are not at increased risk for thrombosis (i.e., do not have a known thrombophilia or history of arterial or venous thrombosis).

COCs treat menstrual pain, and can reduce blood flow by regulating menstrual cycles and thinning the endometrium. One small randomized trial showed an average reduction in menstrual blood flow of 43% (Farquhar & Brown, 2009). However, there is insufficient evidence from large, well-designed clinical trials that COCPs are superior to other agents (Farquhar & Brown, 2009). If COCPs are effective, they will generally work within 3 months. If a woman has had 3-month trials of one or two different formulations of COCPs, with minimal benefit, we recommend that other therapies be considered.

Recent evidence that the LNG-IUD may improve patient-reported HRQL leads us to recommend that it be the first therapy offered to women who do not want to conceive immediately. The LNG-IUD has local and systemic hormonal effects, one of which is the inhibition of endometrial proliferation. A randomized controlled trial of over 500 women (mean age 42 years), comparing the LNG-IUD to usual treatment (tranexamic acid, COCPs, progestin alone, or mefenamic acid), showed that women using the LNG-IUD had significantly higher functional and quality of life scores at 6 months and 2 years (Gupta *et al*, 2013). The LNG-IUD reduces menstrual blood loss by 74–97% after 1 year of use (Lethaby *et al*, 2005; Varma *et al*, 2006). Randomized trials have shown that, in this respect, it is superior to COCPs, other progestin preparations, tranexamic acid and NSAIDs (Stewart *et al*, 2001; Hurskainen *et al*, 2004; Lethaby *et al*, 2005; Reid & Virtanen-Kari, 2005; Marjoribanks *et al*, 2006; Heikinheimo & Gemzell-Danielsson, 2012). The LNG-IUD also appears to confer similar HRQL outcomes to hysterectomy, with lower healthcare costs (Hurskainen *et al*, 2004; Marjoribanks *et al*, 2006). The LNG-IUD is a safe option in women with thrombotic risk, and is effective in women with factor deficiencies, VWD, platelet disorders, and HMB due to use of oral anticoagulants (Kingman *et al*, 2004; Schaedel *et al*, 2005; Pisoni *et al*, 2006; Kadir & Chi, 2007). Women who choose to have an intrauterine device placed should be counselled that it can cause intermenstrual bleeding ('spotting') and breast tenderness. It can also take at least 6 months for their menstrual cycles to become regular and for them to see positive effects of treatment. However, by 6 months, most women experience amenorrhea or oligomenorrhea (Stewart *et al*, 2001; Lethaby *et al*, 2005).

Some women are not good candidates for hormonal treatment of HMB because of increased baseline thrombotic risk, unacceptable side effects, or a desire to conceive immediately. In these women, antifibrinolytic therapy and NSAIDs are suitable options. Tranexamic acid is an antifibrinolytic agent which promotes haemostasis by inhibiting plasmin. It improves symptoms of HMB generally within three cycles, reducing menstrual blood flow by 29–58% (Lethaby *et al*, 2000; Lukes *et al*, 2010). If effective, it can be used long term (Muse *et al*, 2011). Tranexamic acid improves HRQL, haemoglobin and ferritin levels in women with HMB (Winkler, 2001; Lukes *et al*, 2010, 2011; Muse *et al*, 2011, 2012). The

risk of thrombosis is controversial. Several studies have shown no association between thrombosis and tranexamic acid in this population, while one has shown a statistically non-significant association with venous thrombosis (Bernthorpe *et al*, 2001; Wellington & Wagstaff, 2003; Fraser *et al*, 2008; Sundstrom *et al*, 2009). We counsel women who receive this agent about the potential for thrombosis, but stress that the risk is probably negligible. We prescribe 500 mg tranexamic acid tablets, and recommend that patients take 1 g three to four times a day, for up to 4 d during their menstrual cycle.

NSAIDs inhibit synthesis of prostaglandins in the endometrium, causing local vasoconstriction. They can reduce menstrual blood flow by 20 to 49%, and decrease menstrual discomfort (Lethaby *et al*, 2013). Like tranexamic acid, these drugs generally show an effect within three cycles. Though NSAIDs are less effective in reducing HMB than tranexamic acid or the LNG-IUD, they are generally well tolerated and have a good safety profile (Lethaby *et al*, 2013). We prescribe naproxen 250 mg every 6–8 h, or ibuprofen 400 mg every 8 h during menstruation.

Progestogens are commonly prescribed for women with HMB, and are thought to be particularly suitable in women with increased thrombotic risk. A Cochrane Review showed that cyclical progestogens were not superior to other medical therapies for HMB, though some studies demonstrated up to an 83% reduction in menstrual blood loss with the drug norethisterone (Lethaby *et al*, 2008). However, the drug's adverse effects (e.g., fatigue, mood changes, weight gain, nausea, bloating, oedema, headaches, depression, loss of libido, irregular bleeding) made it difficult to tolerate, and not a preferred choice for most women.

Specialist referral and management

If women do not respond to first-line pharmacological treatments, we recommend they be referred to a specialist for further management (Fig 1). Referral to a gynaecologist should be made if the pelvic ultrasonogram is abnormal or if the patient has symptoms suggestive of anovulatory cycles, endocrine disease, or structural problems (see 'Diagnostic approach' above). Investigations performed by the gynaecologist may include determination of hormone levels, endometrial sampling or hysteroscopy. The gynaecologist can also consider advanced therapies, such as gonadotropin-releasing hormone agonists, endometrial ablation, hysterectomy, or other surgical options.

Referral to a haematologist should be made if laboratory investigations are abnormal, or if the patient's history or physical examination suggests a haemostatic defect (see 'Diagnostic approach' above). A haemostatic defect is not a contraindication to any of the first-line therapies described above, apart from NSAIDs, which may worsen platelet function systemically even as they cause uterine vasoconstriction and decreased blood flow locally. However, women with

haemostatic defects sometimes require additional targeted treatment, such as desmopressin or coagulation factor concentrate (Kadir *et al*, 1999; Demers *et al*, 2005; Rodeghiero, 2008; Seligsohn, 2012). Women with HMB due to disorders of primary haemostasis (e.g., platelet function defects, VWD) may benefit particularly from self-administered desmopressin (Rodeghiero, 2008). We have prescribed desmopressin 300 µg daily, to be taken intranasally on the two or three heaviest days of the menstrual period. We warn women about the risk of free water retention and severe hyponatraemia, and the need for fluid restriction during the use of desmopressin.

If a haemostatic defect is diagnosed, the haematologist must develop not only a treatment plan for HMB, but also for future bleeding episodes and situations where bleeding prophylaxis should be offered (i.e., surgery, childbirth, trauma). We communicate this individualized treatment plan not only to the primary care physician and gynaecologist, but also to the patient herself. Every patient diagnosed with a haemostatic defect in our clinic receives a copy of their treatment plan, either in the form of a letter or a treatment card. Written treatment plans and cooperation between physicians can help women with HMB navigate the medical system. As many haemostatic defects are inherited, genetic counselling and testing of family members must be offered as well.

Iron supplementation

The final aspect of managing women with HMB involves replenishing iron stores. We do not recommend intramuscular injection of iron; mobilization of iron from intramuscular sites is slow, and the injection causes pain and visible 'tattooing' (Afzal *et al*, 2009). Oral iron salts are a low cost option for iron supplementation, but often cause gastrointestinal side effects (CDC, 1998). In our experience, patients are non-compliant with these medications if they experience constipation and abdominal pain. We prefer oral iron polysaccharide formulations for uncomplicated iron deficiency, as they may be better tolerated with minimal gastrointestinal side effects, and convenient once-a-day dosing. Intravenous iron is an option for women with who are not responding to maximal oral iron therapy, or for those with concurrent inflammatory disorders which interfere with iron utilization (Notebaert *et al*, 2007). Patients and clinicians embarking on courses of intravenous iron therapy should understand the infusional side effects, including anaphylaxis.

Concluding remarks

There are several avenues for further research to improve the care of women with HMB (Table II). As we move towards a more functional definition, clinically useful, validated PROMs are essential to truly understand the patient's experience of HMB. Bleeding scores are also an area of active

Table II. Avenues for future research to improve the care of women with heavy menstrual bleeding.

Development of clinically useful, validated patient-reported outcome measures for heavy menstrual bleeding (HMB)
Development of clinically useful, validated bleeding scores to quantify menstrual bleeding
Establishing patient preferences for different treatment options for HMB
Establishing safe and acceptable treatments for HMB in women with increased thrombotic risk, and other unique patient populations

research. These would facilitate more efficient assessment of symptoms, in both primary care and specialist settings. Women with HMB currently have a variety of treatment options from which to choose. Further research must focus on patient preferences for different options, and on the development of safe and acceptable treatments in unique patient populations, such as women with increased thrombotic risk.

Changes in clinical practice are needed to ensure that women with HMB have ready access to haematological care, and haematologists must work with other health care providers to create individualized diagnostic and therapeutic plans. Despite the strong link between haemostatic defects and HMB, underlying bleeding disorders often remain unrecognized in women with menstrual problems. For example, the most common symptom in women with VWD is HMB, yet one study showed that the average delay between the onset of bleeding symptoms and the diagnosis of VWD was 16 years (Kirtava *et al*, 2004). Why are bleeding disorders under recognized in these women? Perhaps because testing for systemic haemostatic defects can be complex, because most HMB are managed using hormonal or surgical therapy (without resorting to haemostatic agents), or because the patient's general practitioner and gynaecologist do not have ready access to haematological referral. Despite these barriers, haematologists play an essential part in the care of women with HMB. Our expertise can be brought to bear on the identification, diagnosis and optimal management of these women, as well as the evaluation of possible inherited bleeding disorders in their family members. Timely identification of a bleeding disorder can prevent unnecessary invasive testing or surgery, inform patients about their bleeding risk in other settings, and open the door to effective treatment options. There are many questions left to be answered in the care of women with HMB; the haematologist is instrumental as this challenging area continues to evolve.

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