Dr Dean Morbeck

Scientific Director

Fertility Associates, Lecturer, University of Auckland

Dr Sarah Wakeman

Obstetrician and Gynaecologist

Medical Director, Fertility Associates Christchurch

Dr Michelle Bailey

Fertility Specialist

Fertility Associates, St Georges Hospital, Christchurch

Thursday, August 11, 2016

(Room 4)

14:00 - 16:00 WS #14: Fertility 101

16:30 - 18:30 WS #19: Fertility 101 (Repeated)

Fertility 101

Dr Sarah Wakeman, Dean Morbeck and Dr Michelle Bailey

Fertility Associates Christchurch

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Fertility Skills Workshop

- Practical Fertility Knowledge
  – Dr Sarah Wakeman

- EvolvingTechnology in the IVF Laboratory
  - Dean Morbeck

- Gynaecology from a Fertility Perspective
  - Dr Michelle Bailey

Fertility Skills Workshop

“ Practical Fertility Knowledge”

Dr Sarah Wakeman
Medical Director, FRANZCOG, CREI
Fertility Associates, Christchurch

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Format of Session

- Clinical scenarios
  - Lifestyle and Fertility
  - Fertility Work-Up
  - Fertility Treatment
  - Public Funding
  - Egg Freezing and options for single women
  - Fertility preservation

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Scenario Number 1

- 34 year old Charlotte, who has just seen you for the flu and then says "***hey Doc, I'm thinking about having a baby next year, what should I be doing?"***

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Key Things to Discuss

- Supplements
- Lifestyle Factors
- Checking Fertility
- When should I get help?

Supplements

- Folic acid 0.8mg start 1 month prior to conceiving
- Iodine 150 micrograms begin at pos preg test
- 5mg folic acid : epilepsy, previous neural tube defect or family hx NTD, BMI>30, IDDM

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Lifestyle Factors

- Smoking
- Weight
- Caffeine
- Alcohol

Give yourself the best chance of conceiving

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Smoking is bad for fertility and child

Women

- By-products detectable in fluid around eggs
- Menopause occurs 1 to 4 years earlier
- Zona pellucida (‘egg shell’) thicker

Men

- Sperm production, motility, morphology and increases DNA damage
- Child born to a father who smokes has 4 X risk of childhood

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Smoking is bad for treatment

- Female smoking significantly reduces ICSI and IVF success rates
- Female smoking doubles risk of early pregnancy loss
- …and there is no public funding for female smokers

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Weight…

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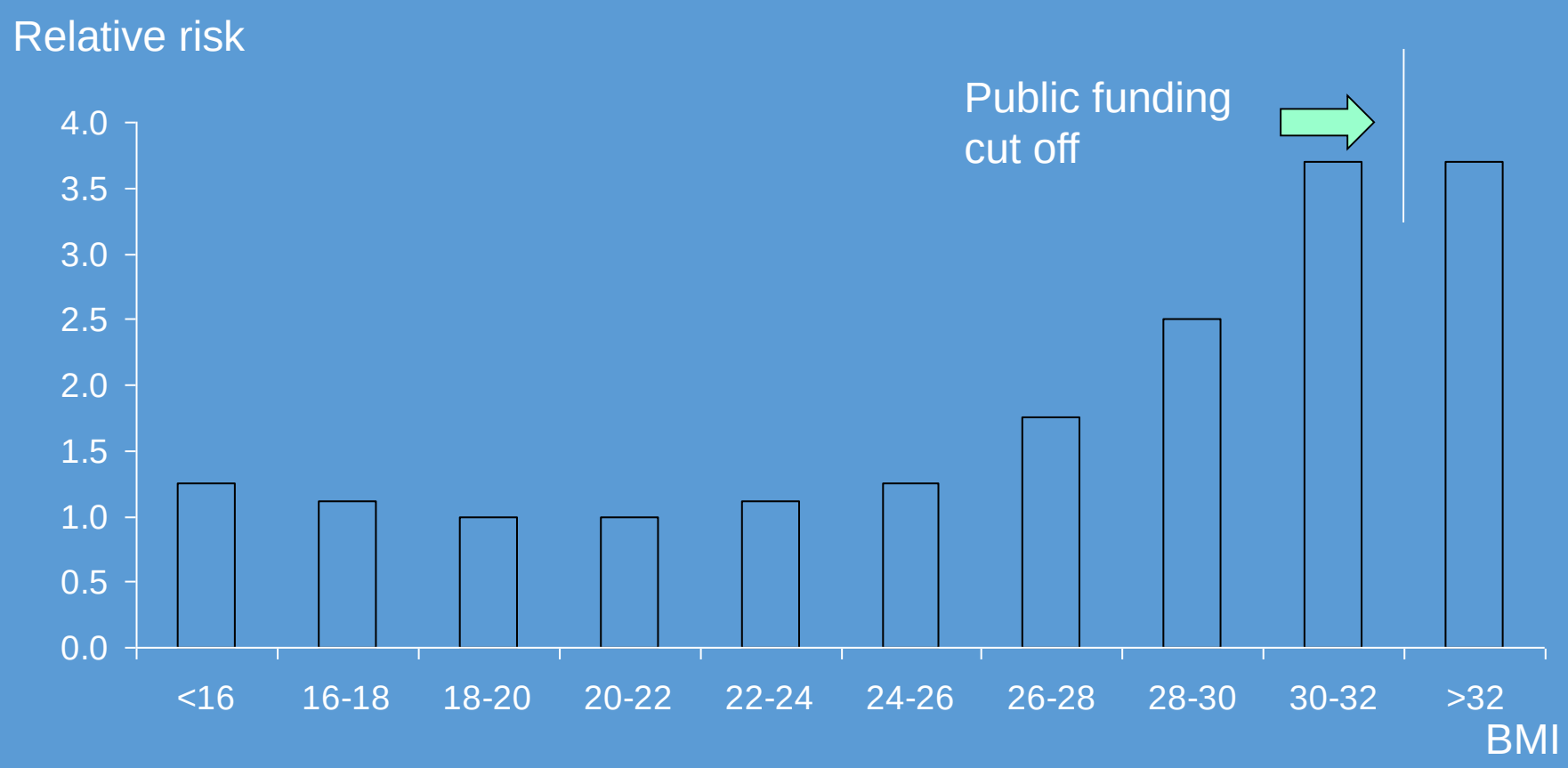
Impact of BMI on female fertility

What can I do?



Homan, G.F. et al. Hum Reprod Update 2007 13:209-223; doi:10.1093/humupd/dml056

Human Reproduction Update

Impact of BMI on male fertility

- Obese men (BMI over 28) have sperm counts 22% lower

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Caffeine…

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Caffeine may impact on treatment

- Trial looked at babies from IVF
- Group of women with caffeine>50mg/day had less babies
- Some evidence that any caffeine is not a good idea
- A Starbucks grande latte has 150mg caffeine

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Alcohol…

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Alcohol is not good for fertility or child

- Known teratogen (affects embryo / fetus development)
- Unknown safe level during pregnancy
- Reduces female fertility
- Increases miscarriage risk
- Men >20 standard drinks per week reduced numbers of pregnancies

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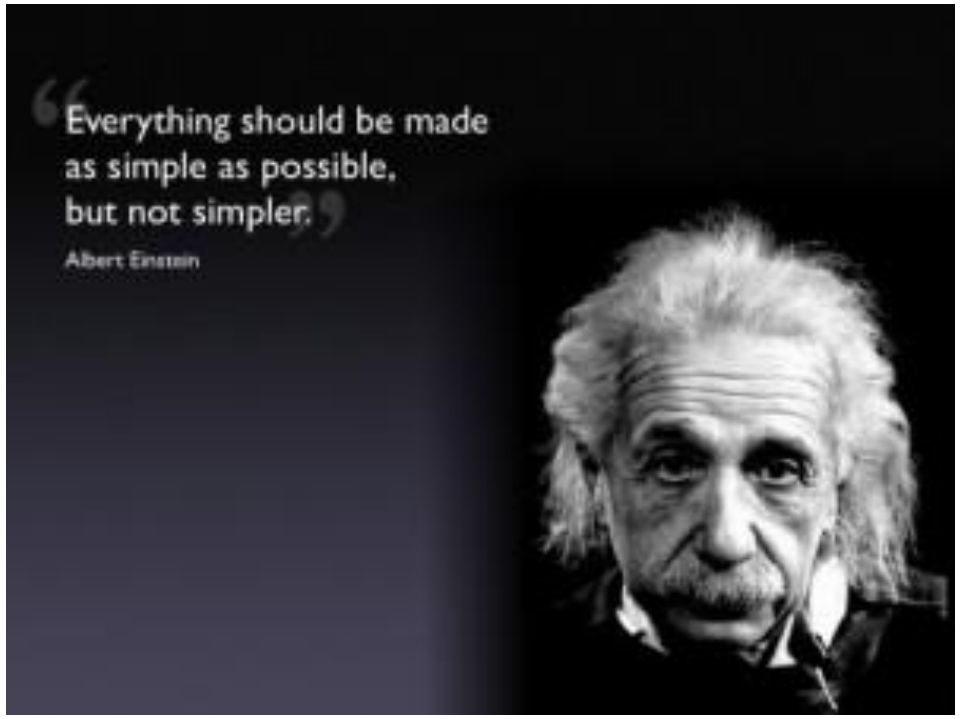
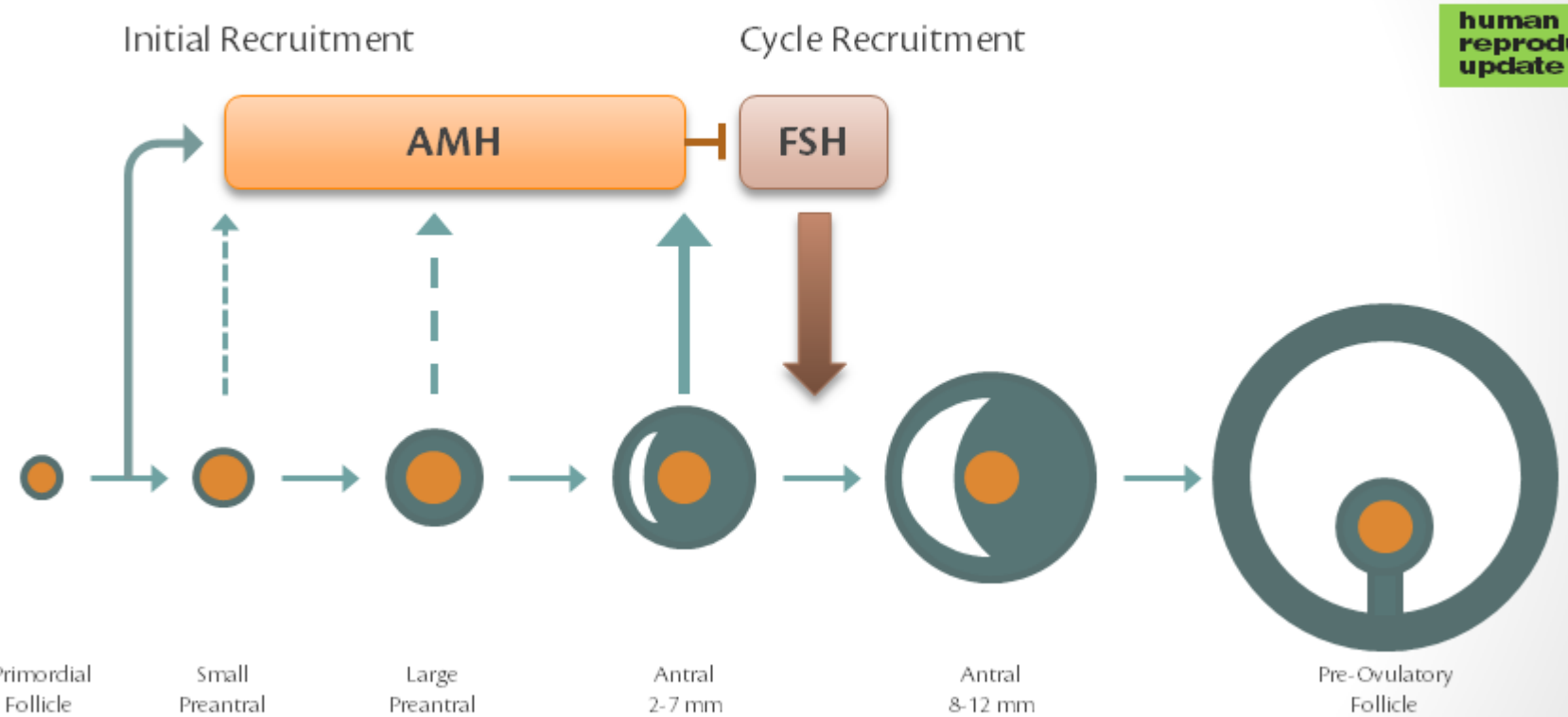
Checking Fertility- The Basics!

- AMH
  - consider TSH
- Semen Analysis



AMH is Secreted by Pre-antral & Antral Follicles

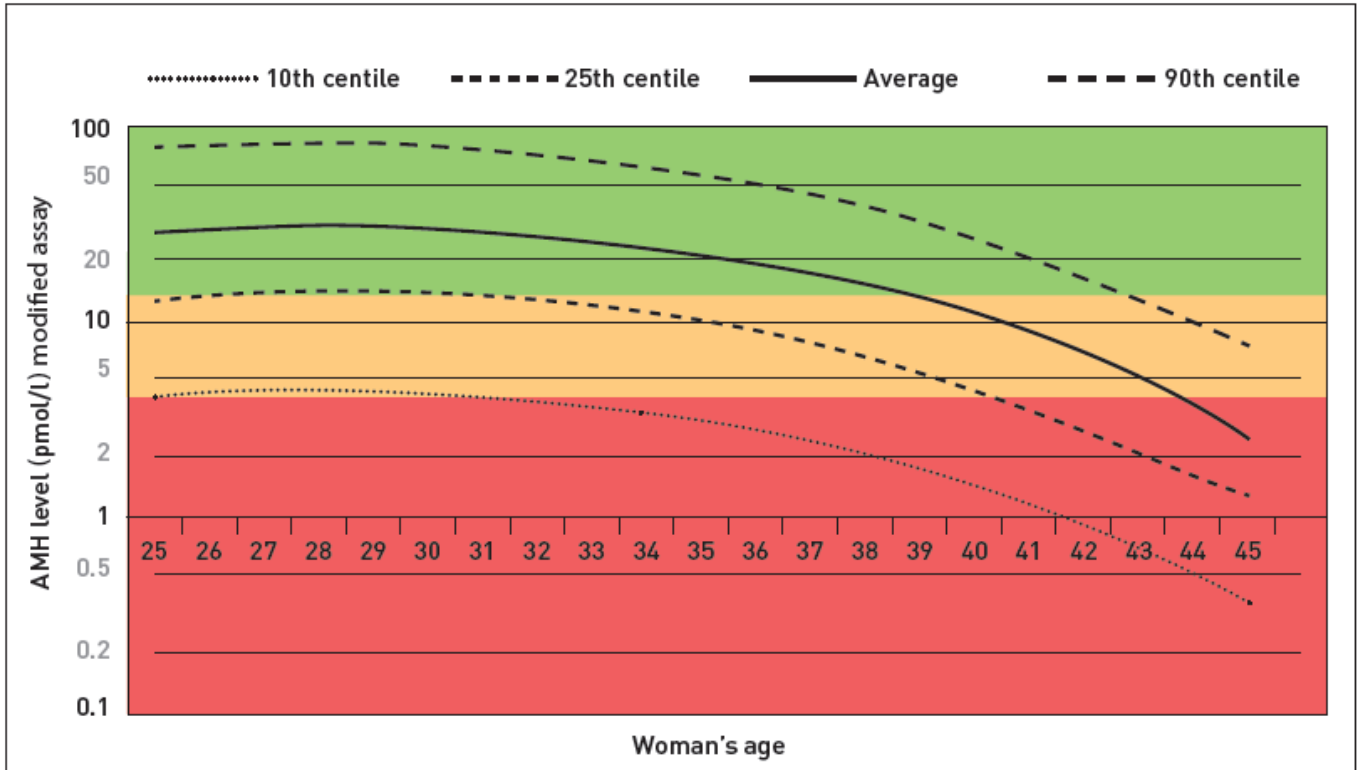


La Marca A et al. Hum Reprod Update 2010

AMH

- Blood test
- Any time of cycle
- Can be done on COC, breastfeeding, pregnancy (slightly lower)
- Not funded in North Island but is in South Island.
- Assay has been problematic (now more stable)
- Polycystic ovaries v high AMH

AMH: Anti Mullerian Hormone



Green zone	Above the 25th centile for younger, fertile women	Very likely normal ovarian reserve – age is the best predictor of your future fertility	80% chance of 6 or more eggs in IVF
Orange zone	Between the 25th and 10th centiles for younger, fertile women	Some women in this range will have reduced ovarian reserve	50% chance of 6 or more eggs in IVF
Red zone	Below the 10th centile for younger, fertile women	Very likely reduced ovarian reserve	20% chance of 6 or more eggs in IVF

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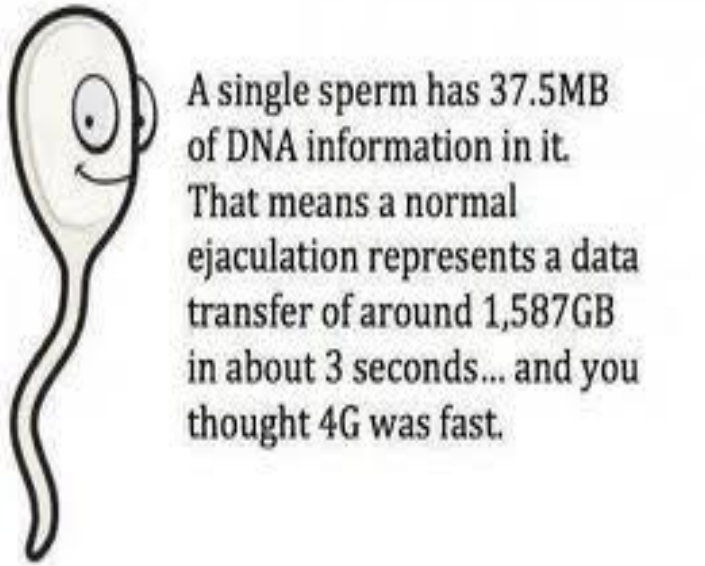
Semen Analysis

- 2-3 days abstinence
- Sample to lab within 90mins
- WHO Criteria (2010)
  - Concentration > 15Million/ml
  - Motility > 40%
  - Morphology > 4% normal



When should I get help?

- Trying for 12 months
  - Ask about contraception

- Consider early referral if:
  - >35yrs
  - Irregular or absent periods
  - Medical or surgical conditions that may affect fertility
    eg endometriosis/pelvic surgery/chemo or radiotherapy
  - Family history early menopause
  - Recurrent miscarriage
  - Genetic conditions amenable to PGD

Scenario 2

- Alice and Sam have been trying to conceive for 18 months: ***"Do we need IVF Doc?"***

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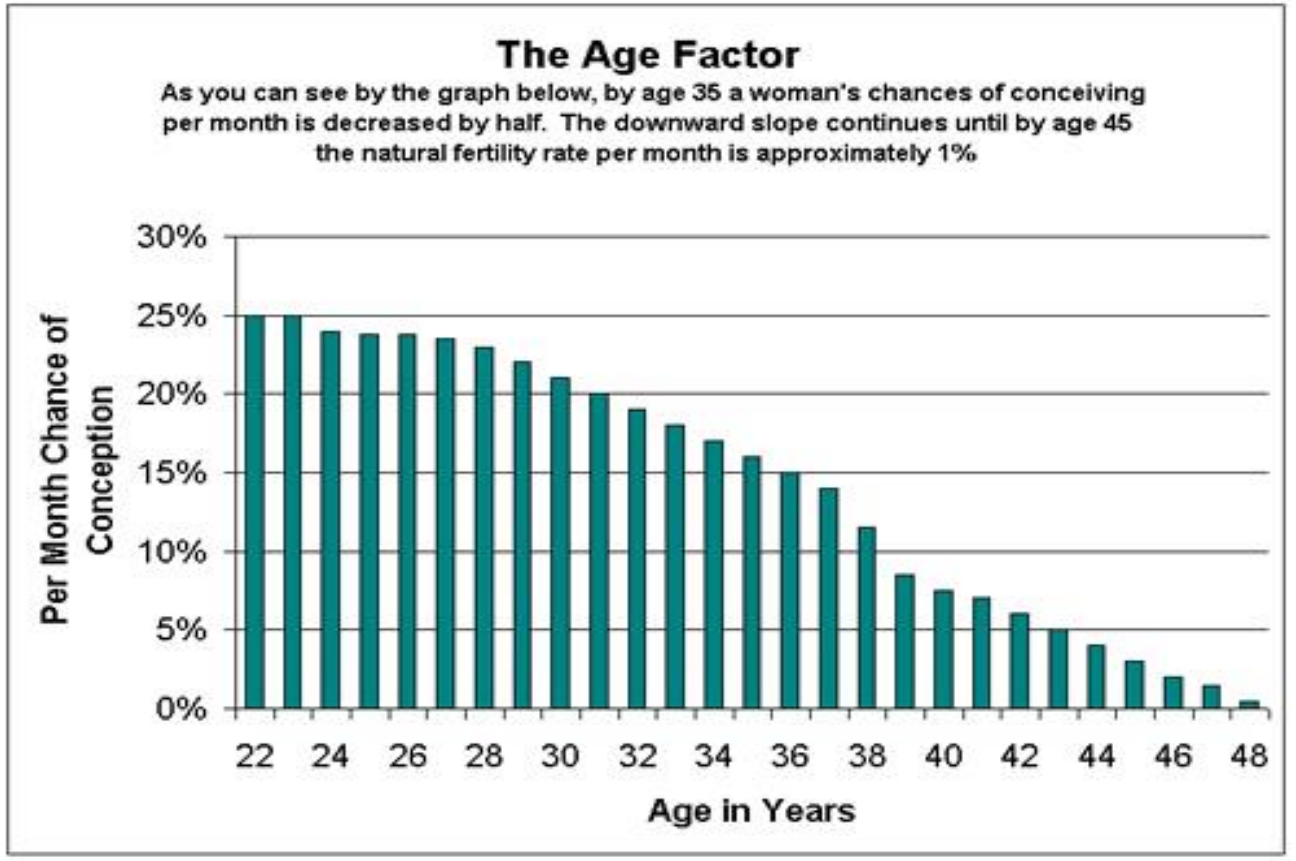
History-Key Aspects

- Treat as couple
- History is critical
  - Age
  - Duration
  - Ask about contraception

History -Key Aspects Female

- Cycle regularity
- Prior conceptions-current and past
- Gynae problems: STDs/Endo
- Medications
- Prior medical or surgical problems
- Family history
- Smoking

Fecundity and age



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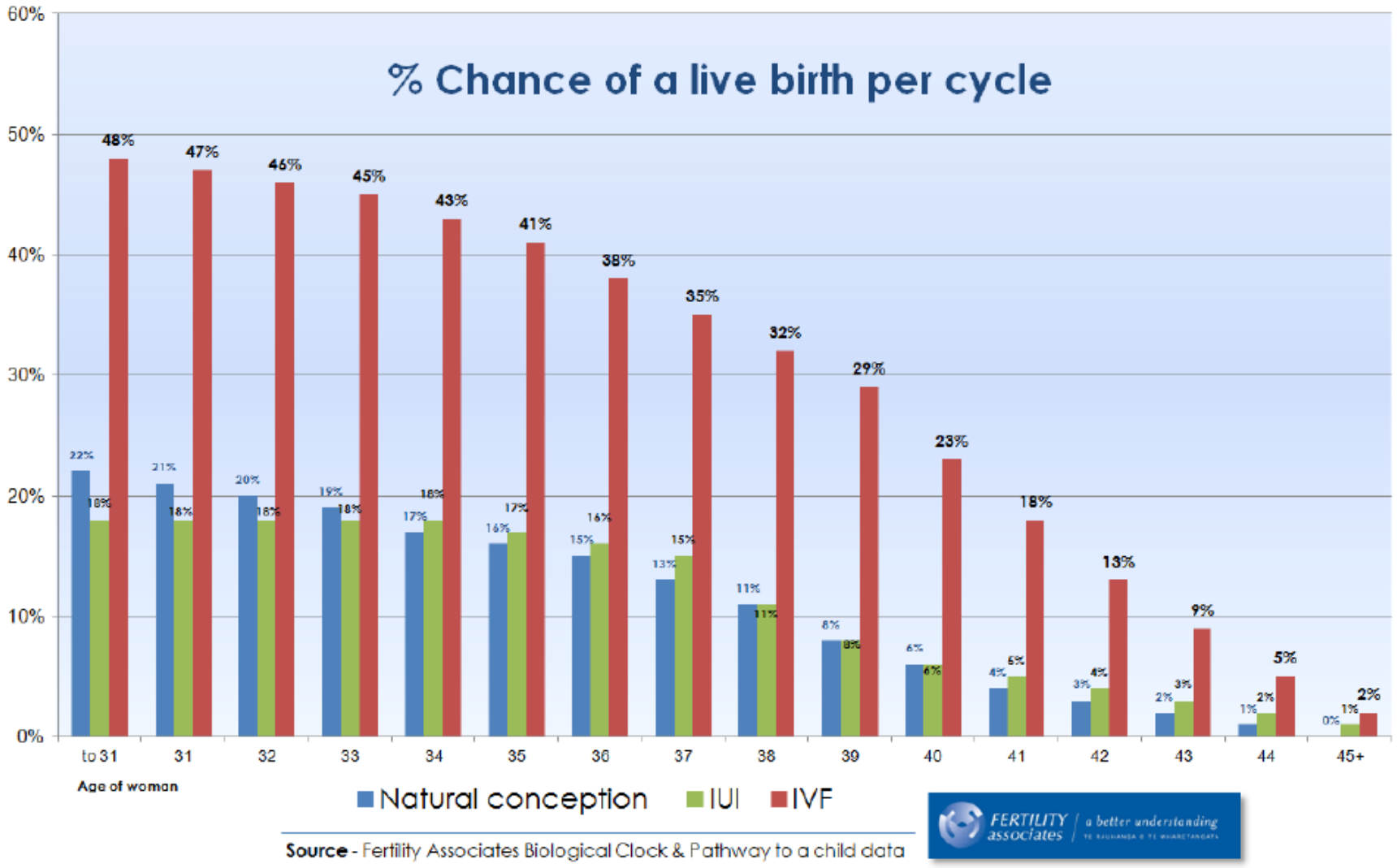
Even IVF can’t overcome ageing



Source - Fertility Associates Biological Clock & Pathway to a child data

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History-Key Aspects Male

- Prior paternity
- Erectile problems
- Medical/Surgical history
- Medications
- Smoking

Drugs and Sperm

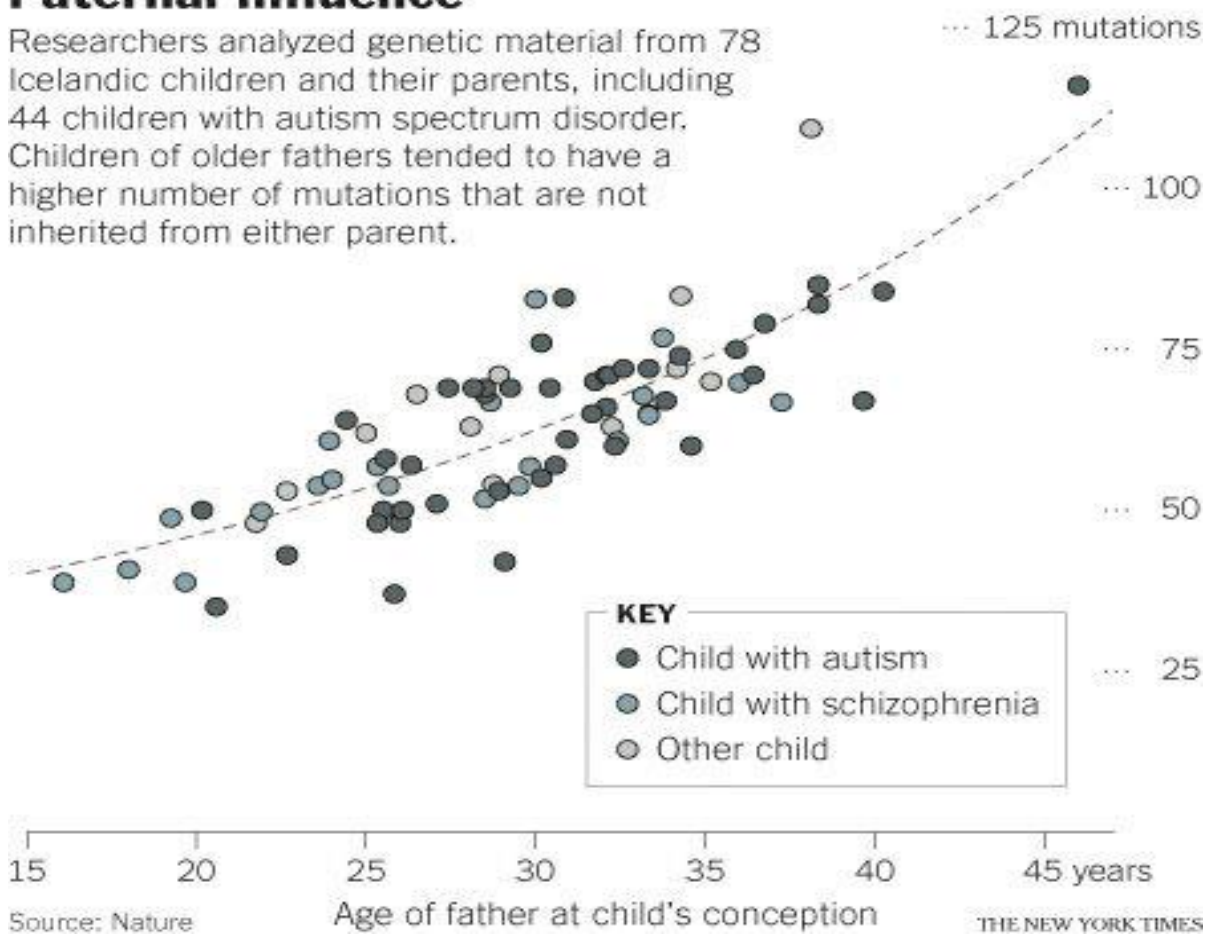
- Teststerone/Anabolic steroids
- 5 alpha reductase inhibitors
- SSRIs
- Alpha-blockers
- Calcium Channel Blockers
- Ketaconozole
- Cimetidine
- Colchicine
- Marijuana

Investigations-keep it simple

- Female:
  - AMH (or early menstrual FSH/Estradiol)
  - TSH/Serology/Prolactin
  - Ultrasound
  - ? Progesterone
- Male:
  - Semen Analysis

Paternal Influence

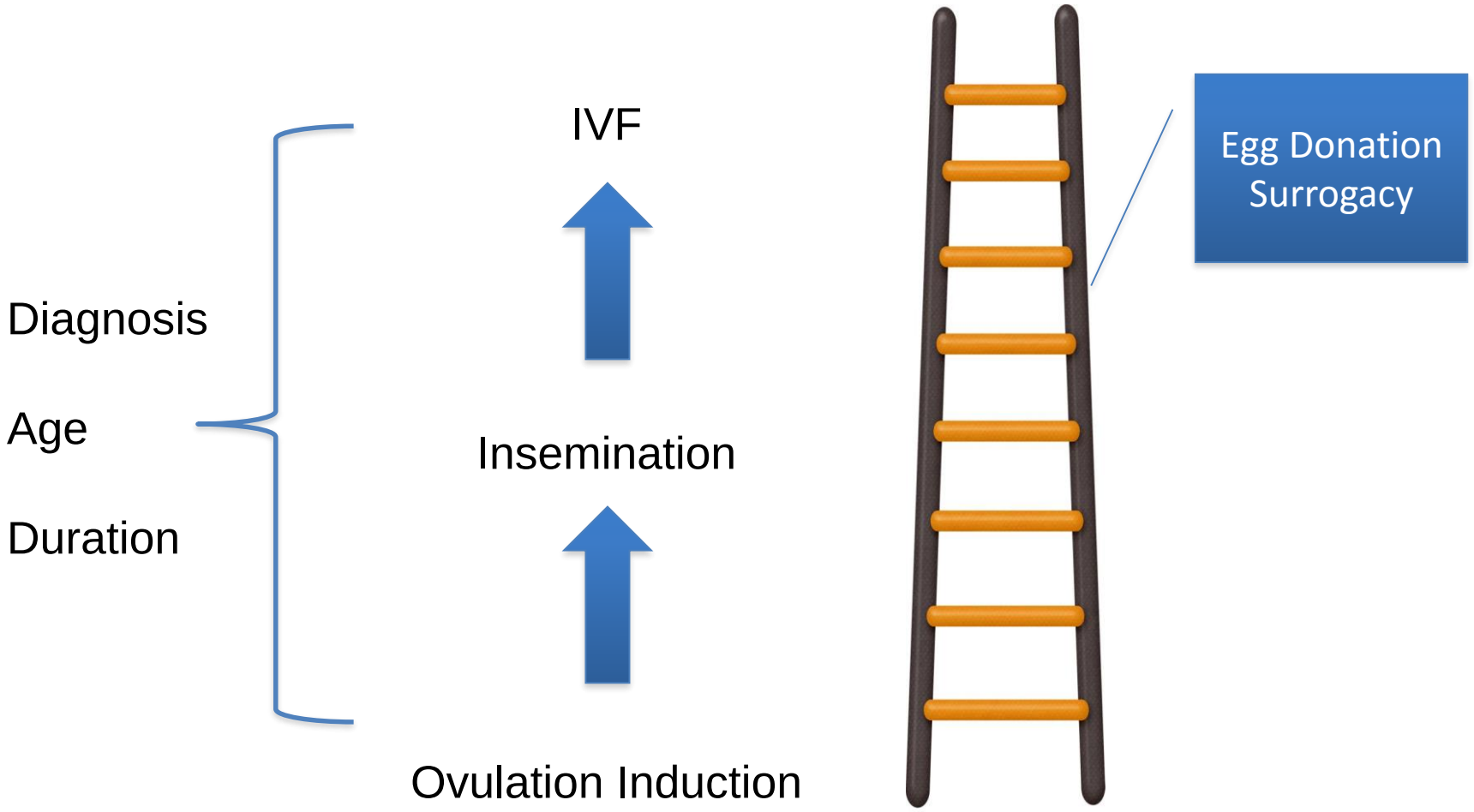
Researchers analyzed genetic material from 78 Icelandic children and their parents, including 44 children with autism spectrum disorder. Children of older fathers tended to have a higher number of mutations that are not inherited from either parent.



Source: Nature

THE NEW YORK TIMES

Treatment Options-The Fertility Ladder



Public Referral

- CWH or local public hospital gynaecology service
- Direct to Fertility Associates in Christchurch or Dunedin asking for a public funded referral
- If meet criteria (same as Health Pathways) can be offered a public funded First Specialist Appointment

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Public Funding Scoring

CPAC SCORING SHEET - FAA

(Clinical Priority Access Criteria)

Patient's name: _____ File N°: _____

Notes/ instructions: _____ Scored by: _____ NZ residence eligibility: Yes / No

Ovulation	6	Annovation due to hypopituitary hyogonadism/ Ovulatory but not pregnant after 9 months Rx/ Resistant to CC +/- Metformin +/- LOD
	3	< 9 ovulatory cycles/year
	0	Other
Male	6	**Any of:** **Strict morphology < 4%** **Sperm concentration < 1 million/ml** **SpermMar > 40% positive** **>= 2 years since vasectomy reversal and not preg** **< 1 million motile after sperm wash** **IUI and < 2 million motile** **3 x IUI for male infertility and not pregnant**
	3	**< 40% total motile or < 15 million/ml in 2 samples**
	0	**Other**
Endo	6	Stage IV
	3	Stage III
	2	Stage II
	1	Stage I
	0	None
Tubal	6	Occlusion/ severe adhesions/ 12 months surgery
	3	Mod adhesions/ 6 months surgery
	2	Polyps/ mild adhesions/ normal tube one side
	1	Minimal adhesions best side
	0	No tubo-peritoneal pathology
Other	6	Severe
	3	Moderate
	2	Mild
	1	Minimal
	0	None

Consultation type: Private / public / from NRFS

Date scored: _____

Month & year started trying: _____

W/H^2 = _____ ÷ _____ → BMI = _____

Planned Treatment:

IVF ICSI DI IUI IUI/S OI PGD*

***For PGD objective criteria (O1, O2) + HART criteria**

*** If the patient wants PGD for aneuploidy, circle IVF - PGD is a private copayment**

☐ Ineligible within next 2 years

☐ ≥ 65, enrol from date _____

☐ < 65 points / smoker / BMI / other

so review in _____ months

			Now	At:	At:
Duration of infertility = sum of all durations > 12 months without live birth	> 5 years ≥ 4 and < 5 years ≥ 3 and < 4 years < 3 years		6 3 2 1	6 3 2 1	6 3 2 1
Total diagnostic score					
	OBJECTIVE CRITERIA	**Points**	**Now**	**At:**	**At:**
Diagnostic (O1)	Total diagnostic score ≥ 6 3 – 5 2 0 – 1	10 7 4 2			
Woman's age (O2)	≤ 39 y = 40, 41 ≥ 42y	10 5 1			
Objective score	*OS = O1 x O2 ÷ 100*				
	SOCIAL CRITERIA				
Duration of infertility over time (S1)	Less than 1 year 1 or 2 years 3 or 4 years 5 years or more	5 20 40 50			
Children at home (50% of time or more and under the age of 12. (S2)	None 1 by relationship 1 by previous relationship • **2 or more children at home excludes eligibility**	30 10 8			
Sterilisation (S3)	Neither partner One or both partners	20 10			
Social score	*SS = S1 + S2 + S3*				
FINAL SCORE	*=OS x SS*				

If **PRIVATE** consultation: ☐ Told IVF at FA since birth month Sep-Dec ☐ Told IVF at F+ since birth month Jan-Aug
☐ Request patient stay at FA because: _____

Public Funded Treatment

- Criteria are the same across New Zealand
- People need ≥ 65 points using the fertility CPAC scoring tool
  - Score > 65 only means eligible
  - All have same wait time till treatment
  - Higher score doesn‘t mean more urgent treatment
- **The CPAC score can only be calculated by a fertility specialist.**

Waitlist for Treatment

- The wait to treatment varies across the country
- Generally **12–18 months**, you can check this when you make your referral to your local clinic.
- You can have a **private consultation to access public treatment.** This is useful when time is of the essence.
- Patients can access **private fertility treatment** whilst on the public waiting list.

Scenario 3

- Caitlin is aged 39 and single: ***"Should I be freezing my eggs?"***

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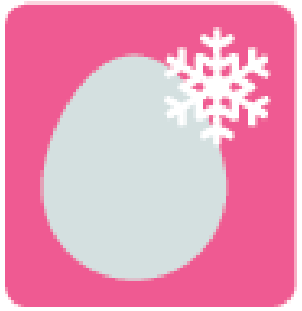
Egg Freezing



Fertility preservation:

- Cancer
- Social
- Religious or ethical objections to embryo freezing
- No sperm at IVF

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Egg Freezing

- >3000 babies worldwide
- Vitrification
- Not funded**
  - $10k Collection & Freezing
  - $5k Insemination & Embryo Transfer
    - ** may be funded in women requiring cancer treatment

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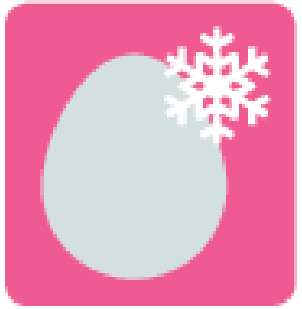
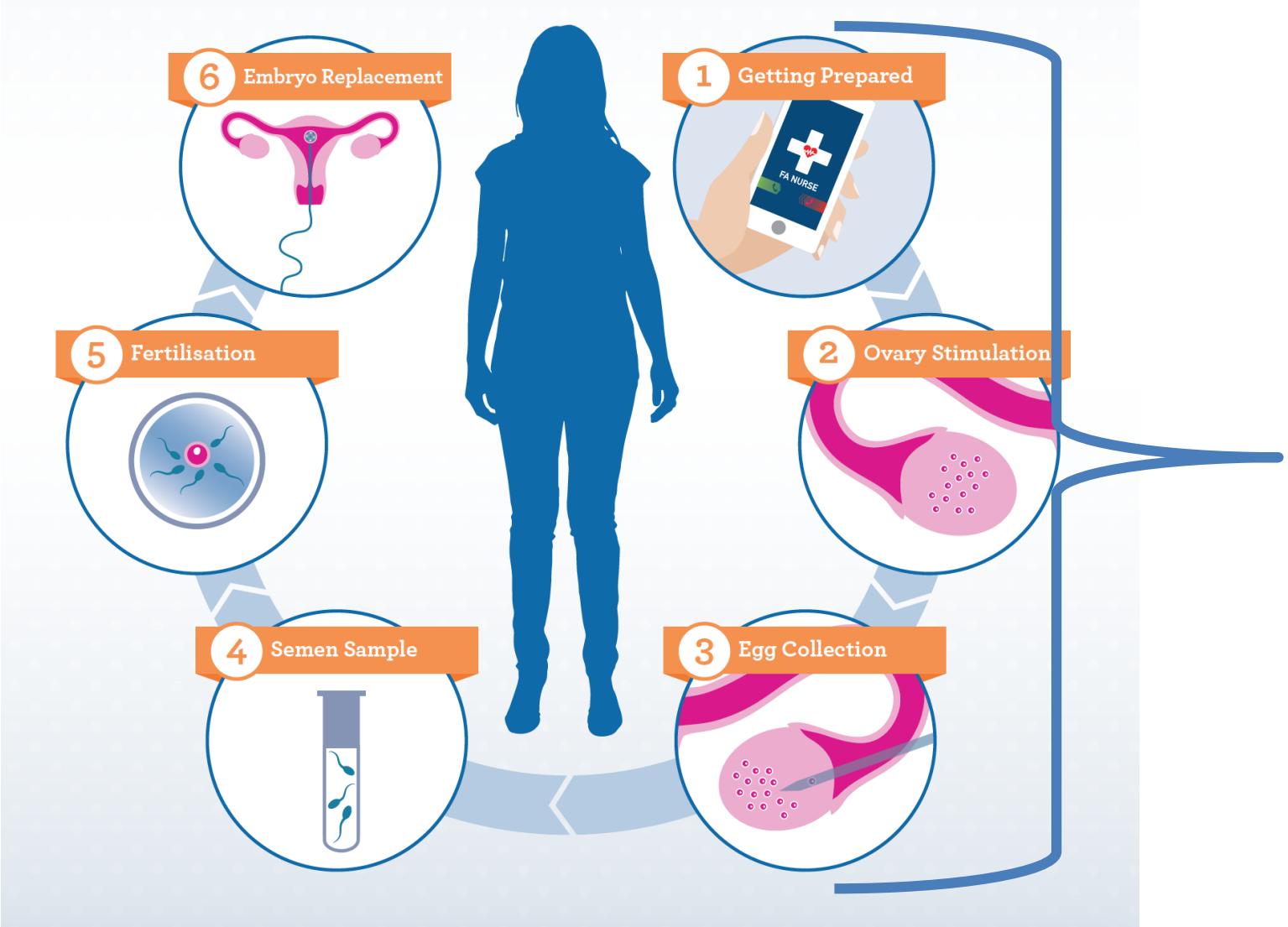


Egg Freezing – first half of IVF cycle



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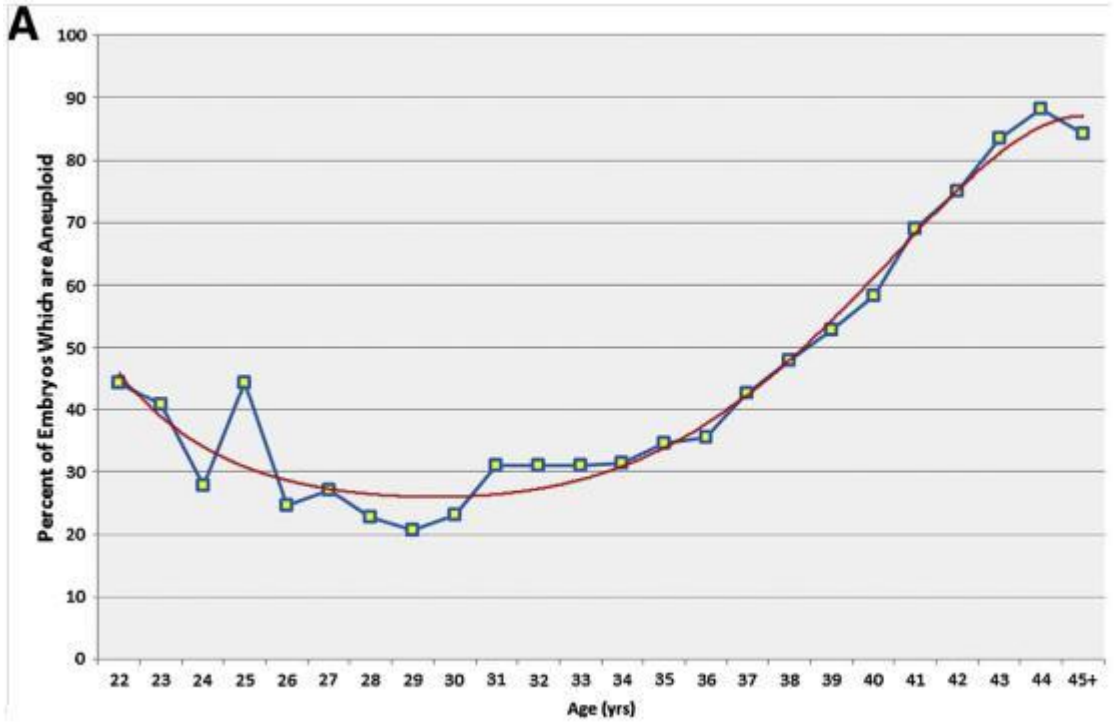
Aneuploidy - rate by age



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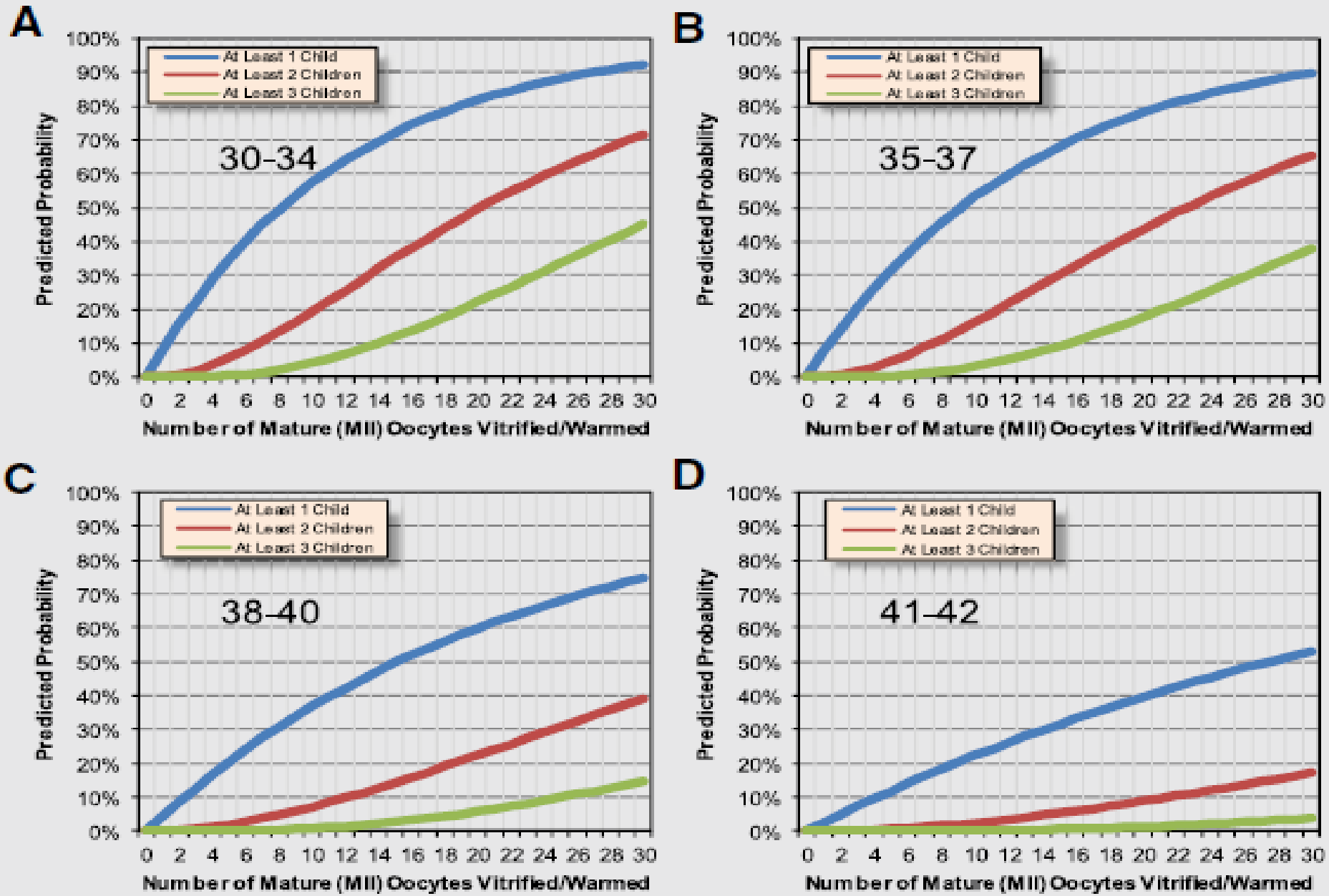
How many Eggs do I need?

Several studies demonstrate how many eggs required per baby (for a 70% chance)

- 25-34 required 10 oocytes
- 35-37 required 14 oocytes
- 38-40 required 25 oocytes
- 41-42 required ?50 oocytes



Predicted probabilities of having at least one, two, and three live-born children according to the number of mature oocytes cryopreserved for elective fertility preservation, according to age at oocyte retrieval and the associated oocyte to live-born child efficiency estimates: (**A**) 30–34 years, 8.2% efficiency; (**B**) 35–37 years, 7.3% efficiency; (**C**) 38–40 years, 4.5% efficiency; (**D**) 41–42 years, 2.5% efficiency.

Doyle. Autologous vitrified oocyte IVF outcomes. Fertil Steril 2016.

Use of donor sperm

- Single women
- Same sex female couples
- Heterosexual couples where no sperm available from man
- Shortage of donors
  - Longer than ideal waiting times
  - Currently 1 year wait to use sperm for IVF and 2 years for DIUI
  - Can have a known donor

Fertility Preservation

- Consider when any treatment might threaten fertility
  - Surgery
  - Chemotherapy, radiotherapy
  - Note some chronic conditions
- Men – freeze 1 or more semen samples
- Women
  - ovarian tissue – can do for prepubertal girl
    - eggs
    - embryos

Key Learning Points

- Discuss importance of lifestyle and fertility
- Age is best indicator of fertility
- AMH best test for female fertility
- Refer early!
- The Fertility Ladder
- Public consultation vs funding (CPAC score)
- Freezing Eggs is available but always better to do when younger

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