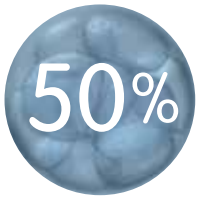
Reasons to use Next Generation Sequencing (NGS) to analyze fetal tissue:

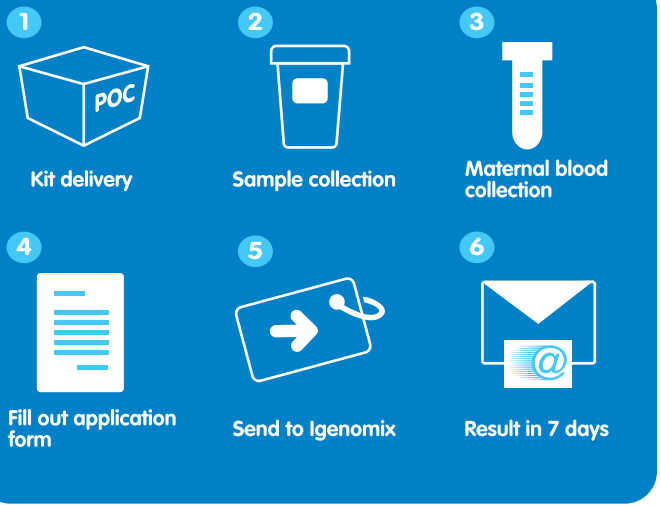
Conventional karyotype	NGS (POC)
Requires in vitro cell culture	1 It does not require in vitro culture
42% of the tests performed are not informative due to tissue degradation	2 More than 98% of tests performed have conclusive results
33.3% are false negatives due to maternal contamination	3 This technique rules out false negatives caused by maternal cell contamination
Results are provided in 2-4 weeks	4 Results are obtained in 1 week
Low resolution analysis	5 Higher resolution than conventional karyotyping



50% of first trimester miscarriages are due to **chromosomal abnormalities**

In women who undergo assisted reproduction this number exceeds **60%**

SIMPLE AND EASY



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POC Products of Conception

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POC Products of Conception

Next Generation Sequencing (NGS) to analyze fetal tissues

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PIONEERS IN REPRODUCTIVE GENETICS

What is POC?

NGS is a molecular technique that allows all **24 chromosomes** to be studied in order to rule out aneuploidies in fetal tissue.

- It does not require in vitro culture before the analysis. Thereby increasing the proportion of cases which obtain results reducing the time required to acquire them.
- In addition, the analysis of microsatellite markers in blood collected allows maternal cell contamination to be detected reducing the chances of false negatives.

What is POC useful for?

- Aneuploidies are chromosomal abnormalities that can lead to spontaneous miscarriages and chromosomal disorders in newborns (babies).
- Chromosomal abnormalities are responsible for **50%** of first trimester miscarriages occuring in both spontaneous conceptions and pregnancies resulting from assisted reproductive treatments. (Martinez *et al.*2010; Campos-Galindo *et al.*2012).
- Genetic diagnosis of the Products of Conception (POC) is necessary to identify the etiology of a gestation failure and to ensure appropriate counseling is provided to the couple.

Who is POC indicated for?

- It is recommended to any couple who have suffered a pregnancy loss, but especially to those who have experienced recurrent miscarriages or are undergoing assisted reproductive treatments.

How should the sample be collected?

- The sample is obtained either by direct biopsy after pre-curettage hysteroembryoscopy (which is then collected and transported in a 10 ml conical tube in sterile saline solution), or in conventional curettages samples (as far as possible avoiding the inclusion of maternal tissue) that are placed in a urine collection vial containing sterile saline. It is essential to also include 5 ml of maternal blood collected in an EDTA vial.

How should the sample be shipped?

- The sample is transported at room temperature in a sealed tube or urine collection vial using appropriate protective measures for shipment. The sample must be shipped within 48 hours. The sample should be stored at 4°C/ 39°F at the place of origin before transport.

How long does it take to obtain results?

- The laboratory protocol requires between 24h - 48h. The reports are issued within 1 week after we receive the sample.

one week

METHODOLOGY MAIN STEPS OF THE ANALYSIS

- **Identifying the cause of pregnancy loss may be of great benefit to couples who have experienced recurrent miscarriages**

Limitations

- This technique does not detect structural chromosomal abnormalities and cannot identify: low degree mosaicism aneuploidies, triploidy/tetraploidy, uniparental disomy, deletions or duplications smaller than 10Mb.

Campos-Galindo I, Martínez-Conejero JA, García-Herrero S, Ayala-Álvarez G, Rubio Lluesa C. Tecnología BACs-on-Beads™ aplicada al diagnóstico prenatal y al estudio citogenético de restos abortivos. Diag Pren. 2012 Volume 23, Issue 2, April-June 2012: 76-82.

Ferro, Jaime; Martínez, Ma.Carmen; Lara, Coral; Pellicer, Antonio; Remohí, José; Serra, Vicente. Improved accuracy of hysteroembryoscopic biopsies for karyotyping early missed abortions. Fertility and Sterility vol. 80 issue 5 November, 2003. p. 1260-1264.

Martínez MC, Méndez C, Ferro J, Nicolás M, Serra V, Landeras J. Cytogenetic analysis of early nonviable pregnancies after assisted reproduction treatment. Fertil Steril. 2010 Jan;93(1):289-92.