What we know from research

- Most people want and expect to have children
- Men want children as much as women do
- Knowledge about factors that affect fertility limited
Five Fertility Factors

- Age
- Obesity
- Smoking
- Alcohol
- Timing of intercourse

Female age and fertility

- Fertility starts to decline around age 30
- By age 35 the decline accelerates
- By age 40 fallen by half
- Increased risk of miscarriage AND
- Obstetric and neonatal complications

Male age and fertility

- Sperm quality and fertility decrease with increasing age
- When controlling for maternal age TTP significantly longer for men aged >45 than for younger men
- Older paternal age increases risk of autism and schizophrenia in offspring
Age and fertility

• People underestimate the age when fertility starts to decline by about 10 years!


Lifestyle factors

• Obesity and smoking
  – Preconception damage to DNA in sperm and eggs
  – Reduce fertility
  – Increase risk of miscarriage
  – Increase risk of obstetric and neonatal complications

• Alcohol
  – Affect male and female fertility, but the level of consumption associated with risk is unclear

Current trends

• Increasing age of childbearing
  – Average maternal age was 30.1 in 2013
  – 22.5% of women were aged ≥35

• Increasing prevalence of overweight and obesity
  – 50% of women and 70% of men aged 25-44 years

• 1 in 7 Australians of reproductive age is a smoker

• 30% of men and 10% of women between 18-35 years old consume alcohol at risky levels
Timing of intercourse

- Poor awareness of the ‘fertile window’ in the menstrual cycle


Consequences

- Increased risk of childlessness or having fewer children than planned
- More age-related infertility
- More use of assisted reproductive technology (ART) and its associated psychological, physical and financial costs

What to do?

- Multi-pronged approach to help people achieve childbearing goals
  - School curricula
  - Fertility protection
  - Health promotion
  - Primary care settings
  - Reproductive life plan
  - Preconception health care
  - Resources to help
Optimisation of natural fertility

- Smoking cessation.
  - Smokers more likely to be infertile
  - Women exposed to smoking take longer to conceive
  - Maternal smoking increases the risk of low birth weight and birth defects.
  - Earlier menopause
  - Smoking can also damage sperm DNA.
- Limit caffeine to 1 cup (max 2)/day
- Alcohol - Avoid (minimise) alcohol when trying to conceive and avoid in pregnancy

Healthy eating
Preconception diet

- Whole food diet, avoid processed foods
- Crowd out unhealthy choices with healthy choices
- Brightly coloured fruit & vegetables
  - Antioxidants, anti-inflammatory
  - Vegetables half the plate
- Lean protein most meals
  - Fist size
  - Legumes
  - Fish 3 times per week
    - Avoid flake, swordfish, fresh tuna, sea perch, mackerel
- Wholegrains no white
- Small handful of raw nuts
  - Walnuts, almonds
- Good oils – olive oil, macadamia, avocado, flaxseed oil
  - Avoid ‘bad fats’ in commercial baked goods
- ‘Sometimes food’ – sometimes only

Antenatal supplementation

- Ideally 3 months prior to conception
Antenatal multivitamin/mineral formula preferable, to include:
  - Folic acid 500µg acid
    - Folinic acid?
    - Cofactors essential: B6, B2, B12
  - Iodine 150-250µg
    - Women with known thyroid disease should consult endocrinologist before taking an iodine supplement
  - Zinc
  - Additional Vitamin D 1600-4000 iu daily

Obesity

- Associated with multiple adverse reproductive outcomes such as ovulation dysfunction, miscarriage, and infertility
- (Adverse pregnancy outcomes such as preeclampsia, foetal growth restriction, gestational diabetes)
Maternal obesity and adverse reproductive outcomes

- Multiple proposed mechanisms
  - Altered hormonal milieu
  - Chronic inflammation
- Adipose tissue is an active organ secreting hormones and cytokines called adipokines.
- Adipokines: may affect follicular maturation and promote granulosa and oocyte cell death through creation of reactive oxygen species (ROS)
  - Tumour necrosis factor alpha (TNF-α), interleukin 6, free fatty acids, adiponectin are adipokines that promote a chronic inflammatory state; may alter the hypothalamic-pituitary-ovarian axis signalling and affect reproductive function.
- Hyperinsulinemia increases the risk for miscarriage.

Maternal weight loss

- Maternal weight loss in the preconception period may improve some reproductive functions including ovulation, time to achieve pregnancy, and miscarriage rates.
- Overweight or obese patients should be appropriately counselled on the benefits of weight loss at their initial infertility or preconception appointment

How much weight loss is needed?

- Modest weight loss of 5-10% of body weight- resumption of ovulation and improves pregnancy rate
- Diet: energy restriction
  - Low GI and higher protein (30%) probably preferable
- Exercise: decreases adipose tissue, improves metabolic function of remaining adipose tissue, and reduces inflammation.
- International guidelines for obesity management recommend 225-300 min/week of moderate intensity physical activity for overweight or obese adults.
  - 210 minutes of moderate intensity exercise/125 minutes of vigorous intensity exercise/week for Type 2 diabetes or insulin resistance
  - no more than 48 hours between exercise sessions
Other considerations

- Stress
- Illicit drugs
- Prescription medications
- Environmental toxins
- Pesticides, endocrine disruptors, chemicals
- Hobbies and occupation
- Heavy metals
- Radiation

(Sharma et al 2013)

References

  CD008189
If I have trouble later, I'll just use IVF

Overestimating the ability of IVF to solve fertility problems

- IVF can dramatically improve pregnancy prognosis for:
  - Severe male factor
  - Blocked fallopian tubes
  - Endometriosis
  - Unexplained infertility for women ≤34

(That has been fully investigated)
Advanced Egg Age (>35)

- Difficulty achieving good egg numbers
- Lower fertilization rates
- Lower numbers of usable eggs and embryos
- High chromosome imbalance risk

Chance of IVF live birth >40 (ANZARD 2012)

- LBR at 40 years <5% per cycle
- LBR at 43 years <1% per cycle
- Cost of IVF cycle to tax payer, approx $10K per cycle

Risk factors for infertility

- Age
- Pelvic STI
- Endometriosis
- Asherman's
- Fibroids
- Iatrogenic
- Obesity
- Smoking
Reasons for delay

- Single status at 30
- Partner non-committed to parenthood
- Education
- Career
- Economic stability

Obstetric risk factors for advanced maternal age

- Hypertension
- Pre-eclampsia
- Gestational diabetes
- Preterm birth
- Extremes of birthweight
- Operative delivery
- Post-partum incontinence

Timing: importance in referral

- Recognise the biological definition of advanced maternal age
- Investigate women >34 TTC
  - Patent fallopian tubes
  - Ovulation
  - Reasonable sperm
- Refer after 6 months infertility
- Egg freezing for single women in early 30s
Limits of IVF

- No proven intervention to reverse effects of ovarian aging
- No enhancing effect on egg quality
- Of limited benefit at age >40
- At age >45 – donor oocyte mandatory

Case study 1:

An opportunity to talk about reproductive life planning

- Paula, 27 years old presents for her pap smear
- Ryan, 30 comes to discuss vaccinations for an overseas trip

RACGP 2012 Guidelines

- “...developing a reproductive life plan that includes whether they want to have children...”
- “...the number, spacing and timing of intended children...”
- Optimising health before conceiving
Opportunities to talk fertility in primary care

• Reproductive health consultations
  – PAP smear
  – Contraceptive counselling
  – STI check

• Other consultations
  – Health checks
  – Immunisation before travel

One Key Question

• ‘Would you like to become pregnant in the next year?’
  – To ensure that more pregnancies are wanted, planned, and as healthy as possible.

www.onekeyquestion.org

Have you thought about having a baby in the next year?

Yes/ Maybe  No

Lifestyle
  - Timing/fertile window, regularity of sex
  - Weight
  - Smoking
  - Alcohol
  - Drugs and other factors
  - Natural therapies

Medical
  - FSH, FSH, endometriosis, PID, ruptured appendix, ectopic pregnancy
  - Supplementation: Folic acid, iron, vitamin D
  - Ask again in 1 year

- Family History/Genealogy
  - Diabetes, thalassemia screening

- STIs: chlamydia screening

- Mental Health: previous and current
- Fertility tests: AHM
Useful resources

- Your Fertility
  - Understanding ovulation
  - Thinking about having a baby
  - Fertility facts for health professionals

- APNA Family Planning Decision Support Tool
  (Download from resources folder)

Thinking about having a baby?

Talk to your doctor!

Top Five Fertility Factors

Understanding ovulation and the fertile window
Lifestyle & nutrition

• Take the opportunity to inform the patients of the importance of commencing antenatal multivitamin/mineral supplement 3 months prior to conception
• Clean up diet and lifestyle – preconception care diet handout

Case study 2: Scenario 1
A 28-34 year old woman

“I’d love to be a mum – I’m hoping I’ll meet someone”

Female fertility and age
Education messages

Future planning
- Fertility declines after 35
- Delaying conception is a major risk factor for female infertility
- Consider AMH screening
- Egg freezing

Immediate action
- Contraception advice
- Lifestyle advice
- STI screening
- Cervical surveillance

Action now, preventing future problems

AMH as marker of ovarian reserve

[Graph showing correlation between AMH levels and age]

www.yourfertility.org.au

- Evidence-based information
- Animations
- Case studies videos
- Fertility quiz
- Ovulation calendar
- Preconception health checklist
- Section for health professionals
- Blog with updates on new research
- Facebook and Twitter
Lifestyle & nutrition

- Dietary & lifestyle factors to optimise natural fertility
- Nutrition - antenatal formula
- Stress minimisation and management

Scenario 2

A 38+ year old woman

"I’d love to be a mum but I haven’t met the right partner yet."

Female fertility and age
Discuss her options: empower your patient to make informed choices

- Educate about age related infertility
- Donor sperm conception
  - IUI
  - IVF
- Egg freezing
- AMH testing
- Referral for specialist advice

Case study 3

Pre-pregnancy planning
- Stacey 29 & Rob 32 present to discuss their plans to start trying to have a baby
- They are both overweight
- Rob smokes 20 cigarettes a day

Preparing for pregnancy

- Preconception care
- Menstrual cycle
- Timing
Lifestyle & nutrition

- Smoking cessation for male - discuss options
- Nutritional advice- education about impact of obesity and the benefits of modest weight loss of 5-10%
- Diet : avoid pro-inflammatory foods and encourage foods that are “anti-inflammatory”
- Regular reviews to encourage weight loss goals
- Specifically ensure Vitamin D replete as obesity increases need for Vitamin D
- Lifestyle- exercise specific recommendations: 225-300 min/week of moderate intensity physical activity for overweight or obese adults. (1 hour 5 days per week)
Case 4: It's not happening

Sub-fertility
– Ana 32 presents to discuss her fertility
– She and her partner have been trying to conceive for about 10 months with no success

Nutrition & lifestyle
This may be when patient first accesses natural therapist
• Ensure all preconception nutrients
• Refer to fertility specialist if not already managed
• Optimisation of fertility with diet
• Avoidance of environmental toxins,
• Stress minimisation and management
• Herbal medicines and antioxidant supplements

Recommended management
• Lifestyle optimisation
• Antenatal/Genetic screening
• Address modifiable risk factors (eg. TSH, smoking, weight, diet, folate)
• Supervised conservative management
• Consider family aspirations (not just first baby) in timing specialist referral
Semen analysis

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Why is sperm compromised?

- Holistic assessment of the male partner
- Lifestyle modification
- Underlying disease state?
- Substance abuse

Endometriosis assessment

- Can be poor correlation between symptoms and disease severity
- Bimanual examination
- 80% cases at laparoscopy positive for endometriosis after 12 months unexplained infertility
Ovarian reserve assessment
- Pelvic USS assessment for anatomical issues
- E.g. endometrial polyps, fibroids, hydrosalpinges
- Antral follicle count (follicular phase)
- AMH

Treatment options
- OI – needs specialist USS monitoring
- IUI
- IVF/ICSI/IMSI
- PGS/PGD
- Donor egg/sperm/embryo

Unexplained infertility
- Often complex: age/partner specific
- Karyotype
- Immune responses poorly understood
- Endometriosis
- Age/egg quality – no in-vivo test
  IVF/PGD can often be diagnostic as well as therapeutic