

Preimplantation Genetic Diagnosis for VHL and Birt Hogg Dube

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The PGD team

Genetic
Counsellors &
Clinical Geneticists

Specialists in
Reproductive
Medicine-
doctors &
nurses

Molecular
scientists &
cytogeneticists

Embryologist
s

PGD
Coordinator

Researchers

Paediatrician



Why PGD?

- Concern about having a child who inherits VHL/BHD
- Other options to prevent passing on the gene not acceptable or not first choice

Other options include:

Take a chance

Test a pregnancy (prenatal diagnosis) ☐

Sperm or egg donation

Adoption

Have no children

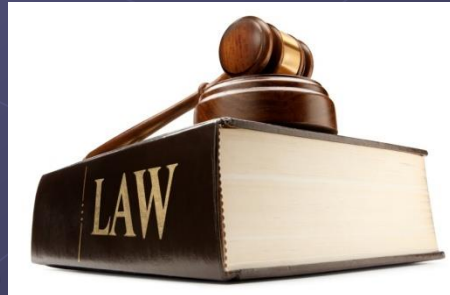


UK law & licensing

Human Fertilisation & Embryology Authority (HFEA)



- All centres must have a licence to offer PGD
- A licence is necessary for each new PGD condition
- VHL has an HFEA licence already



Cost & funding

New NHS England funding policy.

- Up to 3 cycles
- Scotland, Wales & Northern Ireland have different policies

To have funding agreed certain criteria must be met:

- No unaffected children of this union
- Female age is less than 40 yrs at start of treatment
- Non smokers
- Female body mass index (BMI) 19-29
- HFEA licence

If couple have to self fund it is around
£12,000 per cycle



So how do we do it?

PGD preparation timeline

PGD genetics appointment



HFEA licence application



Set up PGD laboratory test



PGD fertility unit appointment



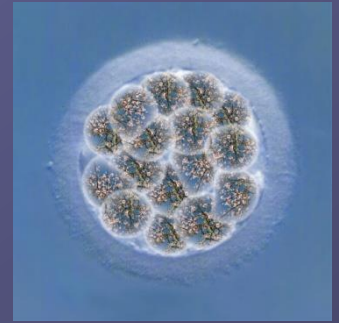
Start of PGD cycle

From 4-12
months



PGD cycle

Blastocyst biopsy with freezing



Step 1

Making the embryos,
followed by biopsy

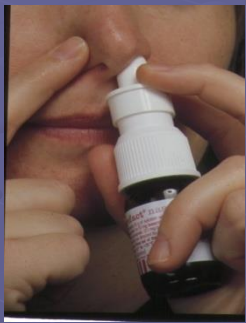
Freeze all
embryos while
testing
completed.

Step 2

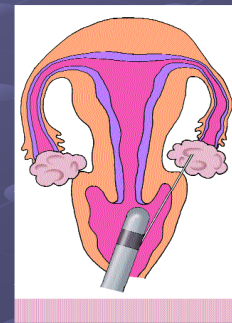
Transfer of unaffected
frozen embryo

12
weeks

PGD cycle to create embryos



+



Drugs used to stimulate the ovaries

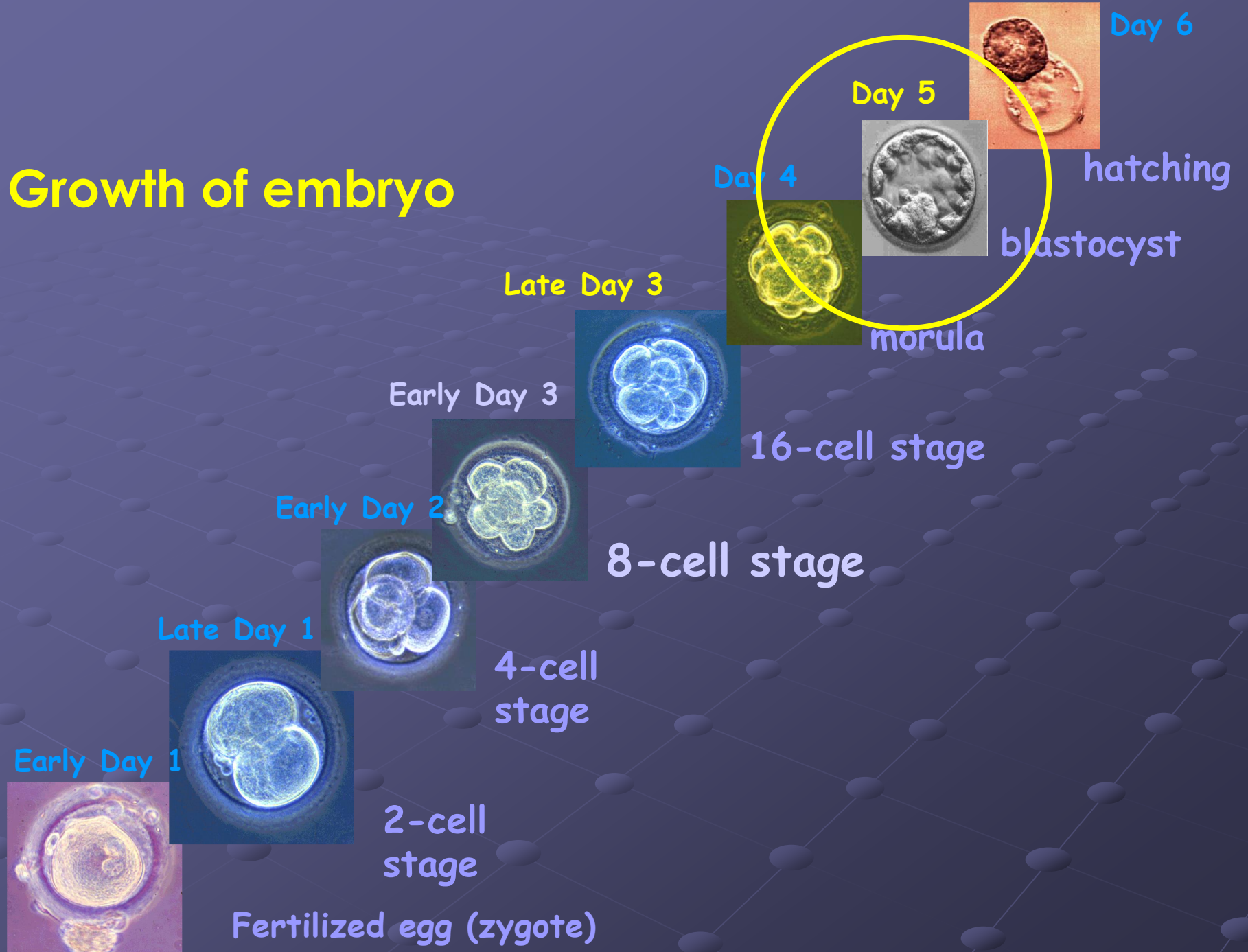
Ultrasound scan of egg production in ovary

Egg collection

Fertilisation with partner's sperm

3 weeks

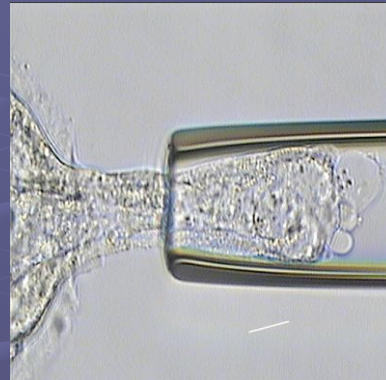
Growth of embryo



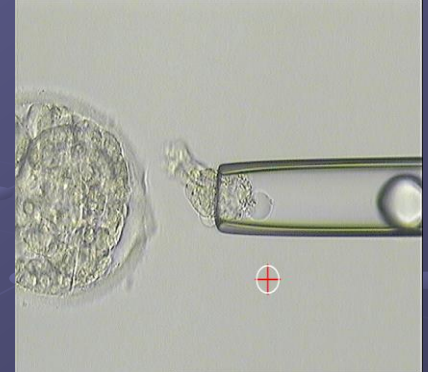
Blastocyst Biopsy



Blastocyst held in position



Trophectoderm cells extrude through small hole made in the outer coating of the embryo

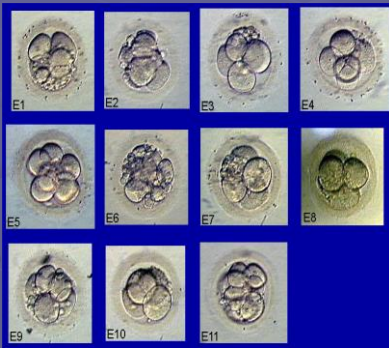


Cells removed and sent for testing



FREEZE ALL EMBRYOS

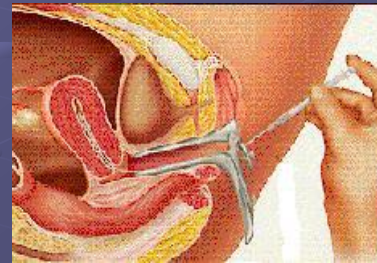
Embryo results to pregnancy test



Test the biopsy
from the embryos



Womb lining
preparation



Embryo transfer



Pregnancy test-
Positive or negative

7-8 weeks

Then.....

If pregnant:

- Confirmation of PGD?
- Antenatal care done locally
- Paediatric follow up;
 - birth
 - 18 months

If not pregnant:

- Follow up appointment
- Future options
 - Use other frozen embryos
 - New cycle
 - Stop

Does it work?

(Sept 1997- Dec 2014)

Cycles started	1741
Cycles to Embryo transfer	1255 (77%)

Ongoing pregnancy rate:
31% per cycle started
43% per embryo transfer

Probably higher because not all embryos have been transferred yet

Babies born (June 2015)

Total babies born = 626

- **464 singletons**
- **147 twins (74 x 2)**
- **15 triplets (5 x 3)**
- **84 ongoing pregnancies**



Limitations of
PGD; what can we
test for?

Success
rate

Multiple
pregnancy risk

Things to think about with PGD

Impact of
travel & cost

Emotional
rollercoaster

Health of the
mother &
pregnancy

Welfare of
the child

Accuracy of
test

So to finish.....

- PGD offers couples another option to have healthy children and success rates are improving.
- However it is important to discuss PGD alongside other options.
- Referral to specialist team needed by local genetics team
- It is complex and takes time so will not suit everyone.