

Comprehensive Chromosome Screening (CCS)

Aims of chromosome screening

The aim of chromosome screening is to achieve the birth of a healthy baby in the shortest time using the safest approach.

- Reducing the number of miscarriages
- Reducing the risk of an abnormal pregnancy
- Reducing the time and cost to achieve a healthy baby by reducing the number of repeat IVF cycles
- Reducing the number of multiple pregnancies by transferring embryos with the best chance of producing a baby
- Provides helpful diagnostic information for patients considering further IVF treatment or egg donation.

Screening for aneuploidy in an IVF cycle

Why are chromosomes important?

Many IVF cycles can result in disappointment as embryos fail to implant. This may be explained by having an incorrect amount of genetic material (known as chromosomes) in embryos being transferred. Missing or extra chromosomes in embryos is called aneuploidy. Whilst some aneuploidy embryos can lead to the birth of a baby with Down Syndrome caused by an extra copy of chromosome 21 and Edwards Syndrome, caused by an extra copy of chromosome 18; the majority of pregnancies with aneuploid embryos result in miscarriages.

With advancing age a woman's risk of aneuploidy increases. Clinicians believe this is the main reason why birth rates fall for women in their late thirties and early forties. See graph below:

How is the screening performed?

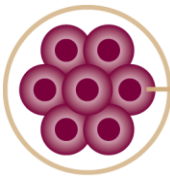
A single cell is removed from the embryo or egg and is screened for all the chromosomes in the cell. It does this by scanning for thousands of sequences of DNA unique to each chromosome. Removing cells from embryos or eggs is called a biopsy.

Embryo biopsy – chromosomes can be screened from a single cell of a Day 3 embryo known as a blastomere or usually 3 to 5 cells from a Day 5 embryo or "blastocyst". Following screening, the results are available before the embryo is transferred to the womb.

What are the success rates?

IVF success rates vary depending on the individual's circumstances, however, screening for chromosome numbers before embryo transfer increases the chance of transferring embryos that are most likely to implant. Screening may reduce miscarriage or a pregnancy at risk of a baby with a genetic condition. In a recent published paper, pregnancy rates were shown to be improved by 65% after transferring embryos with the correct amount of chromosome numbers (n=55 cycles).

*Yang *et al.*, (2012)



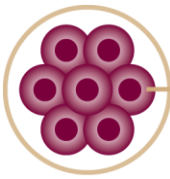
REPRODUCTIVE GENETICS @ NFC

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Tel: 615-277-2448 Fax: 615-277-2458

Factors of the CCS test

- Freeze All. RG@NFC will provide results within 4 weeks of the date of embryo biopsy.
- Failed Amplification (No Result) – This occurs on 3-4% of cells and is usually an indication of poor embryo quality.
- Misdiagnosis rate 2%
- Prenatal testing is still recommended



CCS Biopsy Information

❶ Please label tube numbers the same as your embryos are numbered to avoid potential confusion. Embryo and tube numbers do not have to be consecutive. On the side of the tube containing the cell sample, label the first five letters of the patient's last name, the last five digits of the unique identifier assigned by RG@NFC, and the embryo #. Close tube and on the top put embryo # followed by patient's initials underneath the #. For the control tube label with the Embryo # followed by the letter B and the patient's initials.

❶ Please designate between 6 and 9 with an underline.

❶ Transfer the cell in as minimum of a volume as possible

Supply List

Sterile Tubes

Sterile Rack

Sterile Gloves

Sterile Saline with PVP (in lab freezer)

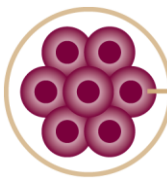
0.2ul pipetter with individual sterile tips

Unopened sleeve of dishes

Stripper with tips or mouth pipet and sterile pulled glass pipets

Marker for labeling the tubes

Patient folder and labels



REQUISITION FORM

PATIENT AND IVF CLINIC INFORMATION:

IVF center: _____	ID # in referring center: _____
Female name: _____	Female DOB: _____ Age: _____
ID # _____	
Male name: _____	Male DOB: _____ Age: _____
If this is a recipient cycle, you must fill information on the donor below:	
Lab ID: _____	Donor DOB _____ Age: _____
Requesting physician _____	Phone: _____
Email: _____	Emergency #: _____

Reason for the PGD (mark as much as necessary):

<input type="checkbox"/> Repetitive abortion (>3 miscarriages)	<input type="checkbox"/> Advanced maternal age
<input type="checkbox"/> Previous abortion (1 or 2 miscarriages)	<input type="checkbox"/> Repetitive IVF failure (>3 IVF attempts)
<input type="checkbox"/> Previous aneuploidy conceptions	
indicate chromosomes: _____	
<input type="checkbox"/> X-linked disorder (indicate the disorder): _____	
<input type="checkbox"/> Translocation or inversion: _____	
(indicate the karyotypes of the carrier)	
<input type="checkbox"/> Robertsonian translocation: _____	
<input type="checkbox"/> Male factor (indicate type): _____	

Test Requested:

<input type="checkbox"/> Aneuploidy 9 chromosomes (XY, 13, 15, 16, 17, 18, 21, 22)	
<input type="checkbox"/> Comprehensive Chromosome Screening (24 chromosomes)	
<input type="checkbox"/> Gender Selection (3 chromosomes) in addition (XY,18)	
<input type="checkbox"/> Robertsonian translocation	<input type="checkbox"/> Reciprocal translocation/ inversion
<input type="checkbox"/> Other	
Diagnosis Code _____	

Physician Signature

Date

(please fax to 615-277-2458)