



MASSACHUSETTS

Blue Cross Blue Shield of Massachusetts is an Independent Licensee of the Blue Cross and Blue Shield Association

Medical Policy

Infertility Diagnosis and Treatment

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Policy Number: 086

BCBSA Reference Number: N/A

Related Policies

- Assisted Reproductive Technology Services Form, #[694](#). **Providers SHOULD complete this ART form.**
- Genetic Testing, Including Chromosomal Microarray Analysis and Next-Generation Sequencing Panels, for Prenatal Evaluation and the Evaluation of Children with Developmental Delay-Intellectual Disability or Autism Spectrum Disorder, #[228](#)
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Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO BlueSM and Medicare PPO BlueSM Members

Aging is not an illness and services to overcome the effects of natural aging are not covered.

Infertility is a medical illness in which an otherwise healthy female member is unable to conceive or produce conception. Ovulation disorders can be addressed with medications or lifestyle changes to restore normal ovulation and are addressed in this policy only after 6 consecutive ovulatory cycles with appropriately timed exposure to normal sperm without a live birth. However, if there is a defined diagnosis of infertility (i.e. tubal factor or male factor infertility) as well, ovulation induction alone would not be required prior to initiating infertility treatment addressed in this policy.

Infertility services are only covered in accordance with the individual subscriber certificate in effect at the time the service is rendered. Members are expected to check their current subscriber certificate (Evidence of Coverage document) to determine their benefits.

In accordance with Massachusetts law (**M.G.L.c. 175, section 47H and 211 C.M.R 37.09**)¹, Blue Cross Blue Shield of Massachusetts may approve coverage for infertility services when:

1. An otherwise healthy female member is age 35 or older and has not been able to conceive after a period of six months of actively trying.
2. An otherwise healthy female member is younger than age 35 and has not been able to conceive or produce conception after twelve months or more of actively trying.

Note: For female members age 35 and older, the six-month period required to define infertility would then replace the 12-month period required in all subsequent sections of this policy unless otherwise specified.

Members who have benefits based on the Massachusetts mandate are eligible for infertility services if the member conceives but is unable to carry that pregnancy to live birth. The period of time the member attempted to conceive prior to achieving that pregnancy or after a loss of pregnancy shall be included in the calculation of the one-year or six-month period, as applicable.

If a provider recommends infertility treatment for a member with recurrent pregnancy loss as defined above, then in accordance with Massachusetts law (**M.G.L.c. 175, section 47H and 211 C.M.R 37.09**)¹ coverage is determined as noted above.

Please Note: Although BCBSMA currently determines coverage for infertility services for those with recurrent pregnancy loss based on Massachusetts State Law (**M.G.L.c. 175, section 47H and 211 C.M.R 37.09**)¹, the American Society of Reproductive Medicine currently indicates that “Recurrent pregnancy loss is a disease distinct from infertility, defined by two or more failed pregnancies.” This distinct condition should be evaluated and treated in accordance with the recommendations of the American College of Obstetrics and Gynecology (ACOG) and ASRM.^{2,3,4}

COVERED SERVICES (MEDICALLY NECESSARY)	NON-COVERED SERVICES (INVESTIGATIONAL)
<ul style="list-style-type: none"> • We cover benefits for services provided to members.⁵ • We cover the treatment only for documented infertility of at least one year’s duration, in accordance with the state mandate. Spontaneous conceptions after the 1 year of inability to conceive while trying do not invalidate the diagnosis of infertility. When the cause of complete infertility is known, the one-year guideline may not be applicable. • We cover services for members who are presumably healthy, for whom fertility would naturally be expected. • Services must be authorized, and delivered according to determinations of medical necessity. • We cover infertility treatment after a reversal of a sterilization procedure, if there is a diagnosis of infertility unrelated to the previous sterilization procedure. • Standard American Society of Reproductive Medicine (ASRM) evaluation: [History/Physical/ Menstrual History/Serum Progesterone/ Endometrial biopsy/transvaginal ultrasound (if indicated)/TSH/Prolactin/basal FSH with estradiol and clomiphene citrate challenge test for women over 35, single ovary, or poor response to gonadotropin stimulation, hysterosalpingography, laparoscopy if indicated, semen analysis, if indicated-genetic evaluation, testosterone, luteinizing hormone]⁶ 	<ul style="list-style-type: none"> • Coverage for a partner’s services when a partner is not a member except for procurement/processing of eggs and sperm, if not covered by partner’s insurer • Coverage for a member who is not medically infertile (i.e., whose female partner’s infertility is age-related.) • If there is a less than 5% chance of success for a live birth, then it will be deemed not medically necessary.^{7,23} • Coverage for services related to achieving pregnancy through a surrogate or gestational surrogate)^{8,9} Note: For BCBSMA members who require a surrogate, we do not cover any services related to the surrogate. However, for women with a clear medical contraindication to pregnancy who are using their own oocytes and self-paying for a gestational carrier, we do pay for our member’s infertility evaluation, stimulation, retrieval, and fertilization. We do not cover for implantation or other services done to a gestational carrier, including, but not limited to transfer, impending pregnancy costs or cryopreservation of embryos. Use of donor egg and gestational carrier is not covered, as the female member is not physically treated in this situation and is effectively a surrogate service. • Gender selection¹⁰ • Treatment to reverse voluntary sterilization^{8,11} • Infertility treatment needed as a result of prior voluntary sterilization or unsuccessful sterilization reversal procedure is not covered.¹²

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
	<p>Voluntary male sterilization (chemical or procedural) ends coverage for ICSI, IVF, and donor sperm based on male factor or unexplained infertility. After male sterilization reversal a semen analysis must be submitted from the beginning of the attempts to conceive and two within 6 months prior to the requested infertility procedure. The semen analyses must be performed within 6 months prior to the requested infertility procedure, since a vasectomy reversal may continue to fail at 6% per year. Semen analysis parameters below 20 million total motile sperm and Krueger strict morphology < 3%³⁷ indicate male factor caused by a previous sterilization that has not been corrected by a reversal. A single semen analysis that falls below the minimums above after prior ones meeting ends coverage of infertility.</p> <p>Voluntary female sterilization ends coverage for IVF based on tubal factor or unexplained infertility even if tubal disease or unexplained infertility was present prior to or developed after a female sterilization procedure. Successful female sterilization reversal must be documented by bilateral or unilateral tubal patency seen on a hysterosalpingogram following the female sterilization reversal surgery.¹³</p> <ul style="list-style-type: none"> • Coverage for women without documented infertility who do not have exposure to sperm.⁸ We require a minimum of 12 donor sperm intrauterine insemination (IUI)¹⁴ cycles for women younger than age 35 and 6 donor sperm intrauterine insemination cycles for women age 35 and older that do not result in live birth. Intrauterine insemination cycles for women who do not have exposure to sperm, are at the member's expense. Exposure to sperm in this instance requires that any prior partner has had a documented normal semen analysis. Intracervical inseminations do not count as the fecundity (pregnancy rate per month) is only 5%. • Donor sperm without documented male factor infertility proven with abnormal semen analysis.

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
	<ul style="list-style-type: none"> • Human zona binding assay (hemizona test)¹⁵ • Serum anti-sperm antibody testing¹⁶ • Sperm acrosome reaction test¹⁷ • Any services/procedures that are considered to be experimental or investigational • Co-culture of embryos • Embryo toxic factor test (ETFL)³ • Ovulation kits • Post-coital testing¹⁸ (effective 10/01) • In vitro maturation of oocytes⁷ • IVF and/or ICSI when performed solely to accomplish PGD and not for meeting the listed criteria for IVF or ICSI in this policy.

A CCCT is required yearly for women ≥ 40 years old by the time of treatment, except women with documented premature diminished ovarian reserve since this test is already abnormal. The CCCT involves measurements of basal serum FSH and estradiol before (labeled with cycle day) and after (cycle day 10 exactly) treatment with clomiphene citrate (100 mg daily, cycle days 5–9). The estradiol on Day 10 confirms the clomiphene was taken by rising over 100 pg/ml except for severe PCOS and hypothalamic amenorrhea. If 6 months have elapsed since the CCCT, a basal FSH and estradiol are required that were done within 6 months from the date of planned treatment, since these values may change rapidly after age 40. The test is prognostic for fresh cycles, but is also used as a biological marker for natural aging.

The normal upper limit for Day 3 or Day 10 FSH is 10 mIU/ml and the upper limit for Day 3 estradiol is 80 pg/ml.^{19,20} To allow for laboratory variation, a consensus of local experts agreed to a highest ever Day 3 or Day 10 FSH coverage limit of 15.0 mIU/ml for 40 and 41 year olds (due to higher chance of ongoing pregnancy) and a limit of 12.0 mIU/ml for women 42 and older while a Day 3 estradiol of 100 pg/ml was also agreed upon as indicating abnormal ovarian reserve for all ages.

When a Day 3 Estradiol (basal labs or CCCT) is found to be over 100 pg/ml and a medical reason is documented such as an ovarian cyst and all other FSH values are under 12.0 mIU/ml, a consensus of local experts concluded that the Day 3 Estradiol and FSH should be repeated prior to determining eligibility for IVF or future ART treatment. The elevated Estradiol suppresses the FSH. The repeat values must meet the criteria as stated above in order for coverage to be provided.

ASRM states a single elevated Day 3 FSH value connotes a poor prognosis, even when values in subsequent cycles are normal.^{19,20} Premature diminished ovarian reserve is therefore defined by a Day 3 FSH > 15.0 mIU/ml in a woman prior to age 40 or day 3 estradiol > 100 pg/ml. For women with a documented contraindication to clomiphene, we accept either 1) the EFORT test, with cutoff value of 78.6 for the difference in Inhibin B values between Day 4 from Day 3 after 300 IU of FSH are given in the PM of Day 3²¹ or 2) a combination of tests (basal FSH, Estradiol, and AFC done on the same day and an AMH done within 1 month of those labs) with cutoff of coverage if AMH ≤ 1.0 ng/ml or AFC < 6 or CD3 FSH > 12.0 mIU/ml or Estradiol > 100 pg/ml.²²

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
<ul style="list-style-type: none"> • We cover artificial or intrauterine insemination. Tubal patency must be checked prior to the inseminations. If the member has an ovulatory disorder, then there must be an additional condition to use IUIs with the medications.²⁴ <p>For conversion from IUI treatment to IVF for women proven infertile (not ovulatory dysfunction), we use the following guideline:</p> <ul style="list-style-type: none"> • 5 follicles greater than 13 mm in size, estrogen of 800 or higher and age <40 may convert from IUI to IVF for the present cycle.²⁷ <p>Patients who do not meet the above guidelines may be reviewed under individual consideration on a case-by-case basis.</p>	<ul style="list-style-type: none"> • Over 6 cycles of any given ART (IUIs or IVF). However, if a new cause of infertility is discovered and treated during covered therapy, then individual consideration may be given to members regarding additional cycles. • Direct intraperitoneal insemination (DIPI) • Peritoneal ovum and sperm transfer (POST) • Drugs for infertility are not covered without an authorization for infertility services. • IUIs treatments are no longer covered after a member has done and failed to deliver with IVF, as there is no study proving these IUI cycles to have a >5% live birth rate in women who have failed prior IVF treatment, except when switching to unmedicated IUIs with donor sperm due to male factor infertility in the member's present male partner. • Fresh IVF cycles when there are high quality cryopreserved embryos, as these should be transferred first.
<p>Assisted Reproductive Technologies, when performed by Reproductive Endocrinology specialists</p> <p>IVF, NORIF, CET/FET, IVC, for:</p> <ul style="list-style-type: none"> • Infertility due to immunological causes,¹⁶ • Bilateral absence of fallopian tubes, • Severe adhesive endometriosis, • Unexplained infertility of one year's duration, • Bilateral fallopian tube obstruction due to prior tubal disease, • Unilateral hydrosalpinx (Salpingectomy performed for hydrosalpinx communicating with the uterus prior to IVF improves subsequent pregnancy, implantation, and live birth rates)²⁸ • Assisted embryo hatching under the following circumstances: <ul style="list-style-type: none"> ○ Documented prior pregnancy following IVF with assisted hatching, or 3 or more failures to implant after embryo transfer (failure to detect rise in HCG).²⁹ 	<ul style="list-style-type: none"> • IVF done with preimplantation genetic screening (PGS), as no randomized controlled study done outside of a trial has proven the outcome per cycle started has equal or better live birth rate than IVF in the same group of women without PGS.³⁰ • Mock transfer

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
<ul style="list-style-type: none"> • A uterine cavity evaluation (saline sonohysterogram, HSG, or hysteroscopy) must be done within a year of the planned transfer to assess for conditions that might warrant treatment. • A SET during IVF treatment is required for all members < 35 years of age or undergoing donor egg IVF treatment during the first 2 IVF treatment cycles with more than one top-quality embryo available for transfer.^{31, 32} A treatment cycle for SET purposes includes the fresh cycle and the usage of all top-quality frozen embryos as SET FETs (STEET) before moving to another fresh IVF cycle. • Members 35 up to 38 years of age must do an SET for the first treatment cycle if there are more than one top-quality embryos available for transfer from a fresh cycle or 1 top-quality embryo after thawing. Members < 38 years of age that have had a prior successful IVF treatment cycle (had a live birth from that IVF treatment) must do a SET for one treatment cycle if there are more than one top-quality embryos available for transfer from a fresh cycle or 1 top-quality embryo after thawing.³¹ This 1 cycle does not count toward the 6 cycle maximum. • Members 38 years of age and older undergoing IVF treatment do not need to attempt a SET as their risk of multiple births is low. <p>ZIFT, GIFT, for:</p> <ul style="list-style-type: none"> • Unilateral absence or damage of the fallopian tube, • Infertility due to immunological causes, • Severe adhesive endometriosis, • Unexplained infertility of one year's duration. <ul style="list-style-type: none"> • Donor sperm is covered when the male partner's sperm meets the criteria below for IVF or IVF with ICSI. If there is no proven female factor requiring IVF, then unmedicated IUIs will be approved with the donor sperm until female factor/unexplained infertility is proven by sufficient failures to conceive. Male partner is defined as having at least one Y chromosome. 	<ul style="list-style-type: none"> • Assisted hatching if PGD is done, as PGD process includes opening the zona. • Donor sperm without documented male factor infertility proven with abnormal semen analysis. • Donor sperm from cryobanks are guaranteed to be normal, so IVF or ICSI based on poor quality of these specimens is not covered. • Emergency ICSI on an IVF cycle when low fertilization rate is discovered at the time of IVF. (Effective 11/1/05) • Sperm penetration assay to determine whether intracytoplasmic sperm injection should be offered for fertilization during an IVF treatment cycle³³ (Effective 9/1/2012) • ICSI for poor parameters of donor sperm

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
<p>ICSI and IVF for:³⁴</p> <ul style="list-style-type: none"> ICSI is covered for severe male factor of non-donor sperm when at least 2 unprocessed semen analyses show < 10 million total motile sperm or ≤ 2% strict Krueger normal forms or post processing semen analyses show ≤ 3 million total motile sperm. IVF is covered for moderate male factor of non-donor sperm when at least 2 unprocessed semen analyses show post processing semen analyses show >3 and ≤ 10 million total motile sperm.³⁵ The abnormalities must be the same in the two specimens. <p>Note: Two semen analysis requirement for the diagnosis of male factor. (Effective 4/2008)</p> <ul style="list-style-type: none"> ICSI is covered on the day of IVF egg retrieval if the post processing semen analysis of non-donor non-frozen sperm on that day meets the ICSI coverage criteria noted immediately above. Retrospective authorizations will be allowed. Reduced fertilization on a prior IVF cycle using donor or non-donor sperm if the rate of fertilization on the prior cycle is less than 40% fertilization with the standard insemination of mature oocytes in the prior IVF treatment cycle. It is expected that the fertilization rate will increase significantly. <p>(See non-covered section regarding emergency ICSI)</p>	<ul style="list-style-type: none"> IVF or ICSI based solely on an isolated sperm parameter of motility, volume, concentration and not for failing to meet the total motile counts listed.
<ul style="list-style-type: none"> Psychological assessment for the donor egg cycle. (This occurs when a member's relative or friend donates her eggs to the member.) This service is limited by the maximum amount allowed under the subscriber's certificate. Donor egg/donor embryo for medical illness which causes unnatural loss of oocyte quantity: <ul style="list-style-type: none"> Premature inadequate harvest, Absent ovaries prior to age 40, Premature diminished ovarian reserve and either menopause or 6 months infertility. <p>The donor must be less than 34 years of age.⁴⁴ Donors who do not meet these requirements must be prior approved by Clinical Exception.</p>	<ul style="list-style-type: none"> Donor eggs for women with genetic oocyte defects Donor sperm for men with genetic sperm defects Cryopreservation for donor eggs⁸ Genetic engineering Egg harvesting or other infertility treatment performed during an operation not related to an infertility diagnosis Donor egg for age-related decline in oocyte quantity or quality, even if the member also has a medical cause of infertility which is normally treated by IVF. Cryopreservation of oocytes is non-covered except as listed on the left as covered.

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
<p>voluntary chemical or procedural sterilization).</p> <ul style="list-style-type: none"> • MESA, only for congenital absence or congenital obstruction of the vas deferens, as diagnosed by the absence of fructose in semen, and confirmed by vasography.³⁸ Prior authorization required. • Microdissection-TESE, for nonobstructive azoospermia, when the man's BMI < 43 kg/m²^{39, 40} Prior authorization required. • Cryopreservation of testicular tissue/sperm in adult men with azoospermia in conjunction with the testicular biopsy to identify sperm in preparation for an intracytoplasmic sperm injection procedure, if sperm are found.⁴¹ (Effective 11/2009) 	<ul style="list-style-type: none"> • MESA (except for congenital absence or congenital obstruction of the vas deferens) • TESA • Sperm storage/banking for males requesting this service for convenience or "back-up" for a fresh specimen.
<ul style="list-style-type: none"> • Infertility treatment medications, for members with pharmacy benefits, according to each member's pharmacy benefit plan. No fertility medications will be dispensed without a valid authorization or verification that no authorization is required. 	<p>Infertility treatment medications are not reimbursed in the following circumstances:</p> <ul style="list-style-type: none"> • Members who do not meet our guidelines for infertility treatment coverage, and • Infertility medications for anonymous donors.

Smoking/Nicotine Products

ASRM states:

Available biologic, experimental, and epidemiological data indicate that up to 13% of infertility may be attributable to cigarette smoking. Smoking appears to accelerate the loss of reproductive function and may advance the time of menopause by 1 to 4 years. There is good evidence that semen parameters and results of sperm function tests are 22% poorer in smokers than in nonsmokers and the effects are dose-dependent, but smoking has not yet been conclusively shown to reduce male fertility. There is evidence that smoking is associated with increased risks of spontaneous abortion and ectopic pregnancy. Gamete mutagenesis is one possible mechanism whereby smoking may adversely affect fecundity and reproductive performance. There is good evidence that smokers require nearly twice the number of IVF attempts to conceive as nonsmokers. The adverse effects of sidestream and passive smoking are now established, and there is good evidence that nonsmokers with excessive exposure to tobacco smoke may have reproductive consequences as great as those observed in smokers. Clinicians can facilitate smoking cessation by providing education, monitoring, and consistent individualized support.⁴²

Therefore, members and their partners who use nicotine products must stop exposure to these for at least 2 months prior to infertility treatment.

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
<ul style="list-style-type: none"> • Smoking cessation medications under pharmacy benefits • Urine or serum cotinine levels, obtained within the month of the requested service, for all members and their partners who acknowledged smoking within the past year. 	<p>All infertility services if continine is found in the member or the member's partner</p>

Obesity

Obesity leads to an increase in spontaneous abortion after assisted reproductive treatment.⁴³ It is 18% for normal weight and 31% for Body Mass Index (BMI) ≥ 35. There is also increased surgical risk in oocyte retrieval. Obesity may be a sign of Polycystic Ovarian Syndrome (PCOS) which may require

different treatment. It has been demonstrated that weight loss can improve the fertility of obese women through the recovery of spontaneous ovulation and others will improve their response to ovarian stimulation. Live birth rate was 9% lower for women with BMI > 30 undergoing IVF. Therefore, women with BMI greater than 30 should be strongly encouraged to lose weight.

COVERED SERVICES (MEDICALLY NECESSARY) (Continued)	NON-COVERED SERVICES (INVESTIGATIONAL) (Continued)
Nutritional counseling, fitness benefits, discounts for Weight Watchers, see policy #379 Medical and Surgical Management of Obesity.	

Prior Authorization Information

Pre-service approval is required for all inpatient services for all products.

See below for situations where prior authorization may be required or may not be required.

Yes indicates that prior authorization is required.

No indicates that prior authorization is not required.

Outpatient

Commercial Managed Care (HMO and POS)	<p>Diagnostic Testing No - for diagnostic testing related to Assisted Reproductive Technology or Infertility services except for Preimplantation Genetic Testing (PGT); see Medical Policy #088 for the specific PGT requirements.</p> <p>Infertility Treatment Yes - for all treatments related to Assisted Reproductive Technology and Infertility services.</p>
Commercial PPO and Indemnity	<p>Diagnostic Testing No - for diagnostic testing related to Assisted Reproductive Technology or Infertility services except for Preimplantation Genetic Testing (PGT); see Medical Policy #088 for the specific PGT requirements.</p> <p>Infertility Treatment Yes - for all treatments related to Assisted Reproductive Technology and Infertility services.</p>
Medicare HMO BlueSM	The service must meet the criteria for coverage noted in this policy, be medically necessary, prescribed by a plan physician and provided by a network provider.
Medicare PPO BlueSM	No

CPT Codes / HCPCS Codes / ICD-9 Codes

The following codes are included below for informational purposes. Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

CPT Codes - Coding Information for Professional Providers

CPT codes:	Code Description
54900	Epididymovasostomy, anastomosis of epididymis to vas deferens; unilateral
54901	Epididymovasostomy, anastomosis of epididymis to vas deferens; bilateral
58321	Artificial insemination; intra-cervical
58322	Artificial insemination; intra-uterine
58323	Sperm washing for artificial insemination

58340	Catheterization and introduction of saline or contrast material for saline infusion sonohysterography (SIS) or hysterosalpingography
74740	Hysterosalpingography, radiological supervision and interpretation
S4026	Procurement of donor sperm from sperm bank Type of service 5, and 1 unit of service, for procurement of donor sperm from a sperm bank, for each vial procured (1 unit = 1vial)

Note: We will reimburse you up to **2** vials per cycle. S4026 should only be billed by specialists who are not contracted globally to provide artificial inseminations or intrauterine inseminations. Documentation and/or actual invoice must be kept in the patient's record. We do **not** cover the cost of shipping and handling; this is a member liability.

CPT/HCPCS codes:	Code Description
0059T	Cryopreservation; oocyte(s)
55870	Electroejaculation
S4028	Microsurgical epididymal sperm aspiration (MESA) Type of service 2 Note: MESA is payable only for congenital absence or congenital obstruction of the vas deferens.
58974	Embryo transfer, intrauterine
58976	Gamete, zygote, or embryo intrafallopian transfer, any method
59866	Multifetal pregnancy reduction
58825	Transposition, ovary(s)
89255	Preparation of embryo for transfer (any method)
89257	Sperm identification from aspiration (other than seminal fluid)
89258	Cryopreservation; embryo(s)
89259	Cryopreservation; sperm
89260	Sperm isolation; simple prep (eg, per col gradient, albumin gradient) for insemination or diagnosis with semen analysis
89261	Sperm isolation; complex prep (eg, per col gradient, albumin gradient) for insemination or diagnosis with semen analysis
89264	Sperm identification from testis tissue, fresh or cryopreserved
89268	Insemination of oocytes
89272	Extended culture of oocyte(s)/embryo(s), 4-7 days
89280	Assisted oocyte fertilization, microtechnique; less than or equal to 10 oocyte
89281	Assisted oocyte fertilization, microtechnique; greater than 10 oocytes
89321	Semen analysis, presence and/or motility of sperm
89335	Cryopreservation, reproductive tissue, testicular (Covered effective 11/1/2009)
89342	Storage, (per year); embryo(s)
89343	Storage, (per year); sperm/semen
89346	Storage, (per year); oocyte
89352	Thawing for cryopreserved; embryo(s)
89353	Thawing of cryopreserved; sperm/semen, each aliquot
89356	Thawing of cryopreserved; oocyte(s), each aliquot

The following codes are considered **non-covered for all Plans** as they do not meet our Medical Technology Assessment Guidelines and if billed will reject leaving *no* patient balance:

CPT codes:	Code Description
89331	Sperm evaluation, for retrograde ejaculation, urine (sperm concentration, motility, and morphology, as indicated)
89344	Storage, (per year); reproductive tissue, testicular/ovarian

89354	Thawing of cryopreserved; reproductive tissue, testicular/ovarian
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Coding Information for Reproductive Specialist Providers

CPT/HCPCS codes:	Code Description
58970	Follicle puncture for oocyte retrieval, any method
S4011	In vitro fertilization, including but not limited to identification and incubation of mature oocytes, fertilization with sperm, incubation of embryo(s), and subsequent visualization, determination of development Type of service 2
89250	Culture of oocyte(s)/embryo(s), less than 4 days; Note: This procedure may be billed once per cycle.
89253	Assisted embryo hatching, microtechniques (any method)
89254	Oocyte identification from follicular fluid Note: This procedure may be billed once per cycle.

Documentation must be in the medical record substantiating the possibility that another procedure may leave the member infertile. Benefits are available when freezing and/or storage are performed in a laboratory, which meets the standards of the American Association of Tissue Banks.

Coding Information for Contracted Sperm Banks

CPT/HCPCS codes:	Code Description
S4030	Sperm procurement & cryopreservation services; initial visit Type of service L Note: This procedure is limited to one visit per lifetime.
S4031	Sperm procurement & cryopreservation services; subsequent visits Type of service L
89259	Annual sperm storage due to other medical treatment rendering a member infertile Type of service L Note: This procedure may be billed once per year . The procedure may be covered for members in active infertility treatment, post microsurgical epididymal sperm aspiration (MESA), performed for congenital absence of the vas deferens.

Coding Information for Contracted ART Providers

HCPCS codes:	Code Description
HCPCS /Crosswalk Code - Complete cycle transfer	
S4013	Complete cycle, gamete intrafallopian transfer (GIFT), case rate
S4014	Complete cycle, zygote intrafallopian transfer (ZIFT), case rate
S4015	Complete in vitro fertilization cycle, not otherwise specified, case rate

Note: A complete IVF, GIFT, or ZIFT cycle that includes a complete donor egg cycle shall be billed using HCPCS code S4011.

Global fee for the above HCPCS codes, S4013-S4015, (stage 4), includes:

- **Office consultations:** May include, evaluations, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring.
- **Laboratory services:** Such as semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, drawing blood/venipuncture, endometrial biopsy, cultures, and lab tests for hormonal evaluation, and all post-transfer lab tests.

- **Imaging services:** Ultrasounds and hysterosalpingography, including ultrasound guided aspiration or laparoscopy procedures, and all post-transfer ultrasounds.
- **Facility services:** Includes all ambulatory surgery, operating room and recovery room charges and supplies.
- **Anesthesia services:** Includes professional fee for anesthesiologist and all anesthesia supplies or drugs.
- **Embryology/urology services:** Donor semen, sperm procurement/preparation for insemination, egg retrieval, assessment and preparation, catheter check and lab monitoring charges.
- **ART services**, includes transfer of:
 - Embryos to uterus for IVF
 - Gametes to fallopian tubes for GIFT
 - Zygotes to fallopian tubes for ZIFT.

Global fee excludes:

- **All drugs:** Including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit).
- **Gynecological services (surgeries)**
- **Cryopreservation and storage of embryos and sperm**
- **Assisted oocyte fertilization (AOF) (formerly known as Intracytoplasmic sperm injection or (ICSI)**
- **Early pregnancy monitoring.**

HCPSC code S4017 for Treatment Canceled Prior to Stimulation, Incomplete Cycle; Stage 1

HCPSC /Crosswalk Code - Treatment cancelled, pre-stimulation, incomplete cycle	
S4017	Incomplete cycle, treatment cancelled prior to stimulation, case rate

Global fee includes:

- **Office consultations:** May include consults, evaluation, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring
- **Laboratory services:** includes semen analysis and sperm antibody tests

Global fee excludes:

- **All drugs:** Including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**

There is no restriction on the number of times that this service may be billed.

HCPSC code S4020 for IVF, GIFT or ZIFT Canceled Prior to Egg Retrieval; Stage 2

HCPSC /Crosswalk Code - Procedure cancelled prior to egg retrieval	
S4020*	In vitro fertilization procedure cancelled before aspiration, case rate

***Note:** Use S4020 to bill cancelled SIUI services after stimulation

Global fee includes:

- **Office consultations:** May include consults, evaluations, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring.
- **Laboratory services:** Such as semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, drawing blood/venipuncture, endometrial biopsy, cultures, and lab tests for hormonal evaluation.
- **Imaging services:** Ultrasounds and hysterosalpingography

Global fee excludes:

- **All drugs:** including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit)
- **Gynecological services (surgeries)**

HCPCS code S4021 for IVF, GIFT or ZIFT Canceled Prior to Embryo Transfer; Stage 3

HCPCS /Crosswalk Code - Procedure cancelled prior to embryo transfer	
S4021	In vitro fertilization procedure cancelled after aspiration, case rate

Global fee includes:

- **Office consultations:** Including any office visit, which may include evaluation, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions, or monitoring.
- **Laboratory services:** Includes all laboratory tests, pre- and post-retrieval, semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, blood drawing/venipuncture, endometrial biopsy, cultures, and all lab tests for hormonal evaluation.
- **Imaging services:** Ultrasounds and hysterosalpingography, including the ultrasound guided aspiration or laparoscopy procedures.
- **Facility services:** Includes all ambulatory surgery, operating room and recovery room charges and supplies.
- **Anesthesia services:** Includes the professional fee for the anesthesiologist and all anesthesia supplies or drugs.
- **Embryology/ and urology services:** Donor semen, sperm procurement/preparation for insemination, egg retrieval, assessment and preparation, catheter check and lab monitoring charges.

Global fee excludes:

- **All drugs:** Including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**

HCPCS code S4011 for Donor Egg Cycle, Complete

HCPCS /Crosswalk Code - Donor egg cycle, complete	
S4011*	In vitro fertilization; including, but not limited to, identification and incubation of mature oocytes, fertilization of sperm, incubation of embryo(s), and subsequent visualization for determination of development

* **Note:** The global case rate for S4011 includes payment for a complete donor egg cycle and a complete IVF cycle (S4015) or GIFT cycle (S4013) or ZIFT cycle (S4014)

Global fee includes:

- **Egg donor:** Services for egg donors include all services in stages 1, 2 and 3 of an IVF/GIFT/ZIFT cycle, such as pre-stimulation, endocrine monitoring and egg retrieval.
- **Egg recipient:** Services for egg recipient include all services in stages 1, 2 and 4 of an IVF/GIFT/ZIFT cycle, such as pre-stimulation and endocrine monitoring, the transfer of gamete(s) or embryo(s) and follow up visits.

Global fee excludes:

- **All drugs:** Including but not limited to injectable and oral drugs for the Egg donor and recipient. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**
- **Any costs attributed as "enrollment fees."**

Note: Completed donor egg cycles are billed under the recipient/member's name and identification number. This service should be billed with a completed IVF, GIFT or ZIFT cycle.

HCPCS code S4037 for Cryopreserved Embryo Transfer (CET), Complete Cycle

HCPCS /Crosswalk Code - Frozen Embryo Transfer (CET), complete cycle	
S4037	Cryopreserved embryo transfer, case rate

Global fee includes:

- **Office consultations:** May include, evaluations, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring.
- **Laboratory services:** Such as semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, drawing blood/venipuncture, endometrial biopsy, cultures, and lab tests for hormonal evaluation, and all post-transfer lab tests.
- **Imaging services:** All ultrasounds, including post-transfer ultrasounds
- **Facility services:** Includes all ambulatory surgery, operating room and recovery room charges and supplies.
- **Anesthesia services:** Includes the professional fee for the anesthesiologist and all anesthesia supplies and drugs.
- **Embryology/and urology services:** Embryo thaw, assessment and preparation, catheter check and lab monitoring charges
- **ART services:** Includes transfer of embryos to uterus or fallopian tubes
- There is no restriction on the number of times that this service may be billed.

Global fee excludes:

- **All drugs:** including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit).
- **Early pregnancy monitoring.**

HCPCS code S4035 for Stimulated (by injectable gonadotropins) Intrauterine Insemination (IUI), Complete Cycle

HCPCS /Crosswalk Code - SIUI by injectable gonatotropins, complete cycle	
S4035	Stimulated intrauterine insemination (SIUI) (formerly known as IUI), case rate

Global fee includes:

- **Office consultations:** May include, evaluations, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring.
- **Laboratory services:** Such as semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, drawing blood/venipuncture, endometrial biopsy, cultures, and lab tests for hormonal evaluation, and all post-insemination lab tests.
- **Imaging services:** All ultrasounds, including post-insemination ultrasounds.
- **Facility services:** Includes all facility charges
- **Andrology services:** Includes the cost of two vials of purchased donor sperm and sperm procurement / preparation for insemination
- **ART services:** Includes mechanical injection of semen into the uterus.

Global excludes:

- **All drugs:** Including but not limited to injectable drugs. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**
- **Early pregnancy monitoring.**

Note: All stimulated (non-injectable) IUIs should be billed using CPT code 58322, under the individual

physician's provider number.

HCPCS code S4036 for Intravaginal Culture (IVC)

HCPCS /Crosswalk Code - Intravaginal culture, complete cycle	
S4036*	Intravaginal culture (IVC), case rate

***Note:** There is no restriction on the number of times that this service may be billed. This procedure is covered only if done at a participating ART center.

Global fee includes:

- **Office consultations:** May include evaluations, comprehensive physical, partner consults, nursing services, psychological and social worker services, patient education, medication instructions or monitoring
- **Laboratory services:** Such as semen analysis, estradiol, assay progesterone, gonadotropin LH (luteinizing hormone levels), gonadotropin FSH (follicle stimulating hormone levels), chorionic gonadotropin (Beta hCG), prolactin, blood serology, drawing blood/venipuncture, endometrial biopsy, cultures, and lab tests for hormonal evaluation, and all post-insemination lab tests
- **Imaging services:** All ultrasounds, including post-insemination ultrasounds
- **Facility services:** Includes all facility charges
- **Anesthesia services:** Includes the professional fee for the anesthesiologist and all anesthesia supplies and drugs
- **Embryology/andrology services:** Donor semen, sperm procurement/preparation for insemination, egg retrieval and assessment and preparation, catheter check and culture kits
- **ART services:** Includes transfer of embryos.

Global fee excludes:

- **All drugs**, including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**
- **Early pregnancy monitoring.**

HCPCS code S4023 for Donor Egg Canceled Prior to Embryo Transfer; Incomplete

HCPCS /Crosswalk Code - Donor egg cancelled prior to embryo transfer, incomplete	
S4023	Donor egg cycle, incomplete, case rate

Global fee includes:

- **Egg donor:** Services for egg donors include all services in stages 1, 2 and 3 of an IVF/GIFT/ZIFT cycle, such as pre-stimulation, endocrine monitoring and egg retrieval.
- **Egg recipient:** Services for egg recipient include all services in stages 2 and 3 of an IVF/GIFT/ZIFT cycle, such as pre-stimulation and endocrine monitoring, up to the transfer of gamete(s) or embryo(s)

Global fee excludes:

- **All drugs:** Including but not limited to injectable and oral drugs. (These should be submitted under the member's pharmacy benefit.)
- **Gynecological services (surgeries)**
- **Any costs attributed as "enrollment fees."**

Note: Incomplete donor egg cycles are billed under the recipient/Member's name and identification number.

Supplemental Services are not included in the global reimbursement and may be billed in addition to the global codes:

- **Frozen embryo Transfer-Canceled before transfer (formerly known as CET):** Cryopreserved embryos are thawed but not viable for cryopreserved embryo transfer cycle. HCPCS code S4018
- **Donor egg injectable drugs:** The pharmacy bill for the donor's drug expenses should be attached

to the Member's claim (refer to medical policy for exclusions).

For non-contracted ART providers:

- CPT code 89252 assisted oocyte fertilization, microtechnique (any method)
- CPT code 89258 for cryopreservation; embryo

Designated Retail Specialty Pharmacy Network

Effective October 1, 2006, Blue Cross Blue Shield of Massachusetts (BCBSMA) members are required to fill their prescriptions for medications commonly prescribed for use in fertility at one of the four designated retail specialty pharmacies, as listed below:

Plans currently excluded from this requirement are: Medex®; Blue MedicareRx, Blue Health Plan for Kids; Medicare Advantage plans that include prescription drug coverage; and closed non-group plans.

Freedom Fertility Pharmacy 12 Kent Way Byfield, MA 01922 www.freedomfertilitypharmacy.com	BriovaRx (800) 258-0106 www.briovarx.com	Metro Drugs (888) 258-0106 www.metrodrug.com	Village Fertility Pharmacy (877) 334-1610 www.villagefertilitypharmacy.com	Walgreens Fertility Pharmacy (800) 424-9002 Walgreens.com/specialty
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Other Information

For all contracted providers, the following services are considered incidental to the delivery of medical care, and coverage is included in current allowances. Members may not be billed separately for:

- Program orientation
- Financial counseling
- Insurance counseling
- Social worker counseling
- Instructional videotapes
- Medication instruction
- Endocrine monitoring
- Nursing services
- Telephone consultation
- Uterus sounding
- Cycle management or
- Donor time or travel expense.

Note: A member liability may be incurred if services are rendered by a non-contracted Provider.

- We do not provide separate reimbursement for embryo preparation/catheter loading, because the allowance for this is included in the global allowance.
- Services related to Donor Egg: submit covered services relating to the donor egg services on behalf of the recipient of the donor egg, rather than on behalf of the donor. No costs or charges shall be attributed to Blue Cross and Blue Shield for any costs of recruitment of or reimbursement to egg donors, or any costs attributed as "Enrollment Fees" in the Donor Egg Program.
- Benefits are not available for fees to a donor for donation of sperm to a sperm bank.
- Cryopreservation should be billed by the provider to Blue Cross and Blue Shield of Massachusetts at the time of freezing, but only for embryos, which are to be used within the next twenty-four months.
- Do not bill members for a deposit or an annual storage fee unless they wish to obtain extra sperm for future use. We will reimburse extra procurements when they are used.

The CPT code listed below will reject according to Medical Technology Assessment Guidelines, leaving no patient balance:

- 89251 culture and fertilization of oocyte(s); with co-culture of embryos

Description

Infertility is defined as failure to conceive a pregnancy after 12 menstrual cycles, during which time ovulation is expected, and semen presumed to contain sperm has been present inside a woman's uterus, in someone who is not undergoing menopause or perimenopause. While infertility may be caused by disease, menopause and perimenopause are natural conditions. There are many known causes of infertility, and in some cases, no specific cause is found. According to a state mandate, health plans should provide coverage for infertility diagnosis and treatment, including artificial insemination and in vitro fertilization when needed due to a medical condition.

Anembryonic Pregnancy (aka blighted ovum): Is a pregnancy where a visible fetal pole never develops within a normal-appearing intrauterine gestational sac (this finding would be seen on an ultrasound exam.) This results in a pregnancy loss.

AFC (Antral Follicle Count): A count of the number of follicles in the ovaries between 2-10 mm by ultrasound exam.

AMH (Anti-mullerian Hormone): A hormone that is measured and compared with how many antral follicles are in a woman's ovaries by an ultrasound exam (AFC) to estimate how many eggs are likely to be retrieved during an IVF treatment cycle.

ART (Assisted Reproductive Technologies): Infertility treatments involving embryology services related to laboratory handling of human eggs and/or embryos and the processing of sperm/semen. Specific infertility treatments include in vitro fertilization (IVF); gamete intrafallopian transfer (GIFT); zygote intrafallopian transfer (ZIFT); frozen embryo transfer (FET); assisted oocyte fertilization (AOF), formerly known as ICSI; and donor egg services in either a certified hospital or IVF center setting.

Artificial Insemination (AI): Placement of semen into the vagina with a syringe, rather than through intercourse

Biochemical Pregnancy: Is a very early pregnancy loss, where there is a positive pregnancy test (BhCG above the lab reported limit of negative). The BhCG level should remain < 1500 mIU/ml; a level below which a pregnancy can be recognized on ultrasound exam. The elevated BhCG level is the only evidence that an implantation/a pregnancy existed.

Blastocyst Transfer: The typical stage of an embryo 5-6 days after an egg retrieval. It is done to reduce ART associated multiple pregnancies

Cryopreserved Embryo Transfer (CET)/ Frozen Embryo Transfer (FET): Extra embryos created but not used during a fresh IVF treatment that were of good enough quality to be frozen. When later thawed, and if survive, are transferred to the uterus.

Conceive/Conception:

- A positive pregnancy test/BhCG, defined by testing lab; or
- A positive pregnancy test/BhCG defined by testing lab with at least one rise of BhCG, if hCG has been administered during that menstrual cycle.

Congenital: Present at birth

Cryopreservation: Special freezing process

DIPI (Direct Intra-Peritoneal Insemination): Process attempting fertilization inside the body by placing a needle into the abdomen

Donor Egg (DE): An egg donated from a woman other than the member

Electroejaculation: In men who are unable to ejaculate, this procedure sends electricity through the pelvic area to attempt ejaculation

Embryo: An egg fertilized with sperm

Endometrial Biopsy: A sample is taken of the uterus lining

ETF-L (embryo toxic factor) Test: This test is done in women who have had frequent miscarriages

Fallopian Tubes: Natural tubes connecting the uterus to the area around the ovaries. Eggs and then embryos travel through these tubes to reach the uterus

Female/Women: A person without any Y chromosome

Fertilization: Egg penetrated by sperm to form an embryo

Frozen Embryo Transfer (FET)/ Cryopreserved Embryo Transfer: Extra embryos created but not used during a fresh IVF treatment that were of good enough quality to be frozen. When later thawed, and if survive, are transferred to the uterus.

Gamete: A mature male or female reproductive cell (sperm or ovum)

Gestational Carrier: An embryo is placed in the womb of a woman other than the member, and the “gestational carrier” carries the baby. In the case of a gestational carrier, the embryo comes from the female member’s egg, so the baby is biologically-related to the member

Genetic Engineering: Manufacture, alteration or repair of genetic material by synthetic means

GIFT: Gamete intrafallopian transfer: a form of IVF: eggs are harvested from the ovary, loaded into a tube with sperm, and immediately placed into the fallopian tube with a special scope, for fertilization inside the body

Hysterosalpingography: X-ray test where dye is injected into the uterus and fallopian tubes, to see their structure

ICSI: Intra-Cytoplasmic Sperm Injection: In a dish in the lab, sperm is injected into the egg to fertilize it, rather than letting sperm penetrate the egg naturally. Embryos are then transferred to the uterus as in usual IVF.

IUI: Intrauterine insemination

In Vitro Fertilization (IVF): The egg is fertilized with sperm in a dish in a laboratory, rather than inside a woman’s body. The resulting embryo is placed into the uterus later. One “cycle” of IVF includes using medicines to stimulate the ovaries to ovulate, and “harvesting” the eggs with an instrument.

Inadequate Harvest: Not enough or a very low number of eggs were obtained from the ovaries

Intrauterine: Inside the uterus

Intravaginal Culture: In this form of fertilization, egg and sperm are mixed together in the laboratory, and placed inside a sealed tube. This tube then “incubates” inside the woman’s vagina. After a few days, it is removed, and any embryos are then placed inside the uterus (or frozen for later use).

Laparoscopy: A small cut is made in the skin, and a scope with a light on the end is placed inside the abdomen

Male/Men: A person with at least one Y chromosome

Menopausal: Natural hormonal change, leading to no further menstrual periods

MESA: Microsurgical Epididymal Sperm Aspiration: in men who were born without a vas deferens, there is no way for sperm to reach the penis. This procedure places a needle into the testicle area to aspirate out sperm for fertilization.

NORIVF/ Natural Oocyte Retrieval: Harvesting eggs from the ovary, when the egg has ovulated naturally (no because of hormone drugs)

Nuclear Transplantation: Is taking genes from body cells and putting them in a donor egg. Cloning is one example that may involve nuclear transfer

Obstruction: Blockage

Oocyte: Egg

Ovarian Transposition: When a young woman is receiving radiation treatments to the pelvic area, because of a tumor in the area, it is possible that the radiation will cause damage to the ovaries. This damage may result in fertility problems later. This surgical procedure moves the ovaries out of the way of the path of radiation treatments.

Ovulation: The monthly process of eggs being released from the ovaries

Patency: Clear opening

Perimenopausal: Around the time of menopause

POST: Peritoneal Ovum and Sperm Transfer: similar to GIFT, but the sperm and egg mixture is injected into the body rather than specifically placed in the fallopian tube with a scope

Premature Ovarian Failure: Disease in which menopause occurs prior to age 40

Preimplantation Genetic Diagnosis (PGD): The genetic material (DNA) of the mother or of the embryo is sampled and analyzed. This information could be used to choose some embryos and not others, before putting the embryo into the uterus.

Procurement: (Harvesting) obtaining

Secondary Infertility: Individuals unable to conceive again after having produced a viable birth by either natural or artificial means.

Selective Fetal Reduction: When pregnancies with multiple babies (such as sextuplets) occur because of fertility drugs, in some cases the mother or the babies are at risk for harm if all babies are carried until delivery. In such cases, sometimes a recommendation is made to inject one of more of the babies with a fatal dose of a chemical, to “reduce” the number of babies. This is a form of abortion.

Semen Analysis: Test on semen to calculate the number of moving sperm per ejaculate and how normal the shape of the sperm is

SET: (Single embryo transfer) the transfer of a single embryo at either the cleavage stage (day 2 or 3 after an egg retrieval) or blastocyst stage (day 5 or 6 after an egg retrieval), that is selected from a larger number of available embryos. This is the best way to reduce the health risks of multiple gestations.

Sex Selection: Determining the sex of an embryo, and selecting an embryo that is either male or female

Sperm Penetration Assay: Lab test designed to check the ability of sperm to enter eggs. Other terms for this test are the heterologous ovum penetration test, and hamster ovum test. A hamster egg (ovum) is used as the target, and sperm are placed in a dish with these eggs for several hours. The number of eggs with sperm penetration is counted, and the semen sample is rated as “fertile” or “non-fertile.”

STEET: A single thawed euploid embryo transfer

Surrogate: An embryo is placed in the womb of a woman other than the member, and the “surrogate” (not the member) carries the baby. In the case of a surrogate, the embryo does not come from the female member’s egg, so the baby is not biologically-related to the member. A gestational surrogate is a variation where the egg is donated from one woman other than the member and the embryo is placed into a different woman that is not the member or the egg donor. A usual surrogate is the egg donor and the carries the pregnancy.

TDI: Therapeutic donor insemination. Using donor sperm when there is no male partner or due to severe male factor in the male partner.

Vas Deferens: Natural tube connecting the testicles to the penis. Sperm travels along this path during ejaculation

Voluntary Sterilization: Choosing to undergo a process that makes a person unable to reproduce. This may include chemical suppression or procedural methods. Examples include tubal ligation, Essure device, a hysterectomy (with or without the removal of the ovaries), taking birth control pills or testosterone in women or vasectomy or taking estrogen in men.

ZIFT: Zygote Intra-Fallopian Transfer: a form of IVF: eggs are harvested, and fertilized in a dish in the laboratory. About a day later, the fertilized egg is placed inside the fallopian tube.

Zygote: A fertilized egg that has not yet divided.

Policy History

Date	Action
10/2014	New medically necessary and investigational indications described; policy statements clarified and new ART Criteria form to submit requests. Coding information clarified. Effective 10/1/2014.
7/2014	Updated to include CPT codes 54900 and 54901.
6/2014	Updated to include Walgreens Fertility Pharmacy - designated retail specialty pharmacy network.
11/2013	Updated to remove supplemental services Y-codes.
10/2013	Updated to clarify that supplemental services are no longer separately reimbursed; reimbursement for supplemental services is included in the global rate.
9/2012	Updated to remove coverage for SPA (sperm penetration assay) based on expert opinion. Effective 9/1/2012.
7/2012	Updated to clarify the Infertility Specialty Pharmacy provider network.
4/2012	Updated to clarify coverage of donor and non-donor sperm for in vitro fertilization.
1/2012	Updated to clarify ongoing non-coverage of CPT 89331 sperm evaluation, for retrograde ejaculation, urine (sperm concentration, motility, and morphology, as indicated); the same information is on document 400.
1/2012	Updated to clarify ongoing non-coverage of cryopreservation; reproductive tissue, ovarian and to add reference to Ascend FertilityRx as a designated retail specialty pharmacy network.
1/2012	Updated to remove the reference to IVPCare, Inc. as a designated retail specialty pharmacy network.
9/2011	Reviewed - Medical Policy Group - Urology, Obstetrics and Gynecology, no changes in coverage.

12/2010	Updated to add infertility treatment for a member with recurrent pregnancy loss in accordance with Massachusetts law (M.G.L.c. 175, section 47H and 211 C.M.R 37.09). Effective December 15, 2010.
1/21/2010	Updated to revise language from Blue Cross Blue Shield HMO Blue to Blue Cross Blue Shield of Massachusetts in third paragraph on page 1.
10/2009	Reviewed - Medical Policy Group - Obstetrics and Gynecology, no changes in coverage.
10/2009	Updated to clarify the required period for updated lab results when six months has elapsed since the CCCT; a basal FSH and estradiol are required that were done within 6 months from the date of a planned treatment. Prior Authorization section clarified.
7/2009	Updated following review of the BCBSA National medical policy on Reproductive Techniques. Coverage change to include cryopreservation of testicular tissue in adult men with azoospermia in conjunction with the testicular biopsy to identify sperm in preparation for an intracytoplasmic sperm injection procedure. Effective 11/1/2009.
10/2009	Revised to include benefit coverage information in the header section of the document that addresses infertility services when a healthy female member is age 35 or older and has not been able to conceive after a period of six months of actively trying. Clarified coverage language for: sperm storage and banking, non-coverage language for more than one cycle of IVF for a member undergoing treatment, oocyte tissue preservation and cryopreservation of oocytes, and one cycle of IVF for a member who will undergo treatment that is expected to render them infertile.
9/2009	Updated to clarify footnote E, covered language pertaining to: embryo freezing, and sperm storage, and non-covered language that pertains to: donation, storage and banking of donor sperm, cryopreservation of embryo, and tissue preservation and cryopreservation of oocytes.
7/2009	Updated to clarify coverage statement for ICSI and IVF, third bullet; reduced fertilization on a prior IVF.
3/2009	BCBSA National medical policy coding information updated on Assisted Reproductive Technologies, no coverage changes noted.
2/2008	Policy edited with the removal of coverage references for preimplantation genetic diagnosis which is now addressed in a new medical policy document, #088 Preimplantation Genetic Diagnosis (PGD).
1/2009	Updated to remove information regarding requirement of 3 FSH IUI prior to receiving IVF treatment for those that meet the definition of unexplained infertility.
10/2008	Reviewed - Medical Policy Group - Obstetrics/Gynecology, no changes in coverage.
5/2008	Review of BCBSA National policy on Laboratory Tests of Sperm Maturity, Function, and DNA Integrity. BCBSMA to cover sperm penetration assay to determine whether intracytoplasmic sperm injection should be offered as part of IVF technique. Effective 11/2008.
3/2008	Updated to include coverage language for infertility services and ART for members not previously defined as infertile, and the required number of 2 semen analysis for the diagnosis of male factor.
12/2007	Policy edited to provide clarification, i.e. non-coverage language - IVF pertaining to prior voluntary sterilization.
10/2007	Reviewed - Medical Policy Group Obstetrics and Gynecology, no changes in coverage.
10/2006	Reviewed - Medical Policy Group Obstetrics and Gynecology, no changes in coverage.
4/2006	Updated to clarify the Day 3 FSH lab result in a woman prior to the age of 40 to be 15.0 mIU/ml.
2/2006	Updated the Preferred Pharmacy Vendors list for Fertility Medications.
12/2005	Updated to clarify policy guidelines based upon discussions with IVF Centers.
10/2005	Reviewed - Medical Policy Group Obstetrics and Gynecology no changes in coverage.
5/2005	Updated to clarify our exclusion guidelines for gestational carriers or surrogacy, effective immediately; to exclude coverage for sperm acrosome reaction test, effective immediately; to clarify coverage guidelines for ICSI, effective immediately; and to exclude coverage for emergency ICSI on an IVF cycle when low fertilization rate is

	discovered at the time of IVF. Effective 11/1/05.
3/2005	Updated to clarify the policy guidelines.
1/2005	Updated to remove antiphospholipid antibody testing under the "when services are not covered" section of the policy.
10/2004	Reviewed - Medical Policy Group Obstetrics and Gynecology no changes in coverage.
10/2003	Updated to include guidelines on conversion from IUI to IVF. The following clarifications were made: thaw cycles do not count toward the 6 medicated cycles; no testing frequency is required for semen analysis; hysterosalpingogram is not required in patients who presents with male factor infertility; defined perimenopausal; defined what is "naturally expected to be fertile."
4/2003	Updated to expand coverage for ICSI to include reduced fertilization (effective 4/03); to clarify that Day 2, 3, or 4 FSH is acceptable; to clarify that we require a minimum of 12 intrauterine inseminations supervised by a physician that does not result in conception, as evidence of infertility (effective 8/03); and to clarify when fertility is naturally expected: for women under 40, this is premature, for women 42 and older, this is within the expected normal range, and for women 40 up to 42, the expected range is extended to 15 pg/ml. Also, to include individual consideration guidelines for patients with extenuating medical circumstances such as an elevated FSH over a prolonged period of time, especially if they have had a successful IVF treatment with similar FSH values may be approved on an exception basis.
10/2002	Updated - Medical Policy Group Obstetrics and Gynecology to include coverage for sperm penetration assay. Effective for services rendered on or after 10/01/02.
7/2002	Updated to clarify coverage guidelines for assisted embryo hatching.
6/11/02	Updated to reflect effective date for coverage exclusion for assisted embryo hatching as published in the January/February 2002 Provider Focus, (April 2002).
10/2001	Updated to exclude coverage for blastocyst transfer; antiphospholipid antibody testing, and effective May 2002 assisted embryo hatching.
9/2001	Updated to include the definitions of successful vasectomy sterilization reversal and a successful tubal sterilization reversal.
5/2001	Updated to include coverage for culture and fertilization of oocyte(s) and to exclude coverage for anti-sperm antibody test, embryo toxic factor test, post-coital test, and donor sperm without documented male factor infertility.
7/2000	Updated to include information on embryo freezing and storage.
4/2000	Updated to include coverage for assisted embryo hatching. Effective 4/2000.
6/1999	Updated to include revisions on procedure codes W1011 and W1004, and to include certificate language on sterilization reversal procedure and unsuccessful sterilization reversal procedure.
3/1999	Updated to reclarify the role of menopause & perimenopause, rather than age, as most significant aspect of medical necessity determination, and to remove BCBSMA deleted local codes for dates of service prior to 9/1/1997.
10/1998	Updated to include 1999 CPT code 89264.
8/1998	Updated to include information from infertility booklet (#32-6070) "Important Information About Your Benefits" and clarified coverage of 6 cycles.
7/1998	Clarified coverage for sperm storage/banking for members in active infertility treatment: males who have undergone MESA; and males undergoing treatment that may cause infertility. No changes in coverage were made.
6/1998	Included billing information for culture and fertilization of oocyte(s) CPT code 89250
2/1998	Updated included coverage for sperm storage for patients with congenital absence of the vas deferens.
11/1997	Updated to increase age restriction to 45th birthday, to exclude coverage for gestational carriers, and to define limits of coverage for women with uterine problems who require a surrogate.
9/1997	Updated to include age guidelines for women for services after 12/1/1997.
7/1997	Updated to include revision regarding reimbursement for local code W1000.

5/1997	Updated to include the Mayo Clinic Infertility Guideline; no changes were made to the types of services covered.
10/1996	Updated to remove the restriction for members residing outside of Massachusetts, and to allow coverage for ICSI based upon the American Society for Reproductive Medicine Practice Committee Statement. The policy is in accordance with state mandate H3721 Chapter 394, 1987, and DOI Regulation 211 CMR 27:00: Infertility Benefits.
12/1995	Medical policy issued.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

Endnotes

1. In accordance with Massachusetts law (M.G.L.c. 175, section 47H and 211 C.M.R 37.09): "Infertility shall mean the condition of an individual who is unable to conceive or produce conception during a period of 1 year if the female is age 35 or younger or during a period of 6 months if the female is over the age of 35. For purposes of meeting the criteria for infertility in this section, if a person conceives but is unable to carry that pregnancy to live birth, the period of time she attempted to conceive prior to achieving that pregnancy shall be included in the calculation of the 1 year or 6 month period, as applicable."
2. The American College of Obstetricians and Gynecologists Practice Bulletin, Clinical Management Guidelines for Obstetrician-Gynecologists. Number 24, February 20001 (Replaces the Technical Bulletin Number 212, September 1995), Management of Recurrent Pregnancy Loss.
3. American Society for Reproductive Medicine, Patient's Fact Sheet, *Recurrent Pregnancy Loss*, 8/2008.
4. Practice Committee Report, *Definitions of Infertility and Recurrent Pregnancy Loss*, Practice Committee of the American Society for Reproductive Medicine, Fertility and Sterility Vol. 89, No. 6, June 2008.
5. In accordance with the Massachusetts state mandate. The mandate states that we must provide benefits to insured covered spouse and/or other covered dependent, <http://www.mass.gov/ocabr/docs/doi/legal-hearings/211-37.pdf>.
6. Diagnostic evaluation of the infertile female: a committee opinion ASRM. Fertil Steril 2012; 98:302-7.
7. Consensus of Reproductive Endocrinology Medical Directors at ART meeting 6-13-05. Fertility treatment when the prognosis is very poor or futile: a committee opinion. ASRM. Fertil Steril_ 2012; 98:e6–e9. "In cases of very poor prognosis, the odds that a treatment (e.g., an IVF or insemination cycle) will achieve a live birth are very low but not nonexistent (>1% and ≤5% per cycle), and are thus not described here as futile." BCBSMA will not cover these for poor prognosis services.
8. In accordance with Massachusetts state mandate. These services need not be covered by health Plans. <http://www.mass.gov/ocabr/docs/doi/legal-hearings/211-37.pdf> and Office of Patient Protection's Infertility Advisory for External Review Agencies.
9. According to Blue Cross Blue Shield of Massachusetts certificates.

10. ASRM Position on Gender Selection. See also ASRM's website: www.asrm.org. The 1994 ASRM Ethics Committee Report concluded that the use of medical technologies to avoid the birth of children with genetic disorders was acceptable. However, using these technologies for non-medical reasons presents a more difficult question.

In October 1999 the ASRM Ethics Committee concluded that initiating IVF with PGD solely for sex selection presents risk of unwarranted gender bias, social harm and diversion of medical resources from genuine medical need, in their statement "Sex Selection and Preimplantation Genetic Diagnosis". This was reiterated in the 2001 ASRM Ethics Committee Report on "Preconception Gender Selection for non Medical Reasons." Therefore, it should be discouraged.

In the 2001 ASRM Ethics Committee report on preconception methods of gender selection. ASRM concluded that "if flow cytometry or other techniques of preconception gender selection are found to be safe and effective, physicians should be free to offer preconception gender selection in clinical settings to couples who are seeking gender variety in their offspring if the couples:

- are informed of the risk of failure
- affirm that they will fully accept children of the opposite sex if the preconception gender selection fails
- are counseled about having unrealistic expectations about the behavior of children of the preferred gender are offered the opportunity to participate in research to track and access the safety, efficacy and demographics of preconception gender selection.

11. This service is specifically excluded in subscriber contracts, and is mentioned in the Massachusetts state mandate as a service which need not be provided by health plans. Exceptions are not made for "medical necessity."
12. In accordance with HMO Blue and Master Health Plus subscriber certificate language.
13. Thanks to our urology expert consultant from Boston University Medical Center and Steve Bayer, MD, Boston IVF Center.
14. A comparison of intrauterine versus intracervical insemination in fertile single women. Carroll N, Palmer, J. *Fertil Steril* 2001;75:656–60. The monthly fecundity rate for IUI with inseminations was 15%, as compared with 9% for ICI. When the analysis was confined to cycles in which only one insemination was performed the monthly fecundity rates were 14% for IUI and 5% for ICI.
15. See Chapter 27 Infertility by Mark D. Hornstein & Daniel Schust in Novak's *Gynecology*, 12 Edition. Williams & Wilkins, Baltimore, 1998, pp 915-962. According to the authors, the human zona test should be considered experimental until more definitive evidence demonstrates its utility in the clinical setting.
16. See Chapter 27 Infertility by Mark D. Hornstein & Daniel Schust in Novak's *Gynecology*, 12 Edition. Williams & Wilkins, Baltimore, 1998, pp 915-962. The authors note that there have been recent improvements in techniques for identifying anti-sperm antibodies. However, the case for these antibodies causing infertility is not clear. Older, poorly designed studies seemed to suggest an association with infertility. However, newer better designed studies fail to confirm the older results. Authors concluded that the proper role of anti-sperm antibody testing is unclear in the clinical evaluation of infertility. Authors note that medical therapy for infertility thought to be associated with antisperm antibodies, with the use of condoms, glucocorticoids, has never been proven effective. Also in *Diagnostic Evaluation of Infertile Male: A Committee Opinion*. ASRM. *Fertil Steril* 2012;98:294-301.
17. *Diagnostic Evaluation of Infertile Male: A Committee Opinion*. ASRM. *Fertil Steril* 2012;98:294-301. "Less commonly used specialized tests on semen (sperm DNA fragmentation testing, acrosome reaction, (ROS) are useful investigative tools but are not recommended for the routine evaluation of

infertile men. Such tests may be considered in the evaluation of unexplained infertility but generally have little clinical utility.”

18. **Post-coital testing:** Diagnostic Evaluation of the Infertile Female: A Committee Opinion. ASRM. Fertil Steril 2012;98:302-7. “The post coital test (PCT), in which a specimen of cervical mucus obtained shortly before expected ovulation is examined microscopically for the presence of motile sperm within hours after intercourse, was the traditional method for diagnosis of cervical factor infertility. However, because the test is subjective, has poor reproducibility, is inconvenient to the patient, rarely changes clinical management, and does not predict inability to conceive, the PCT is no longer recommended for the evaluation of the infertile female.”
19. Aging and Infertility in Women – A Committee Opinion from ASRM 2006.
20. Day 2, 3, or 4 estradiol levels are acceptable as recommended by local infertility centers: Brigham and Women’s Center for Reproductive Medicine, Boston IVF, Reproductive Science Center of Boston, New England Reproductive Center, Baystate Reproductive Medicine, and Massachusetts General Hospital/Vincent IVF.
21. Intercycle variability of ovarian reserve tests. Results of a prospective randomized study Kwee et al. Hum Reprod 2004; 19:590-5.
22. Chronological age vs biological age: an age-related normogram for antral follicle count, FSH and anti-Mullerian hormone. Wiweko et al. J Assist Reprod Genet (2013) 30:1563–1567. This study compared CCCT with AMH, AFC, and basal FSH. The poor responders had AMH<1.4, AFC<8 or FSH < 7.06. To allow for lab variation, the limits are as listed. Additional support is in Testing and interpreting measures of ovarian reserve: a committee opinion. ASRM Fertil Steril_ 2012;98:1407–15 states “Several studies have restricted the sample population to women at high risk of DOR by recruiting older women, those with an elevated FSH, or those with a history of poor response... A higher AMH cutpoint of 1.25 ng/mL yielded 85% sensitivity, 63% specificity, 41% PPV, and 96% NPV for cycle cancelation (≤ 3 follicles).”
23. Ovulation induction combined with intrauterine insemination in women 40 years of age and older: is it worthwhile? G. Corsan, A. Trias, S. Trout and E. Kemmann. Human Reproduction vol.11 (5) 1109-1112, 1996. Live birth rate for 40 year olds was 9.6%, at 41 - 5.2%, at 43 - 2.4% and 0% beyond.
24. A prospective trial of intrauterine insemination of motile spermatozoa versus timed intercourse. Kirby CA1, Flaherty SP, Godfrey BM, Warnes GM, Matthews CD. Fertil Steril. 1991 Jul;56(1): 102-7.
25. Based upon expert advice from the Infertility Board Panel. Cumulative Birth Rates with Linked Assisted Reproductive Technology Cycles. Luke et al. N Engl J Med 2012;366:2483-91. Cumulative Live-Birth Rates after In Vitro Fertilization. Malizia B, Hacker M, Penzia A. N Engl J Med 2009;360:236-43.

Controlled ovarian hyperstimulation and intrauterine insemination for treatment of unexplained infertility should be limited to a maximum of three trials. [Aboulghar M¹](#), [Mansour R](#), [Serour G](#), [Abdrazek A](#).
26. Based upon local expert opinion from Boston IVF and Fertility Center of New England, MPG Obstetrics and Gynecology 10/2003.
27. Conversion from IUI to IVF guidelines: Based upon local expert opinion from Boston IVF, Brigham and Women’s Center for Reproductive Medicine, Reproductive Science Center of Boston, and the New England Reproductive Center.
28. Salpingectomy for Hydrosalpinx Prior to INVF: A Committee Opinion from ASRM July 2001.

29. The role of assisted hatching in in vitro fertilization: a review of the literature. A Committee opinion. ASRM Fertility and Sterility_ Vol. 85, No. 2, February 2006.
According to the ASRM, success rates after assisted embryo hatching in ART programs have varied considerably. Therefore it is difficult to compare reports from different clinics due to differences in patient populations, experience, technique of hatching and study design. Based on ASRM's review of the literature, they suggested that assisted hatching may be useful ≥ 2 failed IVF cycles, and individual ART programs should evaluate patient populations to determine which patients benefit from assisted embryo hatching. Routine performance of assisted embryo hatching for treatment of all IVF patients is unwarranted. Centers may send in their randomized controlled trial data for consideration.

Assisted hatching on assisted conception (in vitro fertilisation (IVF) and intracytoplasmic sperm injection (ICSI). Carney SK; Das S; Blake D; Farquhar C; Seif MM; Nelson L. Cochrane Database Syst Rev. 2012; 12:CD001894

"This update has demonstrated that whilst assisted hatching (AH) does appear to offer a significantly increased chance of achieving a clinical pregnancy, the extent to which it may do so only just reaches statistical significance. The 'take home' baby rate was still not proven to be increased by AH. The included trials provided insufficient data to investigate the impact of AH on several important outcomes. Most trials still failed to report on live birth rates."

30. Preimplantation genetic screening (PGS) still in search of a clinical application: a systematic review. Gleicher et al. Reproductive Biology and Endocrinology 2014, 12:22.
In vitro fertilization with preimplantation genetic screening. Mastenbroek S, et al, N Engl J Med 2007, 357:9–17.
31. Elective Single-Embryo Transfer Fertil Steril 2012;97:835-42. The age cutoffs are from ASRM.
32. van Royen E, Mangelschots K, de Neubourg D, Valkenburg M, van de Meerssche M, Ryckaert G, et al. Characterization of a top quality embryo, a step toward single-embryo transfer. Hum Reprod 1999;14:2345–9 (II-2).
33. A meta-analysis showed that the Sperm Penetration Assay did not discriminate between fertile and infertile men (Mao C, Grimes, DA. The sperm penetration assay: can it discriminate between fertile and infertile men? Am J Obstet Gynecol 1988;159:279-86. Diagnostic evaluation of the infertile male: A Committee Opinion. ASRM Fertil Steril 2012;98:294-301. "Sperm penetration assays may detect defects in sperm-fertilizing capacity and could identify patients who will benefit from application of ICSI. However, since ICSI is routinely used during IVF for male factor infertility couples, this test is rarely of any clinical value."
34. According to the ASRM, ICSI is safe and an effective therapy. Identifying appropriate candidates and accurate assessments of risks to the offspring have not been clearly defined. When genetic abnormalities are identified, couples should undergo genetic counseling before proceeding with treatment. Only couples who have been apprised of the chance of transmitting a genetic defect should be offered ICSI.

Indications for ICSI according to ASRM, Intracytoplasmic sperm injection (ICSI) for non-male factor infertility: a committee opinion Fertil Steril_ 2012;98:1395–9.

- ICSI is a safe and effective therapy for the treatment of male factor infertility.
- ICSI can increase fertilization rates when lower than expected or failed fertilization has previously occurred with conventional insemination.
- ICSI for unexplained infertility does not improve clinical outcomes.
- ICSI for low oocyte yield and advanced maternal age does not improve clinical outcomes.
- ICSI may improve fertilization rates in a subsequent cycle following total failed fertilization in a prior IVF/conventional insemination cycle, although fertilization failure seems to correlate with poor ovarian stimulation.

- ICSI for routine use may decrease the incidence of unexpected failed fertilization; however, more than 30 couples would have to undergo ICSI unnecessarily to prevent one failed fertilization.
 - ICSI may be of benefit for patients undergoing IVF with PGT, in vitro matured oocytes, and previously cryopreserved oocytes.
35. Intracytoplasmic sperm injection (ICSI) for non-male factor infertility: A Committee Opinion. ASRM Fertil Steril 2012;98:1395-9.
 36. Practice Committee Report, Mature oocyte cryopreservation: A guideline, Practice Committee of the American Society of Reproductive Medicine, Fertility and Sterility. 2013 Jan;99(1):37-43. Age limit is based on statement from here “age stratified CPR per transfer were: 48.6% in ≤ 34 year-olds, 24.1% in 35-37 year olds, 23.3% in 38-40 year-olds, and 22.2% in 41-43 year-olds.”
 37. Diagnostic evaluation of the infertile male: A Committee Opinion. ASRM Fertil Steril 2012;98:294-301.
The current WHO criteria for evaluating sperm morphology (10) are similar to the “strict criteria” described by Kruger (Tygerberg) Strict sperm morphology has been used to identify couples at risk for poor or failed fertilization using standard in vitro fertilization (IVF) techniques (11) and thus to identify those who may be candidates for intracytoplasmic sperm injection (ICSI) However, the value and necessity for ICSI in those having isolated abnormalities in strict morphology has been questioned.
 38. See Chapter 14 the Infertile Couple by Rein MS, Barbieri RL in Kistner’s Gynecology and Women’s Health, 7th Edition, Mosby, St. Louis, 1999, pp 325-364. Obstructive abnormalities of the vas deferens, Part III, page 358. Authors note a recent correlation between men with absent vas and mutations in the genes associated with cystic fibrosis.
 39. High serum FSH levels in men with nonobstructive azoospermia does not affect success of microdissection testicular sperm extraction. Ramasamy, R et al Fertil Steril 2009;92:590-3.
 40. Overweight men with nonobstructive azoospermia have worse pregnancy outcomes after Microdissection testicular sperm extraction. Ramasamy, R et al Fertil Steril 2013;99:372-6.
 41. Based on the BCBSA national policy 4.02.05, Reproductive Techniques, issued 4/2009.
 42. Smoking and infertility: a committee opinion. ASRM. Fertil Steril_ 2012;98:1400–6.
 43. Obesity increases the risk of spontaneous abortion during infertility treatment. Wang JX; Davies MJ; Norman RJ Obes Res 2002 Jun;10(6):551-4. Obesity and reproduction: an educational bulletin. ASRM Fertil Steril 2008;90:S21-9.
 44. Third Party Reproduction: A Guide for Patients. ASRM. 1996.