

State of the ART ... Improving Fertility Treatment through Research and Technological Innovation

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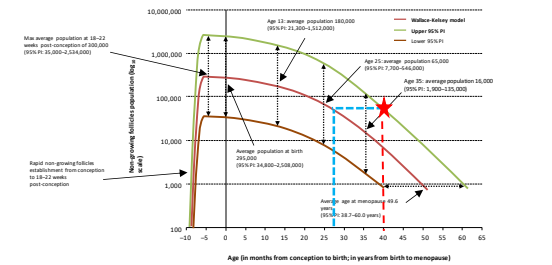


From hype to actual clinical value

- AMH: setting things straight
- Oocyte freezing: keeping it real
- State of the ART: technological innovations that improve safety and efficacy for patients



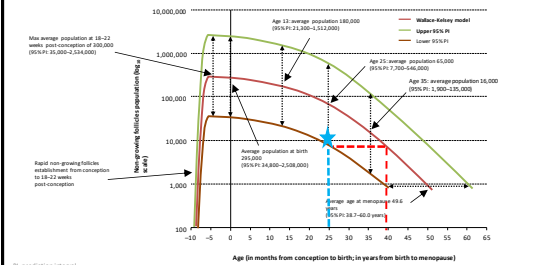
AMH & Ovarian reserve in humans



PI, prediction interval
Figure reproduced from Wallace WH, Kelley TW. PLoS One 2015;10:e8772



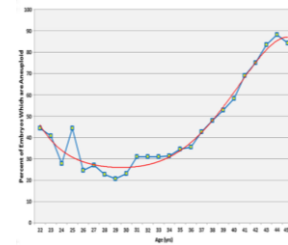
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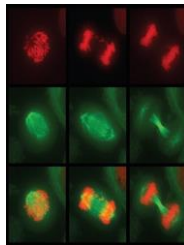


What about egg quality?



Aneuploidy increases with female age

Franzoi et al., F&L 2014



Stefano Santaguida and Angelika Amon, MIT



Issues with AMH measurement?

Inter-individual factors



- Age
- Ovarian surgery/ Endometriosis/ Prior gonadotoxic chemotherapy
- Ethnicity (Chinese, Black African, Hispanic and South Asian/ Caucasian)
- Smoking
- Pregnancy, GnRH analogues, combined hormonal contraceptives
- Chronic disease/ malignancies

Intra-individual factors

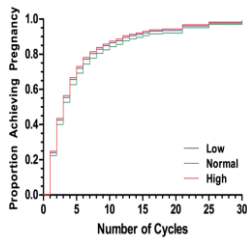


- Minimal cyclic variation during the menstrual cycle (late follicular phase)
- Low variability between menstrual cycles

AMH, anti-Müllerian hormone; GnRH, gonadotropin-releasing hormone
Davaris O, et al. Hum Reprod Update. 2014;20(4):415-430. doi:10.1093/hupd/20.4.415. [Epub ahead of print].
at: Reprod Biomed Online. 2017;34:522-533



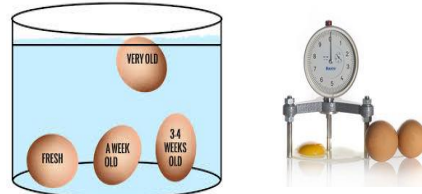
What AMH does not reveal?



Prospective study
N=1202; 18-40yo with 1-2 pregnancy losses
Actively attempting to conceive
F/U: up to 30 menstrual cycles

No association between AMH levels and fecundability

Is there a measure of oocyte quality?



There is no reliable way to measure oocyte quality without performing ART

What AMH **does** reveal?

- Low or high ovarian reserve
- Indicative of time to menopause
- Response to ovarian stimulation
- *Rarely might be indicative of Granulosa Cell Tumour*

Patient with low AMH: What to do?



- Ensure not on the OCP or other forms of HC
- Low but how low? Always adjust for age
- <5th centile: consider genetic testing (karyotype/ Fragile X syndrome)
- Advise to complete family ASAP
- Consider referring to Fertility Specialist

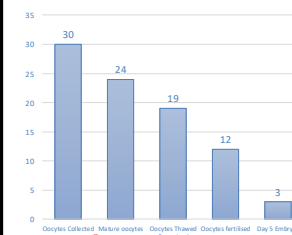
Oocyte freezing: keeping it real



Is social egg freezing the future?

Oocyte freezing: keeping it real

How many eggs do I need?



Depending on age a day 5 embryo could have a 5-40% implantation rate

Hence 3x Day 5 embryos for a 34 year old (30% IR) translate to ~60% CLBR

Oocyte freezing: Main messages



There is no guarantee that a live birth will occur



Oocyte freezing is far more successful in younger women (usually ≤ 36 years old)



The more eggs the better

IVF in 2020: technological innovation



- Optimising culture environment
- Selecting the best embryo
- Shortening time-to-pregnancy

Time-lapse in the IVF laboratory

- Photographs taken every 5-20 mins
- Uninterrupted culture
- More information regarding embryo growth and development
- Stable culture environment



The future: selecting the best embryo



IVY: selecting the best embryo

Artificial Neural Network predicting clinical pregnancy

