Advanced Embryo Selection
For chromosomal abnormalities
Preimplantation genetic diagnosis (or PGD) is a method of testing embryos for genetic abnormalities.

ArrayPGD is a Rapid Genetic Test of all chromosomes in a developing embryo, using a microchip.
Testing the chromosomes: What is it about?

A human cell contains genetic material arranged in dense strands, called chromosomes. A normal cell will contain 23 pairs of chromosomes. If a cell contains the wrong number of chromosomes, this will usually result in death of the embryo at a very early stage. Indeed, it is thought that abnormality in the number of chromosomes is responsible for many cases of implantation failure and recurrent miscarriage.

At IVFAustralia, we use the new technique, called Array Preimplantation Genetic Diagnosis (ArrayPGD) that enables the identification of every one of the 23 pairs of chromosomes in a single cell.

ArrayPGD has been extensively tested in Cambridge, UK and in a small number of other IVF/PGD laboratories in other countries and found to be highly accurate and reliable. This is a significant improvement in testing over the much older, CGH type technologies.

What are the limitations of this technology?

Although the expected degree of accuracy of ArrayPGD is high, all tests have a failure rate, and there is always a small possibility that any test result could be inaccurate.

A normal ArrayPGD result does NOT mean that the embryo will necessarily implant. The result only shows that the chromosomes are normal and therefore that the chances of a healthy ongoing pregnancy are higher.

Only embryos diagnosed as normal after ArrayPGD testing will be transferred, and surplus normal embryos may be frozen for future transfer.

It is expected that, 60-70% of embryos will be found to be abnormal and approximately 20-40% of patients will have no embryos suitable for transfer. Only good quality embryos on Day 3 or 5 can be biopsied. Some embryos will be poor quality even before biopsy takes place and, therefore, cannot be subjected to embryo biopsy.

Sometimes it will not be possible to obtain a result for every embryo and your doctor will then discuss with you what to do in that situation.

Very rarely, (fewer than 1% of embryos) an embryo may be destroyed during the biopsy procedure.
What happens during the actual IVF cycle?

During the IVF cycle, you will receive injections of female hormone (FSH) to stimulate your eggs to grow. You will then go through a short procedure under general anaesthetic to collect the eggs.

The eggs will taken to the IVF laboratory and will be fertilised with your partner’s sperm. After this, the embryos will be grown in the laboratory for five days.

On the third day of growth, a laser will be used to create a small hole in the embryo. After five days, a few cells will be obtained from each embryo and will be sent to the PGD laboratory for testing.
Once the embryos have been biopsied, all the embryos, that are suitable for freezing (possibly including some that have not been biopsied), will be cryo-preserved for later transfer.

Do be aware that the number of embryos that will be available for testing can be very variable.

At IVF, an average of 10 eggs may be collected of which about six (on average) fertilise.

Not all embryos grow well and an average of 2-3 embryos are commonly available for biopsy. However these numbers are only averages. Some women will have more eggs and embryos than this while other women will have fewer.
What approach should I take to testing my embryos for chromosomal problems?

There are two different approaches that can be taken to the testing of embryos for chromosomal problems.

**Day 3 biopsy**

The embryo is biopsied on Day 3 and the result is available by the time of transfer, thus enabling a fresh transfer to be performed of an embryo with normal chromosomes. As this approach requires a specific procedure to obtain a short-term result, the cost for this approach is a fixed price regardless of the number of embryos.

**Day 5 biopsy**

Here, the embryo is biopsied on Day 5, the embryos are all frozen ready for transfer at a later date. There is no difference in the implantation rate of a fresh or a frozen embryo.

There is no major difference between studying biopsies obtained on Day 3 and on Day 5. On Day 3, there are more embryos available for biopsy and a fresh embryo transfer is possible. However, because they are earlier embryos, a greater proportion of these embryos will be chromosomally abnormal and this can be frustrating.

At IVFAustralia, we will normally biopsy embryos on Day 5.

When this happens, the embryos will all be frozen and a frozen transfer arranged for the following cycle. At IVFAustralia, unlike other clinics, we carry out this frozen embryo transfer at no extra cost to you.

In this instance, the charge for PGD is set per embryo tested.

The results from the genetic testing of Day 5 embryos will be available within 10 days of the biopsy being performed. Your doctor and the genetics team will make arrangements to meet with you to go through the results.
Once the genetic testing results are available, you can discuss the next step with your doctor. If there is a genetically normal embryo available, your doctor can make arrangements to have this transferred. A frozen embryo transfer cycle normally involves a fee for the cycle. At IVFAustralia, where all the embryos have been frozen, we will provide the first frozen embryo transfer cycle with no out-of-pocket costs for the cycle.

Regardless of which approach is taken, the resulting number of embryos and the likelihood of success will be approximately similar. The optimum approach for you, will depend on your own individual circumstances, based on your doctor’s advice.
Typical Array PGD results

- Sperm and egg collection
- Intracytoplasmic sperm injection (ICSI)
- Fertilisation
- Day 3 embryo (8 cells)
- Day 5 biopsy for PGD testing
Result: MONOSOMY 7, TRISOMY 10 & 12

Result: TRISOMY 21

Result: NORMAL
Can frozen embryos be tested for PGD?

Yes. Frozen embryos can, after thawing, be tested by PGD and then, with a rapid approach, be replaced the following morning. As this approach requires a specific procedure to obtain a short-term result, the cost for this approach is a fixed price regardless of the number of embryos that are tested.

What does a normal test result mean?

This test studies all the chromosomes and large gene segments and will tell you whether your embryo has normal chromosomes, an important indicator of the likelihood of implantation and successful ongoing pregnancy.

As this test will only study whole chromosomes or large segments of a chromosome, it will not be possible to carry out a full genetic analysis of all the genes involved. There are many other genetic conditions, particularly those involving disorders of a single gene, which cannot be tested with this technique.

Embryos that are diagnosed as having abnormal chromosomes will be discarded.

Remember!
It will also be necessary to:

1. Use ICSI, where a single sperm is injected into the egg, to achieve fertilisation of the eggs in any case where ArrayPGD is being planned. This is to ensure that there are no spare sperm attached to the outside of the egg where they may contaminate the DNA analysis procedure.

2. Avoid unprotected Intercourse during the transfer cycle from Day 1 of treatment until 7 days after embryo transfer. It is vital, in an ArrayPGD cycle, to avoid a spontaneous conception, as, otherwise, we will not know whether the embryo in the uterus is definitely the same one that has been tested and transferred.

Using a condom (with or without spermicidal cream or jelly) is acceptable protection.

Spermicidal cream or jelly alone is not sufficient protection.

Withdrawal is not sufficient protection.
Can I find out the sex of my baby before transfer?

No. Information on the sex of the embryo will not normally be provided prior to embryo transfer. The only exception to this is where PGD is being performed with a medical reason for gender selection.

If a pregnancy results from the transfer, the gender can be made available at that time.

Why do I need to undertake a further genetic test during a resulting pregnancy even if the genetic test on the embryo shows it is quite healthy?

Because of the small possibility of a test result being false, and the serious consequences of this, it is strongly recommended that all women with a PGD pregnancy consider further prenatal testing.
# IVFAustralia’s Network of Care

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Consultation &amp; Monitoring</th>
<th>Consulting Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bondi Jn</td>
<td>16th Floor Westfield Tower 2, 500 Oxford St</td>
<td>8305 9800</td>
</tr>
<tr>
<td>Burwood</td>
<td>Suite 18 Level 7, 74-76 Burwood</td>
<td>8346 6840</td>
</tr>
<tr>
<td>Castle Hill</td>
<td>Suite 4, 15-17 Teminus St</td>
<td>9894 4419</td>
</tr>
<tr>
<td>Dee Why</td>
<td>Level 3, 834 Pittwater Road</td>
<td>9950 6000</td>
</tr>
<tr>
<td>Gosford</td>
<td>Level 2 Suite 24, 207 North Albany St</td>
<td>4349 2000</td>
</tr>
<tr>
<td>Greenwich</td>
<td>Level 2, 176 Pacific Highway</td>
<td>9425 1600</td>
</tr>
<tr>
<td>Haymarket</td>
<td>Level 5 Room 521 Sussex Centre 401 Sussex St</td>
<td>9281 3822</td>
</tr>
<tr>
<td>Kogarah</td>
<td>Level 3 St George Private Hospital South St</td>
<td>8567 6955</td>
</tr>
<tr>
<td>Liverpool</td>
<td>Ground Floor 16-18 Bigge St</td>
<td>8844 1575</td>
</tr>
<tr>
<td>Maroubra</td>
<td>Level 1, 225 Maroubra Rd</td>
<td>8372 3200</td>
</tr>
<tr>
<td>Miranda</td>
<td>Suite 4, 20-24 Gibbs St</td>
<td>8567 6980</td>
</tr>
<tr>
<td>Newcastle</td>
<td>The Heights Private Medical Centre</td>
<td>4957 8515</td>
</tr>
<tr>
<td></td>
<td>2 Lookout Rd New Lambton Heights</td>
<td></td>
</tr>
<tr>
<td>St Leonards</td>
<td>16 Marshall Ave</td>
<td>9439 3158</td>
</tr>
<tr>
<td>Sydney CBD</td>
<td>Level 1, 33 York St</td>
<td>8346 6800</td>
</tr>
<tr>
<td>Wahroonga</td>
<td>Suite 103 Tulloch Building Sydney Adventist Hospital 185 Fox Valley Road Wahroonga</td>
<td>9425 1780</td>
</tr>
<tr>
<td>Westmead</td>
<td>Level 2, 20-22 Mons Rd</td>
<td>8844 1550</td>
</tr>
<tr>
<td>Wollongong</td>
<td>10 Sutor Place Figtree</td>
<td>4271 3900</td>
</tr>
</tbody>
</table>


A member of [Virtus Health](http://virtushealth.com.au)