



CCRM Orange County
Science, Service, Success

Comprehensive Chromosome Screening (CCS)
also known as
Preimplantation Genetic Screening (PGS)

Comprehensive Chromosome Screening (CCS)

- CCS is still a study; patient information is kept confidential
- > 1,200 healthy babies
- Fees associated with CCS
 - Embryo biopsy procedure will be performed at CCRM OC laboratory
 - Shipping to Fertility Genetics in Colorado
 - Analysis at Fertility Genetics in Colorado

CCS Overview

■ Aim

- Identify chromosomally normal (euploid) embryos for transfer

■ Potential Benefits

- Increase likelihood of embryo implantation
- Decrease risk for miscarriage associated with chromosomally abnormal (aneuploid) conception

■ Indications

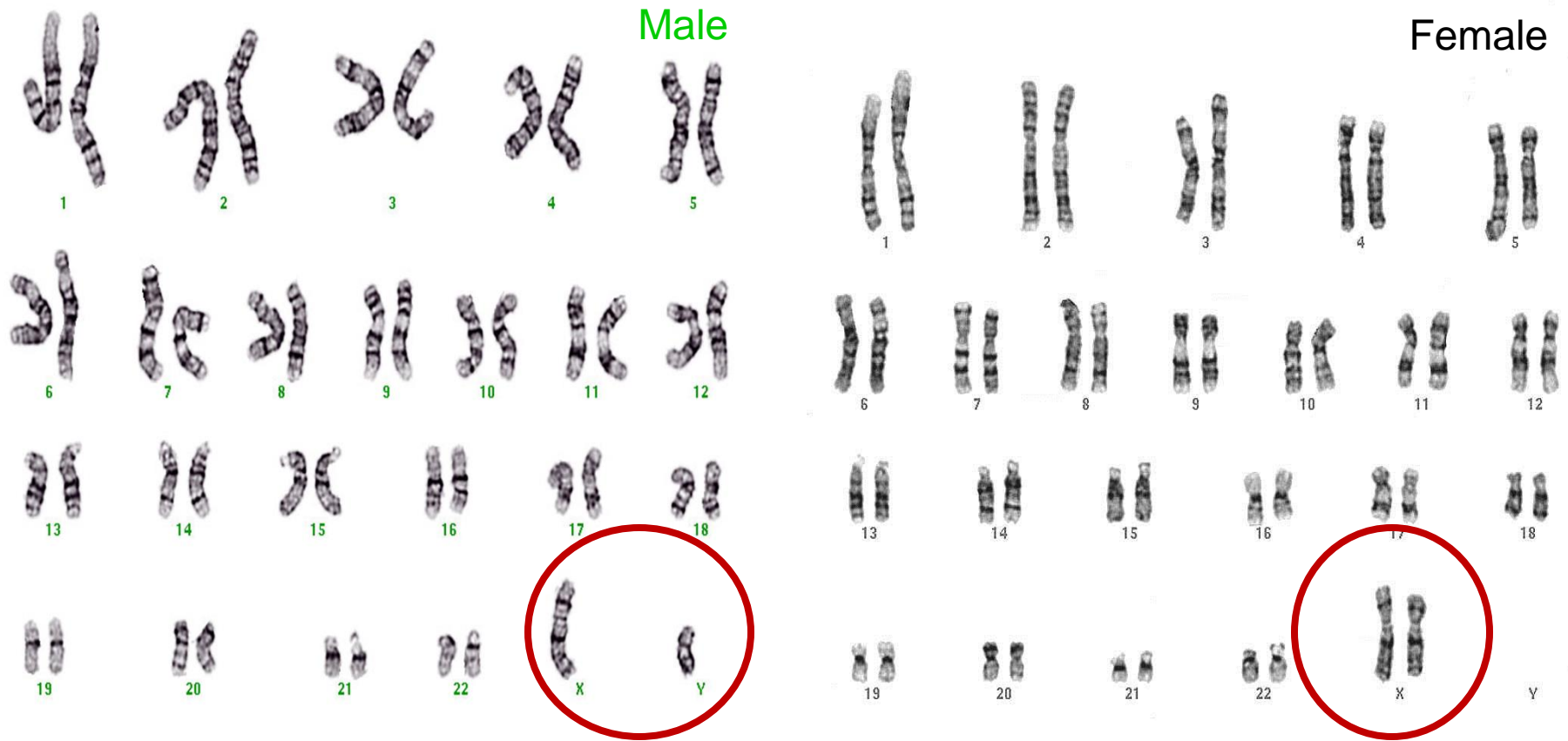
- Women 37 years or older
- Previous history of failed IVF cycles
- Previous history of recurrent miscarriages
- Previous history of a pregnancy diagnosed with a chromosome abnormality

Human Cell

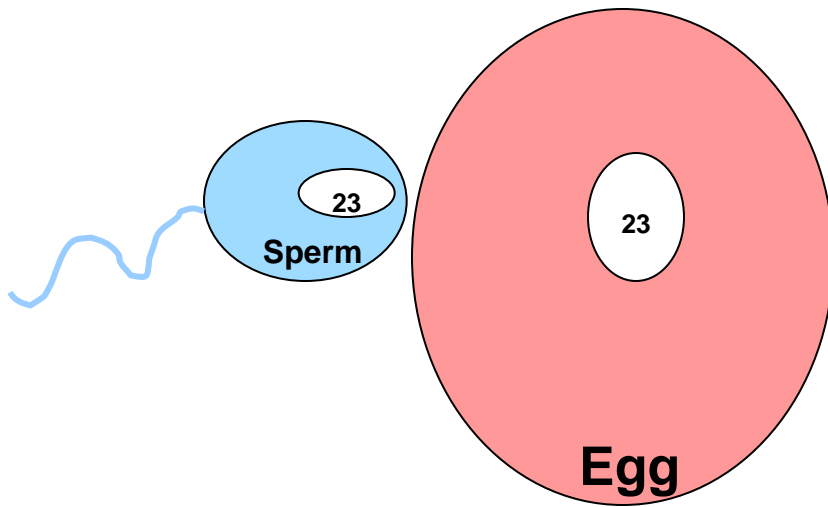
46 Chromosomes (23 pairs)



Normal Male and Female Chromosome Constitutions (Karyotypes)



Normal Embryo Inherits 46 Chromosomes

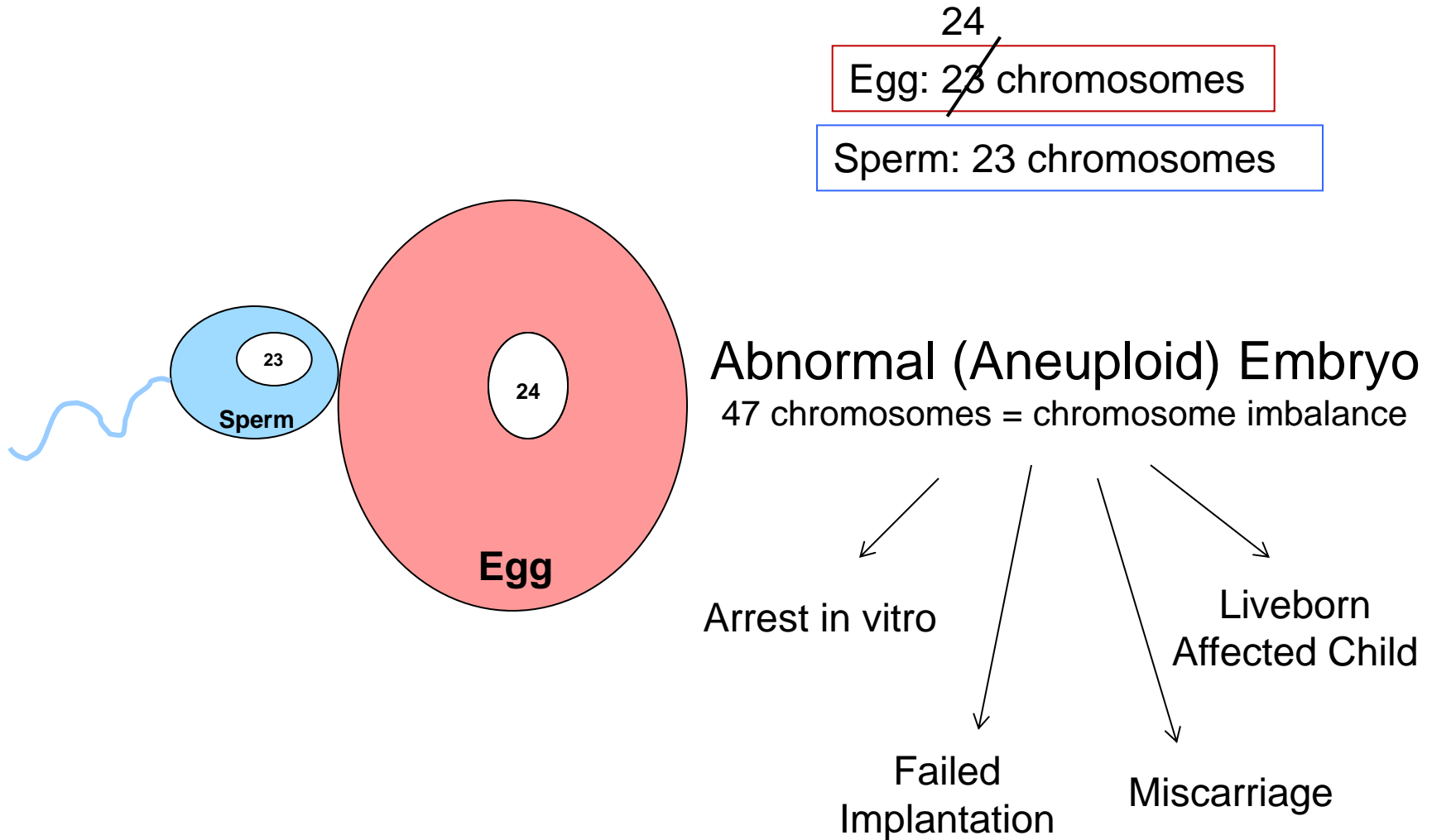


23 chromosomes from egg

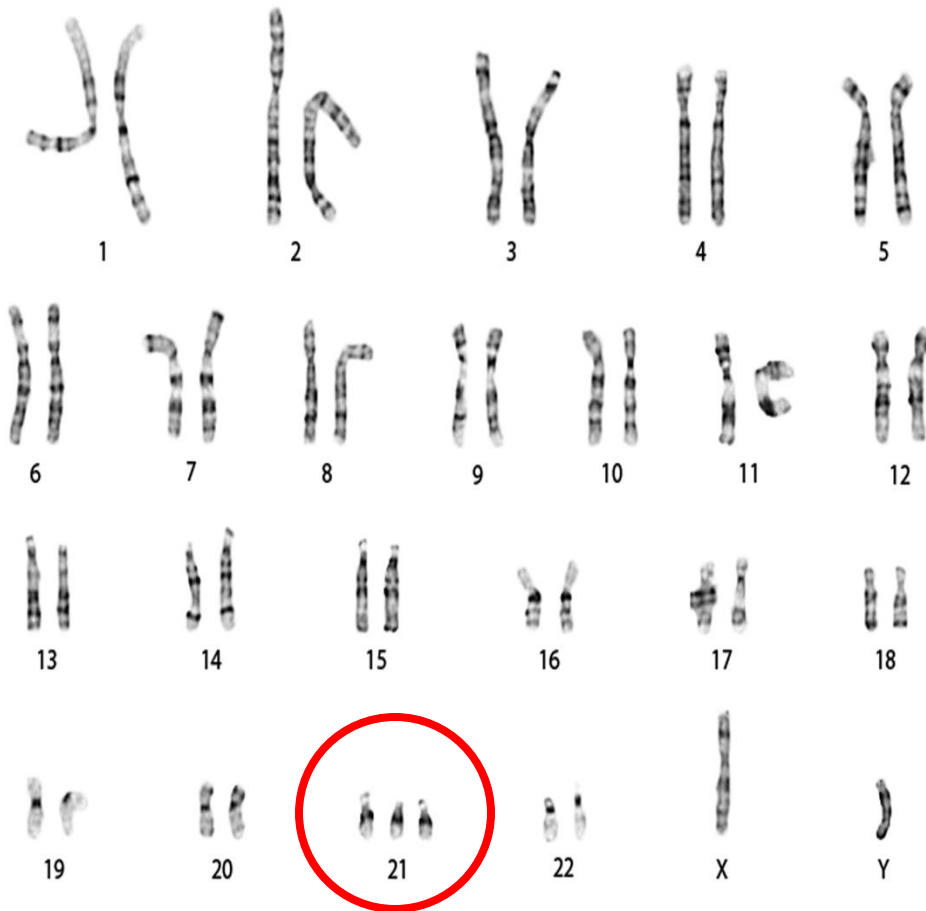
23 chromosomes from sperm

Normal (Euploid) Embryo = 46 total chromosomes
(23 pairs of chromosomes)

Abnormal Embryo Inherits More / Less than 46 Chromosomes



Male Karyotype with Trisomy 21 (Down syndrome)



Three copies of chromosome 21 (trisomy 21)
47 total chromosomes (abnormal, should be 46)

Embryo inherits additional copy of chromosome 21 from egg or sperm

Genetic imbalance leads to Down syndrome

Comprehensive Chromosome Screening



Identifies the number of chromosomes in each embryo

Only chromosomally normal (euploid) embryos are available for transfer

Chromosomally abnormal (aneuploid) embryos are NOT transferred

Retrieval Day (Day 0)

Eggs are surgically retrieved

Partner provides semen sample

Intracytoplasmic Sperm Injection
(ICSI) used to fertilize the egg



Early Embryo Development



Day 2
2-4 cells



Day 3
6-8 cells



Day 5 or day 6
Blastocyst stage

Sources of Chromosomal Material for CCS



Blastocyst Biopsy
Day 5 or Day 6

A small portion of cells taken from the embryo wall (trophectoderm) to be used for CCS testing

Post Biopsy

Three events occur:

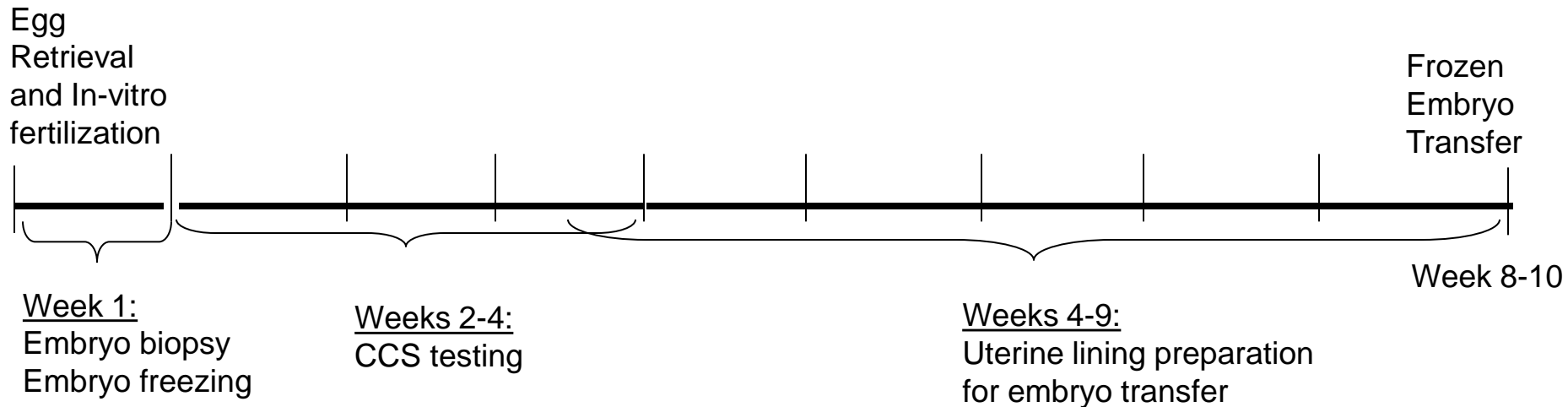
1. Biopsied cells packaged and shipped to Fertility Genetics in Colorado
2. CCS testing begins on biopsied cells at Fertility Genetics
3. Embryos undergo vitrification (freezing)
 - Frozen embryos stored at CCRM Orange County

Results

- Available in 2-4 weeks post biopsy
- Reported to patient by nurse or doctor
- Patient is calendared for future frozen embryo transfer of chromosomally normal (euploid) embryos at CCRM Orange County after results are reported

CCS Timeline

- Oocyte retrieval and In-vitro fertilization
- Embryo biopsy and embryo freezing (vitrification)
- CCS testing (2-4 weeks)
- Uterine lining preparation (4-6 weeks) for embryo transfer
- Frozen embryo transfer (FET) of normal (euploid) embryos



Risks of CCS

- Damage to embryo
 - From biopsy or freezing
- No results upon analysis
 - Insufficient material
 - Damaged sample or lost sample with shipping
 - Problems with analysis
- Misdiagnosis
 - Nothing is 100% accurate
 - Small error rate, but it does exist