

WHO'S
THE
DADDY?



The
University
Of
Sheffield.



British Fertility Society



Association of Biomedical Andrologists



Allan Pacey
University of Sheffield



Allan Pacey
University of Sheffield



The
University
Of
Sheffield.



British Fertility Society



Association of Biomedical Andrologists



Allan Pacey
University of Sheffield

In Vitro Fertilisation

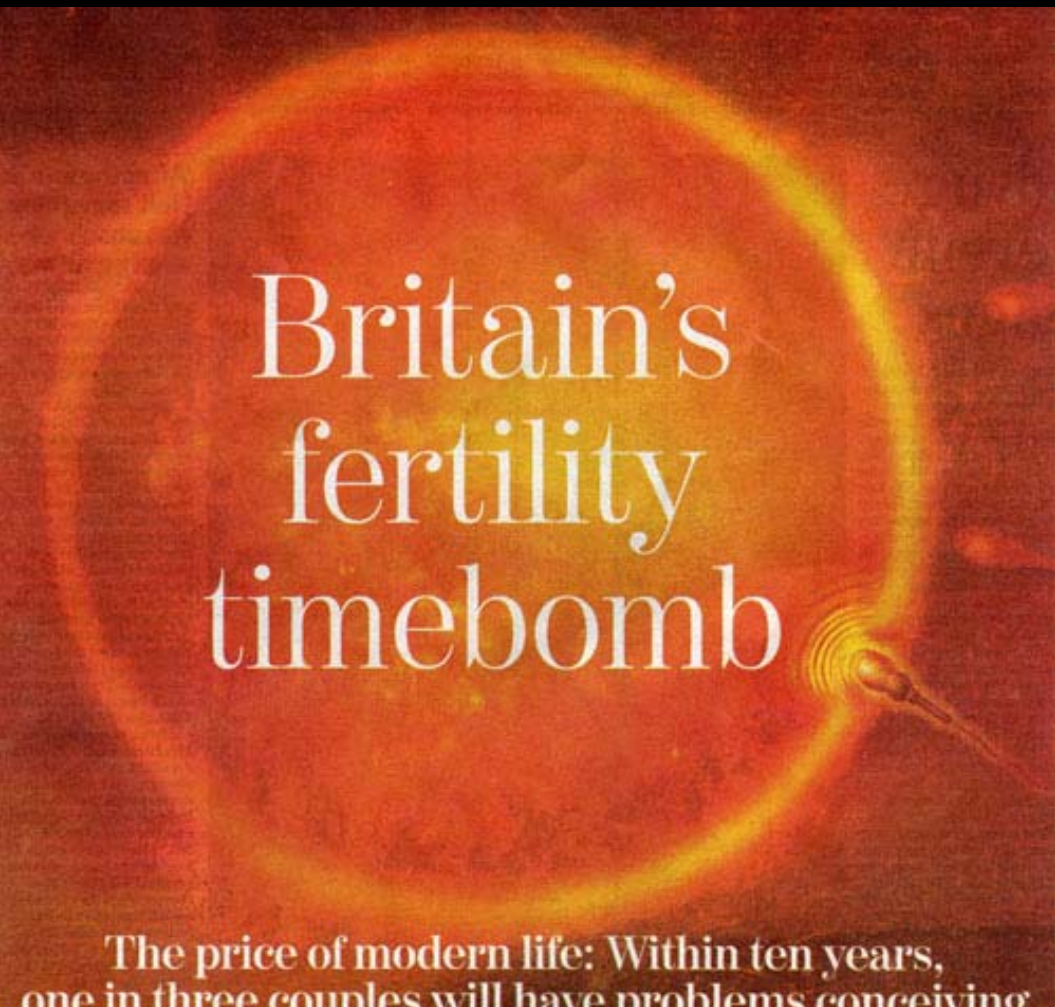


Patrick Steptoe, Jean Purdie, Louise Brown and Bob Edwards
25th July 1978

Background

Facts and Figures

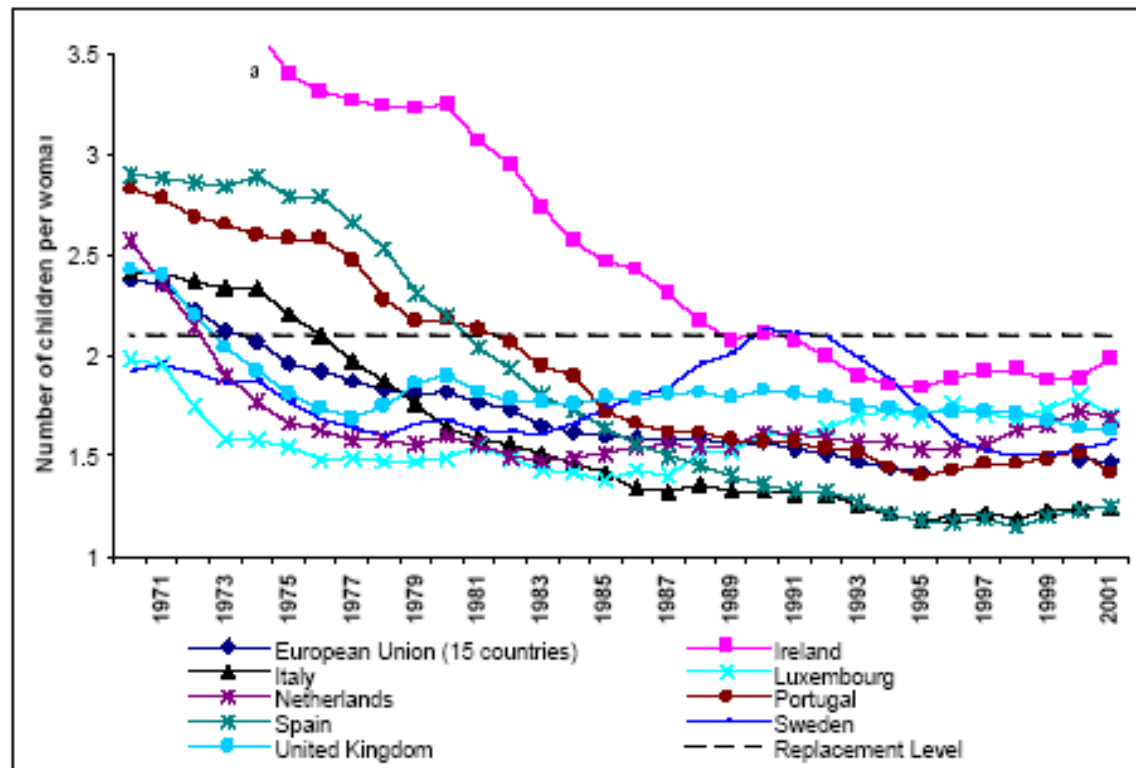
- Infertility is defined as failing to achieve a pregnancy after two years
- 1 in 7 couples in the UK have difficulty in conceiving
- Approximately 3.5 million people in the UK are sub-fertile
- After pregnancy, infertility is the commonest reason for women aged 20 to 45 to see their GP.



Britain's fertility timebomb

The price of modern life: Within ten years,
one in three couples will have problems conceiving

Population structure



a: Ireland, 1971, maximum value of 3.99

SOURCE: Eurostat NewCronos database (2002)

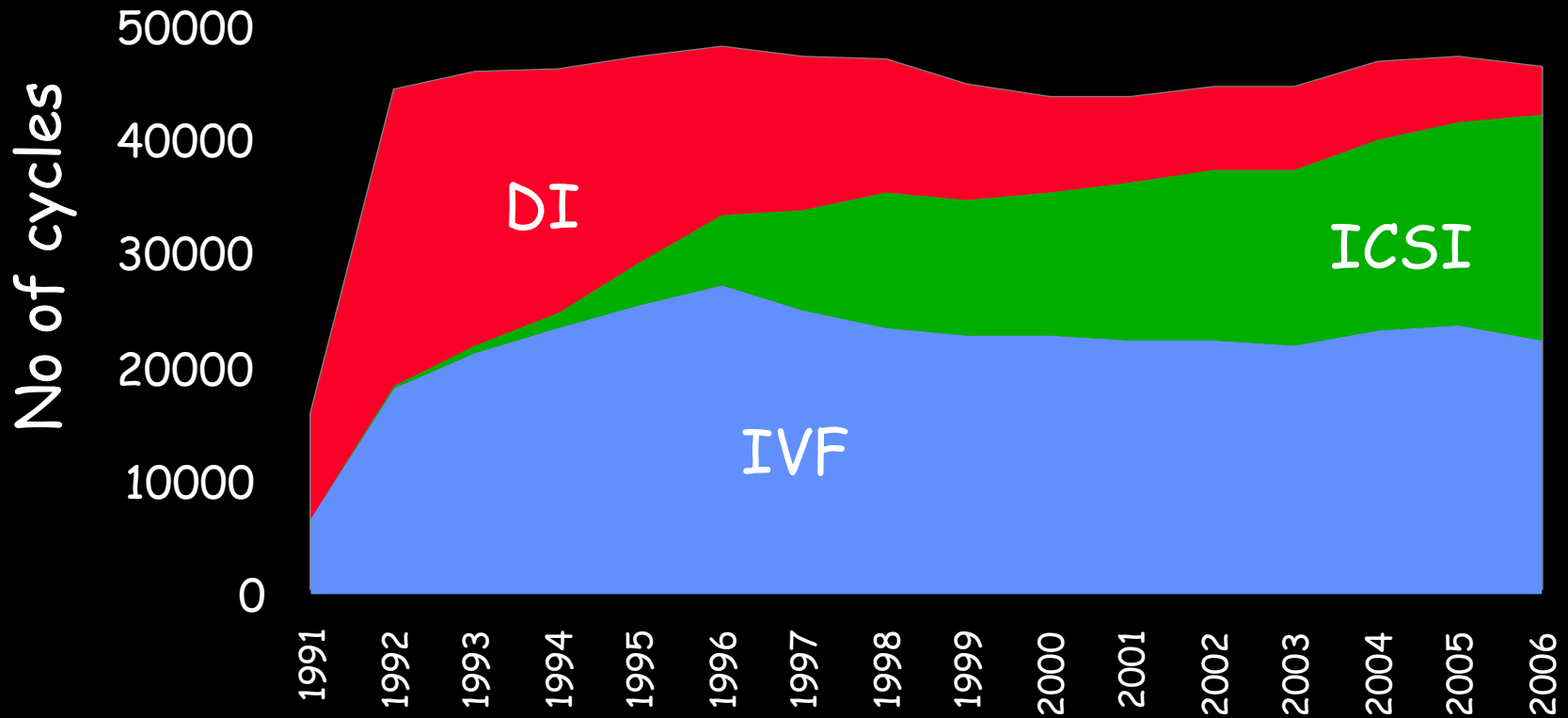
MC206-1.10

The UK Population in 2005



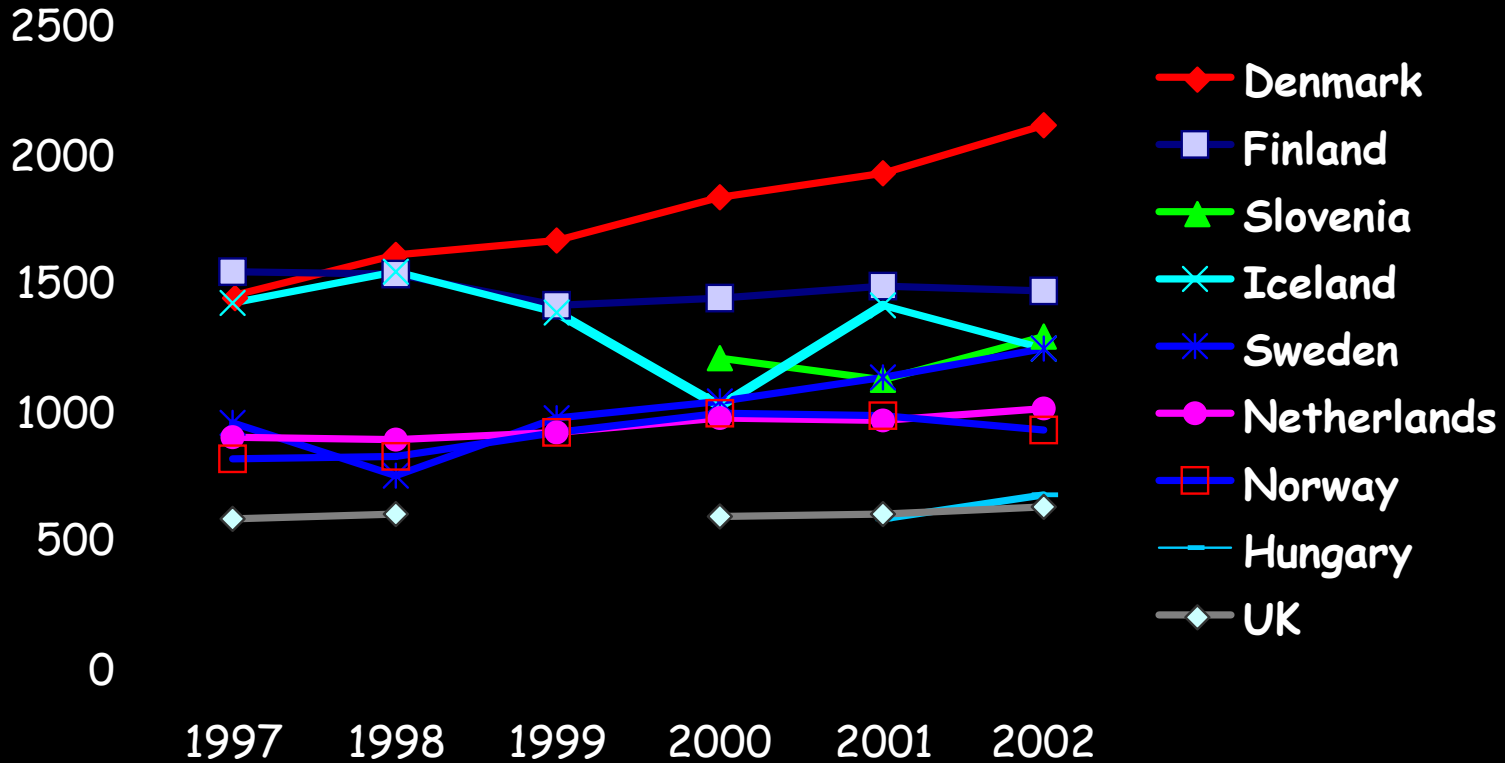
National Statistics Office

Assisted conception in the UK



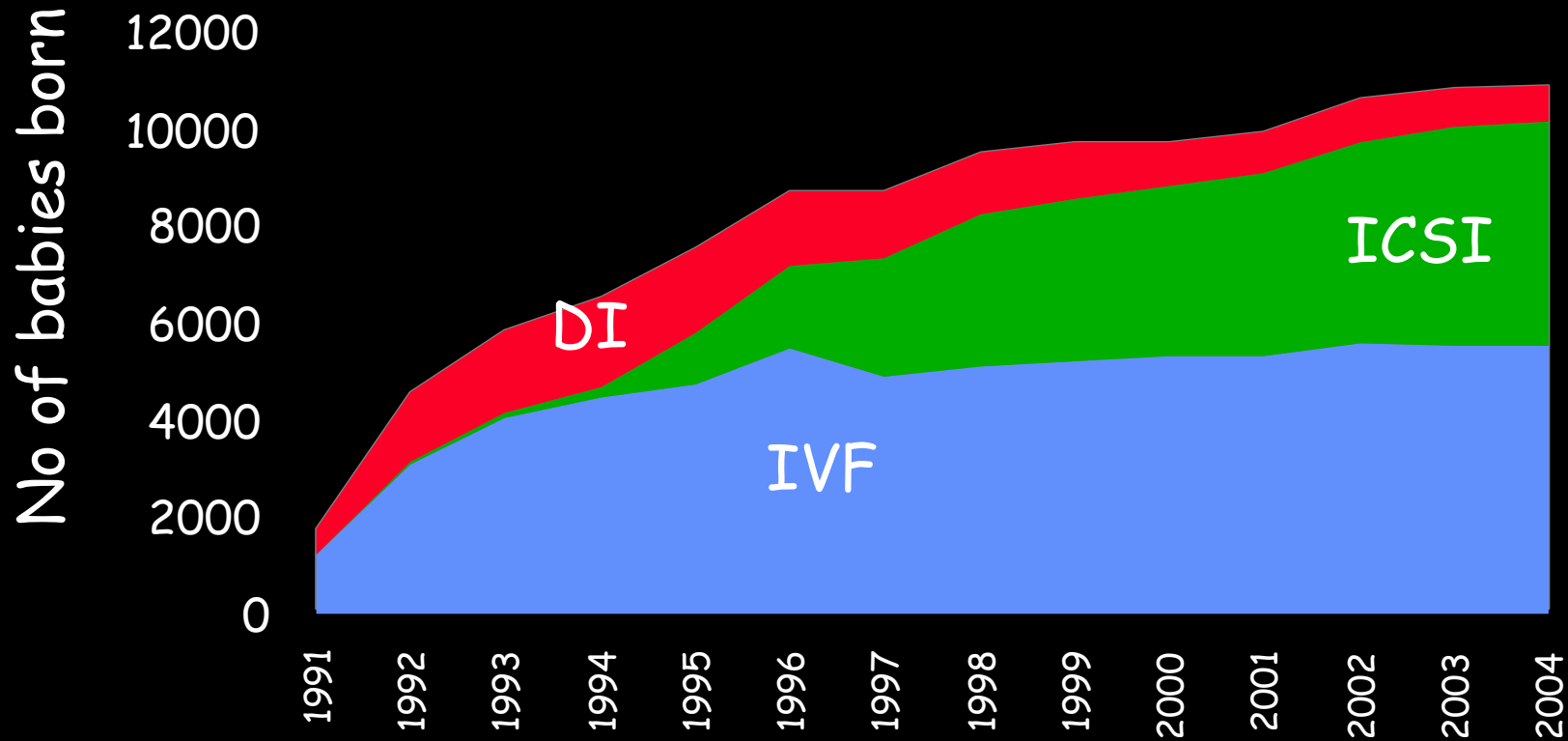
<http://www.hfea.gov.uk>

Number of ART cycles per capita



Nyboe Andersen *et al.*, (2006) *Int. J. Androl.* 29: 12-16

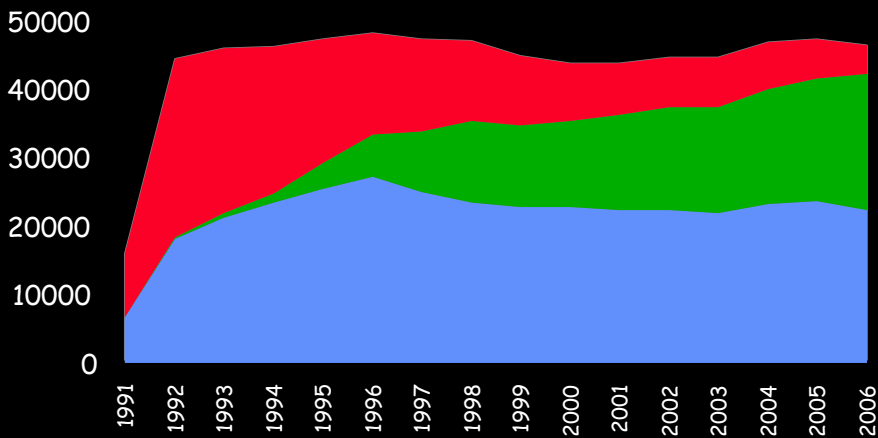
Babies born through ART in the UK



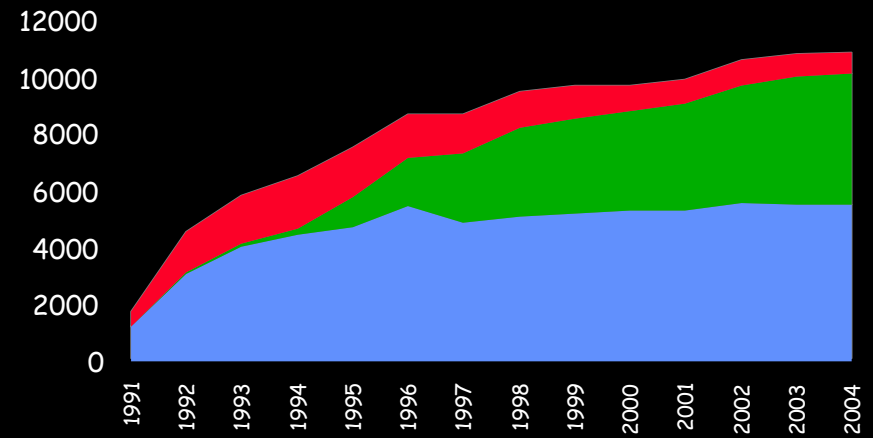
<http://www.hfea.gov.uk>

Increasing success rates

Number of cycles



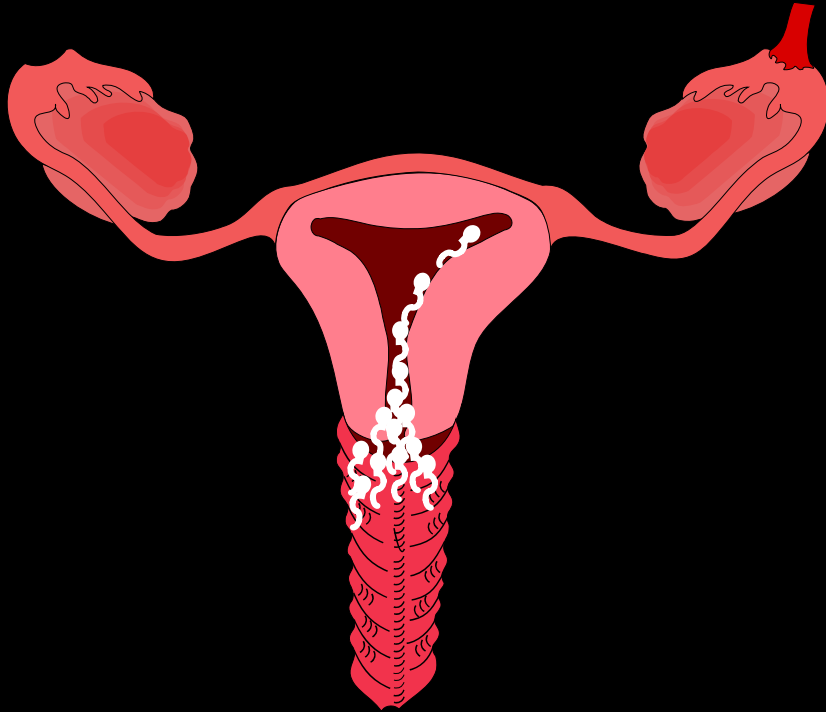
Number of babies



<http://www.hfea.gov.uk>

What does IVF involve?

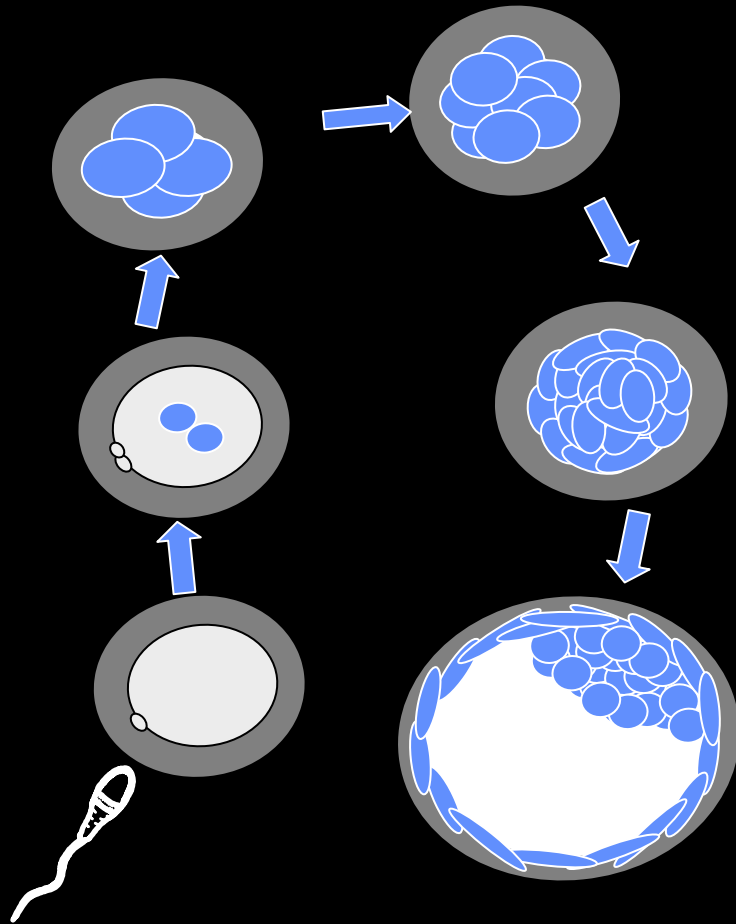
Normal Conception



- Candlelit dinner
- Seductive music
- Early night
- Lights off
- Intercourse
- Cigarette (not recommended)
- Sleep

Live Birth Rate: 10-20% per cycle
Cost: £25

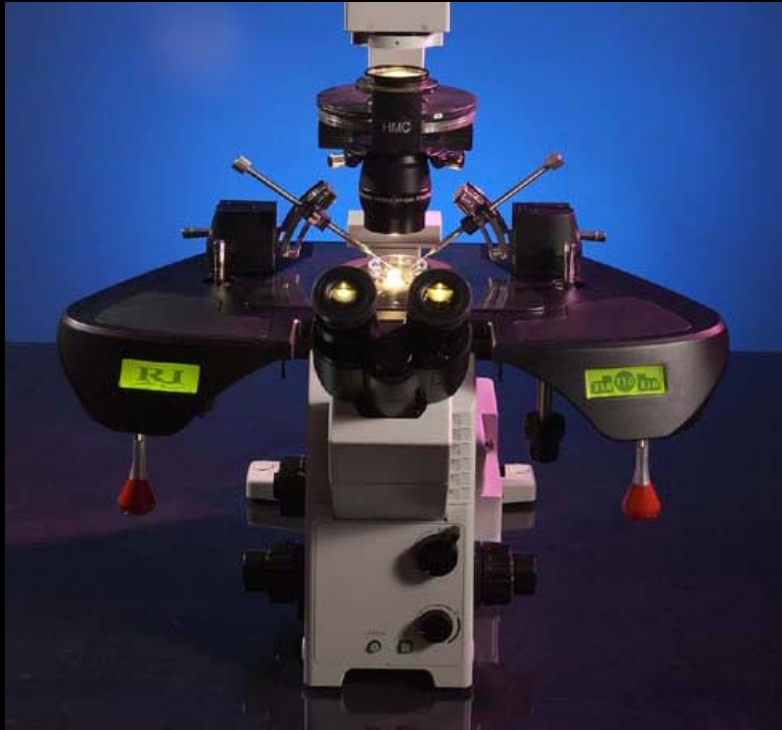
In Vitro Fertilisation (IVF)



- Woman given fertility drugs to stimulate the ovaries
- Eggs are collected under sedation
- Sperm sample obtained from male partner and prepared in the laboratory
- Sperm and eggs mixed in laboratory and embryos grown for 2 to 3 days
- Embryos transferred to the womb and/or frozen

Live Birth Rate: 20-25%
Cost: Approx £2,000 to £3,000

Intra Cytoplasmic Sperm Injection (ICSI)



Live Birth Rate: 20-25%
Cost: Approx £3,000 to £5,000

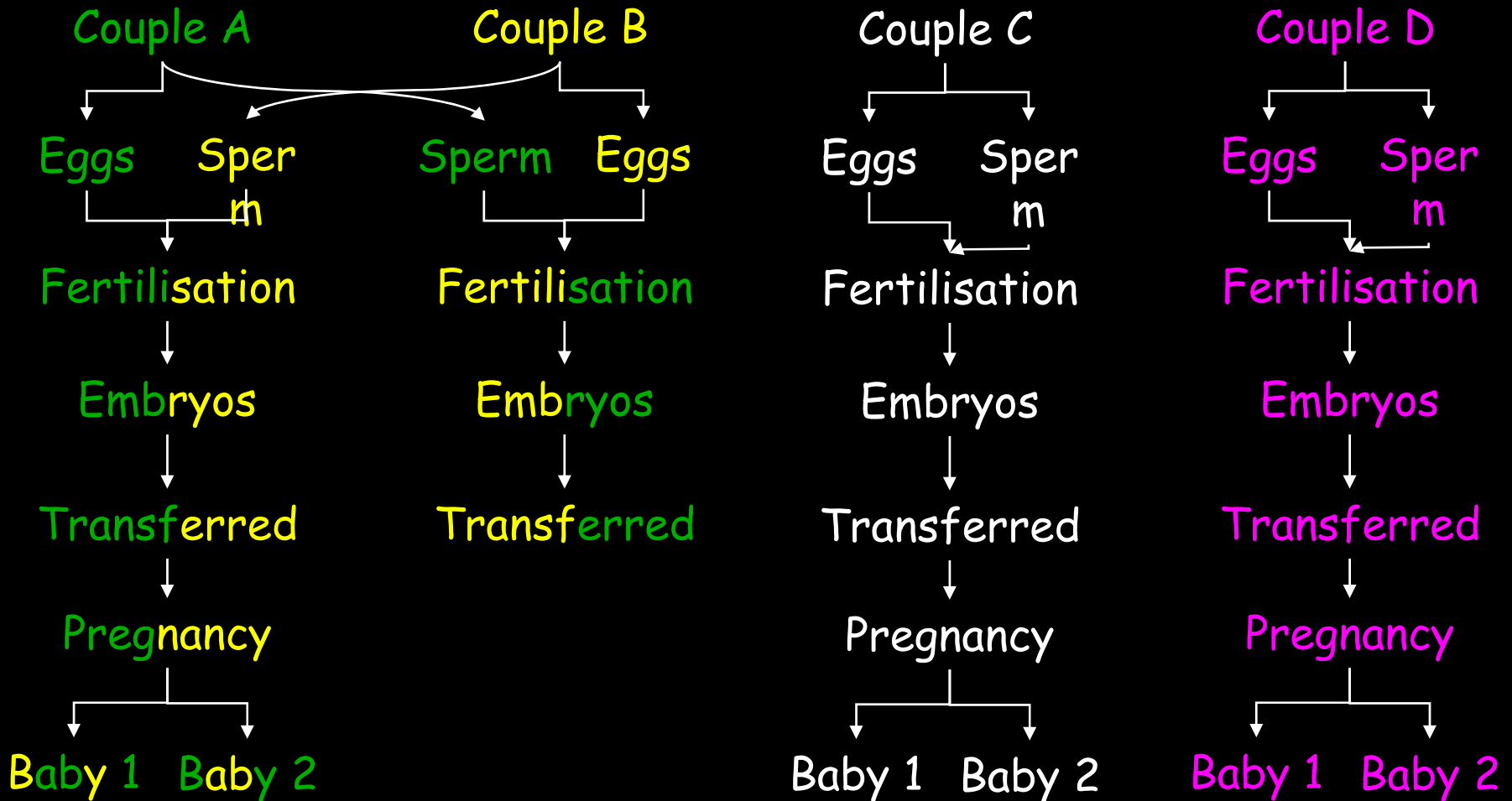
Witnessing in IVF



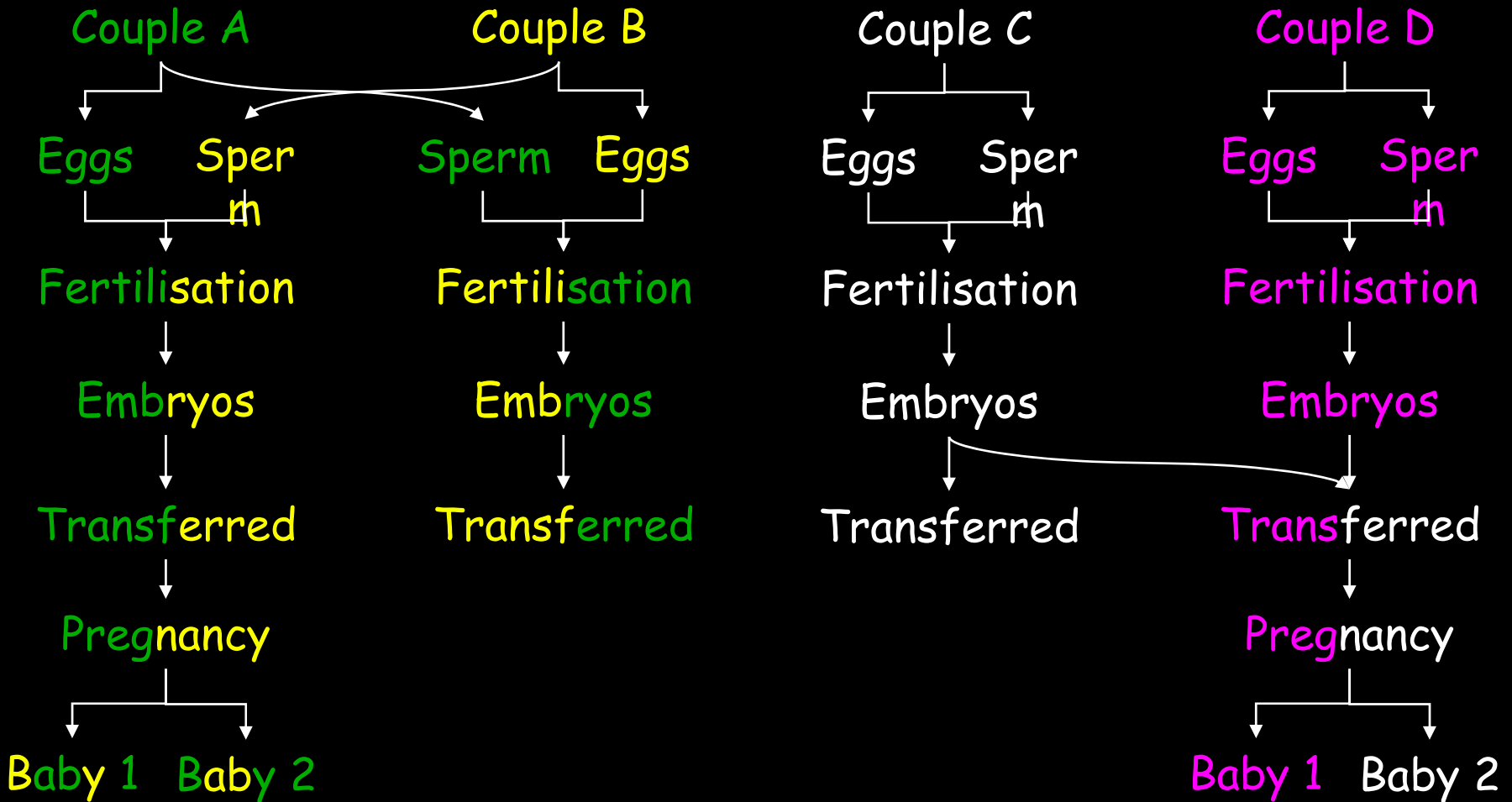
Witnessing in IVF



Witnessing in IVF



Witnessing in IVF



Headlines



BBC NEWS

You are in: [Health](#)
Monday, 28 October, 2002, 20:31 GMT

Embryo mix-up at IVF hospital



Embryos were put back in the wrong women

An IVF blunder at a London hospital left two women with the wrong embryos put back into their wombs, it has been revealed.

A doctor in charge of the clinic at St George's Hospital spotted the error hours after the embryos had been transferred.

Both women required medical procedures and drugs to prevent pregnancy.

The error, which happened in April, involved three women - the first of whom had reportedly produced a number of embryos, from which only the best quality pair were chosen.

Key stories

- ▶ Black twins blunder
- ▶ Embryo mix-up
- ▶ IVF doctor suspended
- ▶ Mistakes are common
- ▶ Barcodes to stop errors

Medical notes

- ▶ In vitro fertilisation

Case history

- ▶ One woman's story

See also:

- ▶ 29 Aug 02 | Health IVF clinic 'postcode lottery'
- ▶ 17 Jul 02 | Health Inquiry into IVF twins blunder

Internet links:

- ▶ Diana, Princess of Wales Centre for Reproductive Medicine
- ▶ HFEA

The BBC is not responsible for the content of external

Navigation: News Front Page, World UK, England, N Ireland, Scotland, Wales, Politics, Business, Entertainment, Science/Nature, Technology, Health, Medical notes, Education, Talking Point, Country Profiles, In Depth, Programmes, BBC SPORT, BBC WEATHER, CBBC news, SERVICES, Daily E-mail, News Ticker, Mobile/PDAs, Text Only, Feedback, Help.

TIMES ONLINE

NEWS | COMMENT | BUSINESS | SPORT | LIFE & STYLE | ARTS & ENTERTAINMENT

UK NEWS | **WORLD NEWS** | POLITICS | ENVIRONMENT | WEATHER | TECH & WEB NEWS | RELATED RE

Where am I? ▶ Home ▶ News ▶ World News

From [The Times](#)
August 5, 2004

Mother wins \$1m for IVF mix-up but may lose son

Two doctors who kept their botched procedure secret have created a legal conundrum where people who have never met must share parenting of a child

By [Chris Ayres](#)

A WOMAN who gave birth to a test-tube baby at the age of 48 has been awarded \$1 million (£550,000) in damages after an infertility doctor accidentally gave her an embryo intended for a married couple. The doctor, fearing that his patient would abort the mixed-up embryo, decided against telling her about the error, even though he knew about it within minutes of the procedure. He later admitted to his patient that he decided to leave the matter "in God's hands".

EXPLORE WORLD NEWS

- ▶ IRAQ NEWS
- ▶ US & AMERICAS NEWS
- ▶ EUROPE NEWS
- ▶ MIDDLE EAST NEWS
- ▶ ASIA NEWS
- ▶ AFRICA NEWS

Witnessing procedures

Involuntary Automaticity



Toft & Mascie-Taylor (2005)
Health Services Management Research 18: 211-216

Involuntary automaticity in medicine



- Error rate for administering medication by nurses was 2.98 per 1,000 for one nurse working alone and 2.12 per 1,000 for two nurses working together
- 77% of errors in blood transfusion involved two members of staff checking each other.
- In one adverse radiotherapy incident the same prescription was mis-read 10 times and checked by three members of staff!

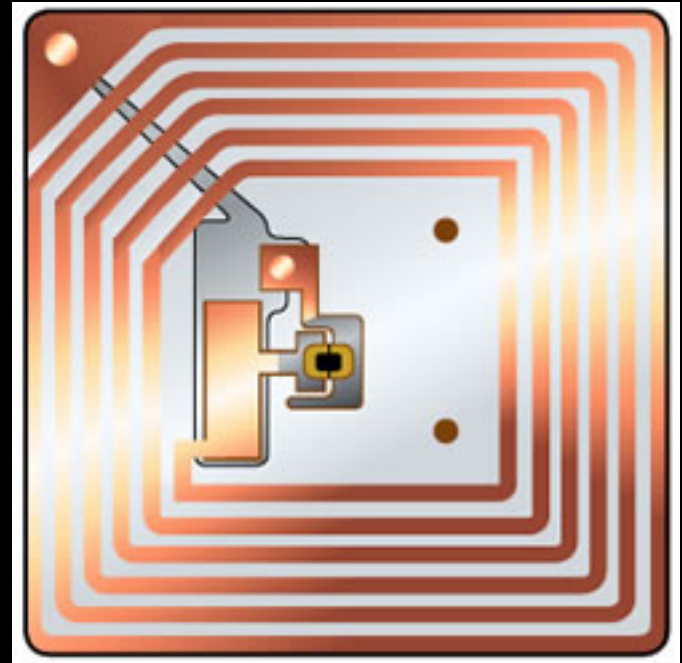
Toft & Mascie-Taylor (2005)
Health Services Management Research 18: 211-216

How can technological
solutions help?

Technological solutions



Barcodes



RFID Technology

Pros and cons of options

Barcodes

- Relies on physical positioning / orientation of sample to read barcode
- User has to remember to read bar code
- Bar codes can become damaged / unreadable
- Increased time to read bar code
- Size of barcode required
- Light pulse to read barcode may be of concern

RFID

- All samples in work area are identified
- User does not have to remember to scan RFID
- Can provide immediate warning if mis-match between samples in work area
- No time needed to identify samples
- Effect of Radio frequency used is unknown

IVF Witness

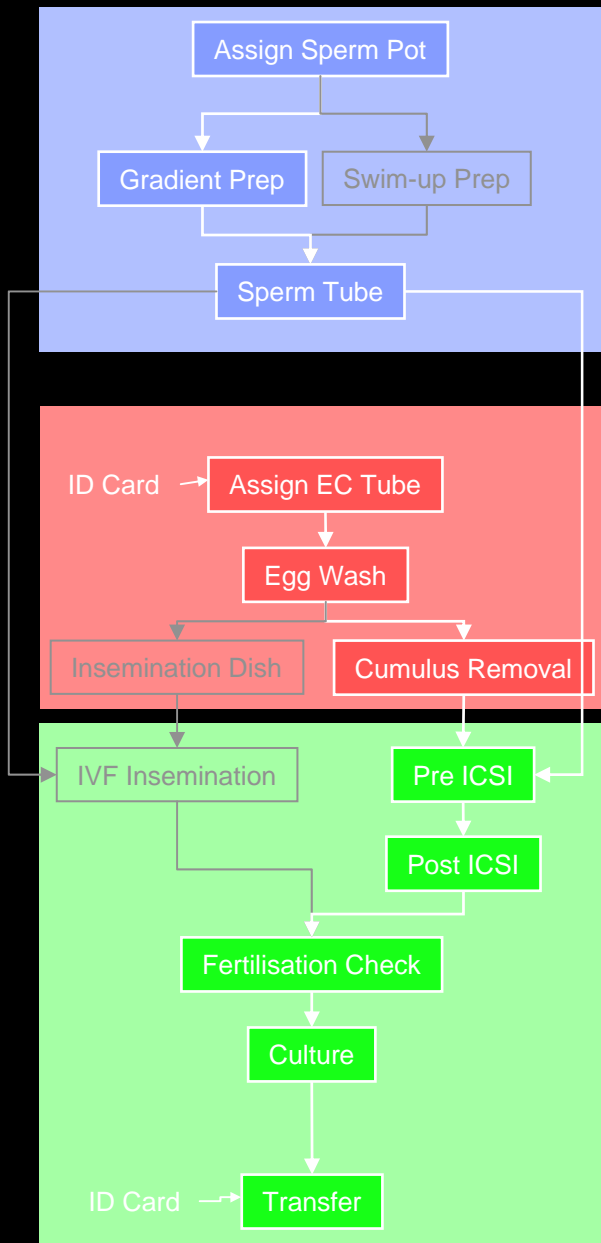


<http://www.research-instruments.com/ie/ivf/witness.htm>



Samples Do Not Match





Witness point:	Assign Sperm Pot	Date: 16/12/2004 10:01:42 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	None	
New Items:	Sperm Pot	
Witness point:	Gradient Prep	Date: 16/12/2004 10:35:15 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	Sperm Pot	
New Items:	Sperm Wash Tube	
Witness point:	Sperm Tube	Date: 16/12/2004 11:05:06 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	Sperm Wash Tube	
New Items:	Sperm Tube	
Witness point:	Assign Egg Collection Tube	Date: 16/12/2004 11:51:02 Operator: Chris Smith Patient Identity Confirmed
Existing Items:	ID Card	
New Items:	Egg Collection Tube	
Witness point:	Egg Wash	Date: 16/12/2004 11:52:10 Operator: Chris Smith Patient Identity Confirmed
Existing Items:	Egg Collection Tube	
New Items:	Egg Wash Dish	
Witness point:	Cumulus Removal	Date: 16/12/2004 11:52:40 Operator: Chris Smith Patient Identity Confirmed
Existing Items:	Egg Wash Dish	
New Items:	Cumulus Strip Dish	
Witness point:	Pre ICSI	Date: 16/12/2004 11:53:09 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	Cumulus Strip Dish	
New Items:	Sperm Tube ICSI Dish	
Witness point:	Post ICSI	Date: 16/12/2004 12:02:34 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	ICSI Dish	
New Items:	Embryo Culture Dish	
Witness point:	Fertilisation Check	Date: 17/12/2004 08:02:34 Operator: Chris Smith Patient Identity Confirmed
Existing Items:	Embryo Culture Dish	
New Items:	Embryo Culture Dish	
Witness point:	Culture	Date: 17/12/2004 13:12:04 Operator: Vicky Green Patient Identity Confirmed
Existing Items:	Embryo Culture Dish	
New Items:	Embryo Culture Dish	
Witness point:	Transfer	Date: 19/12/2004 14:32:24 Operator: Chris Smith Patient Identity Confirmed
Existing Items:	Embryo Culture Dish ID Card	

Patient Identity Checks	<input type="text" value="11"/>	Identity errors	<input type="text" value="0"/>	Cycle Safe
-------------------------	---------------------------------	-----------------	--------------------------------	-------------------

IVF Witness

<http://www.research-instruments.com/ie/ivf/witness.htm>

RFID at low temperatures

Risks of Audit



- During the annual audit samples are at risk of:
 - Being dropped
 - Exploding upon removal from Liquid N₂
 - Temperature changes
 - Damaged during handling
- Samples from oncology patients may be removed 40 times during their life in storage

Cryoscan

<http://www.research-instruments.com/ie/ivf/witness.htm>

Summary

Summary

- Delivering assisted conception treatments requires absolute accuracy
- Human witnessing steps are fallible
- Technological solutions based on bar codes or RFID tags are developed
- In Sheffield we are deploying RFID technology during IVF
- RFID tags should help in auditing material in cryostorage at -196°C

Thank You!