Abortion safety: an evidence-based approach

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February 10, 2017

Objectives

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- Name the most common abortion-related complications
- Identify risk factors for complications and appropriate preoperative steps
- Identify management strategies for different abortion-related complications

Disclosure

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- I have no disclosures or conflicts of interest

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What is a complication?

MAJOR

- Hemorrhage
- Unanticipated surgery
- Infection
- Perforation
- DIC / AFE
- Death

MINOR

- Cervical laceration

COMPLICATIONS OR SIDE EFFECTS?

- Excessive bleeding
- Excessive pain

How do we measure complications?

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Complication	Measure
Hemorrhage	Transfusion Admission UAE Blood loss > 250cc/ 500cc % drop in Hgb Use of uterotonics Re-aspiration
Infection	Fever Antibiotics
Perforation	Clinical suspicion Imaging Surgical confirmation
Unanticipated surgery (extra surgery)	Exploratory laparotomy Diagnostic laparoscopy Re-aspiration
Cervical laceration	Chemical cauterization Suture repair
DIC	Clinical diagnosis Laboratory diagnosis

What *is not* a complication?

- Infertility
- Ectopic pregnancy
- Spontaneous abortion
- Breast cancer
- Depression

Parazzini et al. *Gynecol Obstet Invest* 2010
Moreau et al. *BJOG* 2005
Raatikanen et al. *Ann Epidem* 2006
Freak-Poli et al. *J Matern Fet Neonatal Med* 2009
Melbye et al. *NEJM* 1997
Henriet et al. *BJOG* 2001
Martius et al. *Eur J Obstet Gynecol Reprod Biol* 1998
Kalish et al. *AJOG* 2002
Jackson et al. *Int J Gynaecol Obstet* 2007
Steinberg and Russo. *Contraception* 2009

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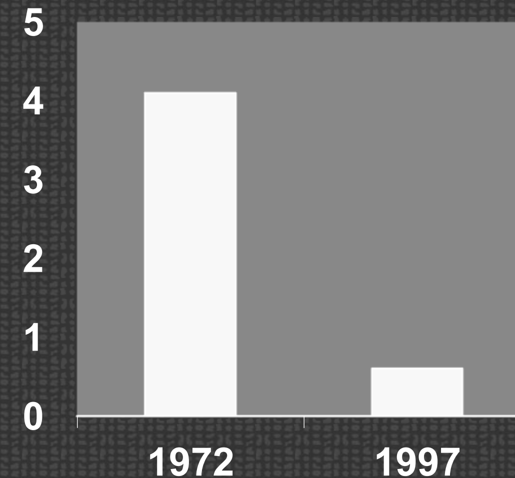
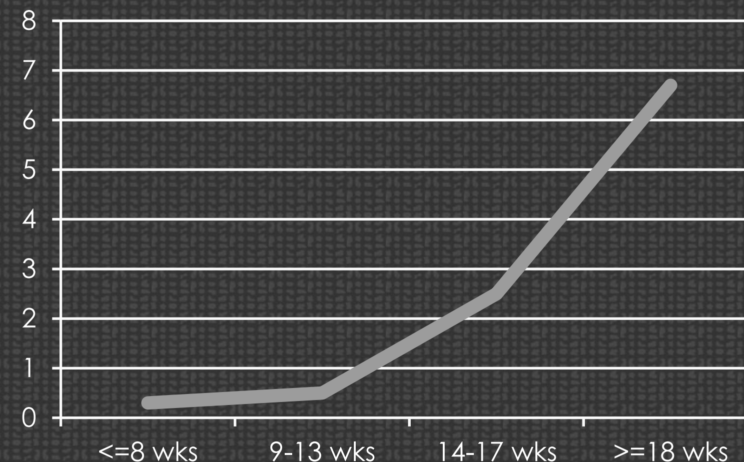
Abortion-related mortality

- 0.7 per 100,000 (1998-2010)
- 20% of the deaths were among women in whom the pregnancy threatened her life
- Decrease in overall abortion-related mortality



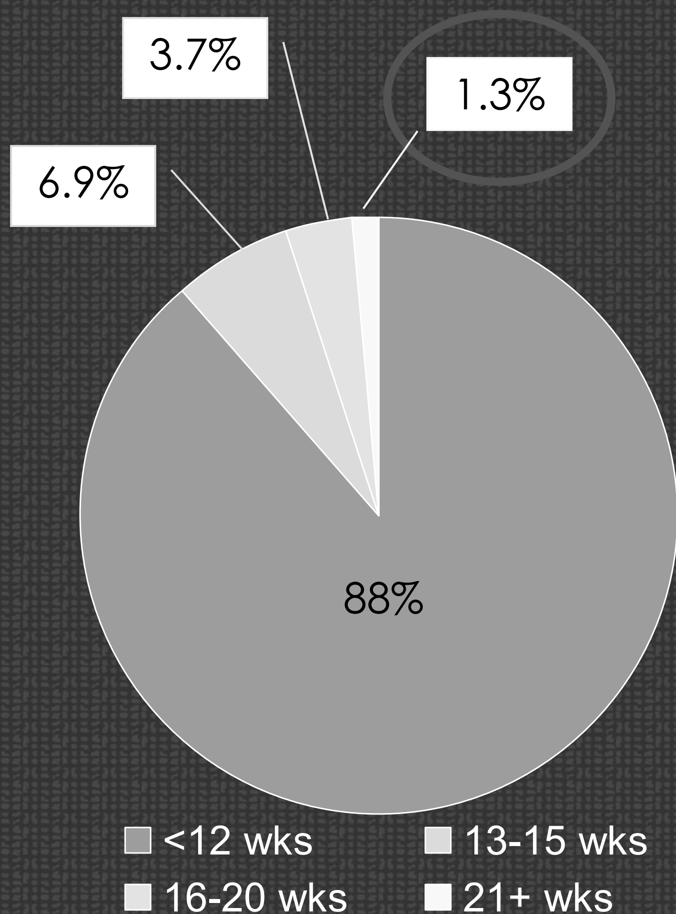
- Risk factors
  - Gestational age
  - Black race
  - Mortality among black women =1.1 per 100,000

Mortality rate by gestational age

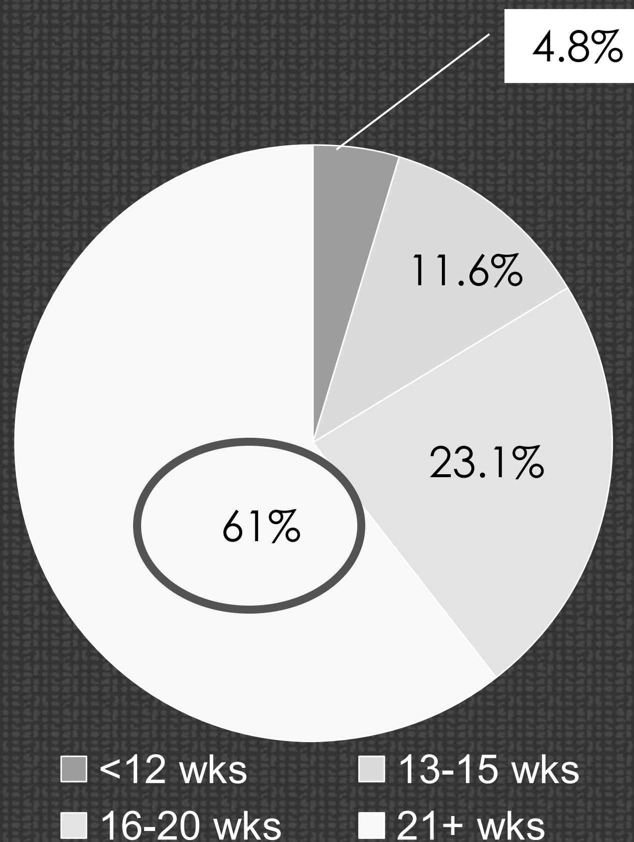


Zane et al. *Obstet Gynecol* 2015

Abortions by gestational age



Abortion-related mortality by gestational age



Jatlaoui et al. *MMWR Surveill Summ* 2016
Bartlett et al. *Obstet Gynecol* 2004

Causes of abortion-related mortality

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First trimester
- Infection
- Anesthesia complications

Second trimester
- Infection
- Hemorrhage

Zane et al. *Obstet Gynecol* 2015

Access critical to safety

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- Limiting access → makes abortion less safe
- Romania, South Africa, Nepal→ examples of liberal abortion laws leading to fewer deaths
- Strategies to increase access
  - Training (residency & post-residency)
  - Advocacy
- Restrictions – 334 restrictions enacted 2011-2016 (30% of all since 1973)
- Incorporating evidence-based practices in the local climate

Turk et al. *Contraception* 2013
Preskill et al. *Contraception* 2013
Conti et al. Curr Opin *Obstet Gynecol* 2016
Kerns et al. *Am J Perinatology* 2012
Guttmacher Institute, State Facts

BANNING ABORTION ENDANGERS WOMEN'S HEALTH

UNINTENDED PREGNANCY IS THE ROOT CAUSE OF MOST ABORTIONS

222 MILLION WOMEN IN THE DEVELOPING WORLD HAVE AN UNMET NEED FOR **MODERN** CONTRACEPTION

47,000 WOMEN DIE YEARLY FROM COMPLICATIONS OF UNSAFE ABORTIONS **MILLIONS MORE ARE INJURED**

86% OF ABORTIONS TAKE PLACE IN THE DEVELOPING WORLD WHERE MOST ABORTION LAWS ARE HIGHLY RESTRICTIVE

Making abortion illegal does not stop it from occurring—it just forces women to obtain clandestine and unsafe procedures

PERCENTAGE OF ABORTIONS THAT ARE UNSAFE

>75% 50-75% 10-49% <10%

For more information visit www.guttmacher.org © 2013

Case 1: MM

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- 14 yo G0 presents for an abortion
- By LMP, she is 7 weeks, but 13wk size
- Seen in ER 2 days ago for abdom pain
- She undergoes counseling, consents for a surgical abortion

- What complications is she at risk for?

- What measures can you take to decrease her risk of complications?

MM's risk for complications

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	1st trimester medical	1st trimester surgical
Overall		0.07% (major)
Hemorrhage	0.1 – 0.4% (transfusion)	<0.01 – 4%*
Infection	0.9%	0.1 – 0.4%
Perforation		0.1%
Cervical laceration		
Retained products	2 – 5%	0.3 – 2%

Peterson et al. *Obstet Gynecol* 1983
Ben-Ami et al. *AJOG* 2009
Frick et al. *Obstet Gynecol* 2012
Hakim-Elahi et al. *Obstet Gynecol* 1990
Ireland et al. *Obstet Gynecol* 2015
Hern et al. *Obstet Gynecol* 1984
Autry et al. *AJOG* 2002
Paul et al. *NAF Textbook* 2009
***White et al. *Contraception* 2015**

Assessing MM's individual risk

- Pertinent factors for MM
  - Patient age
  - Gestational age
  - Experience of the clinicians and staff
  - Symptoms of abdominal pain
  - Discrepancy between LMP and exam

Kapp et al. *Contraception* 2012
Nichols et al. *J Reprod Med* 2002
Fakih et al. *Contraception* 1986
Allen et al. *Contraception* 2007

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Preoperative measures

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- Ultrasound to confirm gestational age
  - 92% agreement for faculty; 75% agreement for residents
  - 94% had < 2wks disagreement
- Cervical preparation
  - SFP: consider for adolescents, provider inexperience, or RF's for complication from inadequate dilation
  - Decreased risk of incomplete abortion OR=0.35 (0.21-0.58)

Kapp et al. *Contraception* 2012
Nichols et al. *J Reprod Med* 2002
Fakih et al. *Contraception* 1986

Meirik et al. *Lancet* 2012
Allen et al. *Contraception* 2016
Kapp *Cochrane Syst Database Rev* 2010

Next steps for MM?

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You've taken her history, now what?

- Ultrasound
  - to determine gestational age
  - By CRL and BPD, she is 11w 0d

- Cervical preparation
  - How?

Cervical preparation < 20 weeks

- Same day
  - Misoprostol alone
  - +Mife same day-no diff
  - Dilapan
- 2-day
  - Dilators (laminaria +/- dilapan)
  - Mifepristone (@ 14-16 wks, no incr in procedure time [3 min] vs dilators)

Maurer et al. *Contraception* 2013
Borgatta et al. *Contraception* 2013
Casey et al. *Contraception* 2016
Bartz et al. *Obstet Gynecol* 2013

Intra- and post-operative measures

- Intraoperative ultrasound (Level C evidence)
- Visual inspection of POCs
- Immediate contraception (Level A evidence)
  - IUD, implant, injection
- Antibiotic prophylaxis (Level A evidence)

Kapp et al. *Contraception* 2012
Sawaya et al. *Obstet Gynecol* 1996
Hohmann et al. *Contraception* 2012

CONGRATULATIONS!

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You've just practiced evidence-based medicine to best avoid 1st trimester surgical abortion complications

Prevention strategies: 1st tri medical abortion

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- Preventing failed abortion
  - No sac on follow-up ultrasound = complete
- Preventing hemorrhage and/or transfusion
  - Pre-procedure hemoglobin
  - Screening for coagulopathy
- Preventing infection
  - Prophylactic antibiotics
  - 7 days Planned Parenthood vs shorter regimen

Case 2: BB

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- 34 yo G4P2, African-American, 22w 4d by LMP
- 2 prior c-sections, BMI 35
- Told 2-3 weeks ago that "the baby is not alive"

- What complications is she at risk for?
- What measures can you take to decrease her risk of complications?

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BB's risk for complications

	2nd trimester medical	2nd trimester surgical
Overall		0.6%
Hemorrhage	<1% (6%?)	0.8 – 2.1%
Infection	2 – 3%	0.3 – 0.6%
Perforation		0.4%
Cervical laceration		0.1 – 0.8% (2.1 – 6.3%)
Retained products	2.5 – 10%	0.4 – 2.7%

Peterson et al. *Obstet Gynecol* 1983
Ben-Ami et al. *AJOG* 2009
Steinauer et al. Unpublished data
Hakim-Elahi et al. *Obstet Gynecol* 1990
Hern et al. *Obstet Gynecol* 1984
Autry et al. *AJOG* 2002
Paul et al. *NAF Textbook* 2009
Lederle et al. *Obstet Gynecol* 2015

Risk factors for D&E complications

Peterson et al. *Obstet Gynecol* 1983
Fox and Hayes *Contraception* 2007
Bartlett et al. *Obstetrics and Gynecology* 2004
Diedrich and Steinauer *Clin Obstet Gynecol* 2009

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Assessing BB's individual risk

Pertinent factors in her history

- Prior cesarean section
- African-American race
- Gestational age
- Possible fetal demise, unknown duration

What additional work-up?

- Ultrasound for
  - Gestational age
  - Determination of fetal demise
  - Placental location

Hemorrhage Risk

Hemorrhage risk group
Low risk • No prior cesarean sections • Fewer than two prior cesarean sections and no previa or accreta • No bleeding disorder • No history of obstetrical hemorrhage
Moderate risk • ≥2 cesarean sections • Prior cesarean section and previa • Bleeding disorder • History of obstetrical hemorrhage not requiring transfusion • Increasing maternal age • Gestational age >20 weeks • Fibroids* • Obesity
High risk • Accreta diagnosis or concern • History obstetrical hemorrhage requiring transfusion • Any of the "moderate risk" categories may be considered "high risk," per discretion of the clinician

Moderate risk

- ≥2 cesarean sections
- Prior cesarean section and previa
- Bleeding disorder
- History of obstetrical hemorrhage not requiring transfusion
- Increasing maternal age
- Gestational age >20 weeks
- Fibroids*
- Obesity

Kerns and Steinauer *Contraception* 2013

Obesity and hemorrhage

- No increased risk of complications with abortion in the second trimester among obese women
- Low numbers of women with BMI > 40
- Referral to a clinic with a higher level of care for obesity increases risk of complications due to increased gestation

Lederle et al. *Obstet Gynecol* 2015
Benson et al. *Obstet Gynecol* 2016

Preoperative measures to decrease BB's risk

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- Ultrasound for
  - Gestational age: 21w 6d by BPD
  - Placental location: Fundal
  - Fetal viability: Demised
- Cervical preparation
  - Dilators, +/- misoprostol

Ben-Ami et al. *Acta Obstet Gynecol Scand* 2012
Edlow et al. *Obstet Gynecol* 2011
Newmann et al. *Contraception* 2008

Intra-operative measures to decrease BB's risk

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Evidence-based

- Intraoperative ultrasound?
- Training
- Avoid halogenated anesthetic gases
- Prophylactic vasopressin (with paracervical block)

Not evidenced-based

- Prophylactic uterine massage
- Prophylactic methergine or other uterotonics
- Intact procedure
- Atraumatic tenaculum, constant pressure

Darney and Sweet. *J Ultrasound Med* 1989
Schulz et al. *Lancet* 1985
Pridmore et al. *Aust N Z J Obstet Gynaecol* 1999
Chasen et al. *Am J Obstet Gynecol* 2004
Kapp et al. *Contraception* 2012
Peterson et al. *Obstet Gynecol* 1983

Post-operative measures to decrease BB's risk

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Evidence-based

- Prophylactic antibiotics
- Immediate post-abortion contraception

Not evidence-based

- Prophylactic methergine or other uterotonics

Sawaya et al. *Obstet Gynecol* 1997
Kapp et al. *Contraception* 2012

CONGRATULATIONS!

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You've just practiced evidence-based medicine for 2nd trimester surgical abortion care

Prevention strategies: 2nd trimester induction

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- Shortening the time to delivery
  - Mife/ Miso (average 6 hrs, vs. 9-15 w/ oxytocin)
- Delivering the placenta
  - RCT: 10mU IM oxytocin
  - Cochrane: tocolytic therapy after oxytocin fails

Borgatta and Kapp. *Contraception* 2011
ACOG Practice Bulletin No 135: Second-trimester abortion. *Obstet* Gynecol s2013
Dickinson and Doherty *AJOG* 2009

Inducing fetal demise

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- Digoxin - transvaginal or transabdominal
- Complications
  - Side effects for the patient, physical and emotional
  - Extramural delivery
- *The risk/benefit equation argues against routine feticidal digoxin injection*

Tocce et al. *Contraception* 2012
Gariepy et al. *Contraception* 2013
Steward et al. *Contraception* 2012
Grimes. *Contraception* 2012

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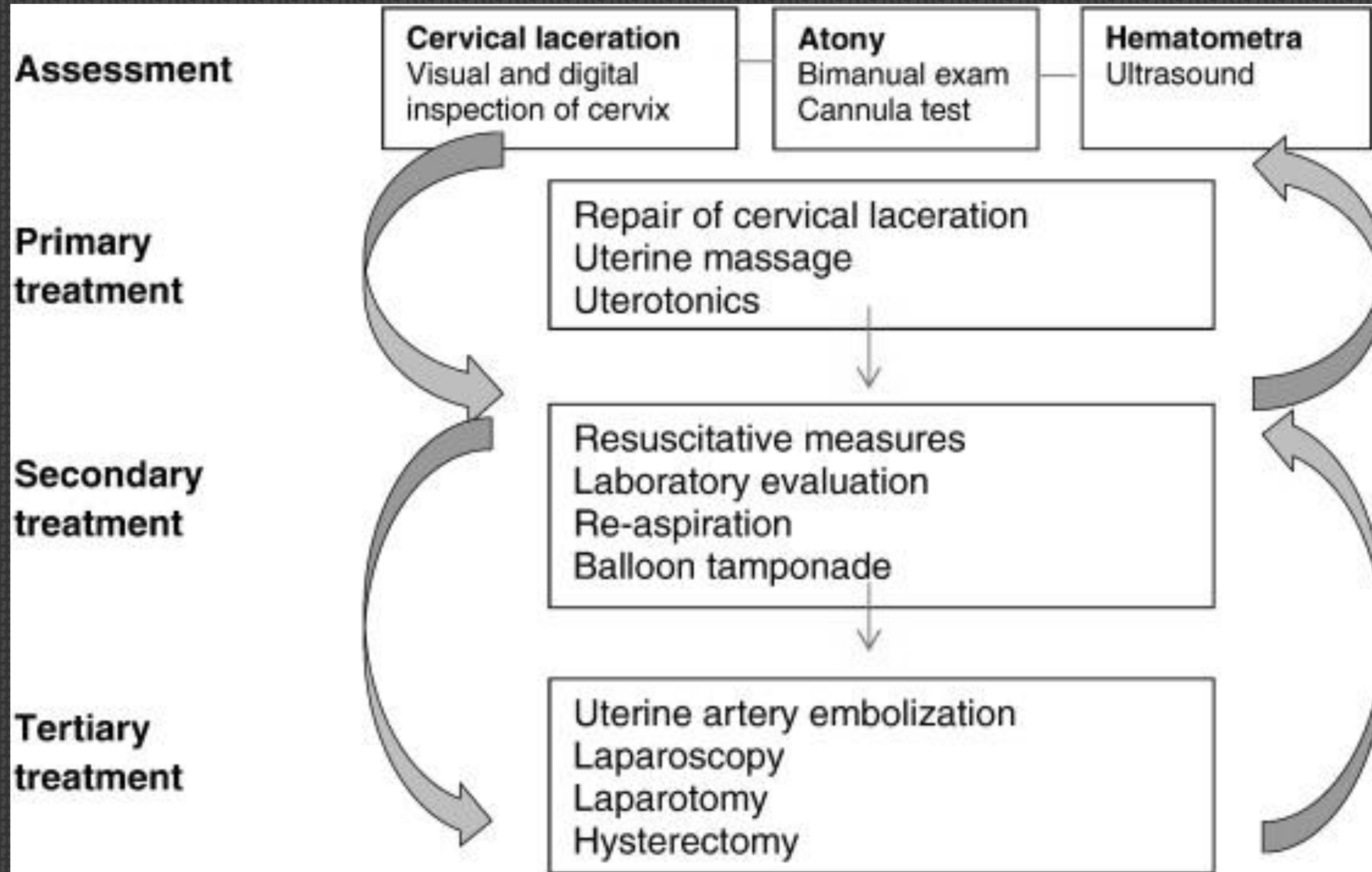
When things *still* go wrong

- Keep your differential broad & be humble
  - Review the specifics of the case out loud
- Enlist support/ help
  - Talk to the RN, call in another attending
- Think through future steps
  - If this doesn't work, then I'll…

Useful tools

- Look with ultrasound
- Get good exposure
- Assistance – extra hands
- Cannula test

Management of hemorrhage



Kerns and Steinauer. *Contraception* 2012

Specifics of hemorrhage management

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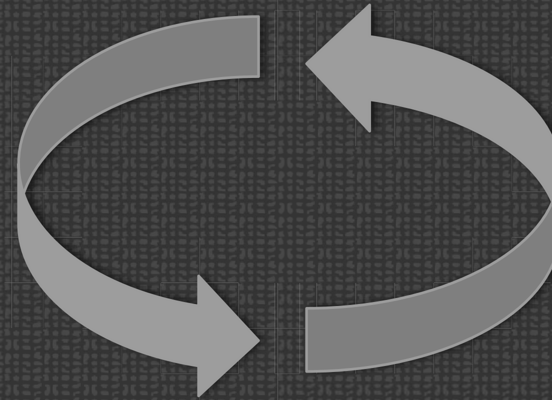
- Cannula test
  - 8 cannula to fundus, slowly withdraw to localize bleeding
- Uterotonics
  - Vasopressin
  - Methergine
  - Misoprostol
  - Hemabate
  - Oxytocin



- Balloon tamponade
  - 30cc Foley, filled to 60cc
  - Bakri, max 500cc – typically < 350cc in abortion setting

Management of cervical laceration

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- Low cervical tears
  - Expectant management (compression)
  - Silver nitrate
  - Ferric subsulfate solution (Monsel's solution)
  - Suturing

- High cervical tears
  - Compression with ring forceps
  - Monsel's
  - Balloon tamponade
  - Angiographic embolization (UAE)

Management of perforation

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- Identifying the perforation
  - Ultrasound (free fluid), digital exam
- Stable or unstable
  - Serial CBCs
  - Serial exams
  - Initial/ serial imaging
- Surgical management
  - Laparoscopy – appropriate if small injury
  - Laparotomy – unstable pt, large injury, ability to run the bowel

Management of the team

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- Call a colleague in the moment
- Call a colleague after the moment
- Debrief with the team
  - What happened
  - What went well
  - What could have gone differently
  - Be a leader with the clinical team
- Expect that complications will happen, and be prepared for them

More research needed…

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- Risk of morbid obesity
- Practice of inducing fetal demise
- Fetal demise and risk of DIC and hemorrhage
- Optimal regimens of cervical preparation
- Fertility after UAE for post-abortion hemorrhage
- Effect of prophylactic uterotonics
- Intact D&E vs. standard D&E