Surviving Shark Week: A Multidisciplinary Case Discussion of Evaluation and Management of Adolescents with Abnormal Uterine Bleeding

Rachel J. Miller, MD; Eric S. Mullins, MD; and Tanya Kowalczyk Mullins, MD, MS
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We will be discussing unapproved use of pharmaceuticals or devices.
Objectives

1. Describe changes classification and terminology related to abnormal uterine bleeding;
2. Determine which adolescents presenting with abnormal uterine bleeding warrant further evaluation;
3. Formulate a plan for clinical and laboratory evaluation of adolescents with abnormal uterine bleeding; and
4. Discuss the management options for an adolescent with abnormal uterine bleeding.
Updated Terminology
Rationale for Updated Terminology

• Inconsistent use of existing terms
• 2011: International Federation of Gynecology and Obstetrics proposed new terminology system
  • Endorsed by ACOG

• Out: menorrhagia, DUB, metrorrhagia
• In: heavy menstrual bleeding (HMB), intermenstrual bleeding
New Umbrella Term: Abnormal Uterine Bleeding (AUB)

• Further classified under PALM-COEIN:

PALM: Structural Causes
• Polyp
  – Endometrial, endocervical
• Adenomyosis
• Leiomyoma
  – Submucosal, Other
• Malignancy & hyperplasia

COEIN: Nonstructural Causes
• Coagulopathy (AUB-C)
  – vonWillebrand’s disease
• Ovulatory dysfunction (AUB-O)
  – PCOS, immature HPO axis, thyroid dysfunction
• Endometrial (AUB-E)
  – Infection (PID)
• Iatrogenic (AUB-I)
  – OCPs
• Not yet classified (AUB-N)
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  – OCPs
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Key Elements of History & PE
What is normal?

- Every 21-45 days
  - Trend toward shorter, more regular cycles with increasing age
  - By 3rd gynecologic year: 60-80% of cycles are 21-34 days
  - Normative cycle length established around 6th gynecologic yr

- Lasting between 3-7 days
  - Prolonged bleeding: ≥ 8 days

- Normal blood loss 30-40 ml per cycle
  - 3-6 pads or tampons per day

Anovulatory Cycles

• Immaturity of HPO axis leads to anovulatory cycles
  • 50% of periods in 1st year after menarche
  • 20% of periods by 2nd year after menarche
  • Regular ovulatory cycles by 20 months after menarche (on avg)

• Estrogen continues to stimulate endometrium
• No ovulation = no corpus luteum = no progesterone
• No progesterone = no stabilizing influence on the endometrium
• Leads to irregular, heavy bleeding
What is heavy menstrual bleeding?

- More than 80 ml blood loss per period\(^1\)
- Longer than 7 day period
- Impact on patient’s quality of life\(^2\)

- Be sure to clarify what kind of products the patient is using

- Warner criteria\(^3\)

Warner Criteria

Clinical features that are associated most strongly with HMB

1. Frequent changing sanitary protection during full flow (<1-2hrs)
2. Poor iron status (low ferritin)
3. Size of clots (>quarter)
4. Greater number of products used
5. Need to change protection during the night

• 76% prediction success for HMB if criteria 1-3 met

Pictorial Bleeding Assessment Calendar (PBAC) Adaptation

• PBAC score $>100$ correlates with $>80$ ml menstrual blood loss in adults$^1$
  • 86% sensitivity, 89% specificity$^{2-3}$

• No studies to validate use in adolescents, but a good place to start
  • Mean PBAC score differed between adolescent girls reporting heavy, normal, or light periods$^4$

Clinical Evaluation – History

• Complete menstrual history
  • Onset of menarche, LMP, PMP
  • Cycle length and duration of periods
  • Pain with periods
  • Number and type of pads/tampons used
  • Need to change product at night
  • Need to “double up” on products
  • Bleeding onto clothes or sheets
  • Symptoms of gushing
  • Missed days of school, impact on activities
  • Does she keep a menstrual calendar?

Clinical Evaluation - History

- Sexual history, including STIs
- Complete general medical history
  - Current medications (such as contraception)
  - Pubertal development
- Recent weight changes, thyroid related sx
- Hx of easy bleeding/bruising
  - Post-partum, post-op, or with dental work
  - Epistaxis, gum bleeding, easy bruising
- Symptoms of anemia – dizziness, fatigue, pica, etc
- Family history
  - Bleeding disorders, PCOS, menstrual disorders, thyroid disorders

Mullins, Pediatr Annals, 2015
Evaluation – Physical Exam

• Assess hemostatic stability
  • Orthostatic blood pressures and pulse
  • Observe for pallor, tachycardia, dizziness, distal perfusion

• Weight, BMI

• Signs of androgen excess

• Petechiae, ecchymosis

• Thyroid exam

• External GU exam
  • Virilization, site of bleeding, trauma
  • Pelvic exam as indicated by hx
Initial Labs/Imaging

• Pregnancy test – everybody!
• CBC (with plts, differential) and ferritin
• Type and cross if hemodynamically unstable
• Anovulation evaluation- thyroid, PCOS, etc.
• STI testing when indicated
• Targeted screening for bleeding disorders when indicated (next section)
• Ultrasonography when indicated
  • Focal abd pain, abd or pelvic mass, non-response to treatment
  • Among <18 yo with HMB who had an u/s, 72% normal, 18% incidental findings, 1.3% structural abnormality – none had change in management based on u/s\textsuperscript{1}

Hemostatic Evaluation for Heavy Menstrual Bleeding
Why Worry about Bleeding Disorders?

• Women with HMB are more likely to have a bleeding disorder than the general population
• VWD has a 10-20 fold higher prevalence in women with HMB\textsuperscript{1,2}
• Platelet defects are also more common among HMB patients\textsuperscript{3,4}
• 76% of women with bleeding disorders report HMB\textsuperscript{5}

When to Worry about Bleeding Disorders?

• Bleeding symptoms other than HMB\textsuperscript{1}
  • Epistaxis, bruising
  • Post-operative bleeding
• Anemia\textsuperscript{*}
• Low ferritin levels\textsuperscript{*}
• Family history of bleeding symptoms

\textsuperscript{1} Shankar et al. BJOG. 2004;111(7):734-740.
\textsuperscript{*}not necessarily confirmed by research studies…
Screening for Bleeding Disorders: History

• One could argue the most cost effective method of screening
• History of bleeding symptoms
• Easy bruising is hard to quantify
  • Multiple, large bruises, especially not over bony prominences are more worrisome
• Post-operative bleeding
  • More common in oropharyngeal procedures
• Family history is quite important
Screening for Bleeding Disorders: Laboratory Evaluation

- CBC
- Ferritin
- PT
- aPTT
- TT
- Fibrinogen
- von Willebrand profile
- Platelet function testing
Complete Blood Count and Ferritin

- Evidence of anemia
- Microcytosis is suggestive of iron deficiency
- Reticulocytosis, in the absence of anemia, may be reflective of acute blood loss
- Don’t forget the platelet count!
  - Thrombocytopenia
- Serum ferritin is more indicative of iron stores/iron deficiency than other iron studies
PT and aPTT

• In vitro coagulation testing covering secondary hemostasis
• It is important to understand what is involved with the tests to allow interpretation
• PT – “Extrinsic” cascade of coagulation
  • Initiated with thromboplastin (Tissue Factor)
• aPTT – “Intrinsic” cascade of coagulation
  • Initiated with kaolin, silica, or diatomaceous earth
PT and aPTT
von Willebrand Testing

A normal aPTT rules out von Willebrand's Disease.

A normal PFA-100 rules out von Willebrand’s Disease.

Consider the veracity of these statements for a moment…
von Willebrand Profile

• vWF:Ag – Total VWF protein in the plasma

• vWF:Act – Activity of vWF that is based on ristocetin agglutination of platelets

• Factor VIII:Act – Clottable activity of clotting factor VIII

• Multimer analysis – Analysis of the size of the multimers in plasma
What is vWF?

• vWF is a protein that provides a “bridge” between the subendothelium and platelets
  • Has collagen binding site
  • Binds Gplb on platelet surface

• vWF also carries fVIII in plasma
  • Half-life of fVIII in plasma with vWF is about 12 hrs
  • Without vWF, fVIII half-life is between 1-4 hrs
When to test for VWD?

- Consensus statement suggests testing during menses as VWF levels are at nadir\(^1\)
- Not recommended to delay treatment for testing or to delay testing due to treatment

- Current OCPs tend to flatten VWF fluctuations during menstrual cycle\(^2\)
  - But do not raise levels as significantly as earlier generation products\(^2\)-\(^4\)

What about the PFA-100™?

• Platelet function analyzer – 100™
• Whole blood platelet aggregation study

• Flows over a collagen covered membrane
• Uses two platelet agonists:
  – Epinephrine
  – ADP

• Measures time until flow stops
Limitations of the PFA-100™

• Sensitivity to both VWD\(^1\) and platelet dysfunction\(^2\) is questionable

• Reproducibility among normal controls is even problematic\(^3\)

• Abnormalities may be caused by transport in a pneumatic tube system\(^4\)

PFA-100™ in Women with HMB

• Two groups specifically looked at the PFA-100™ in HMB

• For VWD:¹,²
  • Sensitivity: 53-80%; Specificity: 88-89%
  • PPV: 33-34%; NPV: 95-98%

• For intrinsic platelet defects:¹
  • Sensitivity: 23%; Specificity: 92%
  • PPV: 75%; NPV: 52%

Testing for Intrinsic Platelet Disorders

• Prevalence has been reported as high as 26% of patients presenting to a HMB clinic¹
• If you can’t rely on PFA-100™, how to test?
• Further testing in consultation with a pediatric hematologist
• Methods to consider:
  – Lumiaggregometry, considered first line by the ISTH²
  – Flow cytometry for platelet receptors
  – Quinacrine uptake/release to assess dense granules
  – Platelet electron microscopy

When should you think about platelet dysfunction?

• Prevalence of platelet defects in HMB varies wildly depending on the study

• Test for an intrinsic platelet defect if first line testing is normal and:
  • HMB is poorly controlled, even with good adherence to standard therapy
  • Significant other bleeding symptoms (i.e., epistaxis, oral bleeding, post-op bleeding)
  • Significant family history of bleeding symptoms
Hormonal Treatments for Heavy Menstrual Bleeding
Goals of Treatment

• Stop the bleeding
• Treat or prevent anemia
• Establish regular periods
• Improve quality of life
Management of Heavy Menstrual Bleeding

Predicated on answers to questions:

1. Is the patient hemodynamically stable?
2. Acute or chronic bleeding?
3. How severe is the anemia?
4. Ovulatory cycles?
5. Is there a hemostatic disorder present?
6. Age/reproductive choices

• Hormonal therapy is the mainstay
  • Estrogen to increase clotting factors
  • Progestin to stabilize endometrium
Acute Management
Mild AUB-O: Hgb > 12 g/dL

- Hemodynamically stable
- Discuss etiology of bleeding
- Menstrual calendar
- Iron supplementation
- Hormonal intervention is optional
- Reevaluate in 3 mos

Mitan and Slap, in Adolescent Health Care, 2007
Bennett, Curr Opin Pediatr, 2014.
Moderate AUB-O: Hgb 10-12 g/dL

- Begin hormonal intervention (e.g. OCP, 30-35 mcg EE)
- Begin regular cycle if not actively bleeding
- If actively bleeding:
  - Take one pill q 6-12 hrs for 24-48 hrs until bleeding stops. Antiemetics prn.
  - Then taper to daily pill by Day 5 and immediately start a new pack when the first pack is done
  - No withdrawal bleed for 1st cycle
- Continue OCPs for 3-6 months
- Iron supplementation
- Follow up in 1-2 mos

Mitan and Slap, in Adolescent Health Care, 2007; Bennett, Curr Opin Pediatr, 2014.
Severe HMB: Hgb < 10g/dL

- Acutely or severely anemic (Hgb < 8) OR hemodynamically unstable: admit

- Type and cross

- Begin OCPs (30-35 mcg EE) q 6 hrs; antiemetics prn
  - If no response to PO regimen or unable to tolerate PO – **ADD** conjugated estrogen 25 mg IV q6 hrs (max 6 doses)
  - Keep q6 hr OCP: progesterone helps stabilize endometrium
  - Taper OCPs to once daily by Day 7 and continue as for moderate bleeding

- If continued bleeding – may need imaging

Estrogen Contraindication? Use Oral Progestin Tapers for Acute Bleeding

• Norethindrone acetate
  • 10 mg q4 hours until bleeding ceases
  • 10 mg q6 hours x 3 days
  • 10 mg q8 hours x 3 days
  • 10 mg BID x 2 weeks
  • 10 mg daily

• Oral medroxyprogesterone acetate (MPA)
  • 20 mg TID x 7 days
  • Then taper

Lethaby, Cochrane Review, 2008
## RCT Strategies

<table>
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<tr>
<th>Drug</th>
<th>Dose</th>
<th>Schedule</th>
<th>Outcome</th>
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</thead>
<tbody>
<tr>
<td>IV estrogen¹</td>
<td>25 mg</td>
<td>Q4-6 hours x 24 hrs</td>
<td>72% stop within 8 hours</td>
</tr>
<tr>
<td>COCs²</td>
<td>Monophasic 35 mcg E2</td>
<td>TID x 7 days</td>
<td>88% stop within 3 days</td>
</tr>
<tr>
<td>Oral MPA²</td>
<td>20 mg</td>
<td>TID x 7 days</td>
<td>76% stop within 3 days</td>
</tr>
</tbody>
</table>

Chronic Management
Combination Hormonal Methods
Combined Hormonal Methods

• Estrogen & progestin birth control pills
  • First line for vWD and other bleeding d/o
  • ↑ fibrinogen, prothrombin, Factors 7, 8, 10 and/or vWF
  • Reduce menstrual blood loss by 40-50%
  • ↑ Hgb in women with anemia

• Patch, vaginal ring likely have similar effects

• Extended-use pills are also helpful: may have more spotting initially, but withdrawal bleed only every 3 mos

Nichols, Haemophilia, 2008; ACOG Practice Bulletin #107, 110
<table>
<thead>
<tr>
<th>Category</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>1</td>
<td>No restriction for use</td>
</tr>
<tr>
<td>2</td>
<td>Advantages of using the method generally outweigh the theoretical or proven risks</td>
</tr>
<tr>
<td>3</td>
<td>Theoretical or proven risks usually outweigh the advantages of using the method</td>
</tr>
<tr>
<td>4</td>
<td>Unacceptable health risk if contraceptive method is used</td>
</tr>
</tbody>
</table>
Contraindications to Estrogen Containing Methods

• Uncontrolled hypertension (4)
• Known thrombogenic mutation or SLE with antiphospholipid antibodies (4)
• Personal h/o venous thromboembolism (4)
  • First degree relative with unexplained VTE is category 2
• Major surgery with prolonged immobilization (4)
• Migraine headaches with aura (4)
• DM with peripheral vascular disease (3/4)
• Stroke or coronary artery dz (4)
• Postpartum < 21 days (4)
• Current breast cancer (4)
• Severe liver disease (4)
Progestin-only Medical Therapies
Progestin-only Pills

- The “mini-pill”: continuous daily progestin
  - 20% amenorrhea to irregular bleeding
  - 40% short irregular bleeding
  - 40% ovulatory bleeding
  - Breakthrough/irregular bleeding in non-punctual dosing

Broome, Contraception, 1990; Lethaby, Cochrane Review, 2008; ACOG, Committee Opinion 606, 2014
Norethindrone Acetate

• Norethindrone acetate 5-15 mg/day continuous
• NOT approved for contraception
• Norethindrone acetate → norethindrone
  • Estrogenic and androgenic effects
  • Side effects: weight gain, acne, mood changes
• Used to stop acute bleeding or for maintenance
• No evidence for use in menstrual suppression
• Limited data on endometriosis
  • Titrated 5-15mg/day until pain and bleeding stop; high rates of amenorrhea

Depot Medroxyprogesterone Acetate (DMPA)

• IM Injection every 12 weeks
• Amenorrhea
  • 26% at 3 months
  • 50% at 1 year
• Less overall blood loss and anemia
• Side effects: Weight gain, bone health, potential irregular bleeding

Jain, Contraception, 2004; Package insert; Hubacher, Contraception, 2009; Bonny, Arch Pediatr Adolesc Med, 2006
Contraindications to Progestin Options

- Current pregnancy (4)
- Current breast cancer (current: 4; past: 3)
- Severe decompensated liver cirrhosis (3)
- Hepatocellular adenoma or hepatoma (3)
- DMPA only: related to lower HDL levels from hypoestrogenic effect
  - Multiple risk factors for atherosclerotic CV dz (e.g., older age, smoking, diabetes, HTN, low HDL, high LDL, or high triglyceride levels) (3)
  - BP >160/100 (3)
  - Vascular disease (3)
  - Current or past ischemic heart disease (3)
  - Stroke (3)
  - Lupus with + antiphospholipid Ab (3)
  - Diabetes with nephropathy, retinopathy, neuropathy; or with other vascular disease or diabetes of >20 years’ duration (3)

CDC, U.S. Medical Eligibility Criteria for Contraceptive Use, 2016
**Subdermal Implant**

- Contraception for 3 years
- Must be inserted & removed by trained provider
- Increase in hemoglobin\(^1\)
- Users should expect a change in bleeding patterns – most common side effect
  - No predictability
  - Does not necessarily improve with duration of use
  - Ranges from amenorrhea to frequent and/or prolonged bleeding\(^2\)
  - 11-15% request removal for bleeding\(^2,3\)
  - 30-40% amenorrhea at 1 year

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How does it work?

• Slow release of progestin
• Suppresses ovulation
• Increased viscosity of cervical mucous
• Thins the endometrium to make it less hospitable
• Return to fertility 7 days after removal
Irregular Bleeding with Implants

• Analysis of 11 clinical trials including 942 implant users found:
  • 33.3% of 90-day cycles had infrequent bleeding
  • 21.4% had amenorrhea
  • 16.9% had prolonged bleeding
  • 6.1% had frequent bleeding

Dainey, Fertil Steril, 2009
What about other side effects?

• May worsen depression and acne\(^1\)
• No impact on bone density\(^2\)
• Does not cause weight gain\(^3,4\)

Contraindications to Implants

- Pregnancy
- Allergy to components of implant
- Stroke, current or h/o ischemic heart disease (Category 3)
- SLE with antiphospholipid antibodies (3)
- Migraine with aura (continuation; 3)
  - Implant may exacerbate severe headaches
- Decompensated cirrhosis or liver tumor (3)
- Breast cancer (current: 4; past: 3)

CDC, U.S. Medical Eligibility Criteria for Contraceptive Use, 2016
NSAIDs as Adjunct Therapy

- Inhibit cyclooxygenase = decreased prostaglandins
- Cochrane review: NSAIDs more effective than placebo at reducing menstrual blood loss
  - But less effective than other interventions (i.e., tranexamic acid or LNG IUD)
- Naproxen 250-500mg BID –QID
- Ibuprofen 600-1200 mg daily

Hematologic Treatments for Heavy Menstrual Bleeding
Fibrinolysis Inhibitors

- Two inhibitors of fibrinolysis are available
  - Tranexamic acid (TXA)
  - ε-aminocaproic acid (EACA)
- Both meds have PO formulations
- TXA is more potent inhibitor of plasminogen activation than EACA
- Both have been used to manage HMB though TXA has been more frequently used\(^1\)

TXA in HMB

• Efficacy has been well described\textsuperscript{1-4}
  – For women with or without bleeding disorders
• Current US formulation dose is 1300 mg TID for five days\textsuperscript{3}
• Questionable risk of thrombosis
  – Mostly case reports
  – One retrospective study showed a trend towards increased thrombosis in adult women (mean age 41 yo)\textsuperscript{5}

Desmopressin (DDAVP)

- **DDAVP**: intranasal formulation (1.5 mg/mL)
  - Nocturnal enuresis formulation is not sufficient
  - Dose is “same” but formulation for treatment of VWD is more concentrated

- Stimulates release of endothelial produced coagulation factors
  - von Willebrand Factor; factor VIII; tPA

- Used to treat:
  - VWD, intrinsic platelet defects, mild hemophilia A

- Typically used on the first three days of bleeding
  - Tachyphylaxis occurs after about three doses

- Note of caution: Causes obligate urinary concentration
DDAVP in HMB

• Data for use in HMB is limited
• A RCT showed a trend toward improvement in HMB with DDAVP\(^1\)
  • Only studied in women with bleeding disorders
• A second RCT comparing DDAVP and TXA showed better efficacy with TXA treatment\(^2\)
  • Both treatments improved menstrual bleeding
  • Only women with bleeding disorders were included
• Increases tPA levels as well as other pro-coagulant levels
  • May explain limited efficacy in HMB treatment

Combination Medical Therapy

• No great data
• One descriptive study of UK adolescents ages 12-19 yo with inherited bleeding d/o¹
  • Tranexamic acid used 1st line for HMB
  • COCP 2nd most common medication for HMB
  • COCP+TA used in 19/23 girls with TA used during scheduled bleeding days
  • No report of VTE

IUDs and Surgical Management of Heavy Menstrual Bleeding
AUB-M: the role of endometrial biopsy

- 2005-2009 incidence of endometrial cancer <20 years old was 0.2/100,000
- 2007-2011 ages 20-24 was 0.3/100,000

- History includes 2-3 years of AUB and obesity

- Endometrial eval should be performed if medical treatment fails after thorough investigation of other causes and co-morbid disorders
IUDs

• IUDs are recommended for contraception in adolescents and young adults
• All types are FDA approved in nulliparous women
• Hormonal IUDs containing levonorgestrel (LNG) are useful for management of AUB and heavy menstrual bleeding
  • Copper IUDs increase menstrual bleeding – not used for this indication
### Comparison of Hormonal IUDs

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<tr>
<td>Daily dose (initial)</td>
<td>20 mcg</td>
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<tr>
<td>Efficacy (12 mo pregnancy rate)</td>
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<tr>
<td>Duration of use</td>
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<td>no</td>
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All info from FDA approved package inserts except cost (courtesy of bedsider.org)
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## Comparison of Hormonal IUDs

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<thead>
<tr>
<th></th>
<th>52mg LNG-IUD (Mirena®; Bayer)</th>
<th>52mg LNG-IUD (Liletta®; Actavis)</th>
<th>19.5mg LNG-IUD (Kyleena®; Bayer)</th>
<th>13.5mg LNG-IUD (Skyla®; Bayer)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose of LNG in IUD</strong></td>
<td>52 mg</td>
<td>52 mg</td>
<td>19.5 mg</td>
<td>13.5 mg</td>
</tr>
<tr>
<td><strong>Daily dose (initial)</strong></td>
<td>20 mcg</td>
<td>19.5 mcg</td>
<td>17.5 mcg</td>
<td>14 mcg</td>
</tr>
<tr>
<td><strong>FDA approval</strong></td>
<td>2000</td>
<td>2015</td>
<td>2016</td>
<td>2013</td>
</tr>
<tr>
<td><strong>Efficacy (12 mo pregnancy rate)</strong></td>
<td>0.2</td>
<td>0.15</td>
<td>0.16</td>
<td>0.41</td>
</tr>
<tr>
<td><strong>Size (length x width)</strong></td>
<td>32mm x 32mm</td>
<td>32mm x 32mm</td>
<td>30 mm x 28 mm</td>
<td>30 mm x 28 mm</td>
</tr>
<tr>
<td><strong>Duration of use</strong></td>
<td>5 yrs</td>
<td>4 yrs (as of 8/2017)</td>
<td>5 yrs</td>
<td>3 yrs</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>$500-858</td>
<td>$50-684</td>
<td>$500-858</td>
<td>$650-714</td>
</tr>
<tr>
<td><strong>Cost per yr</strong></td>
<td>$100-172</td>
<td>$12.5-171</td>
<td>$100-172</td>
<td>$216-238</td>
</tr>
<tr>
<td><strong>Approved for tx of heavy menses</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

All info from FDA approved package inserts except cost (courtesy of bedsider.org)
## Rates of Amenorrhea with IUDs

<table>
<thead>
<tr>
<th>52mg LNG-IUD (Mirena®)</th>
<th>52mg LNG-IUD (Liletta®)</th>
<th>19.5mg LNG-IUD (Kyleena®)</th>
<th>13.5mg LNG-IUD (Skyla®)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of use</td>
<td>5 yrs</td>
<td>4 yrs</td>
<td>5 yrs</td>
</tr>
<tr>
<td>End year 1</td>
<td>20%</td>
<td>19%</td>
<td>12%</td>
</tr>
<tr>
<td>End year 2</td>
<td></td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>End year 3</td>
<td></td>
<td>37%</td>
<td>20%</td>
</tr>
<tr>
<td>End year 4</td>
<td></td>
<td></td>
<td>41%</td>
</tr>
<tr>
<td>End year 5</td>
<td>n/a</td>
<td>n/a</td>
<td>23%</td>
</tr>
</tbody>
</table>

Rates as reported in FDA package labeling.
Bleeding and the 52mg LNG-releasing IUD

• 52mg LNG-releasing IUD
  – 74-97% reduction period blood lost at 3-12 months\(^1\)
  – 44% no bleeding at 6 months\(^2\)
  – 64% of women cancelled hysterectomy at 6 months\(^3\)

• In women with bleeding disorders\(^4,5,6\)
  – Improved pictorial bleeding chart
  – Increased hemoglobin
  – Improved quality of life

• Cochrane Review: “low level but consistent evidence that LNG-IUD” improves bleeding more than medical treatment\(^7\)

Surgical Management

• Not recommended for young women
• Reserved for extreme cases
  - Stability of patient
  - Severity of bleeding
  - Contraindications or lack of response to medical management
  - Underlying medical condition
• Potential options (with GYN consult)
  - Dilation and curettage (D&C)
  - Uterine balloon tamponade
  - Uterine artery embolization
  - Uterine endometrial ablation
  - Hysterectomy
Surgical Management

• Uterine curettage (D&C)
  • May be necessary for tissue diagnosis
  • Not recommended for management of bleeding
    • 2/3 cases led to more bleeding in women with bleeding disorders (1, 2)

1. Greer et al. BJOG, 1991
Uterine Balloon Tamponade for Severe Uterine Hemorrhage

- Bakri tamponade balloon catheter
- BT-Cath
- Belfort-Dildy Obstetrical Tamponade System
- Sengstaken-Blakemore tube (used for treatment of bleeding esophageal varices)
- Single or multiple Foley catheters (used for bladder drainage)
  - 26 French filled with 30ml
- Rusch urologic balloon (used for stretching the bladder)
Uterine Artery Embolization for Life-Threatening Uterine Hemorrhage

Avoid endometrial ablation or hysterectomy

- Routinely used for HMB associated with leiomyomata
- Postpartum hemorrhage
- Ectopic pregnancy
- Uterine AVMs

- Gelfoam
- Polyvinyl alcohol
- Tris-acryl gelatin spherical embolics

Surgical Management

• Uterine endometrial ablation
  • Multiple techniques available
  • Patients must:
    • Have completed childbearing
    • Use birth control
    • Willing to accept normal blood flow\(^1\)
  • Mirena® IUC equally satisfactory\(^2,3\)
  • VWD 4/8 women HMB recurred in 8 months\(^4\)

1. ACOG Practice Bulletin, Endometrial Ablation, 2007
2. Lethaby et al. Cochrane Database Systematic Reviews, 2005
Surgical Management

• Hysterectomy
  • Women with VWD are more likely to undergo hysterectomy and at a younger age\(^1\)

Questions?