Scottish
Cancer Network

NHS
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BREAST CANCER SUPPORTIVE CARE

EDUCATIONAL SYMPOSIUM

Scottish Cancer Network

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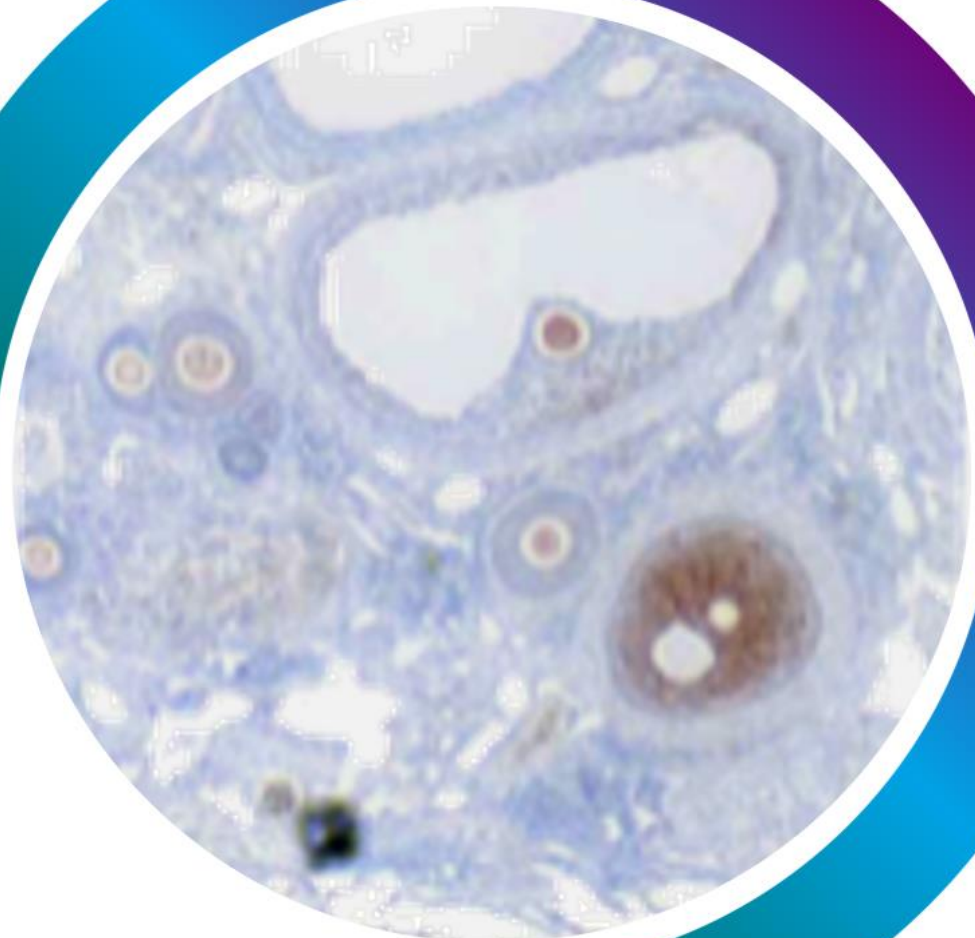
FERTILITY & ITS PRESERVATION IN BREAST CANCER



Richard Anderson

Professor of Clinical Reproductive Science, Centre for Reproductive Health, University of Edinburgh.

THE UNIVERSITY of EDINBURGH

BREAST CANCER SUPPORTIVE CARE
EDUCATIONAL SYMPOSIUM

Questions

Will I be able to have a baby after treatment?

Will it be safe to have a pregnancy?

What can I do to increase my chances of being able to have a baby afterwards?

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BREAST CANCER SUPPORTIVE CARE
EDUCATIONAL SYMPOSIUM

Chemotherapy: immediate and late effects on the ovary

Depletion of growing follicles

Himelstein-Braw R, Peters H and Faber M (1978)

Morphological study of the ovaries of leukaemic children.

Br J Cancer 38, 82-87

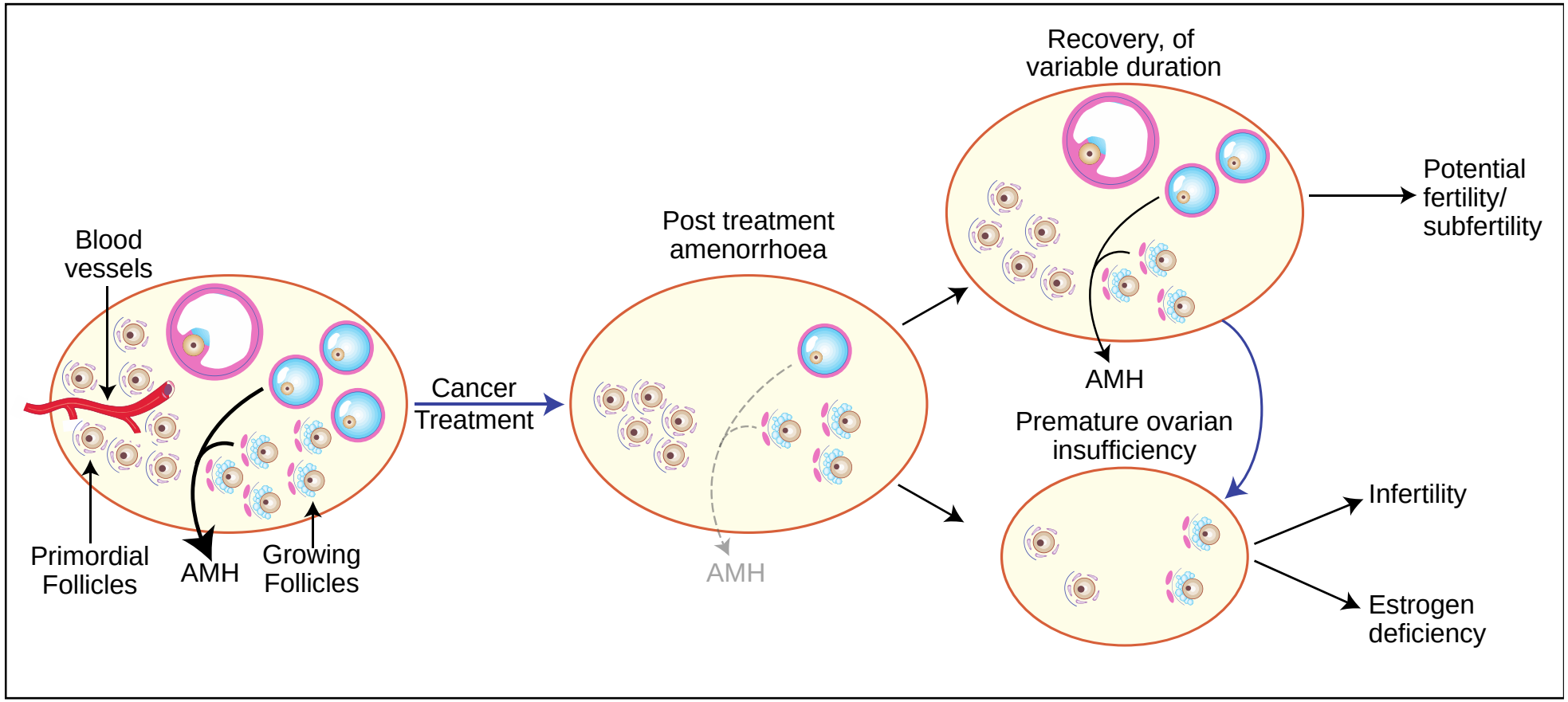
Premature ovarian failure

Chapman RM, Sutcliffe SB and Malpas JS (1979)

Cytotoxic-induced ovarian failure in women with Hodgkin's disease. I. Hormone function.

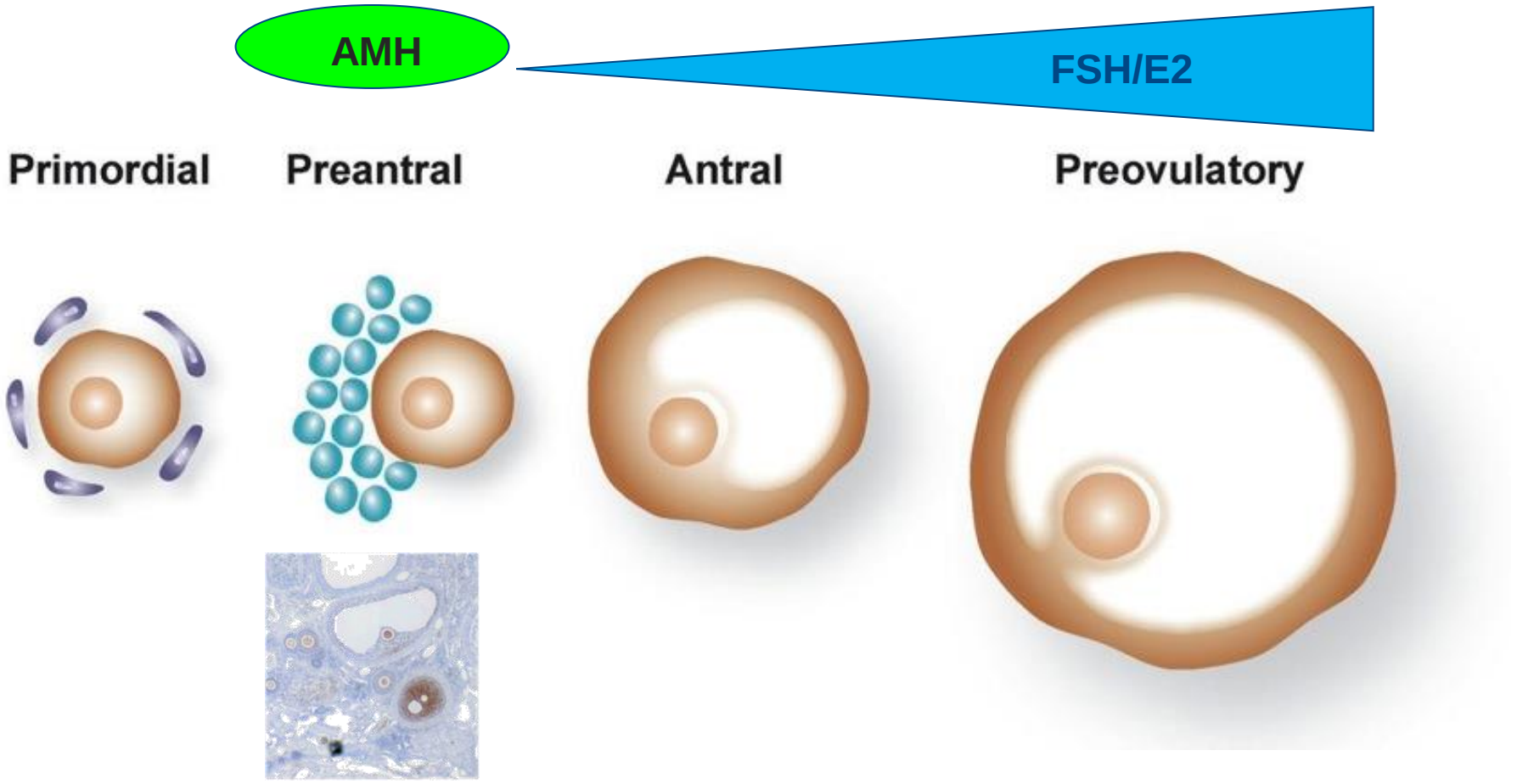
JAMA 242, 1877-1881

Effects of cancer therapy on the ovary



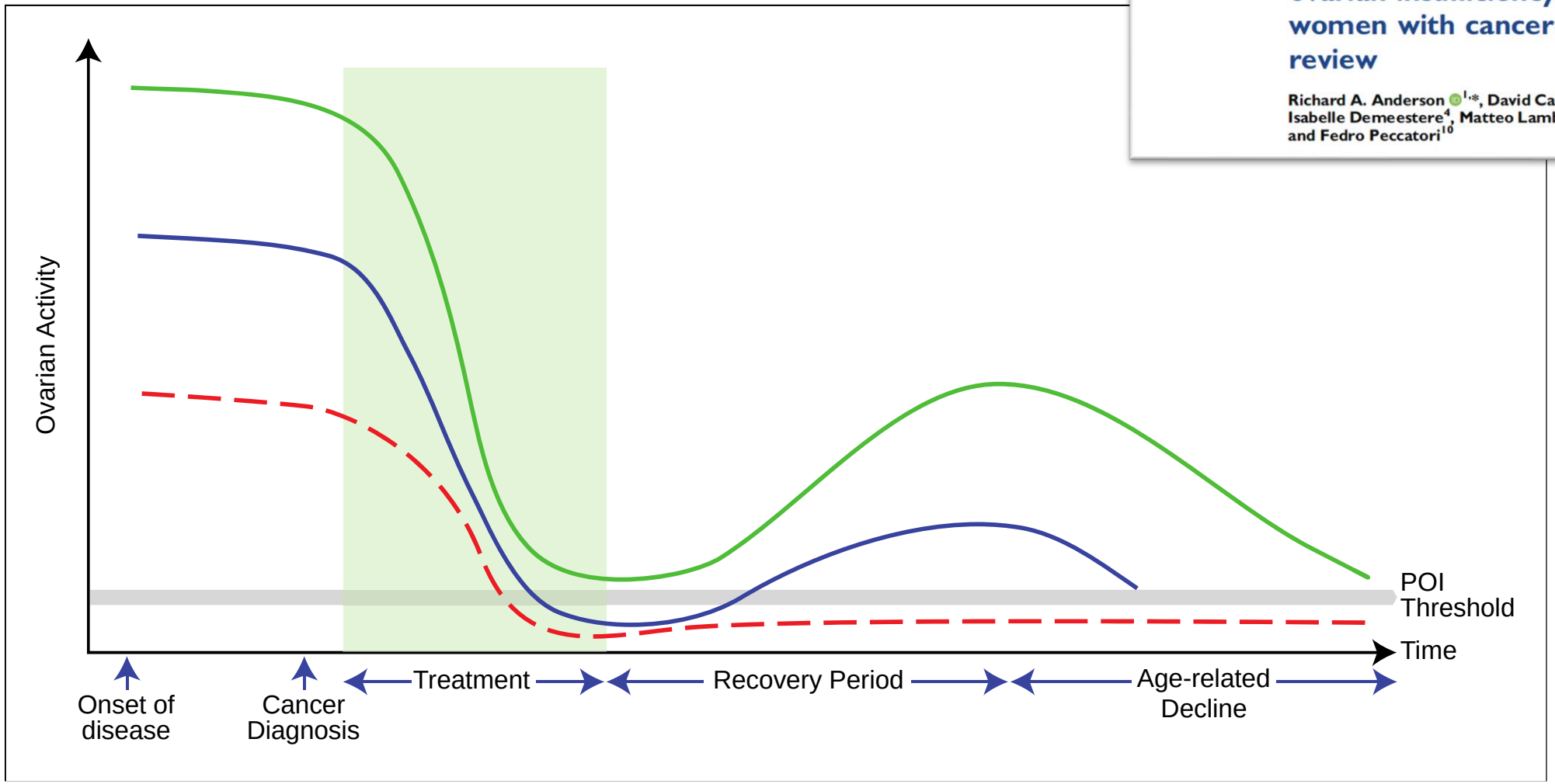
Jayasinghe, Wallace and Anderson 2018 Expt Rev Endo Metab

AMH as key biomarker of the ovarian reserve



Anderson RA 2012 Clin Endocrinol 77, 652

Identify and predict ovarian damage



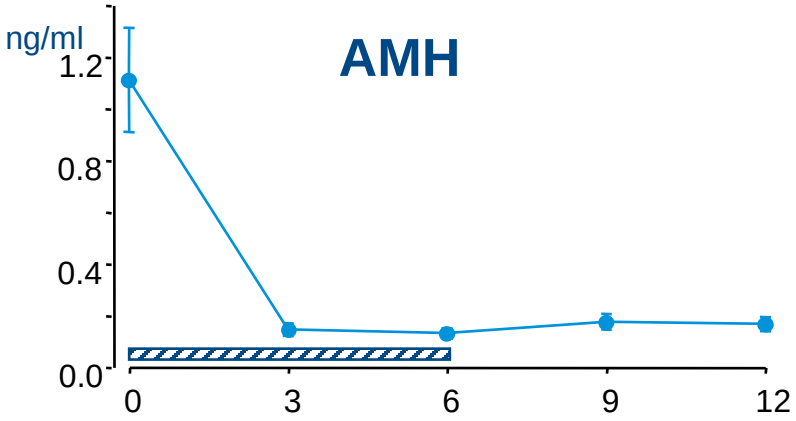
Human Reproduction Update, pp. 1–18, 2022
https://doi.org/10.1093/humupd/dmac004
human reproduction update

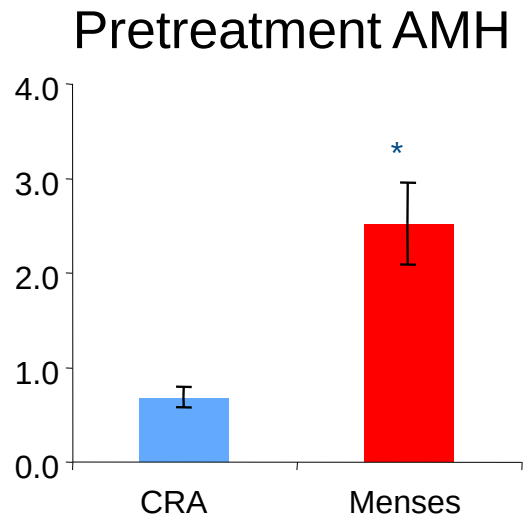
Anti-Müllerian hormone as a marker of ovarian reserve and premature ovarian insufficiency in children and women with cancer: a systematic review

Richard A. Anderson[1,*], David Cameron[2], Florian Clatot[3], Isabelle Demeestere[4], Matteo Lambertini[5,6], Scott M. Nelson[7,8,9], and Fedro Peccatori[10]

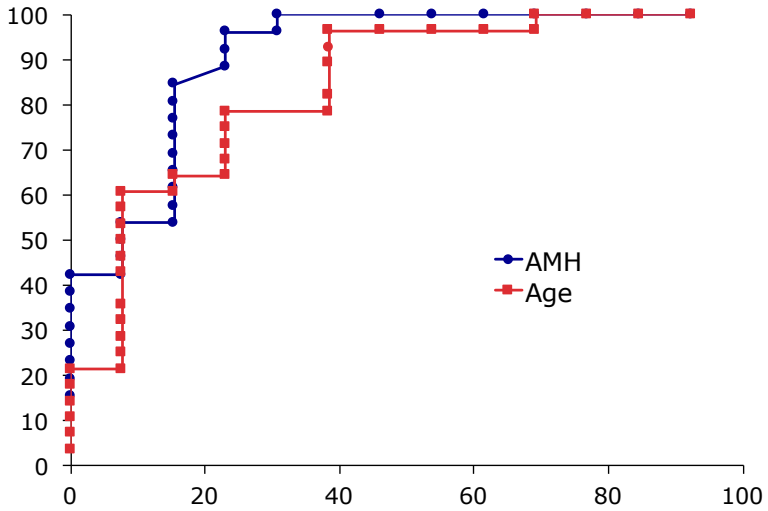
Jayasinghe, Wallace and Anderson 2018 Expt Rev Endo Metab
Anderson et al HRUpdate 2023

Pretreatment AMH predicts long-term ovarian function in eBC



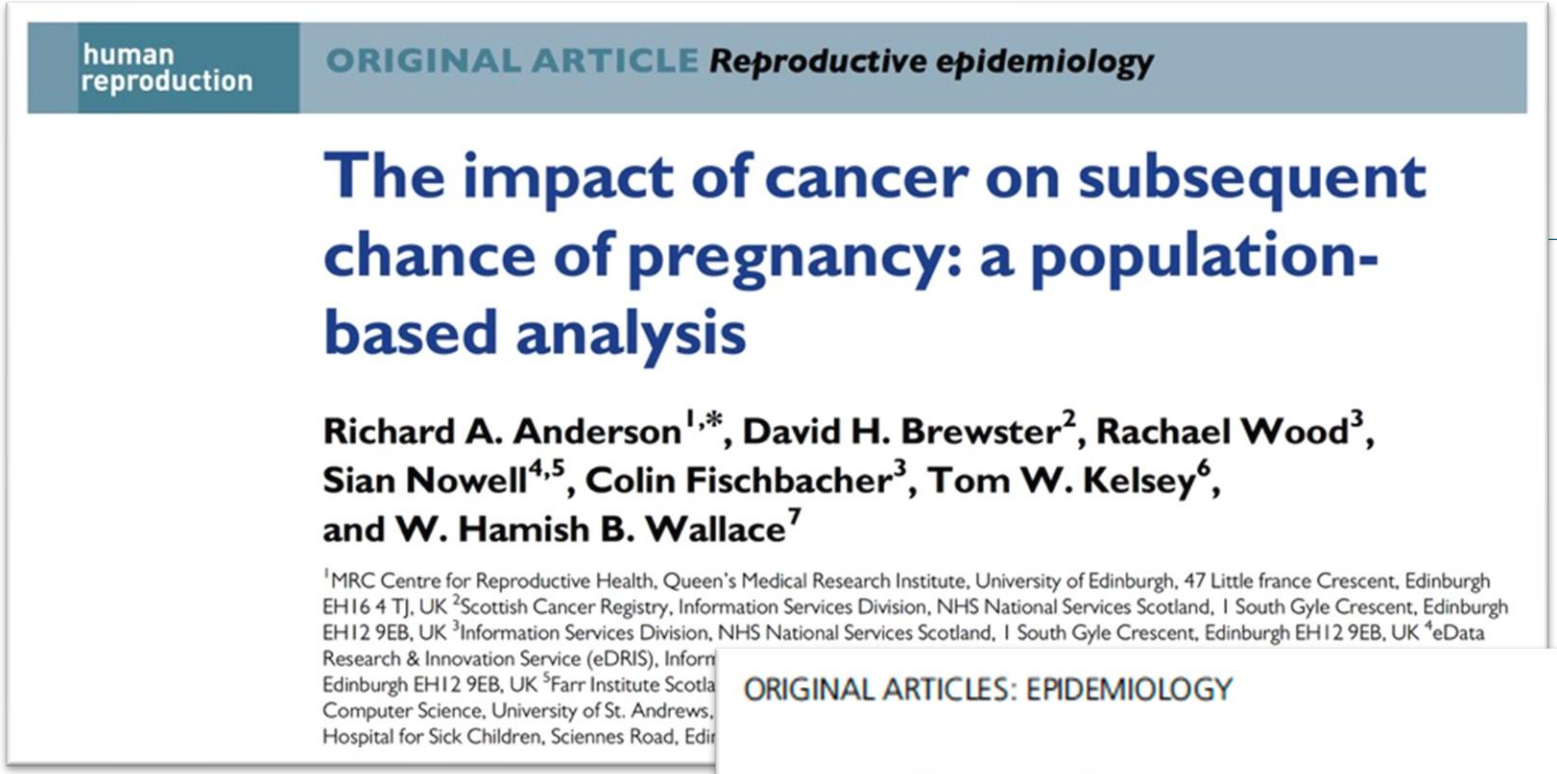


Prediction of amen



AMH at diagnosis of early breast cancer is higher in women still having menses 5 years later

Anderson RA et al 2006 Human Reprod 21, 2583
Anderson and Cameron 2011 JCE&M 96, 1336



human reproduction

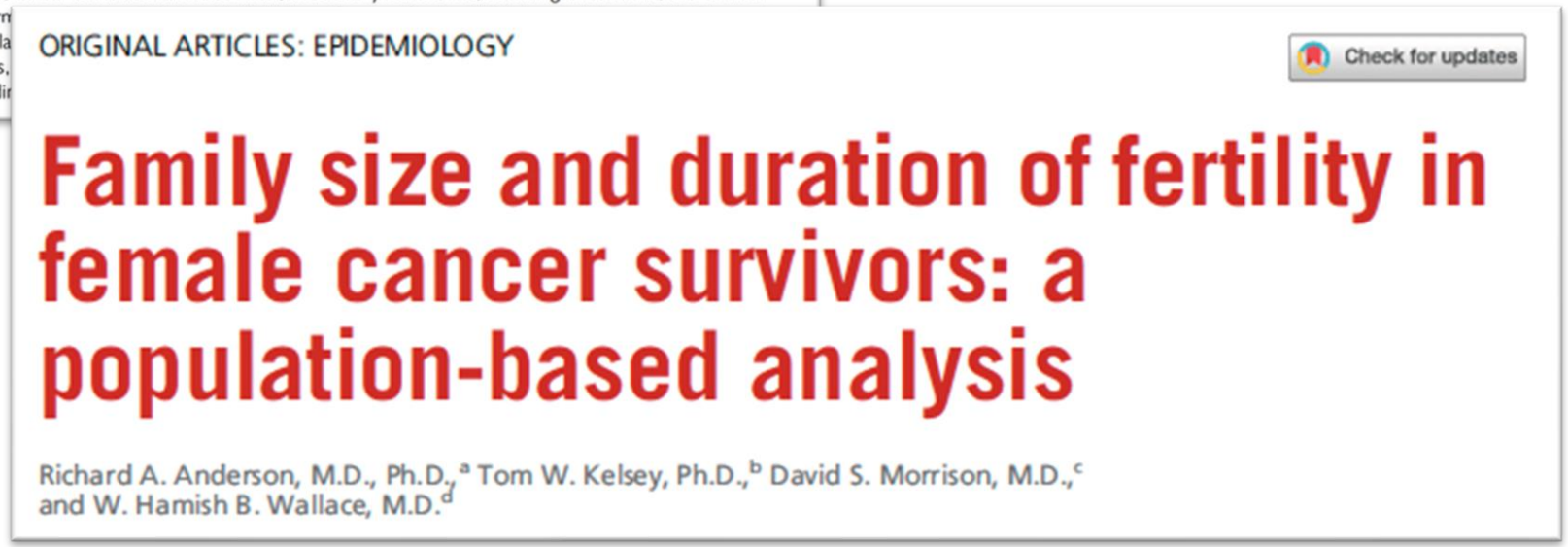
ORIGINAL ARTICLE *Reproductive epidemiology*

The impact of cancer on subsequent chance of pregnancy: a population-based analysis

Richard A. Anderson[1,*], David H. Brewster[2], Rachael Wood[3], Sian Nowell[4,5], Colin Fischbacher[3], Tom W. Kelsey[6], and W. Hamish B. Wallace[7]

[1]MRC Centre for Reproductive Health, Queen's Medical Research Institute, University of Edinburgh, 47 Little france Crescent, Edinburgh EH16 4 TJ, UK [2]Scottish Cancer Registry, Information Services Division, NHS National Services Scotland, 1 South Gyle Crescent, Edinburgh EH12 9EB, UK [3]Information Services Division, NHS National Services Scotland, 1 South Gyle Crescent, Edinburgh EH12 9EB, UK [4]eData Research & Innovation Service (eDRIS), Inform
Edinburgh EH12 9EB, UK [5]Farr Institute Scotla
Computer Science, University of St. Andrews,
Hospital for Sick Children, Sciennes Road, Edi

Human Reprod, 2018



ORIGINAL ARTICLES: EPIDEMIOLOGY

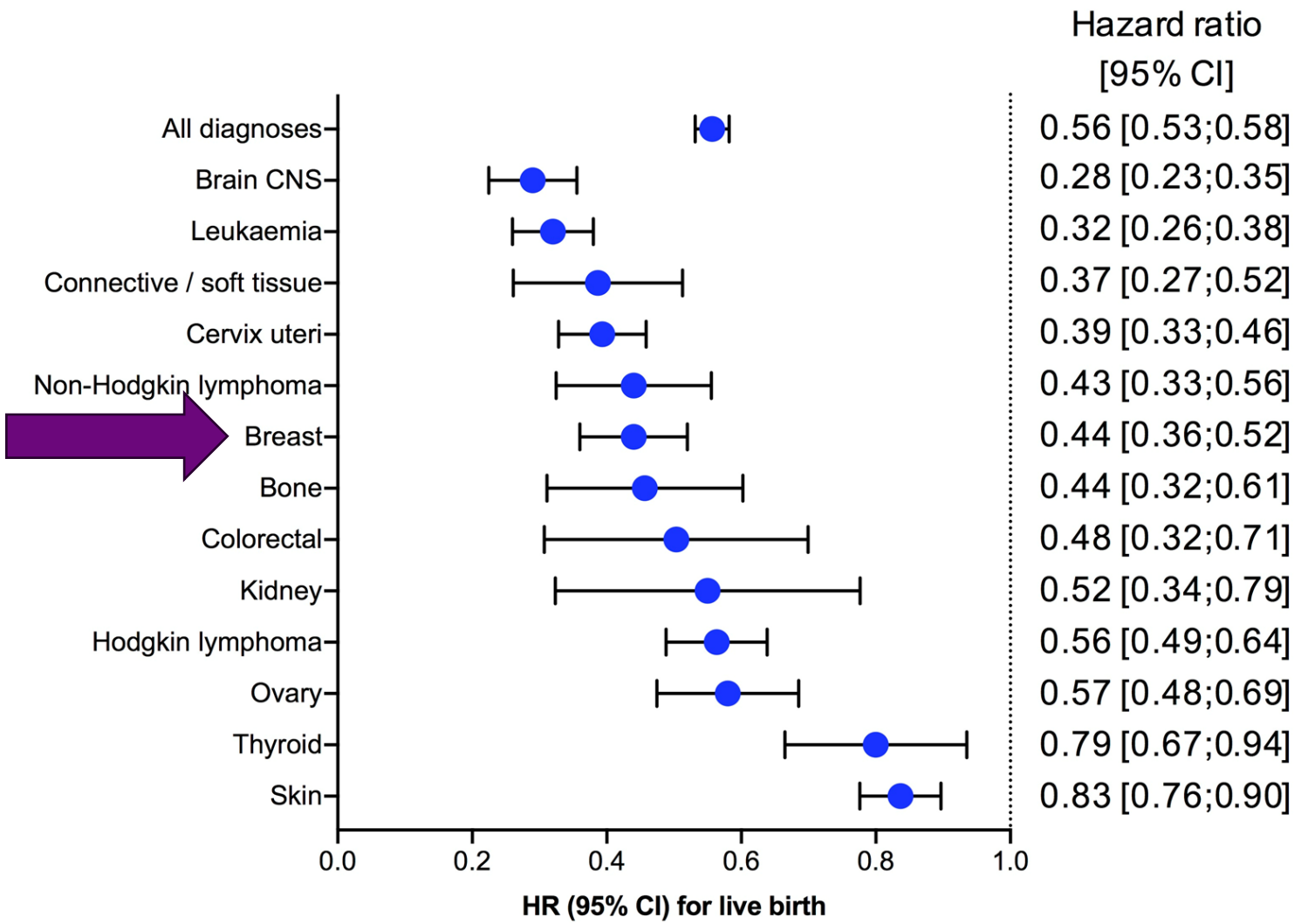
Check for updates

Family size and duration of fertility in female cancer survivors: a population-based analysis

Richard A. Anderson, M.D., Ph.D.,[a] Tom W. Kelsey, Ph.D.,[b] David S. Morrison, M.D.,[c] and W. Hamish B. Wallace, M.D.[d]

Fertil Steril, 2022

Cancer (treatment) reduces the chance of live birth



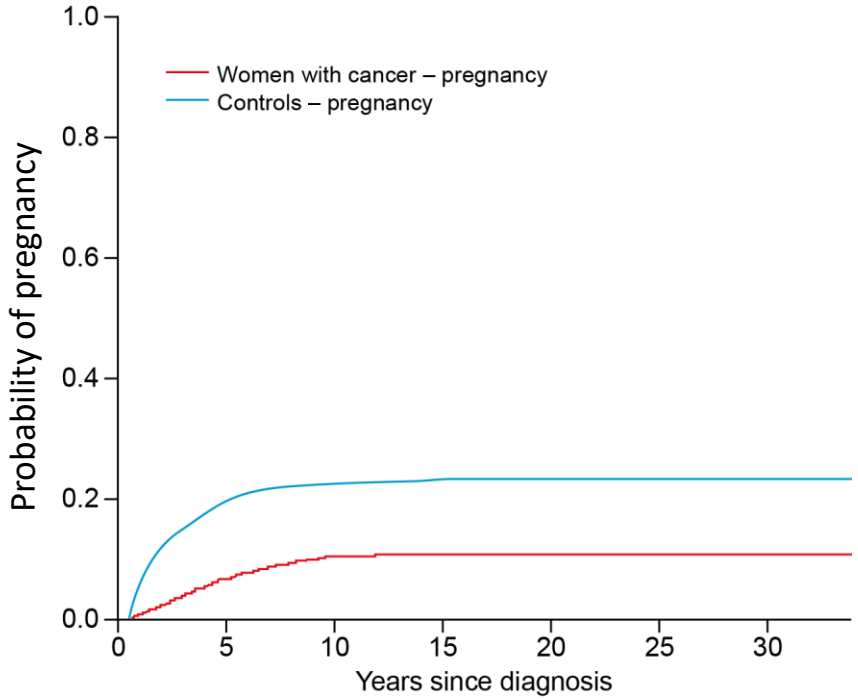
Scottish population data:

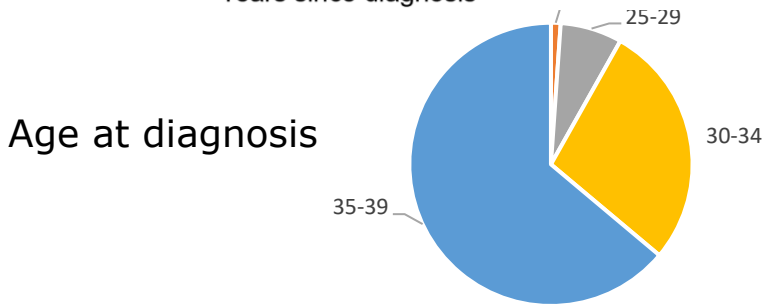
New cancer diagnosis
1981-2012
N=10,267 with no prev pregnancy

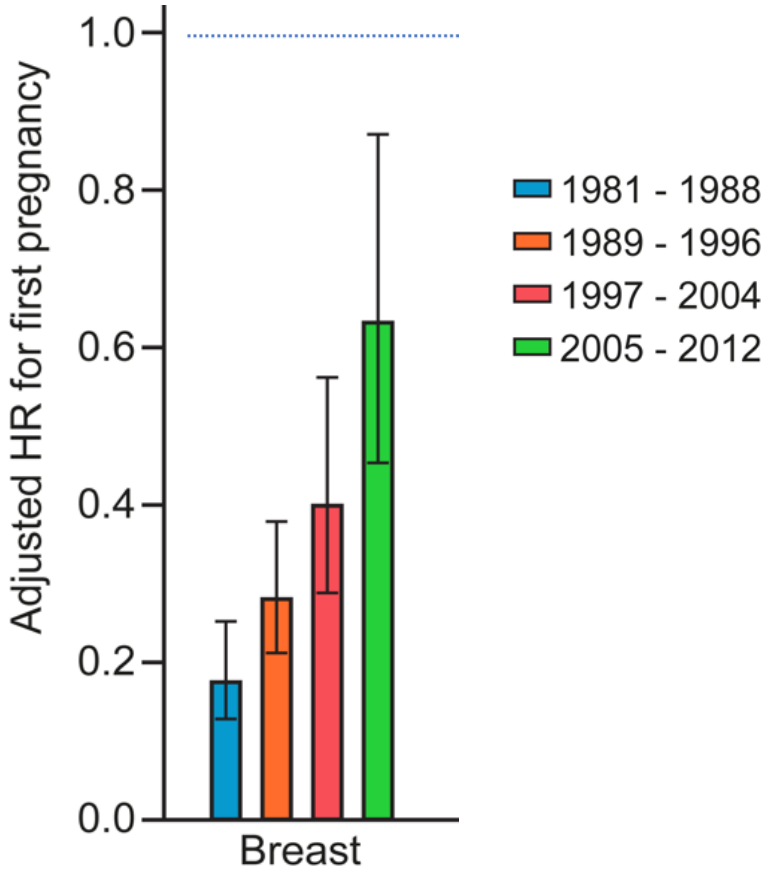
With 3x controls
Matching:
- Age
- Period of diagnosis

Anderson RA et al 2022, Fertil Steril

Impact of breast cancer on fertility: Scottish national data

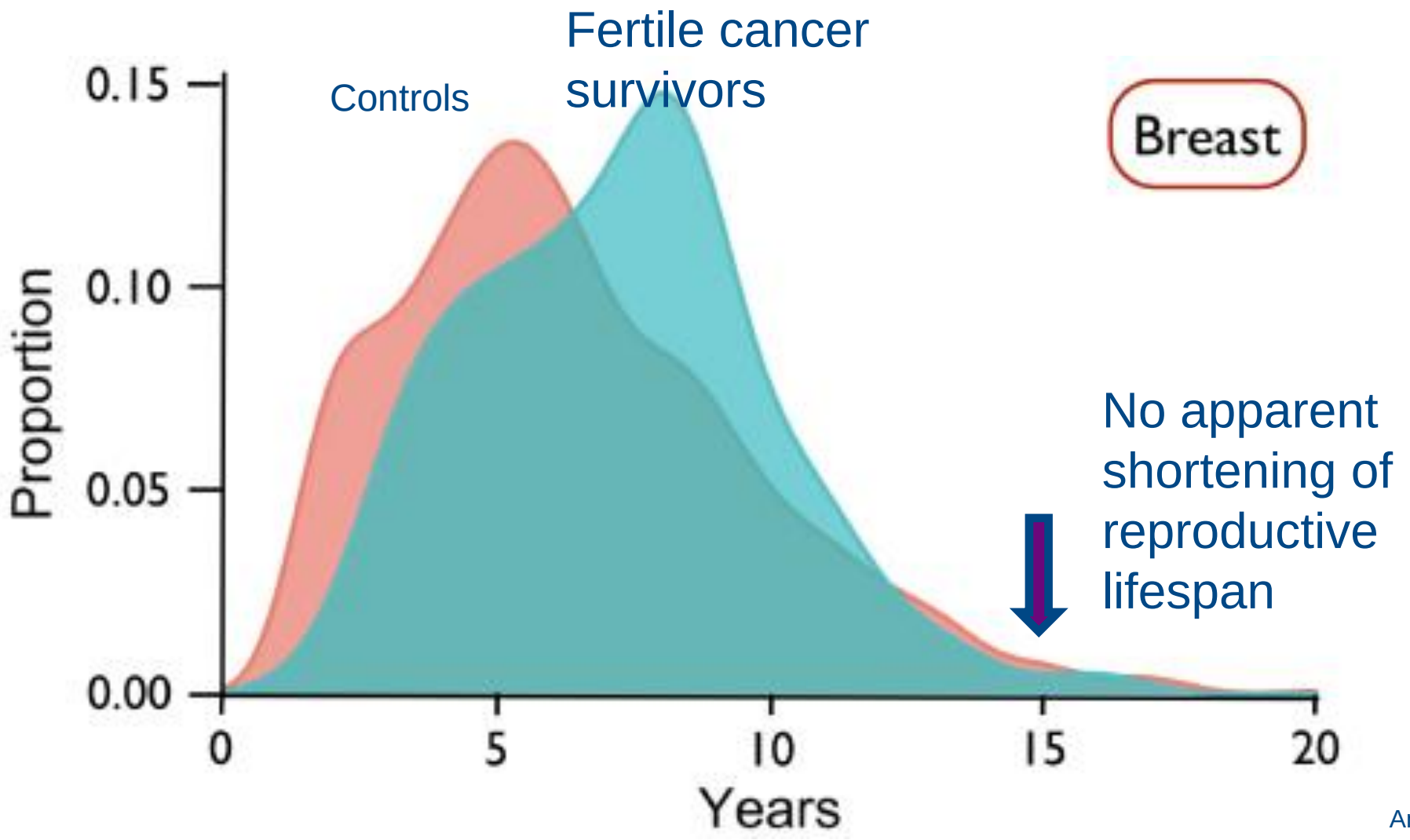






Anderson RA et al Human Reprod 2018

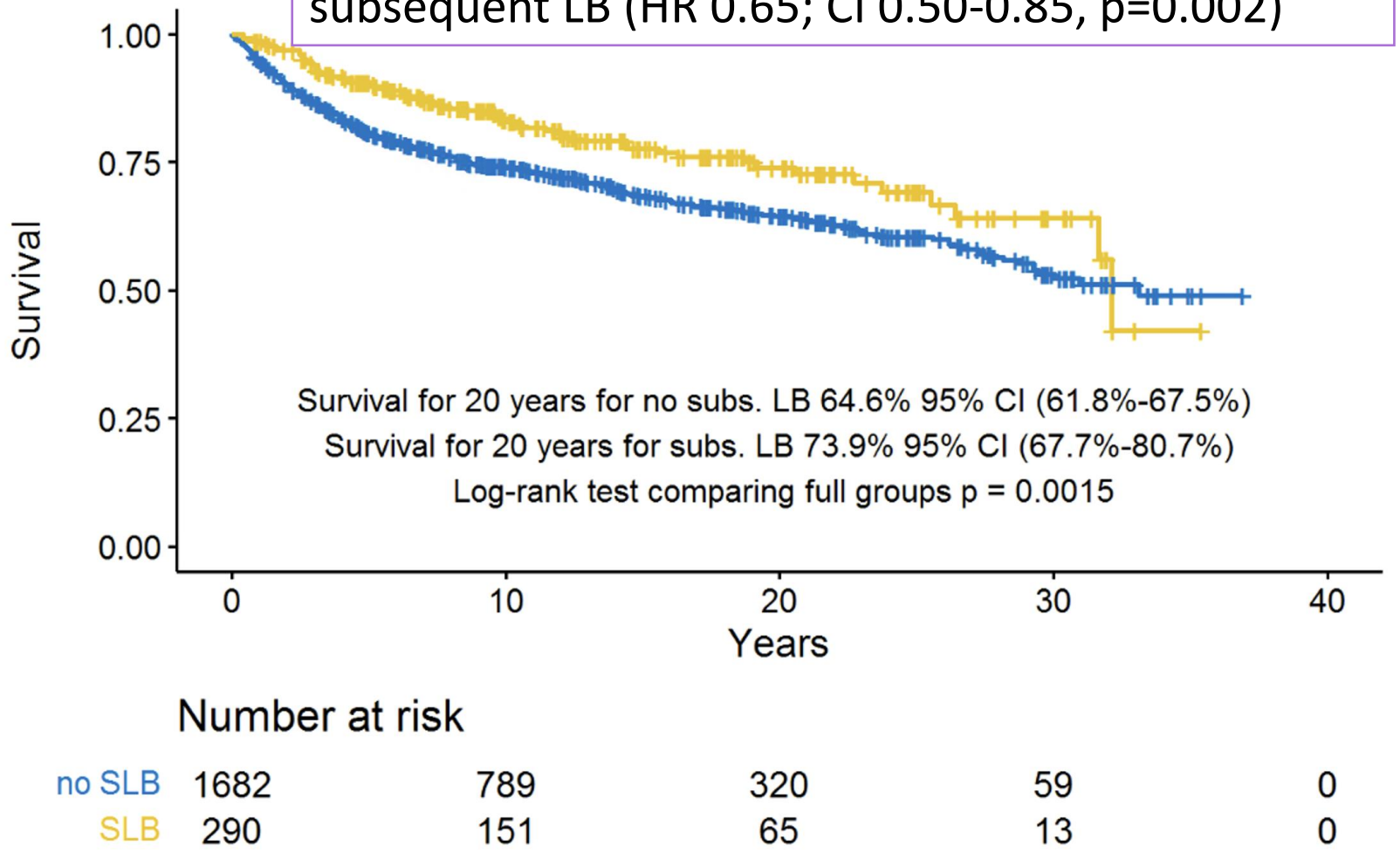
‘Fertile lifespan’ after breast cancer



Anderson RA et al 2022, Fertil Steril

After breast cancer, does pregnancy impact survival?

Overall survival was increased in women who had a subsequent LB (HR 0.65; CI 0.50-0.85, p=0.002)



European Journal of Cancer 173 (2022) 113–122

Available online at www.sciencedirect.com
ScienceDirect
journal homepage: www.ejcancer.com

Original Research

Survival after breast cancer in women with a subsequent live birth: Influence of age at diagnosis and interval to subsequent pregnancy

Richard A. Anderson [a,*], Matteo Lambertini [b,c], Peter S. Hall [d], W. Hamish Wallace [e], David S. Morrison [f], Tom W. Kelsey [g]

5181 with breast cancer, 290 women with SLB

No differences in stage distribution, EP status, age

Anderson et al 2022, Eur J Cancer

Subgroup analyses

Pregnancy prior to diagnosis

Age at diagnosis

<> 5 years interval between diagnosis and LB

ER status (positive or negative)

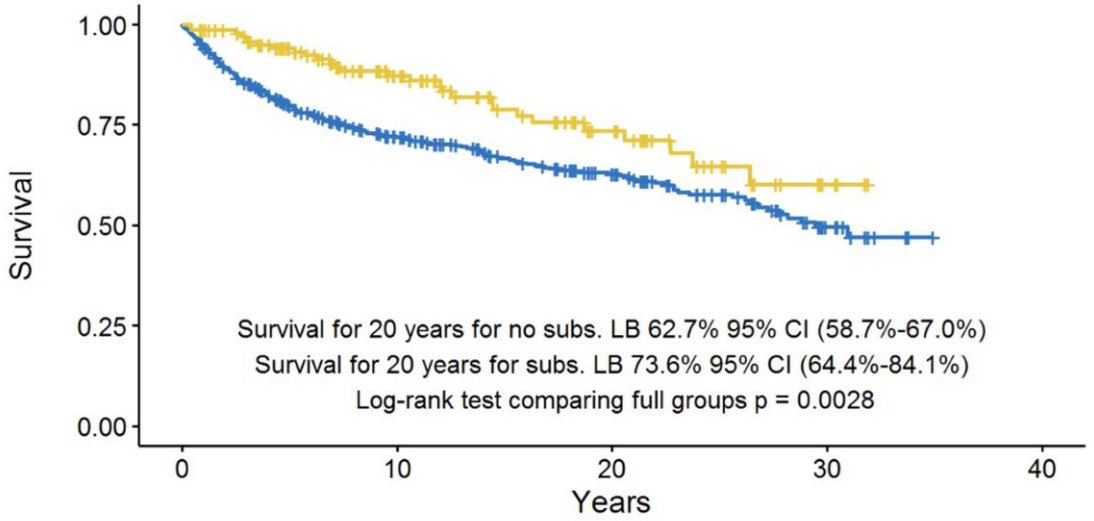
Tumour stage

Known treatment with chemotherapy

Period of diagnosis

Women with no previous pregnancy, and ER+ve

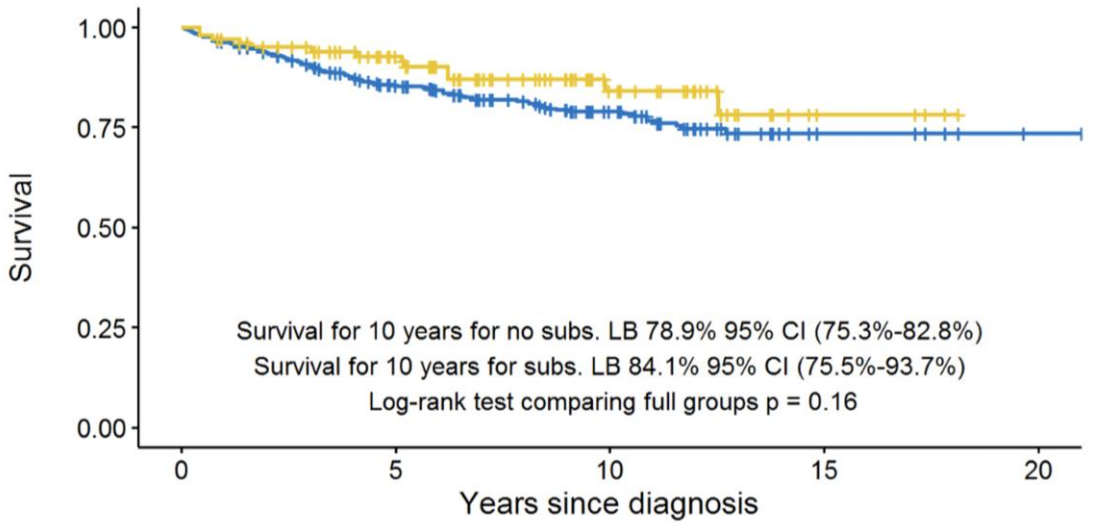
No prev preg: HR 0.56 (0.38-0.82, p=0.003)



Number at risk

no SLB	794	366	159	27	0
SLB	142	75	33	5	0

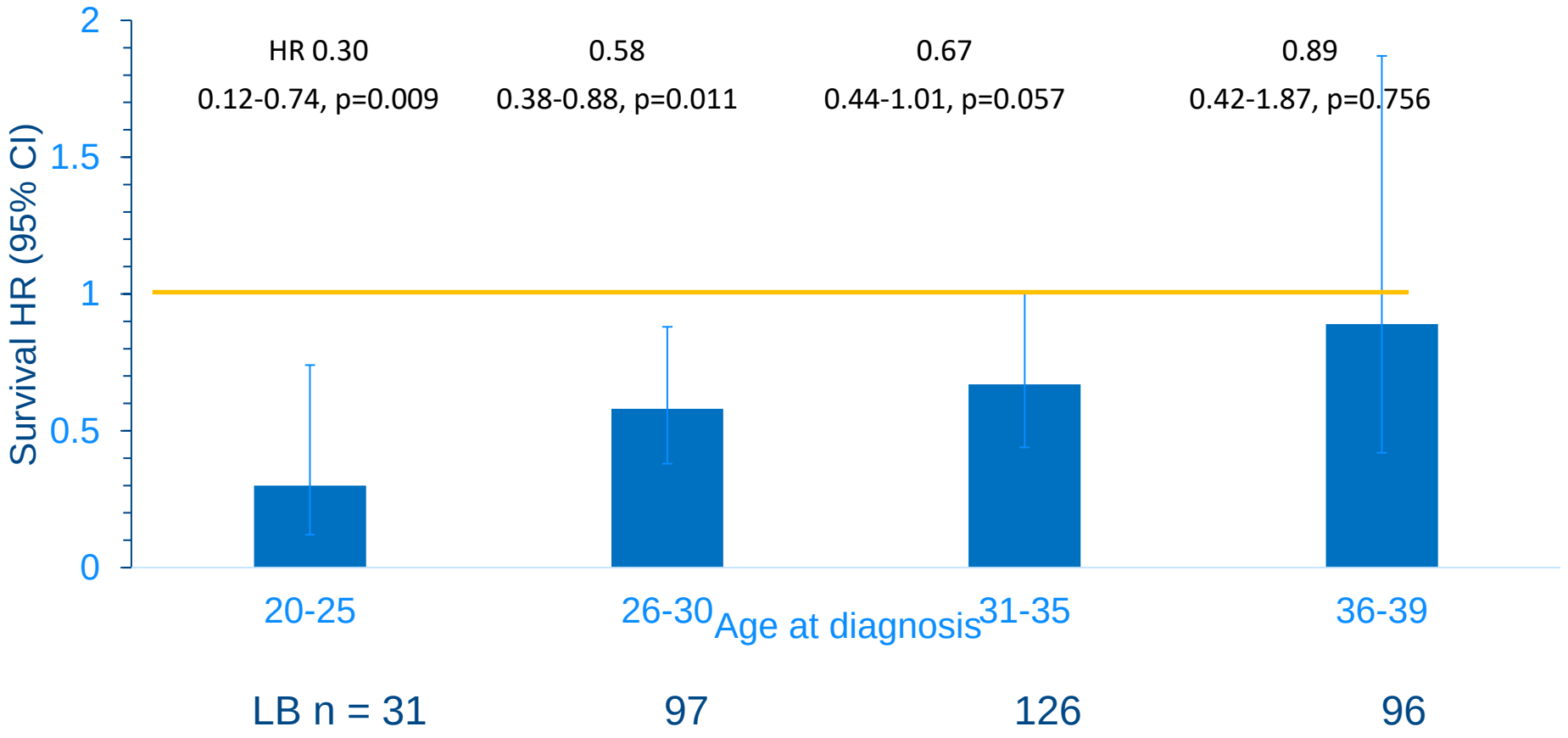
ER Positive HR 0.66 (0.37-1.18, p=0.160)



Number at risk

no SLB	612	389	168	22	4
SLB	102	71	27	4	0

Age at diagnosis



POSITIVE trial: interruption of endocrine treatment for pregnancy

≤42 years of age

stage I, II, or III disease

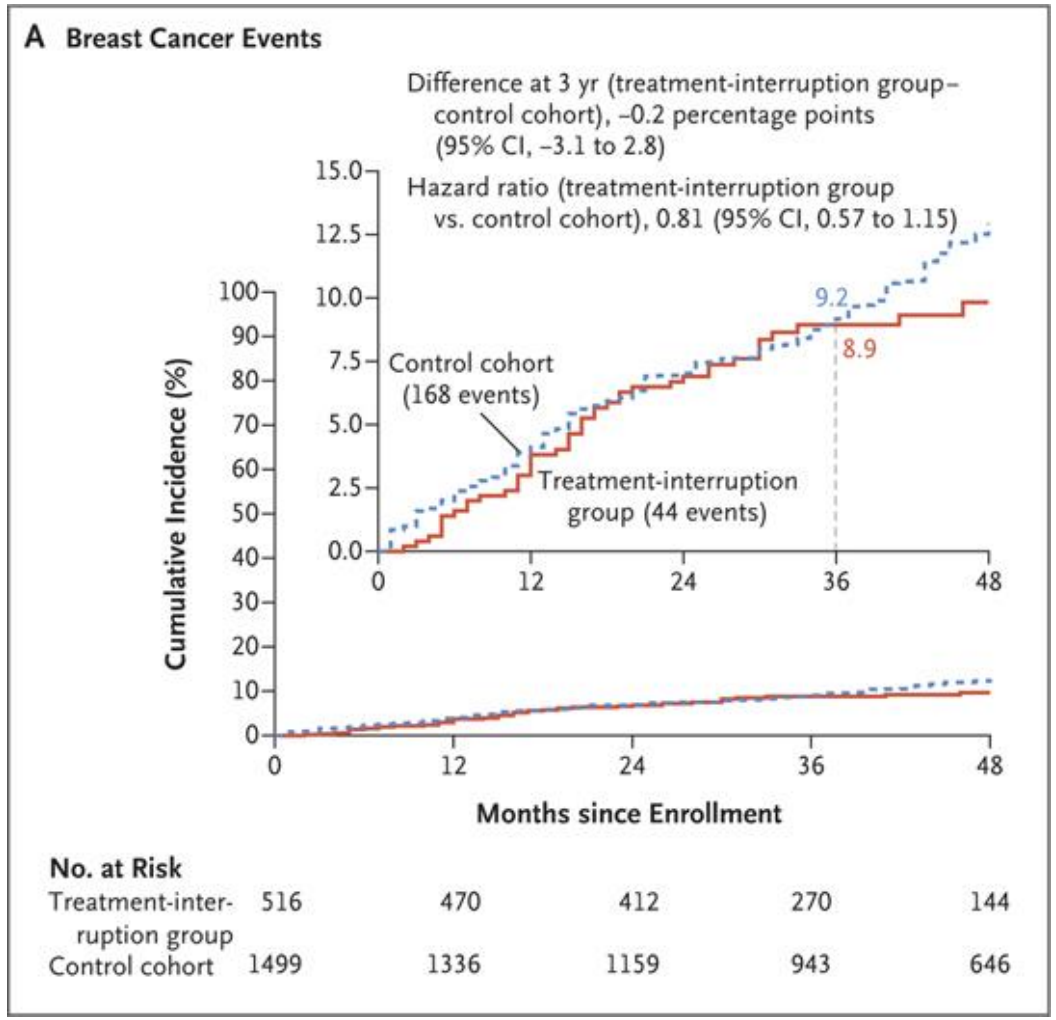
had received adjuvant endocrine therapy for 18 to 30 months

desired pregnancy

Controls: similar but no wish for pregnancy

N=497, 74% pregnant, 64% had LB

Analysis at 1638 patient-years



Partridge AH et al NEJM 2023

Acknowledgements

David Cameron and colleagues at Edinburgh Breast Centre
Peter Hall

Hamish Wallace (paed oncology)
Tom Kelsey (mathematician, St Andrews)


UK Fertility Preservation Conference
May 22-23 2024 - Edinburgh, UK
REGISTER HERE
NOW ACCEPTING
UKFP2024 abstract submissions
Submit by April 11th 2024
Enquiries to UKFP-2024@ed.ac.uk
Society for Reproduction and Fertility
British Fertility Society
THE UNIVERSITY of EDINBURGH
Institute for Regeneration and Repair

FEMALE FERTILITY PRESERVATION IN BREAST CANCER

Maya Chetty

Consultant in Reproductive Medicine,
Edinburgh Fertility Centre, NHS Lothian.

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Fertility Preservation Guidelines

NICE
National Institute for
Health and Care Excellence

asrm
American Society for
Reproductive Medicine

BFS
British
Fertility
Society

eshre
SCIENCE MOVING
PEOPLE
MOVING SCIENCE

ASCO

Breast Cancer Care Survey 2018

254 responses

Women < 45 years old

21% did not have fertility discussion with their cancer team

"When I asked about having children I was made to feel like I was wasting their time and basically ignored as they felt not important."

"I'm in a same sex relationship and it was unfortunately overlooked by my team. I had to ask about fertility treatment as when initially diagnosed I was advised I would be having chemo. This was later reversed due to the Oncotype test but they just assumed fertility was not an issue for me being in a same sex relationship which I found very upsetting."

"I was offered fertility treatment after my lumpectomy and before I started chemo. I was provided a lot of information by [my hospital], where I received my fertility treatment. [My hospital] gave me brilliant service and care, they were amazing. It was quick and painless for me. I had 20 eggs taken and 18 successfully stored"

"I had a fantastic experience - my surgeon discussed fertility treatment and referred me without me even mentioning that it was an area of concern. It's appalling that this isn't the default level of treatment for all women!"

Breast Cancer Care wants to see every breast clinic have a process for referring women promptly to a fertility specialist. This referral shouldn't depend on local in vitro fertilisation (IVF) funding arrangements.

Fertility Preservation Provision in Scotland

Fertility Scotland
NATIONAL NETWORK

- Generous and equitable NHS funding
- Service provided by 4 NHS IVF centres: Glasgow, Edinburgh, Dundee and Aberdeen
- Funding by Health Board
- Referral from secondary care
- Commitment to seeing patients +/- starting treatment ASAP and maintaining close communication with cancer team

Access Criteria

Diagnosis	Subfertility with an appropriate cause of any duration - all couples ***OR*** Unexplained subfertility of two years – heterosexual couples Unexplained subfertility following six cycles of donor insemination – same sex couples	→ Condition or treatment causing imminent threat to fertility
Residency	Live within Lothian or the Borders.	
Stable relationship	Couple have been co-habiting (at the same address) in a stable relationship for a minimum of two years.	→ Not applicable at time of storage
Sterilisation	Neither partner has had voluntary sterilisation (even if reversed).	
Biological child	At least one partner must have no living biological child. Same sex couples who have previously conceived through assisted conception and are both named on the resulting child's birth certificate are not eligible for future treatment.	→ Individual has no children
Body Mass Index (BMI)	The prospective birth mother must have a BMI above 18.5 and below 30.	→ BMI <35
Smoking	Both partners must not smoke, vape or use nicotine for at least three months before referral for treatment and couples must continue to be non-smoking/vaping and nicotine free during treatment.	
Alcohol and Drugs	Both partners must not use illegal and abusive substances. Both partners must be Methadone free for at least one year prior to referral for treatment and continue to be Methadone free for the duration of treatment. Neither partner should drink alcohol prior to or during the period of treatment.	→ Not applicable at time of storage
Age	If a couple is referred for IVF/ICSI treatment where the intended birth mother is aged 39, the couple is unlikely to receive more than one NHS funded cycle. Couples where the intended birth mother is over the age of 42 years old will not be eligible for any NHS funded treatment.	→ Age < 40
Previous treatment	Any frozen embryos stored at another clinic in the UK must be transported to EFC before NHS treatment can commence. If the previous treatment was not NHS funded, the transport will be at the patient's cost.	
Welfare of the Child	Satisfy the requirements Welfare of the Child Assessment.	→ Not applicable at time of storage

Egg or embryo freezing

One cycle of egg/ embryo storage (counts as one of max three NHS funded cycles)

Option of self-funding or private treatment (cost £4-6k and ongoing storage fee)

Fertility counselling always offered

Storage for up to maximum of 55 years

Can nominate named partner for posthumous use

Full access criteria apply at the point of use

Possibility of pre-implantation genetic testing (PGT)

Emergency IVF

Treatment can start ASAP

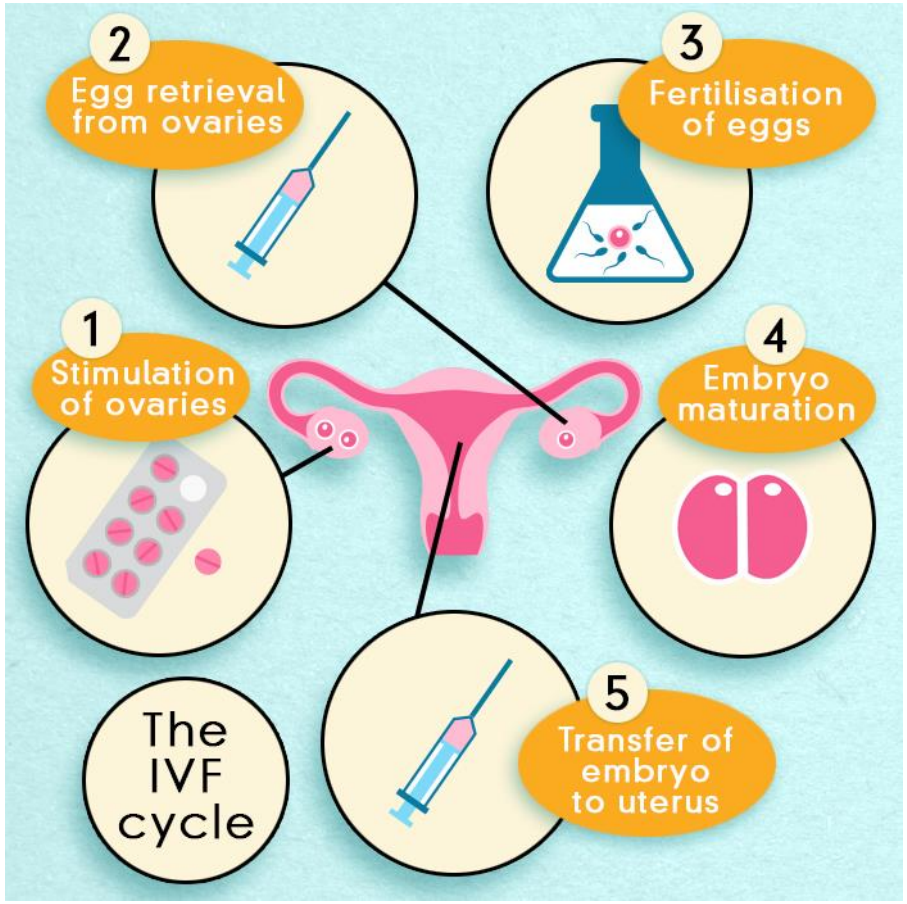
Takes 2-3 weeks start to finish

Risks: operative, anaesthetic, OHSS

Eggs v embryos

Thaw cycle

Chance of live birth approx 4-5% per egg frozen, 30-35% per embryo frozen



Controlled ovarian stimulation

1. Random start
2. Antagonist cycle
3. Higher dose FSH
4. Agonist trigger
5. Co-treatment with anti-oestrogen

Minimize duration

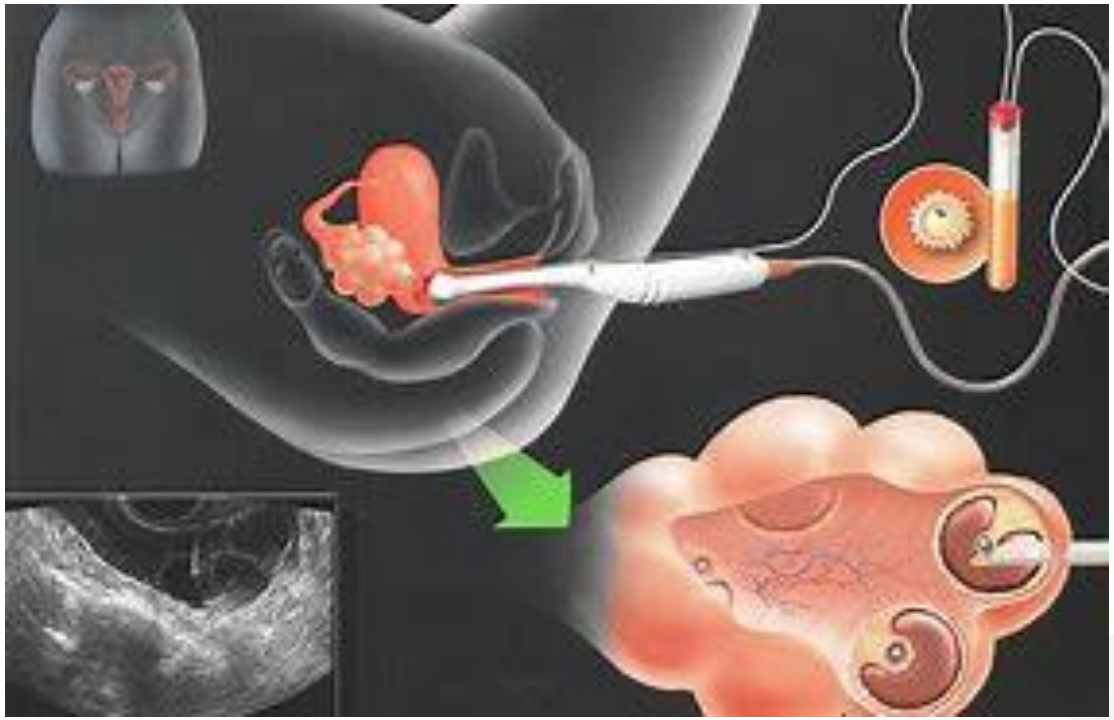
Minimize duration and OHSS

Optimise ovarian response

Minimise OHSS

Oestrogen sensitive tumours

Egg or embryo freezing



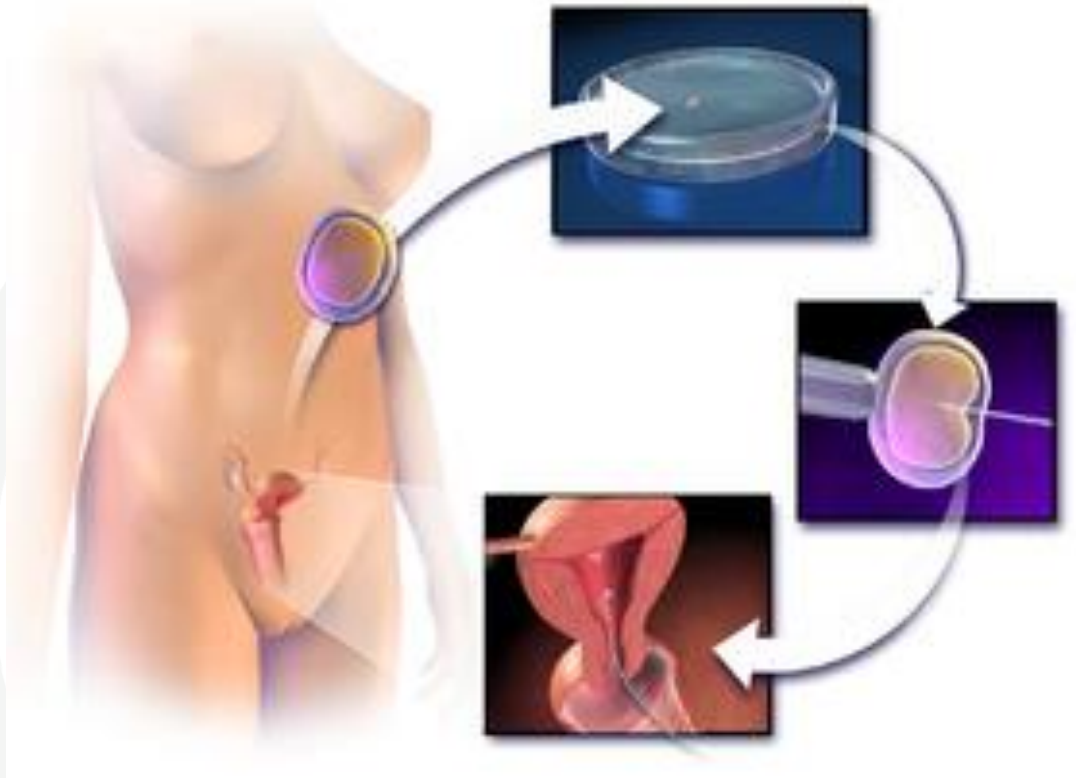
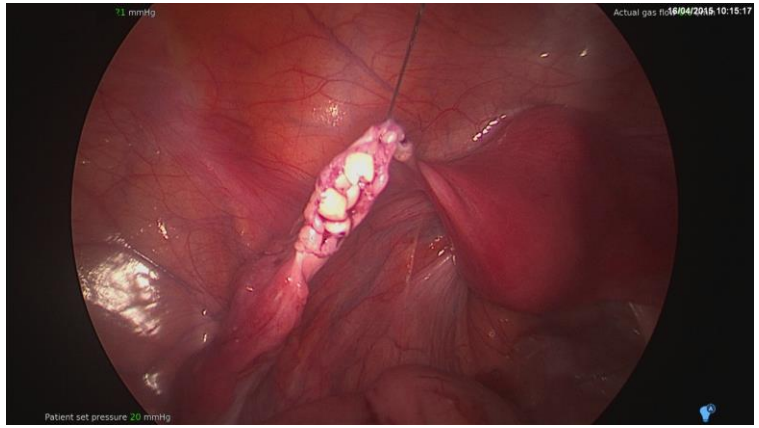


Image fertilitysolutions.com.au

Embryo cryopreservation

established option
But….

Ovarian tissue cryopreservation



Alternative option when time not adequate for ovarian stimulation or other contraindications

Age < 35

Requires laparoscopy for tissue harvesting and re-implantation

First patient in Edinburgh in 1993

1mm thick, 1 ovary, strips v oophorectomy

Slow freezing (vitrification 2 babies in Japan)

Laparoscopic replacement

- Surgical placement and technique
- Risk of malignant contamination
- Chance of live birth ? approx 25-40%

More than 200 live births

Edinburgh data

- 76 referrals since 2015

- Increasing numbers of referrals and patients opting for fertility preservation
- Mainly white women
- Increasing numbers of random starts and agonist triggers
- Small numbers of OTC

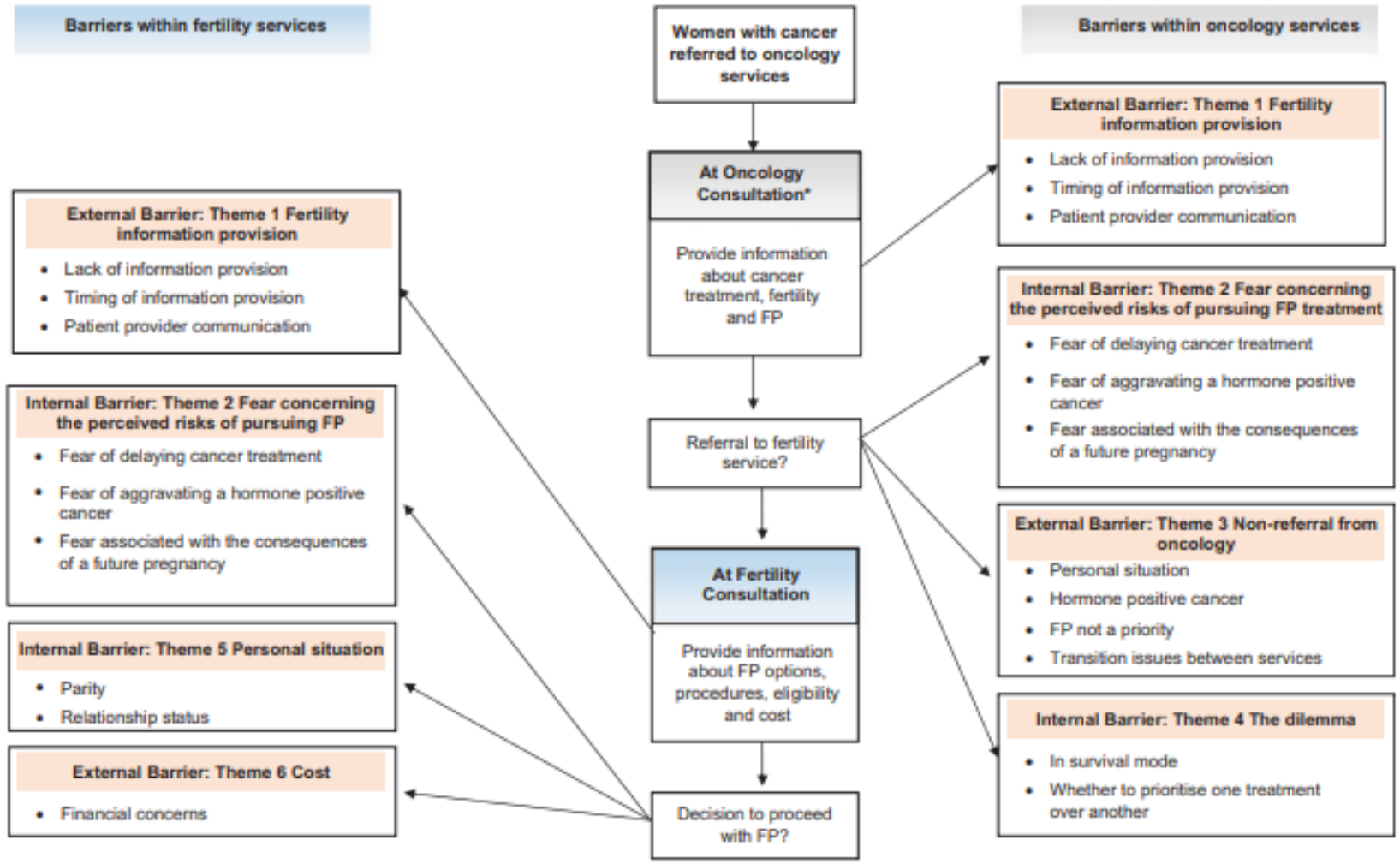
Thanks to Cheryl Dunlop and Richard Anderson

“I do remember thinking it was just totally unfair that guys could freeze their sperm and there really were no options for women.”

“If the situation were ever similar to that which it is for young males, which is to say... freeze your sperm... I think it would be outstanding. But secondarily, I think it also gives a large measure of hope and expectation to someone at the front-end of it.”

Nieman et al. Fertility Preservation and Adolescent Cancer Patients: Lessons from Adult Survivors of Childhood Cancer and Their Parents. Cancer Treat Res. 2007 ; 138: 201–217.

Overcoming barriers



Jones G, Hughes J, Mahmoodi N, Smith E, Skull J, Ledger W. What factors hinder the decision-making process for women with cancer and contemplating fertility preservation treatment? *Hum Reprod Update*. 2017;23:433-457.

Endorsed decision aid

[Cancer Fertility and Me | Helping you make the right decision for you](https://cancerfertilityandme.org.uk/) https://cancerfertilityandme.org.uk/

Questions

Scan or click the QR code to ask a question:

TOPIC:
FERTILITY & ITS PRESERVATION IN BREAST CANCER

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