Basic Infertility Evaluation & Management in the Family Planning Setting

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## Disclosures

<table>
<thead>
<tr>
<th>Name</th>
<th>Commercial Interest</th>
<th>Role</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Policar, MD, MPH</td>
<td>Bayer Healthcare</td>
<td>Consultant</td>
<td>Resolved</td>
</tr>
<tr>
<td>Jordan Vaughan, MSN, APN, WHNP-BC</td>
<td>EMD Serono</td>
<td>Speaker</td>
<td>Resolved</td>
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Objectives

• Discuss evaluation for both male and female patients
• Discuss ovarian reserve testing
• Discuss the management of anovulatory women including pharmacologic options
• Identify patients warranting referral to a specialist for further evaluation
Should Generalist ObGyns, PCP’s and FP Clinics Offer Infertility Services?

- Set referral points based on your expertise, resources
- Referral points to explained patient(s) early
- Relationship with REI practice(s)
  - Consistent work-up plans
  - Phone consults during work-up
  - Detailed referral points
  - Maintain continuity of care
Infertility: Definitions

• Infertility
  – No pregnancy in 12 mo of unprotected intercourse

• Pregnancy rates with “normal” fertility
  – 1 month: 25%
  – 6 months: 60%
  – 9 months: 75%
  – 12 months: 85%
  – 18 months: 90%
Primary and Secondary Infertility

Total Infertility Cases

Primary Infertility 70%
- F: never conceived
- M: never impregnated a woman

Secondary Infertility 30%
- F: previously conceived, but later unable
- M: has impregnated a female, but now is unable to do so
Infertility: Definitions

• Initiate the infertility evaluation
  – Woman < 35 years old: @ 12 months of UPI
  – Woman 35-39 years old: @ 6 months
  – Woman ≥ 40 years old: @ 3 months
  – History of, or risk factors, for infertility: @ 0-6 months
  – After 6 or more cycles insemination

• 1/2 couples pregnant in within 1 year

UPI: unprotected intercourse
Diagnostic evaluation of the infertile female: a committee opinion

Practice Committee of the American Society for Reproductive Medicine
American Society for Reproductive Medicine, Birmingham, Alabama

Practice Committee ASRM, Fertility and Sterility 2015; 103 (6):e44-50
### Causes of Infertility in Couples

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>Male factor</td>
</tr>
<tr>
<td>30%</td>
<td>Tubal/peritoneal factor</td>
</tr>
<tr>
<td>20%</td>
<td>Ovulatory factor</td>
</tr>
<tr>
<td>15%</td>
<td>Unexplained</td>
</tr>
<tr>
<td>5%</td>
<td>Unusual (cervix, uterus)</td>
</tr>
</tbody>
</table>
Female Causes of Infertility

• **Tubal/ Peritoneal Factor**
  – Tubal lumenal occlusion (prior episode of PID)
  – Peritoneal adhesions (prior peritonitis or surgery)
  – Endometriosis

• **Ovulatory Factor**
  – Anovulation: PCOS, hyperprolactinemia
  – Luteal phase insufficiency
  – Poor “quality” ovulation (poor ovarian reserve)

• **Cervical Factor**
  – “Hostile” mucus: anti-sperm antibodies, infection
  – Scant mucus: “hypoestrogenic” effect
Male Causes of Infertility

- Poor sperm production
  - Chronic “overheating” of testicles
  - Varicocele (varicosity of testicular vein)
  - Toxin exposure (environmental, occupational, drugs)
  - Mumps orchitis
Male Causes of Infertility

- Scarring of the vas deferens
  - Epididymitis (GC, chlamydia, ureasplasma)
  - Prior vasectomy or other genital tract surgery
- Hypogonadism
  - Low gonadotropins (LH, FSH)
  - Low testicular testosterone production
  - Aging, especially >50 years old
### The Basic Infertility Evaluation

<table>
<thead>
<tr>
<th>“Factor”</th>
<th>Traditional Method</th>
<th>Modern Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semen quality</td>
<td>Semen analysis</td>
<td>Semen analysis</td>
</tr>
<tr>
<td>Fallopian tubes</td>
<td>Hysterosalpingography</td>
<td>Hysterosalpingography</td>
</tr>
<tr>
<td>Peritoneum</td>
<td>Diagnostic laparoscopy</td>
<td>Selective dx laparoscopy</td>
</tr>
<tr>
<td>Uterus</td>
<td>• Hysterosalpingography</td>
<td>• Hysterosalpingography/sonohysterography</td>
</tr>
<tr>
<td></td>
<td>• EMB and dating</td>
<td>• No longer recommended</td>
</tr>
<tr>
<td>Ovulation</td>
<td>• Serum progesterone</td>
<td>• Serum progesterone</td>
</tr>
<tr>
<td></td>
<td>• BBT</td>
<td>• No longer used</td>
</tr>
<tr>
<td>Ovarian reserve</td>
<td>Day 3 FSH</td>
<td>Serum AMH</td>
</tr>
<tr>
<td>Cervical factor</td>
<td>Postcoital test</td>
<td>No longer recommended</td>
</tr>
</tbody>
</table>

Visit 1: Female History

- Previous pregnancies; outcomes and complications
- Prior infertility; results of evaluation, treatments
- Frequency of intercourse; sexual dysfunction
- Hx of PID; postpartum, post TAB infection
- Pelvic pain, dysmenorrhea; endometriosis
Visit 1: Female History

- Medical: diabetes, thyroid; pelvic surgery
- Medications, alcohol, street drugs
- Cigarette smoking
- Occupation; exposure to environmental hazards
- Galactorrhea
- Menstrual patterns
  - Cycle length range (best 25-35 days apart)
  - Molimenal symptoms (if present, ovulating)
Visit 1: Female Examination

- BP, weight, BMI, waist circumference (PCOS)
- Skin: axial hirsuitism, acne, male-pattern balding (PCOS)
- Thyroid enlargement; any nodules or tenderness
- Breasts: galactorrhea (▲prolactin)
- Cervix: mucopus, friability (infection)
- Uterine corpus
  - Size, shape (fibroids, uterine anomalies)
  - Corpus tenderness (PID)
  - Fixed retroflexion (EM)
- Adnexa: tenderness (PID, EM), mass (EM, tumor)

EM: endometriosis
Does the Male Need to Be Involved?

- Evaluation should focus on the couple
- Both encouraged to attend each visit
- Both partners understand the rationale for tests and procedures
- An ongoing process to ensure that all medical, emotional, and financial concerns are addressed

Visit 1: Male History

Past medical history

• Fathered previous pregnancies within 3 years
• Genital trauma or surgery
• Genital infections; GC, Chlamydia, mumps
• Environmental heat: spa, pants, sitting time

Coital factors

• Coital frequency
• Coital technique, esp ejaculation factors
Visit 1: Male History

Current exposures

- Drugs: b-blockers, Ca channel blockers, cimetidine, HMG-CoA reductase inhibitors
- Toxic chemicals, esp. metals and dyes
- Street drug and alcohol use
- Cigarette smoking
Visit 1: Male Examination

• Utility is controversial
  – “Preferable” to do exam, but little contribution if semen analysis is normal

• Male examination
  – Masculine traits
  – Varicocoele
  – Hypospadias
  – Urethral discharge
  – Prostatitis
Visit 1: Laboratory

- **Women**
  - CBC, ESR
  - TSH, prolactin
  - Ovarian reserve testing (if indicated)
  - Screen for gonorrhea, chlamydia (if indicated by age; risks)
  - Screen for HIV (if indicated)
  - If amenorrhea, serum FSH and $E_2$ (estradiol)

- **Men**
  - Semen analysis if has not fathered children
    - Abstain for 3 days before sampling
    - *Check with your lab for collection rules*
Visit 1: Pelvic Ultrasound

- Diagnostic pelvic ultrasound
  - >10 to 12 follicles per ovary (PCOS)
  - Persistent hemorrhagic cysts with low-level echoes (endometriosis)
  - Anatomical conditions: fibroids, polyps, and Müllerian anomalies (uterine septum)
  - Decreased ovarian volume and reduced antral follicle count associated with reduced fertility
- Serial TV ultrasound used to document ovulation
Visit 1: Counseling

- Preconception care advice
- Optimal timing of intercourse
- Stop smoking (both partners)
  - Offer nicotine replacement
  - Group therapy
- If BMI > 30, recommend/assist with weight loss
- Discuss emotional issues and support, financial costs of planned infertility services, etc.
- Which questions can I answer?
Visit 1: Counseling

• Preconception care
  – Folic acid 400 mcg PO per day
  – Rubella serology; immunize if seronegative
  – Cystic fibrosis screening if risk factors (screen 1 partner, screen the 2\textsuperscript{nd} only if the 1\textsuperscript{st} is identified as a carrier)
  – Change medications to safer FDA pregnancy category
    • Antihypertensives
    • Anti-epileptic drugs
  – Blood glucose control in diabetics
Optimizing natural fertility: a committee opinion

Practice Committee of the American Society for Reproductive Medicine in collaboration with the Society for Reproductive Endocrinology and Infertility
The American Society for Reproductive Medicine, Birmingham, Alabama

The Fertile Window

Probability of pregnancy by cycle day, involving recurrent intercourse, by age. Data from Stanford and Dunson 2007 (16).

Achieving Pregnancy

- Fertility rates are lower among women who
  - Are very thin (BMI <19) or obese (BMI >35)
  - Consume high levels of caffeine (e.g., >5 cups per day, fecundability reduced by 45%)
  - Smoke (infertility RR increased by 60%)
  - Consume alcohol > 2 drinks/day (RR increased 60%)
  - Use recreational drugs (RR increased 70%)
  - Exposure to toxins, solvents (RR increased 40%)

Frequency of Intercourse

- Misperception: frequent ejaculation decreases fertility
  - With daily ejaculation, quality, count, motility normal
  - If oligozoospermia, count and motility may be highest with daily ejaculation
- After abstinence of ≥ 10 days, semen results deteriorate
- Efficiency highest when UPI occurs every 1-2 days
  - To reduce anxiety, optimal frequency best defined by couple preference
ASRM: Coital Practices

- Sperm at midcycle cervix found in tubes ≤ 15 min
- No evidence that coital position affects fecundability
- No relationship between female orgasm and fertility

Ovulation Prediction Kits (OPK)

- Replaced BBT to confirm ovulation
- Positive with LH surge; ovulation in 14-26 hours later
  - Highest fertility on day of the surge and next 48 hours
  - Best: sex or insemination *the day after* a + result
- Accuracy: 98% for LH surge; slightly less for ovulation
- Result is “visual” positive or meter-read
- **Positive test indicates**
  - Presence of ovulation (natural or induced)
  - Ideal timing for intercourse or IVF
Ovulation Prediction Kits (OPK)

- 5-9 urine dipsticks/ cycle; all have control stripe or box
- Perform at time of day listed in package insert
- Start testing 4-5 days before expected ovulation
- Retail cost example...from reputable on-line source
  - $32 for 20 test sticks
  - $8 per cycle if 5 sticks used each cycle
ASRM: Vaginal Lubricants

- Water-based lubricants, olive oil, and saliva inhibit sperm motility in vitro by 60-100%
- Canola oil and mineral oil oil have no effect
- **ASRM**
  - “It seems prudent to recommend mineral or canola oil, or hydroxyethylcellulose lubes, when needed

Male Evaluation: Semen Analysis

- **Semen Analysis (SA):** WHO 2010 Reference Ranges
  - Volume: ≥ 1.5 ml (1.4-1.7ml)
  - Concentration: ≥ 15 million/cc
  - Total sperm count > 39 million
  - Motility: ≥ 40%
  - Progressive: ≥32%
  - Normal forms: ≥ 4%

  Based upon 5%ile of 1,990 men in 8 countries

- **Definitions**
  - Conception increases to 50 million/mL, then plateaus
  - Oligospermia: sperm density <20 million/mL
    - Severe oligospermia < 5 million/mL
  - Odds of male infertility increases with the number of semen parameters in the subfertile range
Male Evaluation: Semen Analysis

• Management of SA Results
  – Normal: proceed with evaluation
  – Oligospermia: repeat after at least 4 weeks
  – If repeat semen analysis is low
    • Measure FSH and total testosterone
    • Evaluation by Urologist or REI sub-specialist
  – Thresholds for treatment
    • 2-20 million: IUI
    • < 2 million: ICSI (ART program)
Infertility: Visit 2

• Review lab results
  – If hyperprolactinemia, evaluate
  – If hypothyroidism, treat with T₄ replacement
  – If abnormal SA x 2, refer to urologist or ART

• Review menstrual calendar and OPK results
  – If ovulatory, proceed HSG
  – If clearly anovulatory, induce ovulation
  – If polymenorrhea or cycle irregularity, evaluate for luteal phase defect
Visit 2: Documentation of Ovulation

- Regular menstrual cycles with intervals of 21–35 days
- Consistent pattern of molimena
- Mid-luteal phase progesterone $\geq 3$ ng/mL
  - Time blood draw 7 days before expected menses
  - Evaluate result relative to onset of actual menses
- Positive ovulation prediction kit
- Pelvic ultrasound evidence of ovulation
- Outdated indicators
  - Secretory endometrium on endometrial biopsy
  - Basal body temperature elevation
Ovarian Aging

- Peak Fertility is between 20-24 years old
- Women have fixed number of oocytes
- At 20 weeks of gestation a female fetus has 6 million oocytes
- Decline in fertility begins in 30s
  - Remaining oocytes are more likely to be aneuploid

Visser JA, de Jong FH, Laven JSE, Themmen, APN, 2006
Pavone ME, Hirshfeld-Cytron JE, Kazer RR, 2011
Ovarian Reserve Testing

• Indications
  • >35 years or risk factors
    • Unexplained infertility
    • Ovarian surgery
  • Family history of premature menopause
  • History of endometriosis
Ovarian Reserve Testing

- Follicle Stimulating Hormone/Estradiol level
  - Cycle days 2-4
  - Typically 3.5-12 IU
  - Estrogen > 70pg/mL abnormal
    - Early follicular development, poor oocyte pool
  - An elevated estrogen level may suppress FSH early
    - False negative day 3 FSH
    - Approximately $25.00

- Clomiphene Citrate Challenge Test
  - Day 3 FSH, 100mg CC x cycle day 5-9, day 10 FSH
  - FSH >10-12 mIU/mL abnormal
  - Contemporary use of CCCT has declined

Pavone ME, Hirshfeld-Cytron JE, Kazer RR, 2011
Ovarian Reserve Testing

• Basal FSH level as predictive as clomiphene challenge
  • PPV 91-100%
  • Failure of treatment

• Prevalence of diminished ovarian reserve
  • Younger vs. older women
  • Premature vs. physiologic
  • Abnormal test in younger women: further testing

Fertil Steril 2008;90:2196-202
Ovarian Reserve Testing

• Elevated FSH predicts poor response
  • <10% pregnancy rate with IVF
  • Young women with diminished reserve

• Older woman with normal FSH
  • Prognosis is age-based
  • “Normal” test does not improve prognosis

Single abnormal test is predictive
Ovarian Reserve Testing

- Antral Follicle count
  - <10mm mean diameter
  - 5-10 antral follicles assoc with good IVF response
  - Good when combined with bloodwork
  - $100-200.00

- Key Point: Screening tests
  - Counseling couples, discussing options
Ovarian Reserve Testing

- **AMH** (anti-Mullerian hormone)
  - Secreted by granulosa cells/involved in the regulation/recruitment of primordial follicle
  - May be drawn at any time of menstrual cycle
  - Avoid drawing while on birth control
  - Approximate cost $50-$60.00

AMH Action In The Ovary

AMH is Secreted by Pre-antral & Antral Follicles

Initial Recruitment

- Primordial Follicle
- Small Preantral
- Large Preantral
- Antral 2-7 mm
- Antral 8-12 mm

Cycle Recruitment

- FSH

Pre-Ovulatory Follicle

AMH vs. FSH

- AMH is a measurement of primordial follicle pool
- Levels decline early ovarian aging
- Elevated levels of FSH do not occur until cycles are already irregular
- Only AMH level shows decline over time

de Vet et al. Fertility and Sterility 2002; 77:357-362
AMH Predictor Of Live Birth

• Study published in 2010 examined an AMH cutoff that discriminates between better and poorer live birth chances

• AMH level <1.05 suggests correlation to FSH 10mIU/ml

• Clinical pregnancies are established at all AMH levels

Fertility and Sterility, 2010:94:7
Live Birth Rate/Retrieval

AMH (ng/ml)

N=1230

*P<.0001

JCEM 2013; 98;1107-1114.
Uterine Evaluation

- Hysterosalpingogram
- Transvaginal Ultrasound
- Saline-infusion sonogram
- Laparoscopy
Hysterosalpingogram

- Water or lipid soluble contrast media is introduced into the cavity.

- Done after menses and before ovulation

- Can document proximal and distal tubal occlusion and salpingitis

- Approximate cost $200-300
Hysterosalpingogram (HSG)

- Good for confirming tubal patency (83% spec)
- Low specificity for tubal occlusion (65%)
  - Poor accuracy for PROXIMAL obstruction
  - Poor assessment of peritubal disease
- Not to be done if a patient has a history of PID
- If normal, may have timed intercourse with or without CC for 3-6 cycles

Hysterosalpingogram

- Abnormal HSG should be followed up
  - Bilateral tubal blockage, refer
  - Endometrial abnormality - Sonohystogram (SIS)
  - Hysteroscopy
I Hypoplasia/agenesis
(a) Vaginal
(b) Cervical
(c) Fundal
(d) Tubal
(e) Combined

II Unicornuate
(a) Communicating
(b) Non-Communicating
(c) No cavity
(d) No horn

III Didelphus

IV Bicornuate
(a) Complete
(b) Partial

V Septate
(a) Complete
(b) Partial

VI Arcuate

VII DES drug related
Uterine Evaluations

• Saline infusion sonography (SIS)
  • Transvaginal ultrasound with the induction of saline
  • High predictive value (>90%) for detection of intrauterine pathology
  • Can cost upwards of $800.00
Laparoscopy/Hysteroscopy

• Definitive method for diagnosis and treatment of uterine pathology

• Laparoscopy with chromotubation can document tubal patency and identify fimbrial phimosis or adhesions

• Laparoscopy is diagnostic for endometriosis and peritoneal factors
  – Not recommended for routine evaluation without pelvic pathology or indications
Causes Of Ovulatory Dysfunction

- Polycystic ovary syndrome (PCOS)
- Obesity
- Extremes of weight gain or loss
- Eating disorders
- Strenuous exercise
- Thyroid dysfunction
- Hyperprolactinemia

ASRM, 2015
Anovulation: Presentations

- Amenorrhea, oligomenorrhea, or dysfunctional bleeding
- Absence of molimenal symptoms
- Cycle length < 24 or > 34 days
- Prior need for ovulation induction
- Physical findings of PCOS
  - Obesity
  - Axial hirsuitism, acne
- Galactorrhea
- No ovulation with OPK or low luteal-P level
Management of the Anovulatory Client

- **Clomiphene Citrate**
  - Initial treatment of choice for most anovulatory or oligo-ovulatory women
  - Used with hypothalamic pituitary dysfunction
  - Selective estrogen receptor modulator
  - Binds to receptors in the hypothalamus
  - Increases FSH/LH and causes mid cycle surge
  - Use lowest effective dose
  - Approximately $10.00
Clomiphene Citrate

- Dose: 50mg (52%), 100mg (22%)
  - 5 days: Cycle days 3-7 or 5-9
  - Higher doses not approved by FDA
  - LH surge 5-12 days after treatment
- Approximately 80% will ovulate
  - Ovulation must be documented
- 15% cycle fecundability
Clomiphene Citrate

- Begin 3-5 days post spontaneous or induced menses x 5 days
  - May induce menses with progestin x 10 days
  - Ovulation usually occurs 5-7 days after last pill

- OPK starting 3-4 days after last clomiphene or serum progesterone level 12-14 days after last clomiphene

- If spotting or no menses do a pregnancy test

- If ovulation is documented and pt is not pregnant after 4 cycles, consider hysterosalpingogram
Clomiphene Citrate

Adverse Effects

• Twins: 5-8%, Triplets 0.3%
• Hyperstimulation is rare
• Impairment of endometrial growth
• Cancer
  – Limited studies
  – No causal relationship to breast or ovarian cancer

More than 6 cycles is rarely successful

Clomiphene Citrate

• Predictors of good response
  • Lower BMI
  • Young age
  • Oligomenorrhea
    • Not amenorrhea!
Clomiphene Citrate

- Clomiphene/IUI: 4100 cycles (n=1738)
  - Retrospective cohort study
  - Oligo-ovulatory and ovulatory
  - Stratified pregnancy rate (PR) by age
  - PR per cycle
  - PR stratified by number of total cycles
  - 95% of pts had ≤ 4 total cycles

Fertil Steril 2008;90:2281-6
Clomiphene Ovulation Induction

<table>
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<tr>
<th>Age</th>
<th># Pts</th>
<th>PR/Cycle</th>
<th>PR/Pt</th>
<th>&gt;5 cycles</th>
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<tbody>
<tr>
<td>&lt;35</td>
<td>983</td>
<td>11.5%</td>
<td>24.2%</td>
<td>18</td>
</tr>
<tr>
<td>35-37</td>
<td>422</td>
<td>9.2%</td>
<td>18.5%</td>
<td>3</td>
</tr>
<tr>
<td>38-40</td>
<td>265</td>
<td>7.3%</td>
<td>15.1%</td>
<td>4</td>
</tr>
<tr>
<td>41-42</td>
<td>81</td>
<td>4.3%</td>
<td>7.4%</td>
<td>0</td>
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</tbody>
</table>

Fertil Steril 2008;90:2281-6
Clomiphene Ovulation Induction

- Improved PR in unexplained infertility with treatment
- <40 yo: 92-98% pregnant with ≤ 4 cycles
  - Little benefit > 4 cycles
- Age 41-42: 6 Pregnancies in 81 pts (166 total cycles)
  - Of 55 pts ≥ 43: Only 1 pregnancy

CC/IUI of benefit for both anovluatory and ovulatory
Letrozole

- Aromatase Inhibitor (AI)
  - Increases GnRH and FSH pulsatility
  - Doses 2.5mg and 5.0 mg taken cycle days 3-7 or 5-9
  - Comparable to clomiphene for ovulation
    - Not FDA approved
    - Half life 2 days (vs 2 weeks for clomiphene)

J Obstet Gynaecol Can 2007;29:668
Fertil Steril 2006;85:1761
Letrozole vs. Clomiphene Citrate

- CC 50 mg daily or letrozole 2.5 mg daily
  - Start on cycle day 3; use for 5 days
  - Up to five menstrual cycles
- Dose increased if nonresponse
- Maximum daily dose (both given for 5 days)
  - CC = 150 mg/d
  - Letrozole 7.5 mg/d

Letrozole vs Clomiphene

• Conclusions
  – Decreased serum estradiol with letrozole
  – Research is conflicting
  – Ovulation rate: 61.7% letrozole, 48.3% CC
  – Live birth rate: 27.5% letrozole, 19.1% CC
Letrozole vs Clomiphene

• Comparable ovulation and pregnancy rates
• May benefit CC resistant pts
• Letrozole may have beneficial endometrial profile
• Majority of studies with PCOS patients
• Letrozole good option, but not FDA approved for this purpose (off-label indication)
Metformin

• Insulin sensitizing agent
  – Reduces circulating insulin/androgen levels
  – Helps to restore normal ovulation in some women
  – GI side effects are most common
    • Dose should be slowly increased

Fritz MA, Speroff L. Clinical Gynecologic Endocrinology and Infertility. 2011
**Clomiphene, Metformin, or Both for Infertility in the PCOS**

RCT 626 women with PCOS treated for 6 months

<table>
<thead>
<tr>
<th></th>
<th>Clomiphene</th>
<th>Metformin</th>
<th>Both</th>
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<tbody>
<tr>
<td>Ovulation</td>
<td>49%</td>
<td>29%</td>
<td>60%</td>
</tr>
<tr>
<td>Conception</td>
<td>30%</td>
<td>12%</td>
<td>38%</td>
</tr>
<tr>
<td>Multiple gestation</td>
<td>6%</td>
<td>0</td>
<td>3%</td>
</tr>
<tr>
<td>Live birth</td>
<td>22.5%</td>
<td>7.2%</td>
<td>26.8%</td>
</tr>
</tbody>
</table>

Legro RS et al., NEJM 2007; 356:551-566
Office Based Infertility Evaluation

“High Risk” factors

None

Present

Ovulation status (Hx, Ovulation predictor kit or P level) +/- FSH/AMH

Ovulatory

Anovulatory

Induce 4 ovulatory cycles

S.A/HSG

Poor ovarian reserve

Pregnant

Not pregnant

Normal

Abnormal

Next

Refer for ART
Ovulatory, HSG normal

Wait 3-6 months/CC, then either

Diagnostic laparoscopy with tubal dye

Normal

“Unexplained infertility”

IUI + induce ovulation x4 cycles

Pregnant

Not pregnant

Abnormal

Refer for ART

strong suspicion of advanced stage endometriosis, tubal occlusive disease, or peritoneal factors.

Refer for ART
Artificial Reproductive Technologies

- Intrauterine Insemination
- IVF
- Donor egg/Donor Sperm
- Donor embryo
- Gestational surrogacy
- Preimplantation Genetic Diagnosis
- Oocyte cryopreservation
Intrauterine Insemination (IUI)

- Used in
  - Cervical factor infertility
  - Unexplained infertility
- Can be done with partner or donor semen
- Sample in lab; washed of antigens, antibodies
- Place 1-4 days before expected ovulation
In Vitro Fertilization

A process by which fertilization take place outside the body
Baseline Follicular Scan

Ovarian Stimulation
Egg Retrieval
Embryo Transfer

- Embryos are watched over the next 5 days
  - Day 3 vs day 5 embryo
Embryo Transfer
**Conclusions**

- Diagnostic evaluation for infertility should include assessment of ovulatory function, tubal patency, and semen analysis.

- Ovarian reserve testing may be considered for women over 35, family history of early menopause, single ovary or ovarian surgery, chemotherapy, unexplained infertility, or undergoing assisted reproductive technologies.

- Routine laparoscopy should not be performed unless there is suspicion of endometriosis or peritoneal factors.
Conclusions

- Clomiphene citrate should be considered for anovulatory/oligo-ovulatory clients and is the first line treatment.
- When ovulation is documented by menstrual calendar, LH urine kit, or progesterone level, and HSG should be considered to evaluate tubal patency.
- Referral to a reproductive specialist should be considered for anovulatory women who are not pregnant after 4-6 cycles of documented ovulation with clomiphene citrate, abnormal HSG evaluation, and an abnormal semen analysis.
References (MP)

- Fritz MA and Speroff L. *Clinical Gynecologic Endocrinology and Infertility*, 8th edition, 2011: Chapter 27 (Female infertility), Ch 30 (Male infertility)
References (JV)


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References


