Clinical Policy Title: Amniocentesis for diagnosis of fetal chromosomal abnormalities

Clinical Policy Number: 12.01.04

Effective Date: October 1, 2016
Initial Review Date: July 20, 2016
Most Recent Review Date: July 20, 2016
Next Review Date: July 2017

Related policies:

CP#: 02.01.01 Maternal genetic testing

ABOUT THIS POLICY: Keystone First has developed clinical policies to assist with making coverage determinations. Keystone First’s clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by Keystone First when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Keystone First’s clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Keystone First’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Keystone First will update its clinical policies as necessary. Keystone First’s clinical policies are not guarantees of payment.

Coverage policy

Keystone First considers the use of diagnostic amniocentesis procedures for fetal chromosomal abnormalities to be clinically proven and, therefore, medically necessary when the following criteria are met:

A. Performed between 15 weeks and 20 weeks of gestation (can be performed at any later gestational age for both singleton and twin pregnancies if there are specific reasons):
   1. First-trimester nuchal translucency (NT) by ultrasound is abnormal.
   2. First-trimester combined screening test NT, Pregnancy-associated plasma protein-A (PAPP-A), free beta- human chorionic gonadotropin (hCG) is abnormal.
   3. Second-trimester triple screen finding is abnormal.
   4. Second-trimester quadruple screen finding is abnormal.

B. Amniocentesis may be performed at any age for any of the following:
   1. Fetal ultrasound finding that indicates an increased risk of aneuploidy, specifically for trisomies 13, 18, or 21.
   2. History of previous pregnancy with a trisomy detectable by cell-free DNA (cfDNA) screening (trisomies 13, 18, or 21).
   3. Positive screening results for aneuploidy that includes a first-trimester, sequential, integrated, or quadruple screen.
4. Members who undergo cfDNA aneuploidy screening, maternal serum alpha-fetoprotein, and/or second-trimester anatomy ultrasound scan.
5. Prenatal genetic studies and assessment of fetal lung maturity.
6. Other indications include, but are not limited to, evaluation of the fetus for infection, degree of hemolytic anemia, blood or platelet type, hemoglobinopathies, and neural tube defects.
7. Amniocentesis performed as a therapeutic procedure to remove excess amniotic fluid, such as in symptomatic polyhydramnios or twin-to-twin transfusion syndrome, or to reduce volume and pressure of amniotic fluid in cases of prolapsed fetal membranes in the second trimester to facilitate placement of an emergency cerclage. This procedure is termed amnioreduction.

C. Referral to parent support networks (e.g., National Down Syndrome Society, if that is the diagnosis of concern), counselors, social workers, or clergy may provide additional information and support.

D. Pregnant members 35 years of age or older who are at high risk of fetal chromosomal disorders, are considered eligible for amniocentesis as requested.

Limitations:

All other uses of diagnostic amniocentesis procedures are not medically necessary.

Alternative covered services:

Non-invasive screening.

Background

Birth defects are the leading cause of infant mortality in the United States, accounting for more than 20% of all infant deaths. Although the causes of approximately 70% of all birth defects are unknown, many birth defects can be attributed to chromosomal abnormalities. Pregnant women who have a high risk of fetal chromosomal disorders, such as those 35 years of age or older, are generally offered chorionic villus sampling or amniocentesis, which allows the karyotype of the fetus to be determined. However, these tests are invasive and can cause miscarriage, and are not indicated as screening tests for women at average risk. Therefore, a number of noninvasive prenatal tests have been developed to screen for fetal abnormalities and to determine the need for additional diagnostic testing. Pregnant women typically undergo prenatal screening during the second trimester with tests that evaluate specific hormone levels in the serum and/or ultrasonographic examination of the fetus.

Amniocentesis is a diagnostic procedure performed on pregnant women that looks for genetic and chromosomal abnormalities (birth defects) in the fetus. Some common conditions that may be detected include Down syndrome (trisomy 21), cystic fibrosis, and neural tube defects (spina bifida). This test is generally performed between weeks 14 and 20 of pregnancy, but may be performed in the third trimester to look for certain conditions, such as infection and fetal lung maturity. It is highly accurate (98-99%) and is usually recommended by obstetricians if the fetus is at a higher risk for any of the health problems mentioned above. Doctors determine that risk by taking into account some laboratory findings, such as the triple screen test.
The biggest risk involved in amniocentesis is that of miscarriage. That being said, there is a only about a 1% incidence of miscarriage as a result of the procedure, although different sources suggest that the true figure may be lower at present because of improvements in the procedure, potentially as low as 0.5-0.6%. A miscarriage is basically when the body aborts a pregnancy, potentially as a result of trauma or injury. Because amniocentesis involves guiding a needle very close to the fetus, it can potentially be a source of trauma that triggers a miscarriage.

It is estimated that about 1 in 1000 amniocentesis procedures can result in a dangerous infection. Because the equipment used is sterilized, and because the procedure itself is performed in a sterile environment, then main cause of such an infection would be the accidental perforation, or puncture, of the bowel. This would result in a leakage of waste materials that can cause infection. In some instances the needle itself can become contaminated through contact with ultrasound equipment, and this can potentially cause an infection as well.

These are the main risks involved in amniocentesis, and while they are a serious concern, they also occur with increasing rarity as the procedure itself and the equipment used are constantly being improved. During amniocentesis, fluid is removed by placing a long needle through the abdominal wall into amniotic sac. Sometimes, the woman's skin is injected first with a local anesthetic, but this is not usually necessary. The amniocentesis needle is typically guided into the sac with the help of ultrasound imaging performed either prior to or during the procedure. Once the needle is in the sac, a syringe is used to withdraw the clear amber-colored amniotic fluid that resembles urine. The volume of fluid withdrawn depends upon the age of the fetus and the reason for the procedure.

Down’s syndrome occurs when a person has three, rather than two copies of chromosome 21; or the specific area of chromosome 21 implicated in causing Down’s syndrome. It is the commonest congenital cause of mental disability and also leads to numerous metabolic and structural problems. It can be life-threatening, or lead to considerable ill health, although some individuals have only mild problems and can lead relatively normal lives. Having a baby with Down’s syndrome is likely to have a significant impact on family life.

The fluid can then be sent for evaluation of fetal lung maturity, genetic evaluation, evidence of spina bifida (a birth defect in spinal cord development) or other neural-tube defects, the presence of infection, or fetal chromosomal analysis. Chromosomes are structures which contain all of the genetic information within our cells. Amniotic fluid contains numerous free-floating fetal cells that can be grown in the laboratory. When these cells multiply and reach a certain number, their chromosomes are extracted and analyzed. It takes approximately two weeks to perform chromosomal analysis. The fluid also contains proteins, minerals and other compounds that can be tested. These additional studies may require 1 to 7 days to perform. Data obtained from amniotic fluid can help women make informed decisions regarding their pregnancies. Noninvasive screening based on biochemical analysis of maternal serum or urine, or fetal ultrasound measurements, allows estimates of the risk of a pregnancy being affected and provides information to guide decisions about definitive testing. However, no test can predict the severity of problems a person with Down’s syndrome will have.

The expectation for effective fetal assessment has increased in the last few decades. The proportion of pregnant women who choose invasive tests like amniocentesis or chorionic villus sampling (CVS) for more definitive diagnosis depends not only on the quality of available health care and screening programs, but also on cultural, ethical and religious beliefs. Women undergoing these procedures are
likely to be at increased risk for fetal loss and other complications and awareness of the factors that may increase the risk of complications (maternal age, previous history fetal anomalies, and increased nuchal translucency) during the procedures is important.

Second-trimester amniocentesis, a needle puncture through the overlying skin into the uterus and amniotic cavity, followed by aspiration of amniotic fluid, is traditionally performed around 16 weeks' gestation. CVS involves aspiration of placental tissue rather than amniotic fluid. Ultrasound-guided aspiration can be performed using either the percutaneous transabdominal approach or the transvaginal/transcervical approach.

According to CfDNA consists of small (<200 base pairs) fragments of DNA that are free floating in the plasma. During pregnancy, after 10 weeks of gestation, approximately 10-15% of the total cfDNA in the maternal plasma is of placental origin (i.e., derived from trophoblast) and can be used therefore to test for fetal disorders. Cell-free DNA screening (also referred to as cfDNA testing, noninvasive prenatal testing, and noninvasive prenatal screening) is a test that uses next-generation sequencing of cfDNA in maternal plasma combined with bioinformatic algorithms to determine the probability of certain fetal chromosomal conditions in pregnancy.

Although such testing has been demonstrated to be possible for a variety of genetic conditions (which include blood type, autosomal single gene disorders, and determination of fetal sex to assess risk for X-linked diseases), the large majority of clinical tests are done to test for fetal chromosomal disorders. Initially focused only on Down syndrome, the laboratories that perform the testing all subsequently have added assessment for trisomies 13 and 18 and the sex chromosomes. In addition, some laboratories provide testing for additional trisomies and some microdeletion syndromes. It is likely that the range of available conditions that can be tested for with the use of cfDNA screening will continue to increase over time.

Genetic testing of the fetus offers both opportunities and ethical challenges. Preconception and prenatal genetic screening and testing are recommended for a limited number of severe child-onset diseases because such screening and testing provides individuals with the chance to pursue assisted reproductive technology in order to avoid conception of an affected child, to consider termination of a pregnancy, or to prepare for the birth of a chronically ill child. With advancing genetic technology, however, physicians may increasingly face requests for testing of fetuses for less severe child-onset conditions, adult-onset conditions, or genetically linked traits.

Principles regarding testing of children provide some guidance for when prenatal testing might be appropriate but this decision is significantly complicated by the various purposes that prenatal testing can have: to detect a fetal condition for pregnancy termination, to allow patients to prepare for the birth and care of a potentially affected child, or, more rarely, to detect and treat a fetal condition in utero. Furthermore, many times, a woman’s intentions regarding pregnancy termination evolve as genetic information becomes available to her. Therefore, testing the fetus for adult-onset disorders with no known therapeutic or preventive treatment (save prevention by pregnancy termination) should raise caution in a way similar to the manner in which testing of children can. In pregnancies likely to be carried to term, consideration should be given to whether, as in the case of testing children, the decision to test should be reserved for the child to make upon reaching adulthood. However, consideration also should be given to personal preference, that is, the interests individuals may have in terminating a pregnancy that may result in a life (such as life that will be affected by Huntington chorea) that they feel morally obliged or prefer not to bring into the world. Because these often are wrenching decisions for
parents, referral to parent support networks (e.g., National Down Syndrome Society, if that is the diagnosis of concern), counselors, social workers, or clergy may provide additional information and support.

**Searches**

Keystone First searched PubMed and the databases of:
- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality's National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on June 21, 2016. Search terms were: “amniocentesis diagnostic tests”, “routine”, “female”, “genetic testing”, “pregnancy”, and “prenatal diagnosis” (all MeSH).

We included:
- **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.
- **Guidelines based on systematic reviews**.
- **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

The NHS in the United Kingdom sponsored the Serum, Urine, and Ultrasound Screening Study (SURUSS), which, like the FASTER trial, is a prospective, multicenter clinical trial but with an enrollment of 47,053 pregnant women. This study was designed to assess the individual and combined performance of serum, urine, and ultrasound markers in the first trimester. The performance of first-trimester screening has been compared directly with second-trimester screening in the same women. The SURUSS project was designed to identify the organizational arrangements needed for implementation of the most effective screening method (Wald et al., 2003a). Based on the results of SURUSS (see Table 1), the National Screening Committee (NSC) of the NHS has recommended that all women be offered integrated first- and second-trimester screening, full first-trimester screening, or the second-trimester “quad screen,” based on their availability for first-trimester screening and their willingness to make decisions based solely on the results of first-trimester screening (NHS, 2003).

Laboratories that perform the biochemical tests involved in prenatal screening are governed by regulations outlined in the Clinical Laboratory Improvement Act (CLIA). Systems for ultrasonographic imaging are regulated by the FDA as Class II devices and a large number of these systems have been approved via the FDA 510(k) process (FDA, 2003; FDA, 2005).

A committee opinion published by American College of Obstetricians and Gynecologists (ACOG) in July 2004 states that first-trimester screening for chromosomal abnormalities is an option that offers potential advantages over second-trimester screening. However, the committee noted that nuchal
translucency measurements rely on several factors, including: ultrasound equipment, equipment operator, fetal position, proper contrast and magnification, correct placement of calipers, and maternal physique. Therefore, the committee recommended that first-trimester prenatal screening be offered only under the following conditions (ACOG, 2004):

- Appropriate programs exist for training ultrasoundographers and monitoring the quality of nuchal translucency measurements.
- Sufficient resources and information are available to provide women with comprehensive counseling about different screening options and the limitations of these tests.
- Appropriate diagnostic tests are available and accessible when a screening test yields a positive result.

policy updates:

None.

summary of clinical evidence:

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
</tr>
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<tbody>
<tr>
<td>Oepkes D, et al. (2006) Doppler ultrasonography versus amniocentesis to predict fetal anemia.</td>
<td>Key points:</td>
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<td>- Pregnancies complicated by Rh alloimmunization have been evaluated with the use of serial invasive amniocentesis to determine bilirubin levels by measuring in the amniotic fluid the change in optical density at a wavelength of 450 nm (DeltaOD450); however, this procedure carries risks.</td>
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<td>- Noninvasive Doppler ultrasonographic measurement of the peak velocity of systolic blood flow in the middle cerebral artery also predicts severe fetal anemia, but this test has not been rigorously evaluated in comparison with amniotic-fluid DeltaOD450.</td>
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<td>- Performed a prospective, international, multicenter study including women with RhD-, Rhc-, RhE-, or Fy(a)-alloimmunized pregnancies with indirect antiglobulin titers of at least 1:64 and antigen-positive fetuses to assess whether Doppler ultrasonographic measurement of the peak systolic velocity of blood flow in the middle cerebral artery was at least as sensitive and accurate as measurement of amniotic-fluid DeltaOD450 for diagnosing severe fetal anemia. The results of the two tests were compared with the incidence of fetal anemia, as determined by measurement of hemoglobin levels in fetal blood.</td>
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<td>- Of 165 fetuses, 74 had severe anemia. For the detection of severe fetal anemia, Doppler ultrasonography of the middle cerebral artery had a sensitivity of 88 percent (95 percent confidence interval, 78 to 93 percent), a specificity of 82 percent (95 percent confidence interval, 73 to 89 percent), and an accuracy of 85 percent (95 percent confidence interval, 79 to 90 percent).</td>
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<td>- Amniotic-fluid DeltaOD450 had a sensitivity of 76 percent (95 percent confidence interval, 65 to 84 percent), a specificity of 77 percent (95 percent confidence interval, 67 to 84 percent), and an accuracy of 76 percent (95 percent confidence interval, 69 to 82 percent).</td>
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<td>- Doppler ultrasonography was more sensitive, by 12 percentage points (95 percent confidence interval, 0.3 to 24.0), and more accurate, by 9 percentage points (95 percent confidence interval, 1.1 to 15.9), than measurement of amniotic-fluid DeltaOD450.</td>
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<td>- Doppler measurement of the peak velocity of systolic blood flow in the middle cerebral artery can safely replace invasive testing in the management of Rh-alloimmunized pregnancies. (ClinicalTrials.gov number, NCT00295516).</td>
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<tr>
<td>Brambati B (2005)</td>
<td>Key points:</td>
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### Citation, Methods, Recommendations

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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| Chorionic villus sampling and amniocentesis. Current Opinion in Obstetrics and Gynecology | - The advantages and disadvantages of common invasive methods for prenatal diagnosis are presented in light of new investigations.  
- Several aspects of first-trimester chorionic villus sampling and mid-trimester amniocentesis remain controversial, especially fetal loss rate, fetus-maternal complications, and the extension of both sampling methods to less traditional gestational ages (early amniocentesis, late chorionic villus sampling), all of which complicate genetic counseling  
- A recent randomized trial involving early amniocentesis and late chorionic villus sampling has confirmed previous studies, leading to the unquestionable conclusion that transabdominal chorionic villus sampling is safer. The old dispute over whether limb reduction defects are caused by chorionic villus sampling gains new vigor, with a paper suggesting that this technique has distinctive teratogenic effects.  
- The large experience involving maternal and fetal complications following mid-trimester amniocentesis allows a better estimate of risk for comparison with chorionic villus sampling.  
- Transabdominal chorionic villus sampling, which appears to be the gold standard sampling method for genetic investigations between 10 and 15 completed weeks, permits rapid diagnosis in high-risk cases detected by first-trimester screening of aneuploidies. Sampling efficiency and karyotyping reliability are as high as in mid-trimester amniocentesis with fewer complications, provided the operator has the required training, skill and experience. |
| Norton ME, et al. (2012) Invasive Chromosomal Evaluation (NICE) Study: results of a multicenter prospective cohort study for detection of fetal trisomy 21 and trisomy 18 | **Key points:**  
- Of the 81 T21 cases, all were classified as High Risk for T21 and there was 1 false-positive result among the 2888 normal cases, for a sensitivity of 100% (95% confidence interval [CI], 95.5–100%) and a false-positive rate of 0.03% (95% CI, 0.002–0.20%). Of the 38 T18 cases, 37 were classified as High Risk and there were 2 false-positive results among the 2888 normal cases, for a sensitivity of 97.4% (95% CI, 86.5–99.9%) and a false-positive rate of 0.07% (95% CI, 0.02–0.25%).  
- Chromosome-selective sequencing of cell-free DNA and application of an individualized risk algorithm is effective in the detection of fetal T21 and T18. |
- To assess comparative safety and accuracy of second trimester amniocentesis, early amniocentesis, transcervical and transabdominal CVS.  
- Second trimester amniocentesis is safer than early amniocentesis or transcervical CVS, and is the procedure of choice for second trimester testing. Transabdominal CVS should be regarded as the procedure of first choice when testing is done before 15 weeks’ gestation. Diagnostic accuracy of different methods could not be assessed adequately because of incomplete karyotype data in most studies. |
| Norton ME, et al. (2014) Chromosome abnormalities detected by current prenatal screening and noninvasive prenatal testing. | **Key points:**  
- Of 1,324,607 women who had traditional screening during the study period, 68,990 (5.2%) were screen-positive. Of screen-positive women, 26,059 (37.8%) underwent invasive diagnostic testing and 2,993 had an abnormal result (11.5%). Of these, 2,488 (83.1%) were predicted to be detectable with current noninvasive prenatal testing methods, and 506 (16.9%) were considered not currently detectable. Trisomy 21 accounted for 53.2% of the abnormal results (n=1,592). Common aneuploidies, detectable by noninvasive prenatal testing, comprised a higher percentage of abnormal results in older women (P<.01).  
- For pregnant women with a positive aneuploidy screen who pursued diagnostic testing, 16.9% of chromosome abnormalities are not currently detectable by noninvasive prenatal testing. Undetectable aneuploidies range from relatively mild to those... |
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|  | • Fetal karyotypes obtained following 11,045 prenatal invasive procedures between January 1999 and December 2011 were retrospectively reviewed. Referral indications were classified as medical and non-medical (anxiety). The number of tests per relevant chromosomal abnormalities (CA) detected in both groups adjusted for indication was calculated.  
|  | • A total of 414 CA were detected (3.8%), 355 of which were considered clinically significant. The percentage of invasive procedures has declined from 49% to 12%, although cases referred by anxiety have increased from 22% to 55%. A total of 3129 invasive procedures did not have any medical indication (28%) and 13 relevant CA (0.42%) were found in this group. In this low-risk series, the index "number of invasive testing needed to detect 1 relevant CA" adjusted for indication was 241.  
|  | • Changes in our national prenatal policy through this 13-year period show an increasing efficiency of prenatal detection of CA. However, despite the intensifying screening policies, low-risk pregnant women show a growing demand for prenatal invasive testing and a baseline risk for cytogenetic abnormality of 1/241. |

Glossary

**Alpha-fetoprotein (AFP)** — Is a protein that is produced by the fetus.

**Aneuploidy** — Numerical abnormality of chromosomes. Any chromosome number not an exact multiple of the haploid number of 23. Normal number in humans is 46 (23 pairs) except for mature egg and sperm. Extra (trisomy) or absence of (monosomy) chromosome.

**Autosomes** — Chromosome pairs 1-22

**Chorionic villus sampling (CVS)** — Is a procedure that allows a small sample of the baby’s developing placenta be collected. Cells from the placenta are therefore similar to the baby’s cells and can be tested for some types of birth defects. The developing placenta is made up of tissue called chorionic villi at this stage of pregnancy.

**Estriol** — An estrogen produced by both the fetus and the placenta.

**Human chorionic gonadotropin (HCG)** — A hormone produced within the placenta

**Medically Necessary** — A service or benefit is Medically Necessary if it is compensable under the Medical Assistance Program and if it meets any one of the following standards:

- The service or benefit will, or is reasonably expected to, prevent the onset of an illness, condition or disability.
- The service or benefit will, or is reasonably expected to, reduce or ameliorate the physical, mental or developmental effects of an illness, condition, injury or disability.
- The service or benefit will assist the Member to achieve or maintain maximum functional capacity in performing daily activities, taking into account both the functional capacity of
the Member and those functional capacities that are appropriate for Members of the same age.

**Multiple Marker Screening and α-fetoprotein (AFP), (MSAFP)** — Is a screening test that examines the level of alpha-fetoprotein in the mother’s blood during pregnancy.

**Robertsonian translocation (ROB)** — A rare form of chromosomal rearrangement that, in humans, occurs in the five acrocentric chromosome pairs, namely 13, 14, 15, 21 and 22.

**Triple Test** — Multiple Marker Screening and α-fetoprotein (AFP), AFP Plus The triple screen test is a maternal blood screening test that looks for three specific substances: AFP, hCG, and Estriol.

**Trisomy** — A condition in which an extra copy of a chromosome is present in the cell nuclei, causing developmental abnormalities.

**Twin-twin transfusion syndrome (TTTS)** — A condition that affects identical twin pregnancies. The diagnosis requires the ultrasound demonstration of excessive fluid (hydramnios) around one twin (the recipient) and little or no fluid (oligohydramnios) around the other twin (the donor) with the separating membrane completely covering this fetus. Both twins should be structurally normal. The recipient twin is usually appropriately grown for gestational age, has a large distended bladder and may, if severely compromised, show tricuspid regurgitation or hydrops fetalis. The donor twin on the other hand, is frequently severely growth restricted with abnormal umbilical artery Doppler waveforms.

**References**

**Professional society guidelines/other:**


ACOG Practice Bulletin No 88 December 2007 Invasive prenatal testing for aneuploidy http://dx.doi.org/10.1097/01.AOG.0000291570.63450.44.


Peer-reviewed references:


Clinical trials:

Searched clinicaltrials.gov on June 17, 2016 using terms diagnostic tests, routine, female, genetic testing, pregnancy, prenatal diagnosis | Open Studies. 17 studies found, three relevant.


CMS National Coverage Determinations (NCDs):

No NCDs identified as of the writing of this policy.

Local Coverage Determinations (LCDs):

No LCDs identified as of the writing of this policy.

Commonly submitted codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

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<th>CPT Code</th>
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<td>59000</td>
<td>Amniocentesis, diagnostic</td>
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<td>O09.51X</td>
<td>Supervision of elderly primigravida</td>
<td>Add 1,2,3,9 for trimester</td>
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<tr>
<td>O09-52X</td>
<td>Supervision of elderly multigravida</td>
<td>Add 1,2,3,9 for trimester</td>
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<td>O28.0</td>
<td>Pregnancy complicated by abnormal hematological, antenatal screening, mother</td>
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<td>O28.1</td>
<td>Pregnancy complicated by abnormal biochemical, antenatal screening, mother</td>
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<td>O28.3</td>
<td>Pregnancy complicated by abnormal ultrasound, antenatal screening, mother</td>
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<tr>
<td>O28.5</td>
<td>Pregnancy complicated by abnormal chromosomal, antenatal screening, mother</td>
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<tr>
<td>O32.1</td>
<td>Abnormal fetal chromosomes, (maternal care for)</td>
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Appendix A

American journal of Obstetric & Gynecology's Summary recommendations

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<thead>
<tr>
<th>No.</th>
<th>Recommendations</th>
<th>GRADE</th>
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<tbody>
<tr>
<td>1</td>
<td>Optimal candidates for routine cfDNA aneuploidy screening are women with:</td>
<td>1B: Strong recommendation, moderate quality evidence</td>
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<tr>
<td>Maternal age ≥35 years at delivery.</td>
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<td>Fetal ultrasound finding that indicates an increased risk of aneuploidy, specifically for trisomies 13, 18, or 21.</td>
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<td>History of previous pregnancy with a trisomy detectable by cfDNA screening (trisomies 13, 18, or 21).</td>
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<td>Positive screening results for aneuploidy that include a first-trimester, sequential, integrated, or quadruple screen.</td>
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<td>Parental balanced Robertsonian translocation with increased risk of fetal trisomy 13 or 21.</td>
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| 2 | Routine screening for microdeletions with cfDNA is not recommended. | 1B: Strong recommendation, moderate quality evidence |
| 3 | For women who desire comprehensive testing for chromosomal disorders, diagnostic testing should be offered. | 1B: Strong recommendation, moderate quality evidence |
| 4 | For women who undergo cfDNA aneuploidy screening, maternal serum alpha-fetoprotein, and/or second-trimester anatomy ultrasound scan should also be performed. | Best practice |
| 5 | Formal genetic counseling by maternal-fetal medicine subspecialist, geneticist, or genetic counselor after a positive cfDNA test is recommended | Best practice |
| 6 | Chorionic villous sampling or amniocentesis should be offered after a positive cfDNA screen to confirm the diagnosis. | Best practice |
| 7 | Traditional aneuploidy screening and cfDNA aneuploidy screening should not be performed at the same time. | Best practice |

cfDNA, cell-free DNA.