This care process model (CPM) was developed by Intermountain Healthcare’s Gynecology Development Team under the guidance of the Women and Newborns Clinical Program. It recommends an evidence-based approach for assessing and treating chronic abnormal uterine bleeding (AUB) in non-pregnant women of reproductive age. AUB is defined as menstrual flow outside of normal volume, duration, regularity, or frequency. Normal volume is <80 ml per cycle, duration is ≤7 days of active bleeding, and regularity is 21–35 days between cycles. This CPM will not address postmenopausal bleeding or the acute management of severe bleeding.

WHY FOCUS ON ABNORMAL UTERINE BLEEDING?

- **Morbidity and prevalence.** One-third of outpatient visits to the gynecologist are for AUB. LIU The prevalence of AUB in reproductive-aged women is 10–30%.

- **Cost.** The estimated annual direct and indirect economic costs of AUB are $1 billion and $12 billion, respectively, not accounting for intangible costs and loss of productivity. LIU

- **Complexity.** AUB has many possible causes and a diverse array of treatments, ranging from medical therapy to surgery. A standardized terminology, describing the causes of AUB, will help to standardize approaches to treatment.

- **A systematic approach to diagnosis and treatment is needed** to ensure that treatment—including surgical approaches—is appropriate for the condition. COR, MAR

Program Goals and Measurements

- Reduce number of hysterectomies performed for AUB by maximizing less-invasive therapies
- Increase number of patients offered and/or attempted therapy with LNG-IUS
- Increase compliance with hysterectomy criteria set
- Increase compliance with EA criteria set
- Reduce number of EAs performed that have high likelihood of failure
- Eliminate EAs performed without prior EMB
- Compliance with the AUB Hysterectomy Checklist

Throughout this CPM, this icon indicates an Intermountain measure.
ALGORITHM: CLASSIFICATION AND MANAGEMENT

Patient with AUB (see page 1)

EVALUATE cause of AUB

- ASSESS medical history.
  - DISCUSS menstrual history including timing and quantity of bleeding
  - DETERMINE ovulatory status
  - DISCUSS family or personal history of bleeding disorders
  - ASSESS risk factors for uterine cancer
  - DISCUSS medications that impact hemostasis, contraception, and associated symptoms
- PERFORM physical exam.
  - EVALUATE size and contour of uterus
  - EVALUATE mobility
  - VERIFY source of bleeding as uterine
  - EVALUATE for physical signs of PCOS
- PERFORM/ORDER pregnancy (urine), CBC, and Pap tests as indicated. CONSIDER additional testing based on history and exam, such as chlamydia PCR, TSH, prolactin, PT, PTT, and others as indicated. (Note: labs not indicated include FSH, LH, estrogens, and progesterone.)
- CONSIDER these procedures as indicated:
  - US based on bleeding severity, age, symptoms, and exam
  - Office hysteroscopy or saline infusion sonohysterography, which may be indicated if intracavitary pathology suspected on US or history of intermenstrual bleeding
  - EMB, which is indicated for all women ≥ 45 with AUB or for women < 45 with history of unopposed estrogen (obesity or PCOS), failed medical therapy, or persistent AUB

CLASSIFY and TREAT AUB using PALM-COEIN system (see page 3)

Did medical therapy fail, or did patient meet exclusion criteria?

- yes
  - CONTINUE treatment based on PALM-COEIN classification (page 3)
- no
  - CONTINUE

EVALUATE criteria for endometrial ablation (EA) or hysterectomy for AUB

Criteria for endometrial ablation (ANY below)ACO

- Normal endometrial sampling without hyperplasia/ atypia within 3 months or at time of surgery
- Finished with childbearing
- No submucous fibroids or polyps ≥ 2 cm (CONSIDER hysteroscopic resection prior to EA)
- Failure of LNG-IUS or other medical therapy or intolerance to medical therapy
- Age ≥ 40 (if age < 40, CONSIDER placement of LNG-IUS at time of EA)LONPAP
- Plan for contraception (CONSIDER placement of LNG-IUS at time of ablation to provide contraception and increase success rate of ablation)PAP

Criteria for hysterectomy

- Medical therapy with LNG-IUS for a minimum of 3 months within 2 years prior to hysterectomy unless contraindicated or not tolerated OR
- Medical therapy with oral contraceptive pills/patch/ring, progestins, or other hormonal control or tranexamic acid (Lysteda) for a minimum of 3 months within 2 years prior to hysterectomy unless contraindicated or not tolerated OR
- EA with/without placement of LNG-IUS unless contraindicated (prefer failure of medical therapies prior to proceeding to EA; see criteria for EA) AND
- Persistent excessive bleeding during trial of therapy that results in persistent anemia or dramatically altered quality of life

Notes:
- Patients should attempt more than a single therapy prior to hysterectomy, including control of bleeding with LNG-IUS, unless contraindicated.
- Exclusions from criteria include uterus > 12-week size, or estimated size > 250 g; submucous fibroids ≥ 2 cm; and other concurrent indications for hysterectomy including malignancy, bulky fibroids, and symptomatic uterovaginal prolapse.
- A questionnaire to document alternate therapies attempted will be required at the time of surgery scheduling in iCentra (see online questionnaire here).
## TABLE 1. PALM-COEIN Standardized Classification System for AUB

<table>
<thead>
<tr>
<th>Name (Classification)</th>
<th>Symptoms or Characteristics</th>
<th>Diagnostic Approach</th>
<th>Treatment Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PALM - Structural Causes of AUB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Polyp (AUB-P)</strong></td>
<td>Mild to moderate IMB or irregular spotting, which may not respond to hormonal therapy</td>
<td>Pelvic US with irregular or thickened stripe; confirmed by SIS, HSG, diagnostic hysteroscopy</td>
<td>PERFORM hysteroscopic resection. (Note: blind polypectomy with D&amp;C is not an acceptable treatment.)</td>
</tr>
<tr>
<td><strong>Adenomyosis (AUB-A)</strong></td>
<td>Dysmenorrhea, potential HMB</td>
<td>Pelvic US, MRI, clinical suspicion on exam with &quot;boggy&quot; and/or tender uterus</td>
<td>INITIATE combined hormonal or progestin therapy including LNG-IUS.</td>
</tr>
<tr>
<td><strong>Leiomyoma (AUB-L)</strong></td>
<td>HMB, with menses that may last &gt; 7 days</td>
<td>Pelvic US, MRI, possibly diagnostic hysteroscopy, SIS, or HSG</td>
<td>TREAT with Lupron, followed by hormonal or LNG-IUS therapy. OR PERFORM hysteroscopic resection followed by hormonal, LNG-IUS, or EA therapy with or without LNG-IUS. OR PERFORM hysterectomy for large submucous fibroids. (Note: Hormonal treatments, including LNG-IUS, are often ineffective unless fibroid is resected.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No indication for therapy as unlikely to contribute to AUB. CONSIDER other therapies — UAE, Lupron, or hysterectomy — based on bulky symptoms.</td>
</tr>
<tr>
<td><strong>Malignancy or hyperplasia (AUB-M)</strong></td>
<td>HMB or IMB, often suspected with co-existing obesity, type 2 diabetes mellitus, or hypertension co-morbidities</td>
<td>EMB, hysteroscopy with endometrial sampling</td>
<td><strong>No atypia</strong> – TREAT with LNG-IUS or oral progestins; REPEAT EMB as indicated. <strong>Atypia</strong> (endometrial intraepithelial neoplasia) or malignancy and no desire for fertility – CONSULT gynecologic oncology. (Note: If atypia or grade 1 endometrial malignancy present and patient desires fertility, CONSULT gynecologic oncology or reproductive endocrinology and infertility specialist prior to treatment.)</td>
</tr>
<tr>
<td><strong>COEIN - Nonstructural Causes of AUB</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coagulopathy (AUB-C)</strong></td>
<td>HMB or IMB in presence of anticoagulant therapy or other coagulopathy</td>
<td>History and exam, possible EMB</td>
<td>MAXIMIZE medical therapy. • If anticoagulant therapy necessary, PAIR with factor infusions/DDAVP/other as indicated. • LNG-IUS is often very effective. • Tranexamic acid may be effective and paired with other medical therapy.</td>
</tr>
<tr>
<td><strong>Ovulatory (AUB-O)</strong></td>
<td>Irregular bleeding that is heavy, may have IMB, often accompanied by PCOS and/or obesity</td>
<td>History and exam, possible EMB, imaging</td>
<td>MAXIMIZE medical therapy. LNG-IUS is very effective.</td>
</tr>
<tr>
<td><strong>Endometrial (AUB-E)</strong></td>
<td>Regular HMB, ovulatory cycles, diagnosis of exclusion</td>
<td>History and exam, possible EMB, imaging</td>
<td>MAXIMIZE medical therapy. LNG-IUS is very effective. CONSIDER hysterectomy for failed medical therapy with severe and/or persistent bleeding or anemia.</td>
</tr>
<tr>
<td><strong>Iatrogenic (AUB-I)</strong></td>
<td>Medication-induced, IUD</td>
<td>History and exam, possible imaging, EMB</td>
<td>CHANGE medications; REMOVE IUD; and PROVIDE other indicated therapy.</td>
</tr>
<tr>
<td><strong>Not otherwise specified (AUB-N)</strong></td>
<td>Chronic endometriosis, arteriovenous malformation, myometrial hypertrophy</td>
<td>History and exam, imaging</td>
<td>PROVIDE indicated therapy.</td>
</tr>
</tbody>
</table>

* The PALM-COEIN standardized classification system for AUB was introduced in 2011 by the International Federation of Gynecology and Obstetrics, and its use is supported by the American College of Obstetricians and Gynecologists for describing AUB. This system classifies uterine bleeding abnormalities by bleeding pattern (i.e., HMB or IMB) and by etiology. This classification system will be used to define the workup and appropriate treatments for AUB. Note that this classification is different from the nomenclature used by ICD-10 codes, which are assigned for billing purposes.*
### TABLE 2. Medications used in the treatment of AUB<sup>ACO4</sup>

<table>
<thead>
<tr>
<th>Medication name — generic (Brand)</th>
<th>Dosage and Frequency</th>
<th>Tier&lt;sup&gt;1&lt;/sup&gt; / Cost&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progestins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>levonorgestrel IUD (Mirena, Liletta, Kyleena, Skyla)</td>
<td>Place every 3 – 5 years.</td>
<td>N/A&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Treatment of choice for long-term control of bleeding, cost-effective therapy, and provides contraception if needed.</td>
</tr>
<tr>
<td>medroxyprogesterone acetate or norgestimate tablets (Provera, Aygestin)</td>
<td>Use daily or cyclic during luteal phase of cycle.</td>
<td>Tier 1 – $</td>
<td>Medroxyprogesterone tablets have a quantity limit of 30 per fill.</td>
</tr>
<tr>
<td>medroxyprogesterone injection (Depo-Provera)</td>
<td>150 mg intramuscularly every 3 months.</td>
<td>Tier 1 – $</td>
<td>Potential bone loss with long-term use.</td>
</tr>
<tr>
<td>megestrol acetate (Megace)</td>
<td>20 – 80 mg orally twice a day.</td>
<td>Tier 1 – $ to $$$</td>
<td>Risk of VTE.</td>
</tr>
<tr>
<td>Combined estrogen-progestin oral contraceptive pills</td>
<td>One tablet daily; option for continuous cycle (may use estrogen dose and type of progestin best tolerated by patient).</td>
<td>Most are Tier 1 or Tier 2 – $</td>
<td>Potential for VTE, hypertension, MI, CVA. See online formulary tool to view specific products.</td>
</tr>
<tr>
<td>ethinyl estradiol and norgestimate (NuvaRing)</td>
<td>One ring for 3 weeks; option for continuous cycle.</td>
<td>Tier 2 – $</td>
<td>Potential for VTE, hypertension, MI, CVA.</td>
</tr>
<tr>
<td>ethinyl estradiol and norelgestromin (Xulane)</td>
<td>0.53 mg (ethinyl estradiol); 4.86 mg (norelgestromin).</td>
<td>Tier 2 – $</td>
<td>Potential for VTE, hypertension, MI, CVA.</td>
</tr>
<tr>
<td>Antifibrinolytic agent tranexamic acid (Lysteda)</td>
<td>1,300 mg (2 tablets) every 8 hours for 5 days during menses.</td>
<td>Tier 1 – $$$</td>
<td>Potential for increased VTE risk.</td>
</tr>
</tbody>
</table>

<sup>1</sup> Tier: Tier 1 = $5 to $15 copay; Tier 2 = $30 to $45 copay; Tier 3 = $60 to $75 copay (based on typical SelectHealth 2017 benefit design; some benefit designs may differ).

<sup>2</sup> Cost: Estimated monthly cost based on usual dose. $=1 to $25; $$=26 to $75; $$$=76 to $150; $$$$ = $150 to $300; $$$$$ = > $300

<sup>3</sup> IUDs: These are covered under the medical benefit and not the prescription benefit; thus, they don’t have a tier.

### REFERENCES


**Note:** This document presents an evidence-based model of care that is appropriate for most patients. It should be adapted to meet the needs of individual patients and situations and should not replace clinical judgment. Send feedback to Sara Jane Pieper, MD, Intermountain Healthcare (gyn@imail.org).