



# Listening & Learning



Reviewing the case by case approach  
to the licensing of Preimplantation  
Genetic Diagnosis

1 December 2009  
The Barbican Centre  
Silk Street, London

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## Welcome

Dear Colleagues,

I would like to thank you most warmly for deciding to attend this consultative meeting to discuss case by case decision making in embryo testing. It is important that we at the HFEA should learn from those affected by, and those who have an interest in these licensing decisions. Your contribution today will help to ensure that any changes we make are informed by your views.

The licensing of embryo testing is now set out in law, but it is important that we remember not to see this solely as a matter of regulatory decisions taken by a statutory authority. This is especially true of decisions we take on applications made by particular families. Our decisions determine whether or not that family can proceed with treatment. We must also not forget that the wider public continues to take an interest in, and sometimes has concerns about regulatory decisions involving genetic testing and reproductive technology.



Tests which we license on a family by family basis, such as tests for cancer susceptibility and for tissue typing have historically attracted special attention. It is because of the specific concerns that these cases raise that we have taken a different approach to their licensing. It is also because of these concerns that we are now taking this opportunity to hear your views on the appropriateness of this approach, in order to see whether it remains the most robust, efficient and proportionate way to continue.

This document provides you with important background information, highlights areas to be discussed on the day, and identifies those areas where the HFEA would particularly value your advice. We would be grateful if you would familiarise yourselves with its contents in advance of the meeting.

I hope you enjoy what promises to be an instructive and stimulating event.

Best wishes,

A handwritten signature in black ink that reads "Lisa Jardine". The signature is written in a cursive, flowing style. There is a small mark resembling a closing parenthesis or a flourish at the end of the signature.

Professor Lisa Jardine CBE  
Chair, Human Fertilisation and Embryology Authority

## Overview

The Warnock Committee report, which formed the basis for the Human Fertilisation and Embryology Act 1990, set out that the human embryo has a special status, and should be afforded some protection in law. The Warnock report also sets that this protection should not be absolute and needs to be balanced against potential benefits – for example, the use of human embryos in research.

This recognition of the special status of the embryo is central to the work of the Human Fertilisation and Embryology Authority (HFEA) and the decisions we take. This is why regulatory decisions such as licensing preimplantation genetic diagnosis (PGD) for later onset, lower penetrance conditions and for tissue typing have been taken with caution, care, and, as with today's event, in consultation with those affected.

On the 1<sup>st</sup> of October 2009 the Human Fertilisation and Embryology Act 2008 came into force, amending the Human Fertilisation and Embryology Act 1990. The changes contained in the Act clearly set out that embryo testing must continue to be licensed by the HFEA, and details the statutory tests that must be satisfied before such licences are issued.<sup>1</sup> The Act also sets out the circumstances in which the tissue typing of embryos is a licensable activity.

When licensing the testing of embryos for genetic abnormalities, the Authority must be satisfied:

- that there is a risk that the embryo has the abnormality being tested for
- that there is a risk that a person with the abnormality will have or develop a particular condition
- that the particular condition is serious.

In response to these changes, the HFEA recently redesigned the PGD licensing process, outlined in the box below.

### The licensing of preimplantation genetic diagnosis from October 1<sup>st</sup> 2009

When a clinic wishes to set up a PGD service, they need to apply to the HFEA to become licensed for this activity. Once licensed, they may carry out the PGD testing for any condition previously approved by the HFEA.

If that clinic wishes to offer PGD for a condition not previously approved by the HFEA then they must apply to do so, setting out how they consider the genetic condition in question meets both the risk and seriousness requirements in the new Act. These applications are considered by the Licence Committee of the HFEA, which is comprised of Authority members. The Licence Committee meets once a month.

In most instances, an HFEA Licence Committee will now consider a licence application for a genetic condition only once. Once we agree that the condition applied for meets the statutory tests, any clinic licensed for PGD in the United Kingdom will be able to test for that condition.

<sup>1</sup> *Human Fertilisation and Embryology Act 2008 Sch. 2(3).*

There are two categories of condition which continue to be treated separately from this process, and are considered on a case by case basis. For these, we require PGD clinics to submit a licence application based upon the details of the family seeking treatment.

These are tests:

- for conditions which develop later in life, where the genetic abnormality tested for does not inevitably lead to that condition developing and where there is a form of therapy available (referred to here as later onset, lower penetrance conditions)
- intended to secure that a resulting child would have compatible tissue with (and thus could act as a donor for) an existing sibling with a serious medical condition. Since October 1<sup>st</sup>, preimplantation tissue typing applications for conditions previously licensed by the Licence Committee have been delegated to the **Executive Licensing Panel (ELP)**.<sup>2</sup>

When the HFEA decided that we would consider applications to test for later onset, lower penetrance conditions and preimplantation tissue typing on a family by family basis, we committed ourselves to reviewing this decision once evidence had accumulated. Now that the bulk of the Human Fertilisation and Embryology Act is in force, a new process for PGD licensing is in place, and both the sector and the HFEA have several years of experience to draw on, we are in an ideal position to review the case by case licensing approach.

Your contributions today will help to ensure that decisions we take about the future of the licensing process for all categories of PGD is proportionate, robust, and efficient.

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<sup>2</sup>The amendments to the Human Fertilisation and Embryology Act 1990 allow for some licensing decisions to be delegated to the HFEA Executive. In response to these changes, the HFEA has created a panel of senior executive staff called the Executive Licensing Panel (ELP) which meets every fortnight.

## Meeting aim

The aim of the meeting on the 1<sup>st</sup> of December is to seek the views and the advice of those who are involved in, affected by, or concerned about the way we license testing embryos for later onset, lower penetrance conditions and preimplantation tissue typing.

The afternoon will start with an expert panel discussion, members of which were selected for their knowledge and perspective on the case by case approach to the licensing of embryo testing in the United Kingdom. Following the panel discussion, there will be an opportunity to participate in a question and answer session.

Participants will then break up into two parallel workshops based on their area of interest. In these workshops participants will have the opportunity to set out their views in more detail and to respond to the specific questions set out in this pre-meeting document. One workshop will focus on case by case licensing of later onset, lower penetrance conditions, and the other workshop will focus on case by case licensing of tissue typing.

This meeting will *not*:

- seek views on the in-principle appropriateness of PGD, or preimplantation tissue typing.
- seek views on the existing Code of Practice guidance on embryo testing and tissue typing.

## Agenda

1:00	Registration (lunch available) – <i>Conservatory terrace</i>
1:45	Introduction from Juliet Tizzard, HFEA Head of Policy
2:00	Panel presentation – <i>Redgrave room</i> - Dr Sue Price, HFEA Authority Member - Dr Sioban Sengupta, UCL Centre for PGD - Dr David King, Human Genetics Alert  Chaired by Juliet Tizzard  Discussion
3:15	Consultation workshops run in parallel (tea and coffee available)  <b>Case-by-case licensing of lower penetrance, later onset conditions</b> A workshop in which participants will be asked for their experience of the case by case licensing process lower penetrance, later onset conditions and consulted on alternative models for the future. ( <i>Redgrave room</i> )  <b>Case-by-case licensing of tissue typing applications</b> A workshop in which participants will be asked for their experience of the case by case licensing process for preimplantation tissue typing and consulted on alternative models for the future. ( <i>Mozart room</i> )
4:15	Plenary – summing up and next steps
4:30	Close

## Licensing later onset, lower penetrance conditions for use in PGD

### What are later onset, lower penetrance conditions?

It is possible to use PGD to test embryos for the presence of genes that result in an increased predisposition to cancer. These include tests for increased susceptibilities to forms of ovarian, breast and bowel cancer. The HFEA has considered conditions to fall into this category if they meet three criteria:

- they are lower-penetrance (not everyone with the faulty gene will develop the cancer)
- the cancers have a later age of onset (often in adult life)
- there is a possibility for preventative surgery, early detection and effective treatment for these cancers in susceptible individuals.

Though the conditions licensed so far usually involve increased predispositions to cancer, other genetic susceptibilities which meet the above criteria would be considered in the same way.

### The 'Choices and Boundaries' policy review

In 2005, the HFEA established a policy review to consider how to approach licensing emerging tests for genetic susceptibility to disease. A public event was held on the 12th of December 2005 and the review also sought written submissions.

The results of this review were taken to the Ethics and Law Committee (ELAC) of the HFEA.

ELAC recommended to the Authority that:

- The penetrance of a condition is not the only factor that determines significant risk, although it is relevant. Also important is how the risk is perceived by a person seeking treatment. For serious conditions, even a lower risk of penetrance can be perceived as unacceptable to a person seeking treatment.
- That the cancer susceptibility conditions identified by the policy review (BRCA1, HNPCC) could be considered serious genetic conditions because they cause suffering and are life-threatening.
- The fact that the inherited cancer conditions under consideration are later onset, have a lower penetrance and are in some cases treatable is not incompatible with the fact that these are serious genetic conditions, and a Licence Committee should, in principle be able to then license for use in PGD.

The Authority considered the recommendations of ELAC, and decided in June 2006 that it was acceptable for a Licence Committee to license later onset, lower penetrance conditions. It was agreed that this should proceed on a **case by case** basis, with a review to be carried out once evidence and experience had accumulated.

*“The Authority decided that applications for lower penetrance conditions should initially be considered on a **case-by-case basis** because of the difference in the way that families are affected by these conditions and also because this is a new class of PGD conditions.*

*This will be reviewed in two years when the Authority has more knowledge and experience of dealing with such applications.”*

### **The current licensing application process for later onset, lower penetrance applications**

1. When a clinic wishes to carry out PGD to test embryos for later onset and lower penetrance conditions, they must have a specific family in mind. For each family case in which a clinic wishes to test for later onset and lower penetrance conditions, they must apply to the HFEA.
2. The clinic follows the guidance in the HFEA Code of Practice when deciding whether treatment is appropriate for that family. The guidance advises that clinics should discuss the seriousness of the condition with the family, and take into account the family's perception of the level of risk of passing on that condition. The clinic should also consider the availability of effective therapy, the suffering associated with the condition, amongst other criteria.
3. The clinic then lodges a case by case application form with the HFEA, based upon that family's case. This form requires clinics to provide evidence which details why the condition should be considered serious, whether there is a risk that the embryo has the relevant abnormality, and whether there is a risk that an embryo with that abnormality will develop the relevant condition.
4. The application is then considered by a Licence Committee of the HFEA, comprised of Authority members. The Licence Committee must ensure that the statutory requirements in the amended HFE Act are met.

Since 2006, Authority has issued 8 licences for later onset, lower penetrance conditions. These include:

▶ **BRCA1**

Women who have an abnormal BRCA1 gene have up to an 85% risk of developing breast cancer by age 70. Women with BRCA1 abnormalities also have a 55% lifetime risk of developing ovarian cancer. Prophylactic options to reduce the risks of breast and ovarian cancer (mastectomy and oophorectomy) are often considered.

▶ **Lynch syndrome (HNPCC)**

Individuals with HNPCC have up to an 80 per cent lifetime risk of colorectal cancer and increased risks of uterine cancer and other mostly gastrointestinal cancers. The age of diagnosis of colorectal cancer in the condition is usually in the forties, but can be earlier.

▶ **Carney complex**

Carney complex is associated with skin pigmentation, and benign or cancerous tumors of the endocrine glands. The age of onset varies from birth to adulthood. People with Carney complex have an increased risk of cancer, but the specific risk is unknown. Types of cancer reported include thyroid, colorectal, and pancreatic.

▶ **Hereditary diffuse gastric cancer (HDGC)**

HDGC is an increased susceptibility to diffuse gastric cancer. The average age of onset is in the late thirties, with a range of 14-69 years. The estimated risk of gastric cancer by age 80 years is 67% for men and 83% for women. Women also have a 39% risk for lobular breast cancer. Management of individuals is through either monitoring and treatment or prophylactic gastrectomy.

## To think about before the workshops

Before the workshops, we would like you to think about the following areas:

### ? **The costs and benefits of addressing applications for later onset, lower penetrance conditions on a case by case basis.**

- ▶ What are the costs to clinics, the HFEA and families of approving these licences on a case by case basis? Time, resources?
- ▶ Are these costs balanced by the benefits of taking a case by case approach? What do you think the benefits might be to clinics, to the HFEA, to families or to society?
- ▶ What quality and rigour does the case by case approach add – is there a continued benefit in caution?

### ? **What differences might there be between family cases in later onset, lower penetrance applications?**

- ▶ How might each family be differently affected by the knowledge they have an increased risk of cancer, and the knowledge that they might pass on to their children that increased risk?
- ▶ Are there any clinical differences between families at risk of a particular heritable later onset, lower penetrance condition such as BRCA1?
- ▶ Do you think any of the identified differences are *relevant* differences for the HFEA to consider continuing to license these applications on a case by case basis, or could these differences be addressed by clinicians?

### ? **Ways of licensing later onset, lower penetrance conditions:**

*(Remember that the law requires that embryo testing must be licensed by the HFEA, and the HFEA needs to be satisfied of the statutory criteria of seriousness and risk)*

1. Status quo: Continue licensing applications on a case by case basis. The Licence Committee would continue to be responsible for licensing novel conditions, and also for licensing subsequent applications from further families for the same condition.
2. Continue licensing applications on a case by case basis. However, the Licence Committee would only consider licence applications for novel conditions, with the Executive Licensing Panel (ELP) responsible for licensing applications from subsequent families. The delegation of subsequent decisions to the ELP may help to resolve concerns about the time the process takes.<sup>3</sup>
3. Cease licensing on a case by case basis. The Licence Committee would continue to license novel conditions, but once they are satisfied of the criteria of risk and seriousness, the clinician would have sole responsibility for deciding the appropriateness of treatment in particular cases using HFEA Code of Practice guidance. Departures from Code of Practice guidance would be investigated on inspection. This would bring later onset, lower penetrance conditions in line with other PGD applications.

- What might be lost, or gained, in each of these scenarios?
- Are there any alternatives?

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<sup>3</sup> Note that while applications for BRCA1 approved by the Licence Committee have previously taken between 1-3 months to approve, applications considered by the ELP for existing licensed conditions could be approved in 1 to 4 weeks.

# Licensing preimplantation tissue typing of embryos

## What is preimplantation tissue typing?

Preimplantation tissue typing uses the same techniques as PGD, but involves testing for the embryo's tissue type. This allows the selection of embryos which will be a tissue match with an existing sibling who is in need of a tissue transplant. If a child is born as a result, blood from the umbilical cord can be retained and stem cells taken to treat the sick sibling. Children conceived through preimplantation tissue typing, as with any tissue donor, receive the full protection of the law and Human Tissue Authority consideration.

In most cases, tissue typing of embryos is carried out in combination with PGD to additionally ensure that the child born does not inherit the condition. However, in some cases the condition the older sibling suffers from is not heritable, and in these cases preimplantation tissue typing is carried out without the additional step to test the embryos for that condition.

## Policy reviews and the amended HFE Act 1990

### The 2001 policy review

In November 2001, following consideration of the issues raised by the possibility of preimplantation tissue typing, the HFEA produced an interim policy on preimplantation tissue typing. This policy was produced on the basis of a detailed analysis of the issues by the HFEA's Ethics and Law Committee.

The Authority recognised that the decision to pursue preimplantation tissue typing was a personal one and involved complex motivations. It took the view that preimplantation tissue typing would not necessarily compromise the welfare of a child born as a result of the procedure. The Authority therefore agreed that in principle the procedure was acceptable, but that safeguards should be put in place in order to prevent unacceptable uses of the procedure.

At this point the HFEA took a cautious view, based upon the unknown risks of the biopsy required during testing to embryos. The Authority concluded that embryos should only be exposed to the risks of biopsy if there was also a demonstrable benefit to the embryo, namely that the embryo selected would also be free from the risk of inheriting the condition which the existing sibling has.

The Authority stated that the procedure would only be acceptable if applications for tests were considered on a **case by case** basis and that certain conditions were met, in particular:

1. That the embryos conceived in the course of this treatment should themselves be at risk from the condition by which the existing child is affected.
2. That the tissue to be taken from the tissue-matched child should be limited to cord blood, and not other tissues or organs.
3. That the condition of the affected child should be severe or life-threatening, of a sufficient seriousness to justify the use of PGD.
4. That all other possibilities of treatment and sources of tissue for the affected child should have been explored.

## The 2004 policy review

In 2004 the Authority decided to review the 2001 policy on the use of preimplantation tissue typing. This followed a court case which challenged the Authority's power to license preimplantation tissue typing and a sustained period of public and professional debate.

This review also involved an investigation of the risks of embryo biopsy to embryos tested. The Authority concluded following this investigation that the risks of biopsy were not significant enough to warrant a policy which prohibited tissue typing without a genetic testing step.

This review resulted in the following key modifications to the policy:

1. That the distinction be removed between cases in which preimplantation tissue typing is used in combination with PGD and where matching tissue type was the sole objective.
2. That the HFEA could not impose a condition preventing the future use of bone marrow, or other tissues from a tissue matched child. Any child born as a result of a licence granted by the HFEA would receive the consideration of both the Human Tissue Authority licensing process and the protection of common law prior to such donations being made.
3. A requirement that any application to carry out preimplantation tissue typing must be fully supported by the clinical team treating the sick child (usually a consultant haematologist or similar). The child's clinical team would be expected to have considered the availability of alternative treatments, and the availability of alternative sources of tissue for treatment.

The Authority concluded following this review that preimplantation tissue typing should continue to be available in cases in which there is a need for matched tissue and a likelihood of therapeutic benefit for an affected child. The Authority continued to regard preimplantation tissue typing as a treatment of last resort, and that it should continue to be considered on a **case by case** basis.

## The Human Fertilisation and Embryology Act 1990 (as amended)

Among the amendments made to the 1990 Act is the inclusion of a specific provision setting out that embryo testing for the purposes of tissue typing can be licensed by the HFEA. The Act limits this to cases intended to secure that a resulting child would have compatible tissue with an existing sibling with a serious medical condition, and that the sibling could be treated by that donation. A further restriction is that tissue typing cannot be licensed in cases where the intent would be to use a whole organ of the resulting child. Cord blood stem cells, bone marrow, and other tissues are permitted. This provision was subject to, and passed, a free vote in the House of Commons on 19<sup>th</sup> May 2008.

## SCAAC investigation into the risks of embryo biopsy

The 2004 policy on tissue typing recommended that the risks to embryos from embryo biopsy be kept under review. In 2008, the Science and Clinical Advances Committee (SCAAC) of the Authority conducted a further literature review regarding these risks and concluded that there was still no evidence to suggest that embryo biopsy had a detrimental effect on the health of children born following embryo testing.

### The current licensing application process for preimplantation tissue typing

1. Each time a clinic wishes to carry out preimplantation tissue typing, they must apply to the HFEA, basing the application on the family to be tested.
2. The clinic follows the guidance in the 8<sup>th</sup> edition of the HFEA Code of Practice when deciding whether treatment is appropriate for that family. The guidance derives from the 2001 and 2004 reviews, and includes statements that clinics should consider the availability of alternative therapy, and the availability of alternative sources of tissue.
3. The clinic completes a case by case application form with the HFEA, based upon that family's case. In addition to demonstrating that the condition meets the relevant statutory requirements, Clinics must also provide a letter from the clinician responsible for the care of the affected sibling which demonstrates that clinician's support for the proposed treatment. The letter must provide information about the degree of suffering associated with that sibling's condition, the speed of degeneration, other treatment options available, and whether alternative sources of tissue to treat that child are available.
4. In the case of novel conditions, applications are considered by the HFEA Licence Committee, comprised of Authority members. Where the conditions concerned have previously been licensed for other families, since October 2009 these decisions have been delegated to the ELP.

Since 2001, the Authority has issued 24 licences for specific families for preimplantation tissue typing. Conditions licensed have included:

▶ **Diamond blackfan anaemia**

Diamond blackfan anaemia (DBA) is a blood condition, characterised by a failure of the bone marrow to produce red blood cells. It can be treated with cord blood stem cells from an HLA compatible sibling. Most cases are sporadic (not heritable) but dominant heritability has been observed in some cases.

▶ **Fanconi's anaemia**

Fanconi's anemia is an inherited blood disorder that mainly affects the bone marrow. It results in decreased production of all types of blood cells. It can be treated with HLA compatible stem cells, derived from cord blood or from bone marrow.

▶ **Beta thalassaemia**

Beta thalassaemia is an inherited blood disorder involving the defective production of hemoglobin, the protein that enables red blood cells to carry oxygen. It can be treated with HLA compatible stem cells derived, from cord blood, or from bone marrow.

▶ **Acquired Aplastic anaemia**

Aplastic anaemia is a rare acquired disorder, in which there is a failure of the bone marrow to produce sufficient blood cells for the circulation. Acquired means that the condition is neither present at birth nor inherited but has developed during the patient's life. Aplastic anaemia can be treated with HLA compatible stem cells, derived from cord blood or from bone marrow.

## To think about before the workshops

Before the workshops, we would like you to think about the following areas:

### ? **The costs and benefits of addressing tissue typing applications on a case by case basis**

- ▶ What are the costs of approving these licences on a case by case basis? One concern we are aware of is that tissue typing decisions have a heightened urgency, because they involve an existing child with a degenerative disorder
- ▶ Are these costs balanced by the benefits of taking a case by case approach? For example, how else could it be demonstrated that tissue typing was used as a treatment of last resort, where other tissue donors were not available, and other therapies not possible?
- ▶ Is there a continued benefit in analysing each case, particularly now that the statute makes explicit provision for tissue typing?

### ? **What differences there might be between family cases when tissue typing is being considered**

- ▶ How might each applicant family be differently affected by their situation?
- ▶ Are the clinical differences currently examined between cases (whether tissue donation is the only effective treatment, whether there are other sources of matched tissue available) still relevant? Is this best demonstrated by the support of the sibling's treating clinician?
- ▶ Do you think any of the differences identified above are differences that the HFEA is well placed to, and should continue to consider on a case by case basis? If so, how is the evidence of these differences best captured?

### ? **Ways we could license tissue typing applications:**

*(Remember that the law requires that embryo testing must be licensed by the HFEA, and the HFEA needs to be satisfied of the seriousness of the condition the sibling suffers from)*

1. Status quo: Continue to license applications on a case by case basis. The Licence Committee would continue to be responsible for licensing novel conditions, and the ELP responsible for licensing applications from subsequent families, on the basis of evidence provided from the clinician responsible for the sibling's care. This delegation of subsequent decisions to the ELP may help to resolve concerns about the time the process takes.<sup>4</sup>
2. Centres to notify the HFEA of the intention to tissue type. The Licence Committee would continue to licence novel conditions. Clinicians would assess the appropriateness of treatment in particular family cases, using HFEA Code of Practice guidance. Centres would simply notify the HFEA that they intended to tissue type, by supplying to the HFEA a letter indicating the support of the sibling's treating clinician.
3. Cease consideration on a case by case basis. The Licence Committee would continue to license novel conditions. The clinician would have responsibility for deciding the appropriateness of treatment in particular cases, using HFEA Code of Practice guidance. The HFEA would require clinics to obtain the support of the sibling's treating clinician, as currently set out in the case by case application form. Evidence of this support and adherence to Code of Practice Guidance could be checked on inspection.

- **What might be lost, or gained, in each of these scenarios?**
- **Are there any alternatives?**

<sup>4</sup> Note that while applications approved by the Licence Committee have previously taken approximately 2 months to approve, applications considered by the ELP for existing licensed conditions were recently approved within 2 weeks.

## What happens following this event?

The outcomes of this meeting will be used to inform a policy recommendation which will be discussed by the HFEA's Ethics and Law Advisory Committee on **15<sup>th</sup> December 2009**. Following the Ethics and Law Committee discussion a final recommendation will be presented to a full meeting of the Authority on **20<sup>th</sup> January 2010**.

## Further information

If you would like further background information before attending this event, please visit the following pages on our website:

- Further information about this policy review:  
<http://www.hfea.gov.uk/5602.html>
- Information about preimplantation genetic diagnosis:  
<http://www.hfea.gov.uk/preimplantation-genetic-diagnosis.html>
- Information about preimplantation tissue typing:  
<http://www.hfea.gov.uk/saviour-siblings.html>
- Science and Clinical Advances Committee 2008 investigation into the risks of embryo biopsy  
[http://www.hfea.gov.uk/docs/SCAG\\_Preimplantation\\_Genetic\\_ScreeningFeb08.pdf](http://www.hfea.gov.uk/docs/SCAG_Preimplantation_Genetic_ScreeningFeb08.pdf)  
[http://www.hfea.gov.uk/docs/2008-02-21\\_SCAG\\_Minutes.pdf](http://www.hfea.gov.uk/docs/2008-02-21_SCAG_Minutes.pdf)
- Background information about the policy review informing the Authority's decision to licence, in principle, later onset and lower penetrance conditions  
<http://www.hfea.gov.uk/516.html>
- Background information about the 2004 policy review informing the Authority's decision to licence, in principle, preimplantation tissue typing  
<http://www.hfea.gov.uk/515.html>
- Information about recent changes made to the licensing process for preimplantation genetic diagnosis made, including the Authority decision to licence PGD conditions on a condition by condition basis  
<http://www.hfea.gov.uk/5259.html>

## Contact

If you have further questions about case by case licensing of embryo testing or would like to make a suggestion about this area of work, contact:

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