

ABNORMAL UTERINE BLEEDING

by Tim Chang September 2013

Menstruation perception influenced by:

- Age
- Culture
- Religion

Average MBL 30-40ml per cycle

Average loss of Iron is 13-15mg / cycle

Average blood content of menses is 25%-30% ie. 70- 75% tissue desquamation + endometrial transudate

Menarche 12 (in western countries) vs world average 13.5

Menopause 51.1

Normal menstruation defined by 4 characteristics:

Defined 5-95 centile

Volume is woman's perception

	Normal	Abnormal 1	Abnormal 2
Regularity	<14 days	>14 days	Absent
Frequency	22-35 days	<22	>35
Duration	3-8	>8	<3
Volume	Normal	Heavy	Light

Anatomy:

Uterus pear shaped organ

8 x5x3cm

myometrium

endometrium:

- Basalis (permanent)
- Functional (sheds) supplied by spiral arteries

Function is to hold and nurture a pregnancy

Physiology of Normal menstruation:

Hormonal:

sequential production of estradiol followed by
progesterone (P4) after ovulation then
withdrawal P4 that leads to menstruation

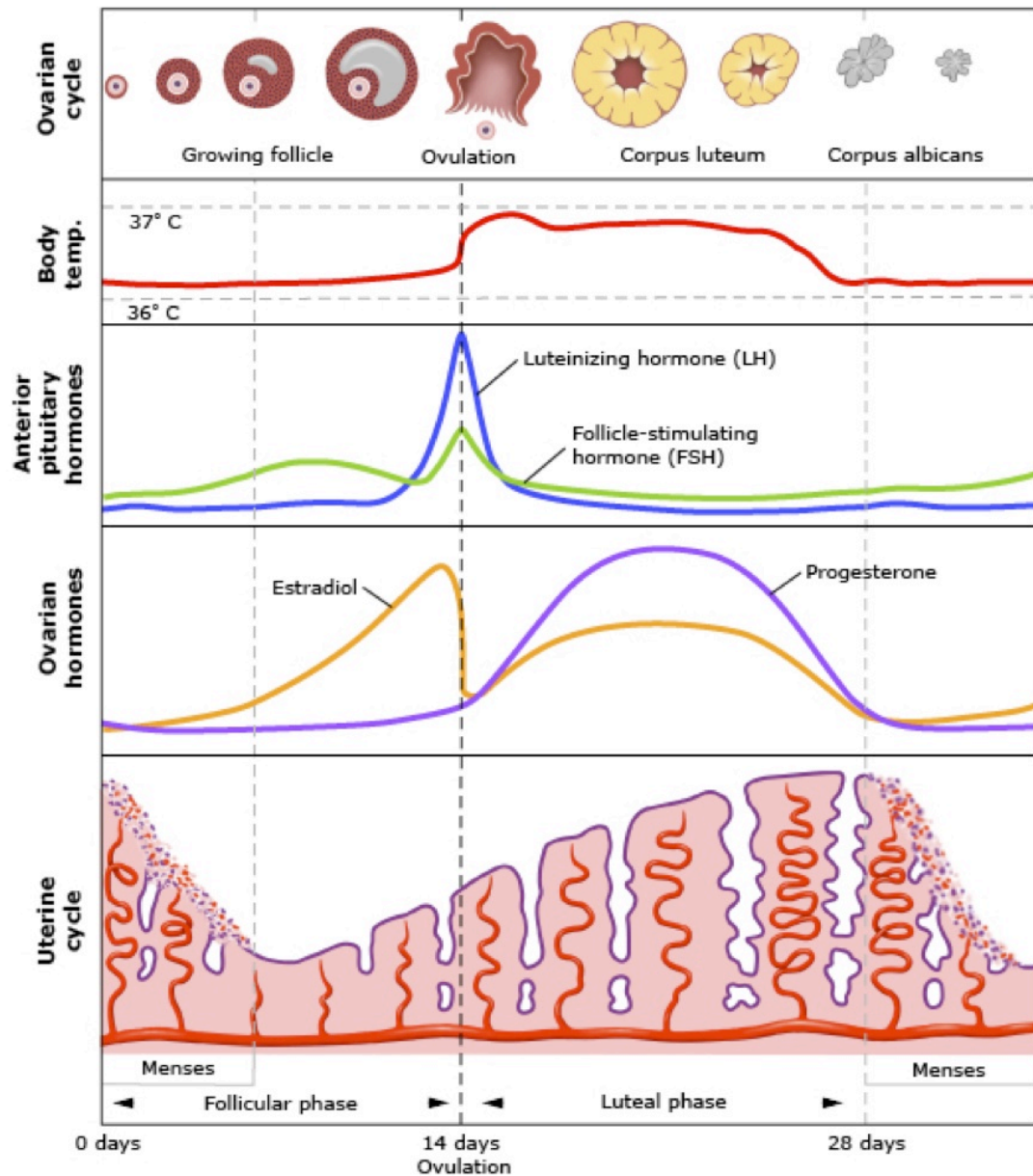
Molecular:

P4 withdrawal leads to increase in metalloproteinases (MMP) degrades the functional layer together with vasoconstriction and hypoxia leads to sloughing of the functional layer.

Vasoconstriction vessels with PGF2 α + endothelin-1 also leads to controlling blood flow (excess PGE2 + PGI in AUB)

Coagulation cascade activated leading to blood clot formation

NB very little platelet activity with controlling menstruation



Menstrual cycle divided into 5 phases histologically depending on:

- glandular
- stromal
- vascular components

menstrual phase

proliferation phase

secretory phase

implantation phase

endometrial breakdown

Self limited character of normal menses depends on:

universal event at menses when the whole endometrium is shed together due to endometrial tissue response to sequential E+P to stabilize endometrium.

the factors that lead to menses also control / limit bleeding eg:

- platelets with \uparrow PG F2 α / PGE2
 \uparrow Thromboxane A2 / PGI2
- fibrin formation
- vasoconstriction later and
- endometrial build up from oestrogen response

- NB**
- (a) haemostatic plug, most important functional layer
 - (b) vasoconstriction, important basalis layer (controlled by PGs)

Increased menses associated with:

- parity
- weight / height
- age

70% loss first 2 days

90% by 3 days

Patterns of AUB

Acute (in emergency setting requiring immediate intervention)

Chronic (>3 months)

Intermenstrual Bleeding

- Spontaneous, including BTB
- Contact eg PCB

Heavy Menstrual Bleeding (HMB) replaced term menorrhagia = bleeding >80ml per cycle

Irregular Menstrual Bleeding replaced metrorrhagia = bleeding irregular

HMB is defined as ≥ 80 ml / cycle

- 95th centile 76ml
- significant reduction Iron stores (Ferritin) with MBL >80 ml (with no significant depletion iron stores <60ml)
- Incidence of 5% women aged 30-49
- Menorrhagia accounts for 10-12% gynaecology referrals
- 25% women self reported incidence HMB ie 1/2 patients with perceived HMB NOT confirmed objectively

around 50-70% women complain of HMB, fulfill this criteria.

ie 30-50% of women who complain of HMB do NOT fulfill the criteria.

Not just the total volume of blood that is important, but how it affects the woman, related to heaviest days, duration and frequency / regularity.

Causes of vaginal bleeding

- Pregnancy related
- Uterus
- Cervix
- Vagina
- Vulva
- Others eg fallopian tubes

Classification AUB (non pregnant)

FIGO 2009 developed classification AUB to standardize terminology and facilitate communication and research after extensive consultations. The terms DUB, menorrhagia , metrorrhagia discarded.

Structural

Polyp

Adenomyosis

Leiomyoma (SM or other)

Malignancy

Non Structural

Coagulopathy

Ovulation disorders

Endometrium

Iatrogenic

Not otherwise classifiable eg AVM, infection

Pathogenesis

Presence of pathology may not be the cause of AUB

Polyps

Localized proliferation of glandular + stroma with single feeder blood vessel

Exact aetiology unknown:

- Abnormal proliferation basal cells
- Incomplete shedding endometrium

Typical symptoms erratic IMB rarely heavy

0.5-5% polyps are malignant in AUB

recurrence after polypectomy:

blind removal	15%
visual removal	0-5%

hysteroscopic removal preferred:

- Scissors + grasper
- Resectoscope / electrosurgery
- Myosure

Adenomyosis

Endometrial glands in the myometrium. Depth invasion varied from 2.5mm-8mm beyond endomyometrial junction

Diagnosis:

- Histopathology
- Ultrasound
- MRI

Incidence 25% in 1 series equally present in women with AUB vs prolapse / cervical cancer patients with wide variation 5-70%

Posterior wall affected> anterior wall

Leiomyomas

Common found in upto 70% Caucasian women at age 50 and up to 80% in African descendants

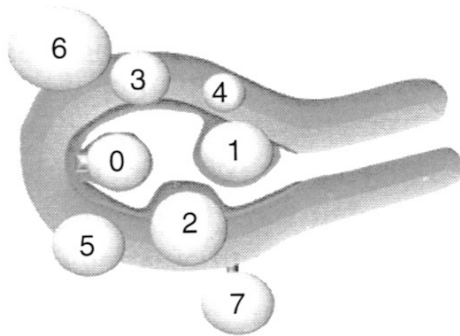
Mechanisms bleeding:

- Increasing surface area
- Biochemical release factors leading to bleeding eg MMP, VEGF etc

AUB depends on:

- Site
- Size

Leiomyoma subclassification system



SM submucosal fibroids	0	Pedunculated intracavitary
	1	<50% intramural
	2	≥50% intramural
O-Other	3	Contacts endometrium 100% intramural
	4	Intramural
	5	Subserosal ≥ 50% intramural
	6	Subserosal < 50% intramural
	7	Subserosal pedunculated
	8	Other eg cervical parasitic
Hybrid leiomyomas (impacts endometrium and serosal)		2 numbers separated by hyphen, endometrium first followed by serosal fibroid

Malignancy

Hyperplasia

Non atypical 1-3% risk progression cancer

Atypical 25-50% pregression

Epithelial cancer eg adenocarcinoma, papillary serous

Sarcomas eg MMMT, leiomyosarcomas etc

Coagulopathy

Congenital eg von Willebrands disease, Glanzmann disease (qualitative defect in platelets)

Acquired

Iatrogenic over anticoagulation

prevalence 13% HMB in general population presenting to gynaecology clinic (Shanker et al)

Important ask history bleeding other sites eg PPH, bleeding after dental / surgical procedures, epistaxis + family history etc

Structured history sensitivity 90% for detecting common coagulopathies

PFA 100 screening test for platelet defects

paucity data specific treatments for AUB-C but ideally treated in multidisciplinary clinics
treatment :

- Cyklokapron
- OCP
- Progestins
- Mirena
- Danazol useful ITP, but SE
- GnRHa
- DDAVP for vWB chronic HMB
- EA

Ovulatory dysfunction

Prolonged unopposed E2 exposure with lack of P4 leads to disturbances in uterine vasculature, angiogenesis, disordered PG Synthesis etc leading to AUB

Characterized by episodes amenorrhoea with erratic HMB

Aetiology:

- Hypothalamic eg weight changes, stress, extreme exercise, peri-menarchal + perimenopausal
- PCOS
- Thyroid dysfunction
- Hyperprolactinaemia

Precursor to hyperplasia + Cancer

Concept of endometrial protection in chronic anovulation

Endometrial causes

“Ovulatory DUB” diagnosis of exclusion in regular cycles
mechanisms:

- impaired vasoconstrictor production eg endothelin and PGF2 α
- increased production vasodilators eg PGE2 + PGI
- enhanced fibrinolysis
- other “procoagulants”

Iatrogenic

Steroid hormones

- OCP
BTB caused by atrophy or non compliance
Antibiotic eg rifampicin, anticonvulsants may lead to BTB by increasing metabolism oestrogen
Smokers increased BTB related to increased hepatic metabolism
- progestins

IUCD both copper + mirena

Anovulatory drugs eg tricyclic antidepressants, phenothiazones causes elevated prolactin, SSRIs

Anticoagulants (by convention classified under AUB-C)

NOT Classified

Arterio-venous malformations

- congenital (rare)
- acquired eg post partum

Infection

Assessment of menstrual loss

- alkaline hematin test (most accurate but impractical)
- pictorial blood loss assessment chart (PBAC) semi objective assessment blood loss has variable accuracy 80% -90% sensitivity but variable specificity and PPV & NPV 60% (score >100 = menorrhagia) see appendix.
- ordinary menstrual charts are useful and are semi-objective
- pad weighing has a moderate correlation NB 40% weight is blood
- patient history / perception has a poor correlation
 - 30%-50% patient perceive periods as heavy have normal volumes
 - 40% patient with menorrhagia perceive period to be normal

pads used, frequency of change, clots, soaking clothes/sheets etc.

despite this from a practical perspective, patients perception of bleeding has been the major determinant influence on management.

Investigations

BhCG exclude pregnancy

FBC / Fe studies, Ferritin levels are low in 2/3 with true menorrhagia and normal in 1/3

TFT

1-2% of females with menorrhagia have thyroid abnormalities, often subclinical hypothyroidism ie. clinically euthyroid, diagnosed by elevated TSH normal T3/T4, can be improved with Thyroxine. Therefore, TFT useful all menorrhagia.

FSH / LH and luteal phase progesterone

EUC (suspect renal disease)

LFT (suspect liver disease)

Prolactin (if amenorrhoea / anovulation)

Androgens (anovulation suspected)

coagulation studies: if bleeding from menarche, family history or bleeding diathesis

- vWB levels
- platelets
- PTTK/PT

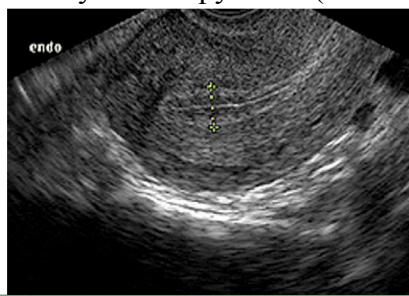
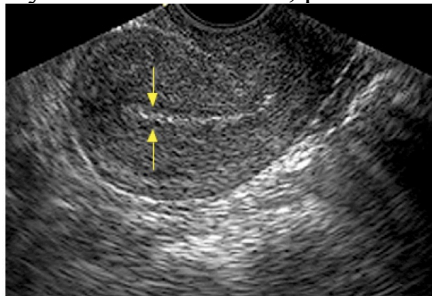
Urine PCR Chlamydia / NG

pap smear

Pelvic (transvaginal) ultrasound

- Endometrium
- Myometrium for fibroids + adenomyosis
- Adnexa / ovaries

Normal TVUS ie homogenous endometrium, echodense line middle uterus, distinct endometrial myometrium interface, predicts normal hysteroscopy 97%. (Emanuel et al 1995).



Saline Infusion Sonography (SIS)

Better defines focal endometrial lesion eg polyps

Better defines SM fibroids depth invasion myometrium

Performed follicular phase

SIS as good as hysteroscopy assessing anatomy endometrium but NO histology

Endometrial sampling

Pipelle

Sensitivity for EC depends on population:

- PM patients >99% sensitive detection EC
- Pre + post menopause 90% sensitive EC
- 80% sensitivity detection hyperplasia

procedure failure 10%

inadequate specimen 10%

will miss focal lesions eg polyps

Tao brush utilizing cytology may be better obtaining specimen

hysteroscopy and endometrial biopsy

- Diagnostic
- Therapeutic eg polypectomy, EA + TCRM

NB D&C will miss up to 25% lesions

MRI

Can detect position location fibroids, adenomyosis

Management depends on:

- Cause
- Severity of bleeding (interference with patient's life)
- Associated symptoms eg pain, pressure
- Fertility / Contraceptive needs
- Medical co morbidities eg thrombophilia
- Patient and Surgeon preferences

Clinical scenarios of AVB

- premenarchal
- adolescent
- reproductive age woman
- perimenopausal
- postmenopausal
- acute vaginal bleeding
- Intermenstrual bleeding

In the perimenopausal women ($\geq 35-45$)

Dysfunction HPO axis leading to anovulation

hysteroscopy / D&C mandatory to exclude local pathology, particularly if the history is suggestive of chronic anovulation.

Intermenstrual bleeding

Spontaneous

- Polyps
- Malignancy uterus, cervix
- Inflammation eg cervicitis, endometritis
- Iatrogenic
 - OCP
 - Oral progestins
 - Implants
 - DMPA
 - Mirena
 - Other meds
 - Ring pessaries

Provoked (PCB)

Usually cervical, vaginal pathology

- Cervical polyps
- Cervicitis, vaginitis
- Malignancy

IMB associated with steroids termed Break through bleeding (BTB)

Causes:

- Non compliance
- Drugs affect estrogen metabolism eg anticonvulsant, rifampicin, griseofulvin, broad spectrum antibiotics reduce enterohepatic circulation estrogens
- Smoking enhances enterohepatic metabolism estrogen
- Endometrial fragility
- Other pathology esp malignancy in PM woman
-

If BTB persists beyond first 6 months after HRT or after a period of amenorrhoea should have endometrial pathology excluded.

Management

OCP

- Persevere at least 3-6 months before changing OCP
- Stop smoking
- Monophasic OCP high estrogen eg M50

Progestin oral

Little evidence course estrogens work but useful

DMPA

- 30-50mcg ethinyl estradiol or equivalent for 2 weeks
- NSAIDs eg ponstan 500mg bd for 5 days
- Mifepristone 50mg every 14 days reduced BTB

Implanon

- Marvelon for 21 days (implied from study successful use of OCP with norplant)
- NSAIDs eg ponstan 500mg bd 5 days
- Doxycycline 100mg bd for 5 days (potent inhibitor MMP)
- Vit E 200mg for 10days (variable results with Norplant)
- Tamoxifen 10mg bd for 10 days (success in Norplant)

Mirena

>50% women will experience BTB in the first 6 months after insertion, but diminishes to <20% after 12 months with increasing rates of amenorrhoea.

Addition of estrogen for 2-3 weeks may be beneficial, but no evidence for efficacy.

HRT

Change from continuous to cyclic regimen

Exclude endometrial pathology

Medical treatment

Iron therapy

Oral

150-200mg elemental iron

ferrous form

better absorption vit C

Parenteral

IV iron modern formulations iron Low MW dextran or Iron salts safe with minimal adverse reactions vs high MW iron dextran formulations

Total dose infusion LMW Fe

Iron salts up to 400mg Fe single infusion as higher doses can have adverse reactions

Estrogens

Control acute bleeding

IV Premarin 25mg q6h (max 4 doses)

Small RCT bleeding stops within 5 hours in 72% vs 38% placebo

PO Premarin 1.25mg qid for upto 7 days

Little difference between IV & PO meds.

Progestin added once acute bleeding settles to promote an orderly withdrawal bleed.

BTB

OCP

Acute bleeding

High dose estrogen eg M50 or high dose progestin eg B1 x3-4 daily for 1 week then daily for 3 weeks

long term control of menorrhagia.

Reduces MBL by 50%

Few good studies on HMB

Limited data suggests OCP as effective as danazol / NSAIDs reducing HMB and better than placebo

Less effective compared to mirena with lower reduction in MBL & higher treatment failure

Less successful vs estrogens alone in acute bleeding as progestin → decreased estrogenic effect.

Extended cycles theoretically better

Persistent BTB with chronic OCP / MPA use.

Progestin

acute bleeding

MPA 10-50mg

primolut N 5-30mg

anovulatory and basal is not denuded

MPA 60-120mg first 24 hours then 20mg daily for 10 days

25% pt stop after 24 hours with most stopping after 3 days

mechanism:

- decreases estradiol receptors
- increase enzymes that convert estradiol → estrone (less potent)
- induce secretory changes

long term use

MPA 10mg or NET 5mg

useful in anovulatory women

1/3 patient stop medical therapy by 6 months

Reduces MBL up to 50%

cyclic for 3/4 weeks or continuously (no clinical trials for HMB)

luteal phase progestin NOT effective in reducing bleeding and may increase bleeding

DMPA

50% amenorrhoeic at 12 months, but erratic bleeding prior to this with 50% having erratic bleeding

No trials use of DMPA for HMB

Treatment BTB on DMPA

- estrogens eg 50mcg for 14 days
- NSAIDs useful short term eg ponstan 500mg bd for 5 days
- Anti progesterone eg mifepristone 50mg PO every 14 days

Mirena

IUCD releasing levonorgestrel

- reduction MBL 80-95% by 12 months
- erratic spotting / BTB with upto 55% in the first 6 months, but only 20% BTB at 12 months
- 20% amenorrhoeic at 12 months and 50% at 5 years
- 65% patients with Mirena declined hysterectomy after insertion vs 15% on medical therapy
- SE in 20% leading to discontinuation in 1st year eg bloating mastalgia, BTB, ovarian cysts
- 5-10% expulsion rate
- perforation 1-2/1000

Fibroids

Mirena can be used in presence fibroids, although increased failure expulsion with SM fibroids.

Soysal et al in non randomized study of mirena with SM fibroids (type II <5cm or type 0/I <3cm) had reduction MBL 90% at 12 months with 5% expulsion rate.

Adenomyosis

Mirena can:

- reduce dysmenorrhea
- uterine volume
- likely reduce HMB

NSAID

are useful in AUB –E usually in conjunction with other modalities

decreases menses by 25%

useful given onset of menses, duration whole of menstruation

ideally used as first line treatment especially if dysmenorrhoea is present.

Mefenamic acid (ponstan) theoretically better as COX inhibitor + impairs PGE2 binding, but studies show NSD between NSAIDs

Antifibrinolytic Agents

tranexamic acid (cyklokapron) 1g qid with beginning of heavy bleeding

decreases menses 50%

again useful in AUB-E and usually used in conjunction with other treatment

SE:

nausea, vomiting and diarrhoea

thrombosis (theoretical) some evidence safe to use in women with hx DVT (but numbers in study are low)

Androgens

Danazol

reduction in MBL proportional to the dosage:

100mg → 60% reduction

200mg → 85% reduction

400mg → 99% reduction (50% amenorrhoeic)

for HMB dosages 200-400 mg

Cochrane most

SE occur in 75% vs 30% with NSAID

Lower doses treats mastalgia and PMS

Indications;

- endometrial preparation prior to ablation / surgery
- acute bleeding

GnRH analogues

Initial flare may exacerbate bleeding

Majority of women develop amenorrhoea in the longterm however cannot be used

for > 6/12 unless HRT addback is combined.

Main indication is short term use to correct anaemia / shrink fibroids / prepare endometrium prior to surgery

Surgical Treatments

15%-58% of women end up with a surgical solution

indications:

- Failed medical therapy
- SE medical therapy
- No desire fertility (except myomectomy)
- Patient / surgeon choice

D&C will not be curative, therefore used as

- (a) diagnostic modality in conjunction with hysteroscopy
- (b) Rx acute haemorrhage

Endometrial ablation (EA)

Hysteroscopic ablation / resection (REA)

TCRE / EA / vaportrode

Determinants of success:

- Age (EA more successful women >45 years with need for additional surgery in women < 45 doubled from 27% to 54% up to 8 years.)
- *Surgeon experience important with improved success rate and less complications cf NREA*
- Adenomyosis / large uterus (although success good in experienced hands)

success:

- Variable amenorrhoea rates with 90% less bleeding
- 90% patient satisfaction rates

complication <5%

- fluid overload
- perforation
- haemorrhage
- post ablation sterilization syndrome (PASS)

EA less complications TCRE:

- bleeding x3 with TCRE
- uterine perforation x4

Non hysteroscopic (blind) ablation techniques (NREA)

Novasure

- NSD MBL or satisfaction rates
- Less OT time

Balloon (thermachoice / cavaterm)

Compared with REA

- amenorrhoea rates higher with REA, but more complications
- 1 trial in SM fibroids type II , 3cm NSD vs REA

HTA

- cf REA NSD satisfaction rates (>98%) and reoperation rates (6-9%)
- Minor burns to vagina from leaking fluid
- Can treat abnormal cavities

Cryoablation

- Less amenorrhoea rate (0.3) NSD patient satisfaction rates

MEA

- NSD amenorrhea rates at 1 year but higher satisfaction rates with MEA at 5 years (OR 2.3)
- Less risk haemorrhage (OR 0.14) but higher equipment failure (4.07)

Specific treatment of fibroids

Myomectomy

UAE +

MRgFUS

Hysterectomy

Definitive therapy

VH vs TLH vs TAH

Guaranteed amenorrhoea with high satisfaction rates

Short term surgical morbidity

Assessment outcomes for AUB in trials

When comparing trials, important to note what are the outcome measures:

- Specific clinical measures eg Blood loss, amenorrhoea rates etc
- Patient satisfaction rates QoL measures eg SF36
- Side effects, complications
- Costs

Therapies compared to each other

Mirena compared to other therapies

Cochrane 2005: 10 trials

Mirena vs other medical therapy

- NSD blood loss Mirena vs cyclic Primolut,
- Greater reduction blood loss vs other “medical” therapies
- Mirena patient more willing to continue therapy at 12 months vs NET (75% vs 25%)
- Mirena better QoL scores

Mirena vs ablation

Ablation results in

- greater reduction blood loss
- Improved success rates (PBAC <75) 90% vs 75%
- Less SE (bloating , acne , weight gain , mastalgia) RR 3.1 at 1 year
- NSD patient satisfaction rates

Mirena vs Hysterectomy

70% retained mirena at 12 months and 50% at 5 years with hysterectomy in 20% and 40% of patients at 1 and 5 years

- NSD QoL measures
- Lower overall cost vs hysterectomy as first line treatment
- More ovarian cysts (clinical significance unknown)

Medical treatments (including mirena) compared to surgery

Cochrane 2006 12 trials 1049 patients

- 58% patients randomized to PO medical therapy had surgery at 2 years and 77% at 5 years
- EA more effective reducing bleeding with less SE than oral therapy
- EA reduced bleeding more than mirena at 1 year but amenorrhoea rates NSD
- Mirena and surgery NSD patient satisfaction rates
- Hysterectomy stopped all bleeding with better improvement mental health but caused serious complications in some women

Medical therapies compared with each other.

Cochrane 2000, 2007, 2008, 2009

- NSAIDs reduced MBL more than placebo but less than mirena, danazol and tranexemic acid.
- NSAIDs useful for dysmenorrhoea
- Antifibrinolytics reduce MBL more than placebo, NSAIDs and luteal progestins with NSD SE
- Danazol reduced MBL more than placebo, OCP, progestins and NSAIDs but more SE (NO trial compared to mirena and antifibrinolytics)
- Cyclic progestin luteal phase less MBL compared to mirena, tranexamic acid and danazol.
- Progestin for 21 days eg D5-26, less effective than mirena with MBL with higher proportion reporting treatment unacceptable
- OCP paucity of data. Limited evidence suggests as efficacious as other PO medical therapy and better than placebo
- OCP is less effective than mirena with less MBL and less improvement in Hb, higher treatment failures.

EA techniques compared

Cochrane 2009 21 studies with 3395 patients all with normal uterine cavity

First generation techniques compared:

- NSD MBL reduction and patient satisfaction
- Vaportrode resulted easier operation, less fluid absorption and OT time cf TCRE
- EA OT time shorter

First generation vs second generation

- NSD MBL, amenorrhoea rates, patient satisfaction rates
- NREA less OT time, perforation (OR 0.32), fluid overload (OR 0.17), cervical laceration (0.22) and haematometra (0.31)
- NREA had higher equipment failure

NREA compared

Bipolar (Novasure) vs Balloon (thermacheice / cavaterm)

- Greater amenorrhoea rates
- NSD patient satisfaction

Surgical therapies compared

EA vs hysterectomy

- Less operating time / quicker recovery / less complications but some unique risks with hysteroscopic ablation eg perforation, fluid overload etc.
- Lower proportion of women with improved MBL 85% vs 100% at 12 months
- NSD patient satisfaction rates at 4 years
- 3% required further intervention at 1 year, 20% at 2 years, 28% at 3 years and 38% at 4 years

Summary of treatment

Medical treatment with oral agents may be useful short term, but most women will not continue prolonged therapy

Mirena has greater reduction of MBL cf medications, but less so than endometrial ablation, but equal satisfaction rates and increased SE

Mirena can avoid hysterectomy in 2/3 women and overall cost is lower with NSD QoL measures, but up to 40% proceed with hysterectomy at 5 years

Little difference outcome in all ablation techniques with high patient satisfaction rates 90% at up to 5 years
NREA are simpler, quicker to perform with less risk of complications cf HREA, but cannot treat the abnormal uterine cavity

Additional surgery including hysterectomy required 20-40% of EA up to 5 years

Hysterectomy results in high patient satisfaction rates with guaranteed amenorrhoea with higher short term complications, some which are serious

Conclusions

- AUB common
- Woman's perception important
- FIGO classification
- Treatment based on age
- Individualize therapy

References

- 1) Fraser IS. Menorrhagia – a pragmatic approach to the understanding of the causes and the need for investigation. BJOG 1994; 101; suppl 11: 3.
- 2) Speroff et al. DUB in Clinical Gynecologic Endocrinology and Infertility 1994; Williams and Wilkins; chapter 16: 531
- 3) Weeks AD, Duffy SRG. AUB: diagnosis and medical management in Studd progress in O&G vol 12 1996; Churchill Livingstone; chapter 17: 309
- 4) Lethaby et al. Progesterone or progestogen-releasing intrauterine systems for heavy menstrual bleeding (Review) Cochrane Database of Systematic Reviews 2005, Issue 4. Art. No.: CD002126. DOI: 10.1002/14651858.CD002126.pub2.
- 5) Soysal et al. The efficacy of mirena in selected cases of myoma related menorrhagia. Gyne Obs Invest 2005; 59: 29-35
- 6) Lethaby A, Hickey M, Garry R, Penninx J. Endometrial resection / ablation techniques for heavy menstrual bleeding. Cochrane Database of Systematic Reviews 2009, Issue 4. Art. No.: CD001501. DOI: 10.1002/14651858.CD001501.pub3.
- 7) Shanker et al. von Willebrand disease in women with menorrhagia: a systematic review. BJOG 2004; 111: 734.
- 8) M Munro et al. FIGO classification system (PALM COEIN) for causes of AUB. Int J Gyn Obst 2011; 113: 3-13
- 9) M Munro. Abnormal Uterine Bleeding. . University press Cambridge 2010. ISBN: 978-0-521-72813-7
- 10) Emanuel et al. A prospective comparison of transvaginal ultrasonography and diagnostic hysteroscopy in the evaluation of patients with abnormal uterine bleeding: Clinical implications. AMJOG 1995; 172: 547

Appendix

Pictorial Blood Assessment Chart and Scoring System for Assessment of Menstrual Blood Loss

How to use the PBAC scoring system:

- During the course of your period record your use of tampons and sanitary towels by placing a tally mark under the day next to the box that represents how stained your sanitary materials are each time you change them.
- Record clots by indicating whether they are the size of a 5c or 50c coin in the clots/ flooding row under the relevant day. E.g. under day 1 you may say 50c x 1 and 5c x 3.
- Record any incidences of flooding by placing a tally mark in the clots/ flooding row under the relevant day.







Scores:

- A lightly stained towel (pic 1) will score 1 point, a moderately stained towel (pic 2) 5 points, a towel which is saturated with blood (pic 3) will score 20 points.
- A lightly stained tampon (pic 4) will score 1 point, a moderately stained tampon (pic 5) 5 points and a tampon that is fully saturated will score 10 points
- A clot the size of 1p scores 1 point, a 50p sized clot scores 5 points and flooding also scores 5 points

Results

Once you have finished your period total up your scores. A score of 100 or greater may indicate that you have heavy periods and you should seek advice from your doctor. However if your score is less than 100 and you have concerns about your period you should always consult your GP.

PBAC Scoring System

Pads		
1 point	For each lightly stained pad	
5 points	For each moderately stained pad	
20 points	For each completely saturated pad	
Tampons		
1 point	For each lightly stained tampon	
5 points	For each moderately stained tampon	
10 points	For each completely saturated tampon	
Clots/Flooding		
1 point	For each small clot (Australian 5 cent coin)	
5 points	For each large clot (Australian 50 cent coin)	
5 points	For each episode of flooding	