REPRODUCTIVE GENETICS @ NFC
345 23rd Avenue North, Suite 401, Nashville, Tennessee 37203
Tel: 615-277-2448 Fax: 615-277-2458

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)

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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

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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)

O.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

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EMBRYO BIOPSY WORKSHEET

Tube/ Embryo #	Cell (C) or Media Blank (MB)	Embryo Quality & # of cells	Nucleus Seen? Y/N	Nucleus Intact? Y/N	Comments	Embryo Quality at Transfer

Please photocopy this form as necessary for additional pages or future use. Fax the cover sheet and this form to 615-277-2458.

Include the originals with the samples. If you have any questions, please call 615-270-2448

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, 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

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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):

☐ Repetitive abortion (>3 miscarriages) ☐ Advanced maternal age

☐ Previous abortion (1 or 2 miscarriages) ☐ Repetitive IVF failure (>3 IVF attempts)

☐ Previous aneuploidy conceptions indicate chromosomes: _____

☐ X-linked disorder (indicate the disorder): _____

☐ Translocation or inversion: (indicate the karyotypes of the carrier) _____

☐ Robertsonian translocation: _____

☐ Male factor (indicate type): _____

Test Requested:

☐ Aneuploidy 9 chromosomes (XY, 13, 15, 16, 17, 18, 21, 22)

☐ Comprehensive Chromosome Screening (24 chromosomes)

☐ Gender Selection (3 chromosomes) in addition (XY,18)

☐ Robertsonian translocation ☐ Reciprocal translocation/ inversion

☐ Other

Diagnosis Code_____

_____ _____

Physician Signature Date

(*please fax to 615-277-2458)*