



4th Edition

Coordinated by:
Dr. Julio Herrero

Collaborating
centers:





It is my pleasure and honor to introduce the 4th edition of **The Atlas of Assisted Reproduction**.

This 2018 edition, being released in the year of the 350th Anniversary of Merck, is based upon the original concept of **Dr. Julio Herrero** from Barcelona, Spain, whom foresee the importance of having a document like **The Atlas, to clearly explain, in a graphic and interactive way, from A-Z in the field of reproduction, including potential treatments and technologies to be applied during the treatment of infertility.**

During the last 10 years I have been visiting clinics all around the globe and I was pleasantly surprised to see the high level of utilization and value this document brings to practitioners from many countries. This new edition of The Atlas has been entirely improved and includes **new 3D graphics, movies and interactive models**, generated in an electronic format, to demonstrate how to perform retrievals, transfers and many other procedures routinely used in the IVF clinics.

Like previous versions The Atlas covered not only basic concepts on female and male Anatomy and Physiology, protocols of stimulation for IUI, IVF and ICSI but also the most advanced laboratory procedures and technologies applied in modern ART clinics.

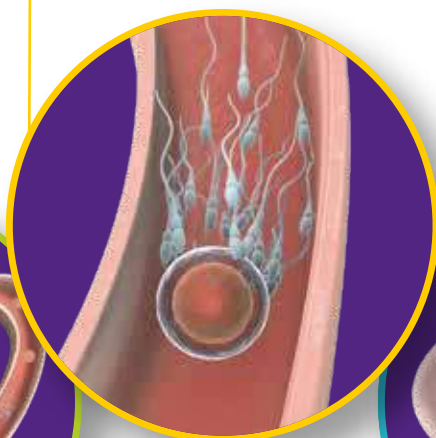
Warm regards

Dr. Diego Ezcurra

Index

OI/IUI*

- 05. Protocols of stimulation for timed intercourse/artificial insemination
- 06. Intrauterine insemination



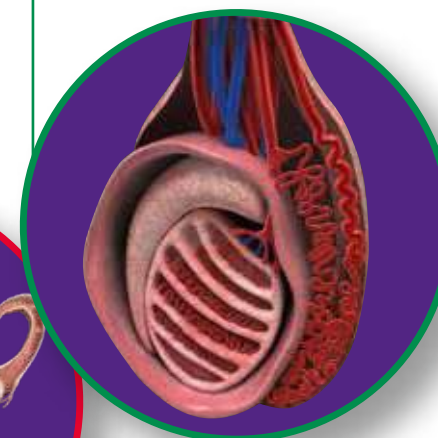
Cryotransfer*

- 19. Protocols of stimulation for cryotransfer
- 20. Embryo transfer



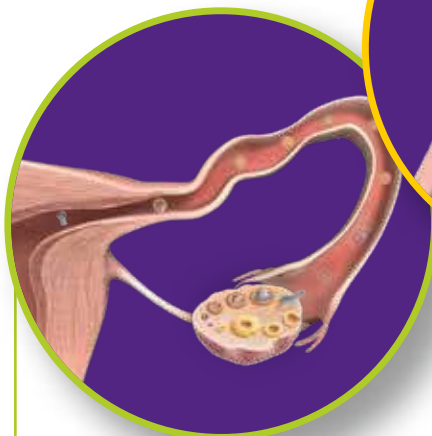
Andrology

- 24. Anatomy and physiology of the male reproductive system
- 25. Testicular biopsy



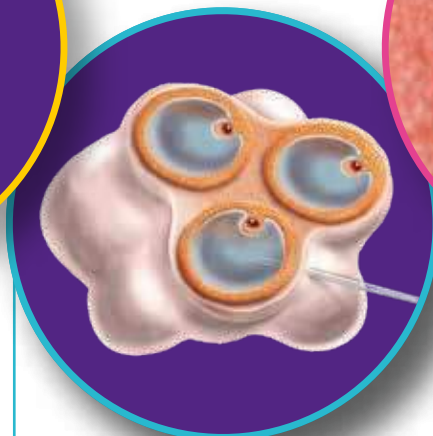
Diagnosis

- 01. Menstrual cycle
- 02. Embryo development and implantation
- 03. Hysterosalpingography
- 04. Uterine, ovarian and oviduct pathologies



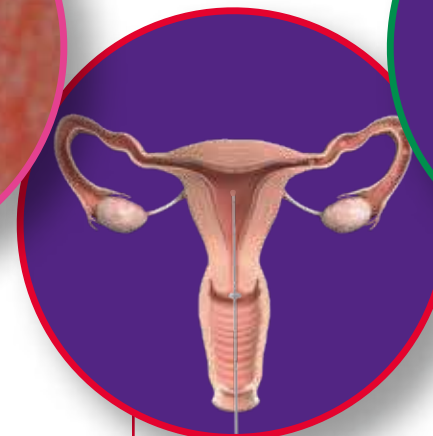
IVF*

- 07. Ovarian stimulation. Fertility preservation
- 08. Ovarian stimulation. Long Agonist protocol
- 09. Ovarian stimulation. Short Antagonist protocol
- 10. Oocyte pick-up
- 11. Insemination
- 12. Fertilization and Embryo development
- 13. Embryo transfer
- 14. Examples of oocytes and embryos
- 15. Assisted hatching
- 16. Genetic compatibility test
- 17. Preimplantation genetic diagnosis
- 18. Waiting for Beta hCG results

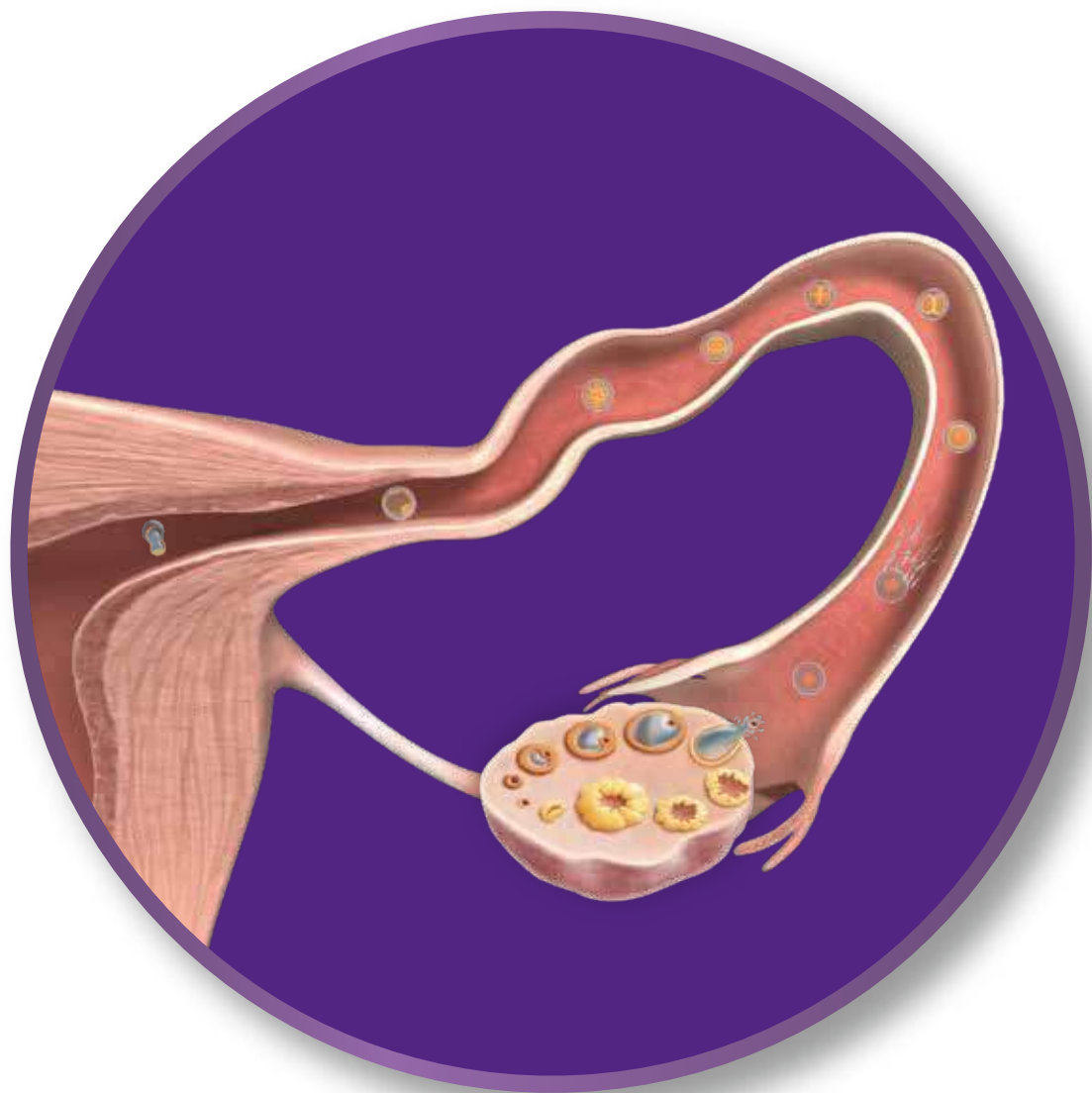


Oocyte donation*

- 21. Stimulation of Donor/Recipient
- 22. Oocyte pick-up in Donors
- 23. Recipient Embryo transfer



* Each product's posology and indications may change and do not exactly correspond with the represented framework.



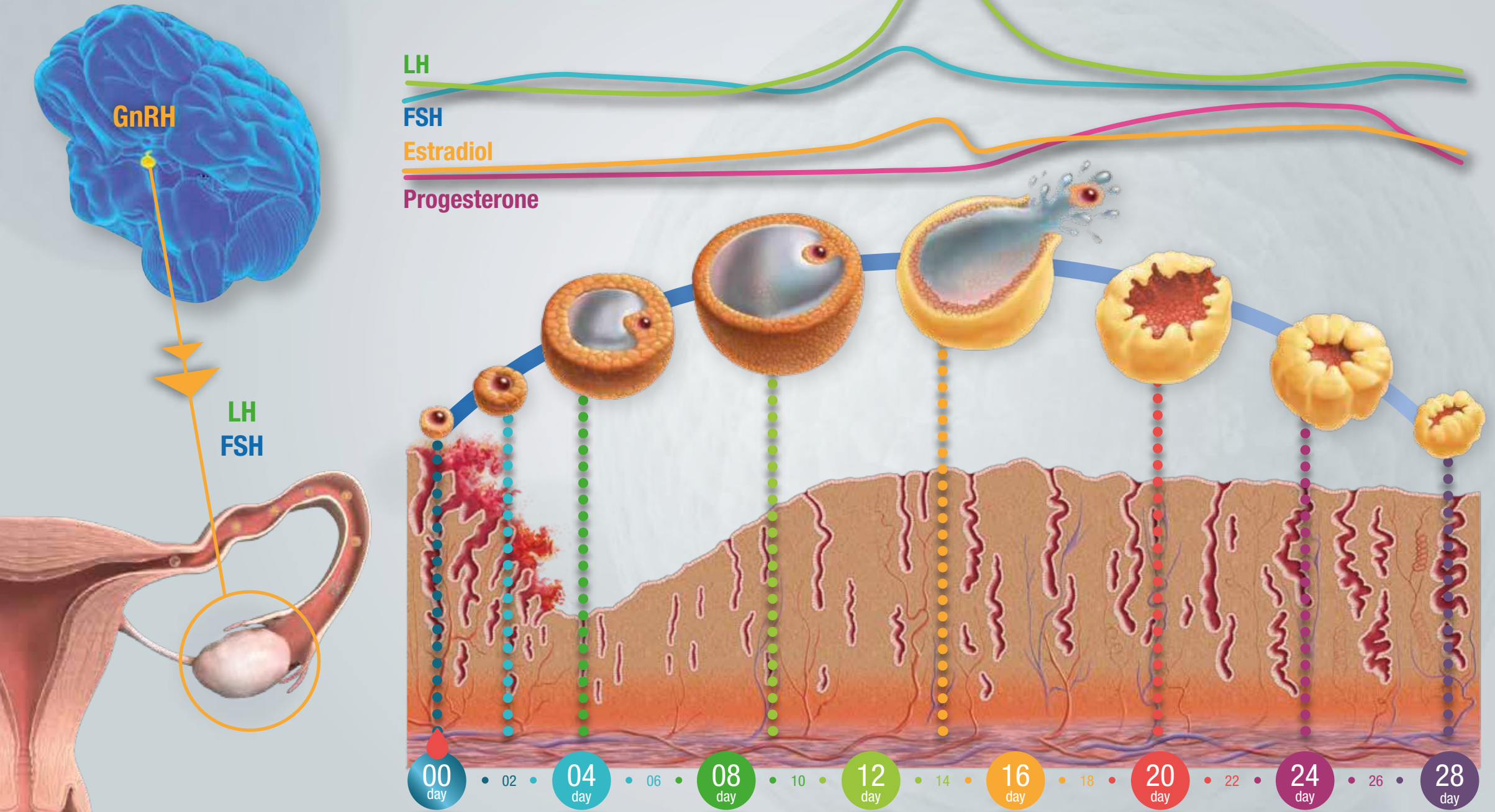
Diagnosis



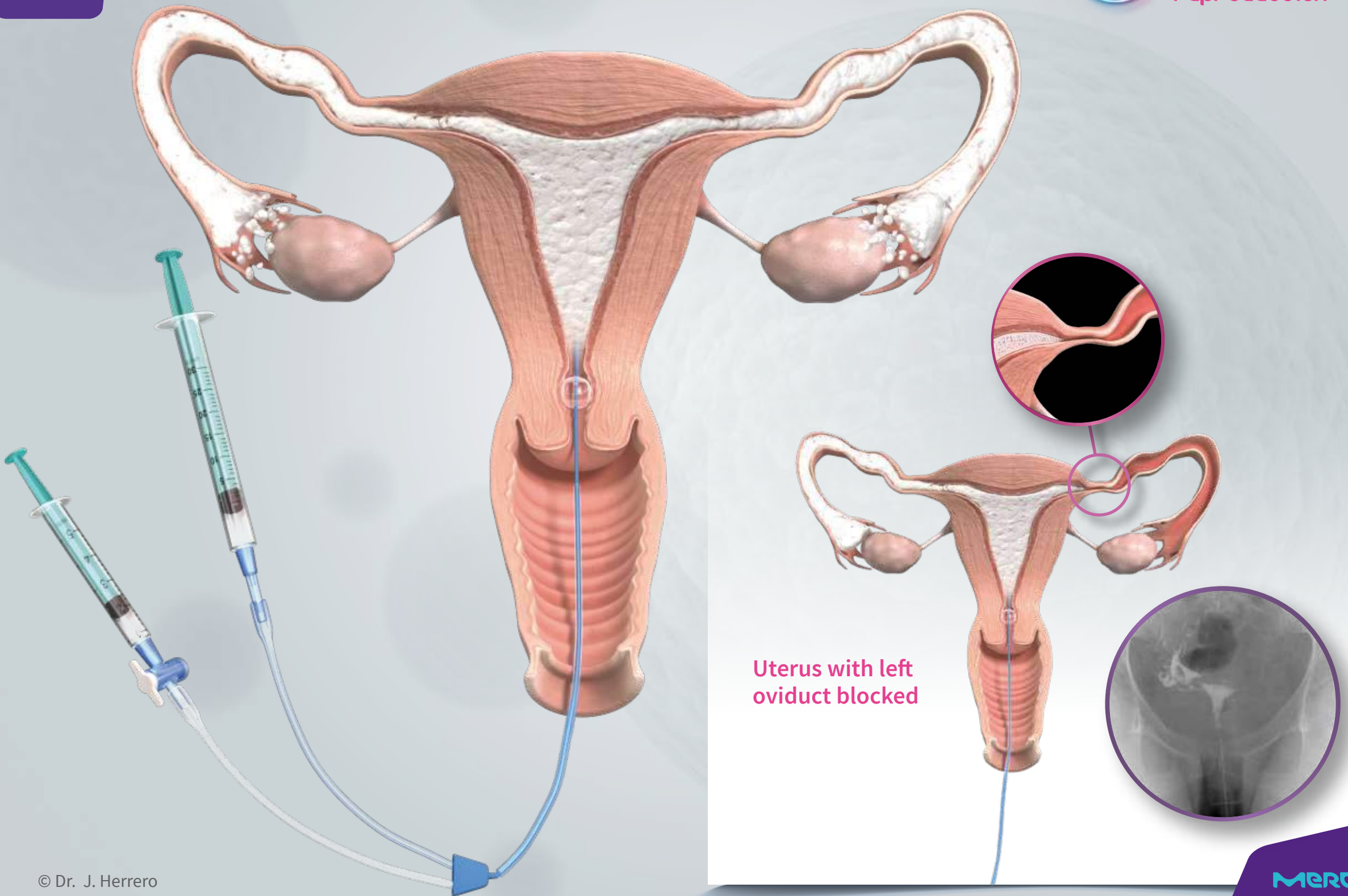
Atlas
of assisted
reproduction

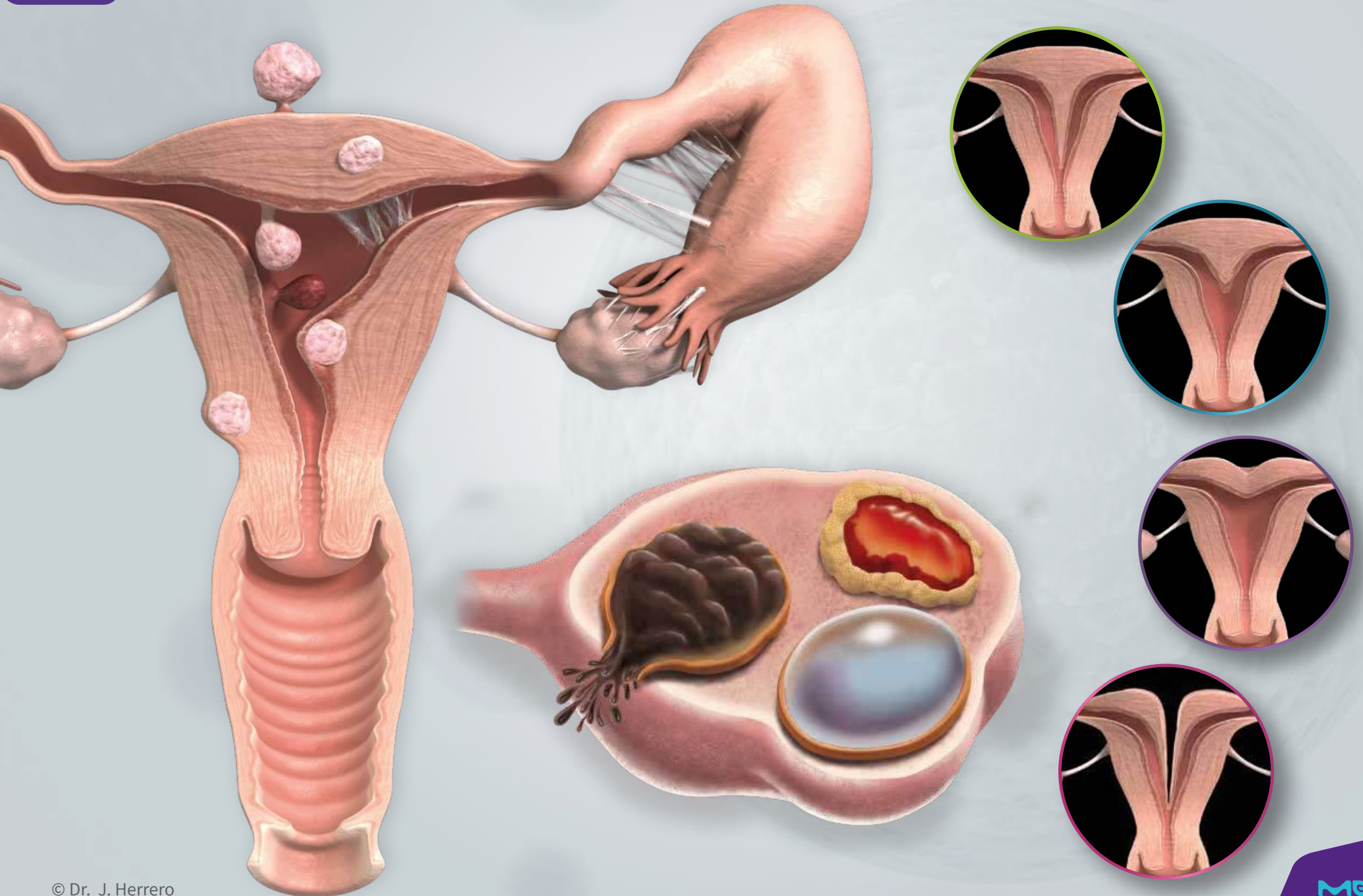
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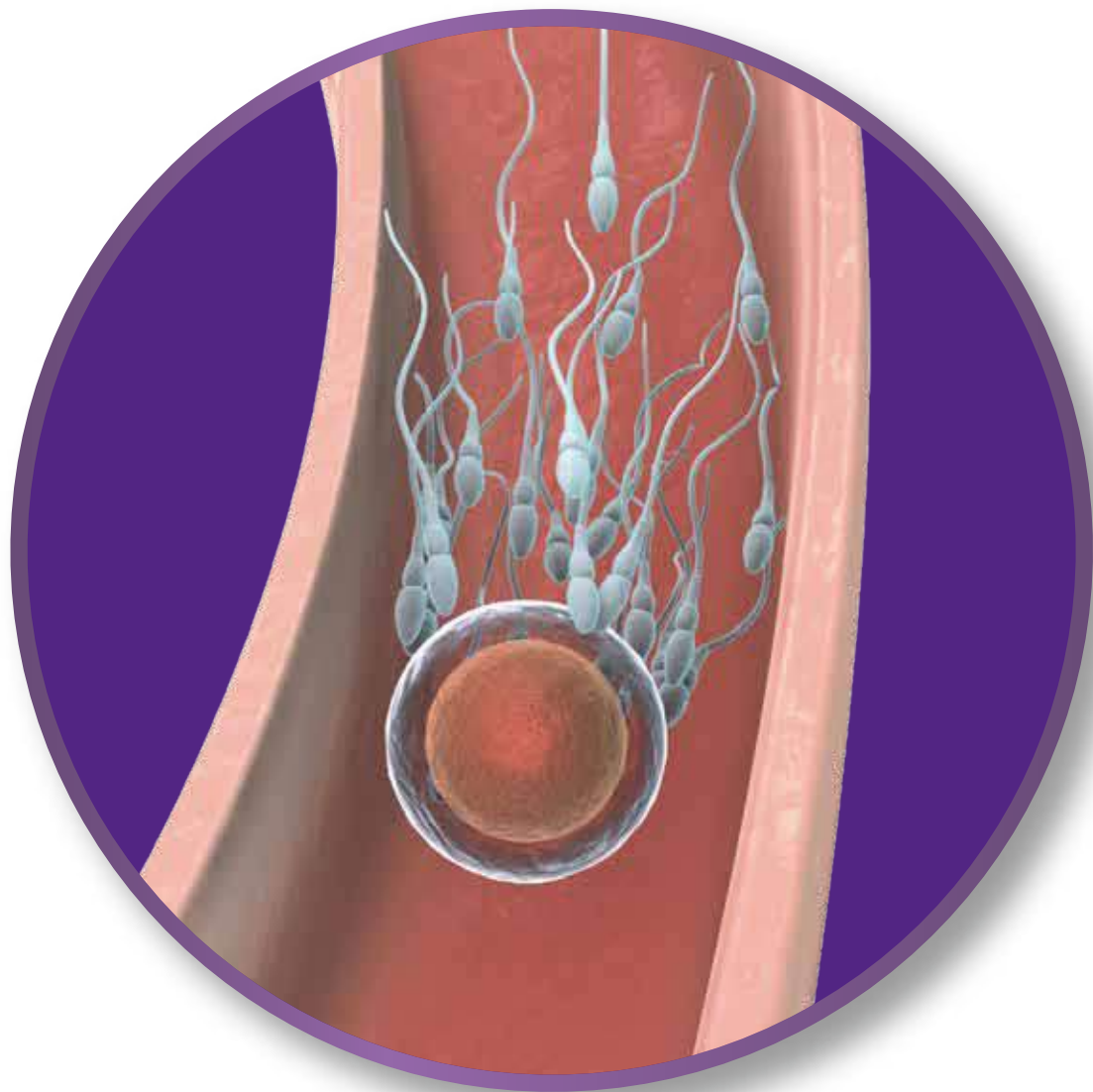
Menstrual cycle











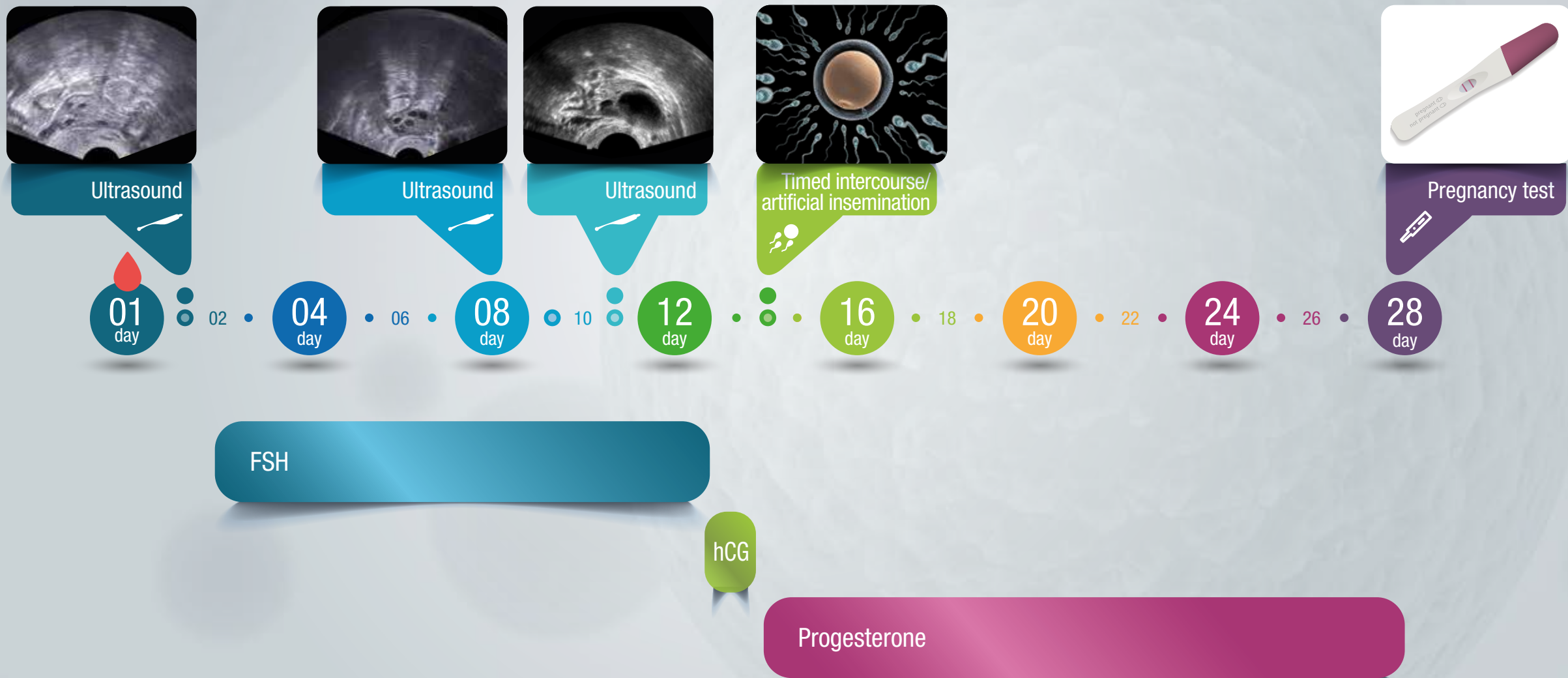
OI/IUI



Atlas
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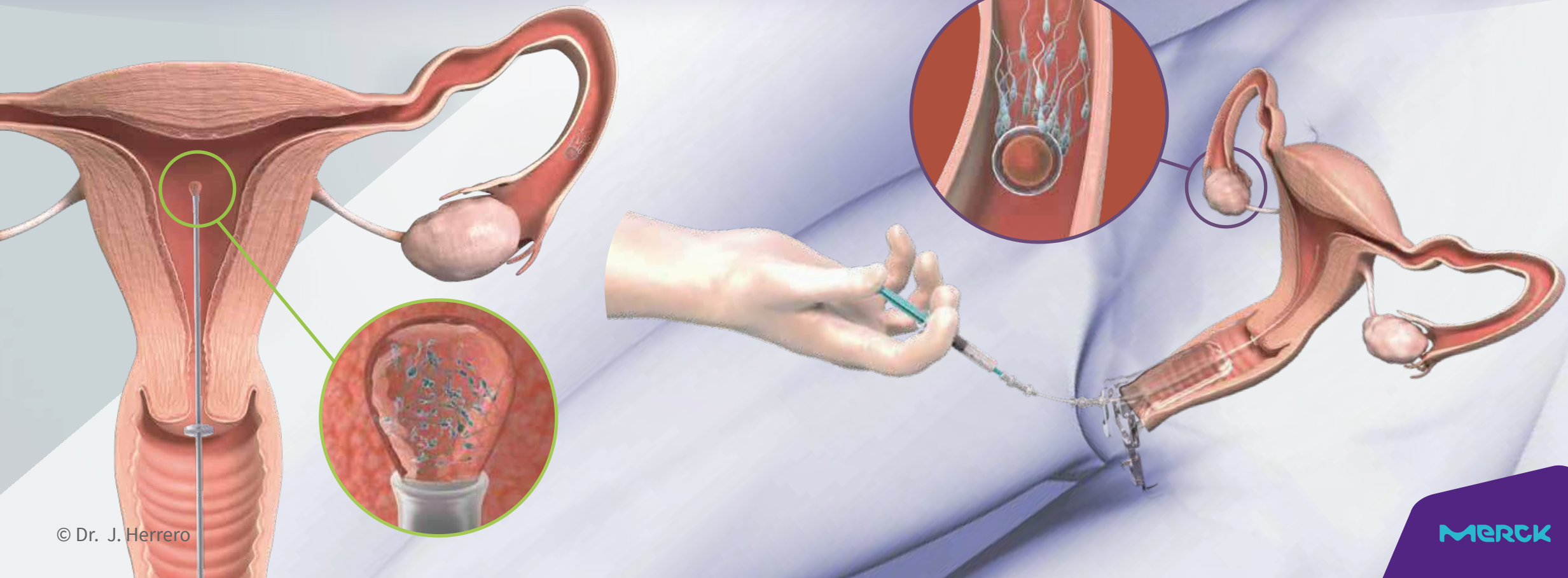
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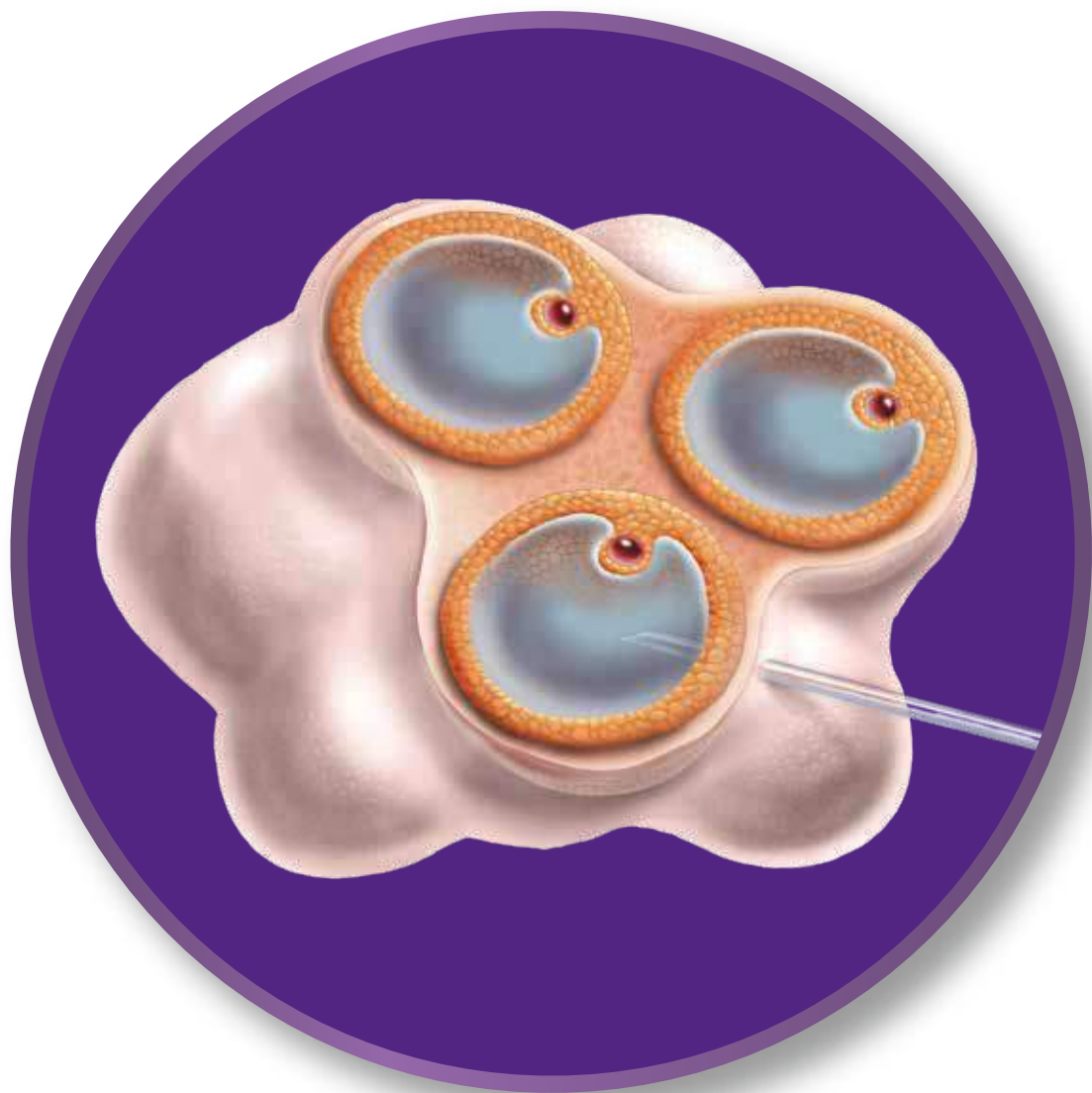
Protocols of stimulation for timed intercourse/artificial insemination



06

Intrauterine insemination





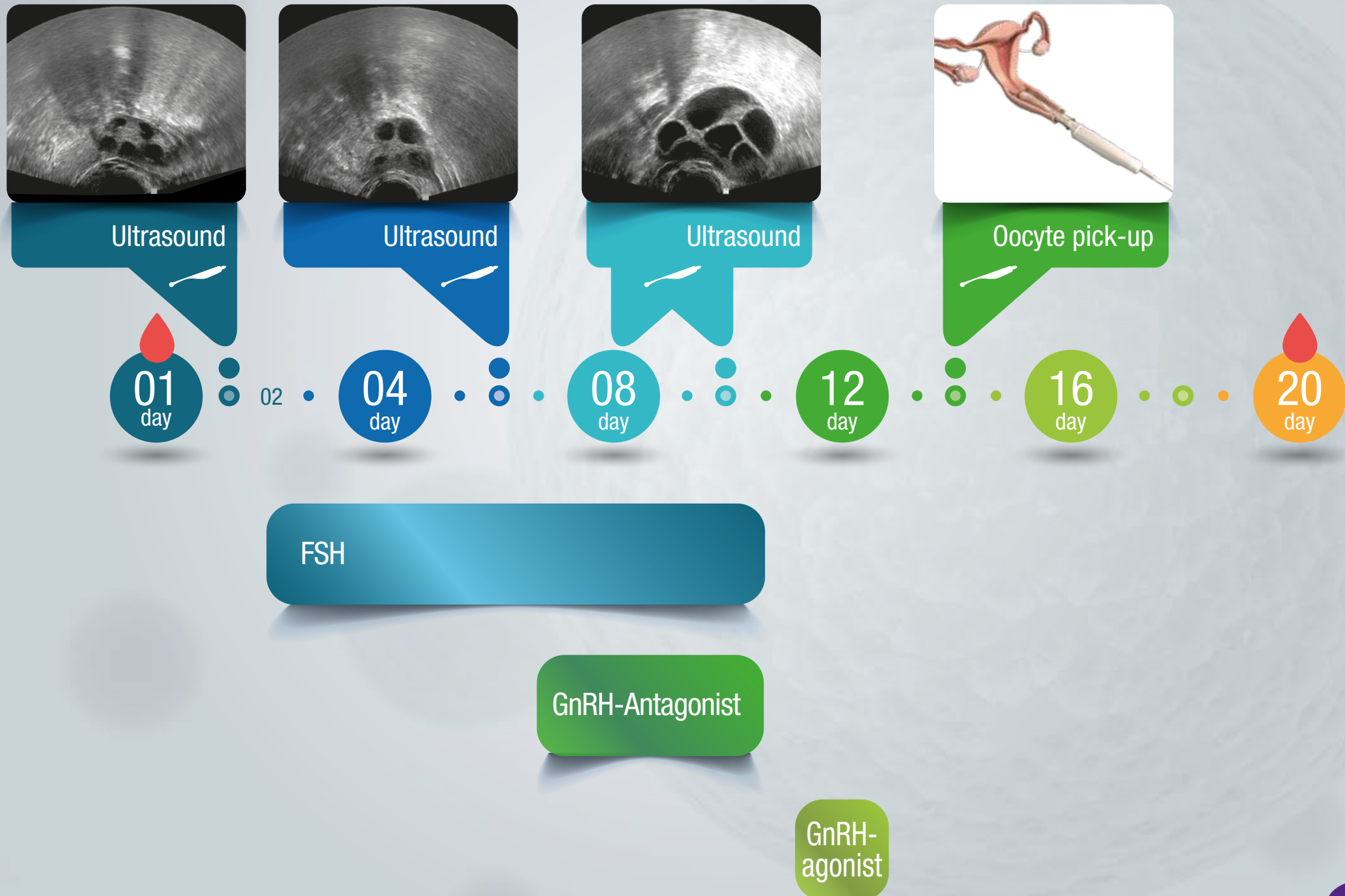
IVF



Atlas
of assisted
reproduction

07

Ovarian stimulation. Fertility preservation



08

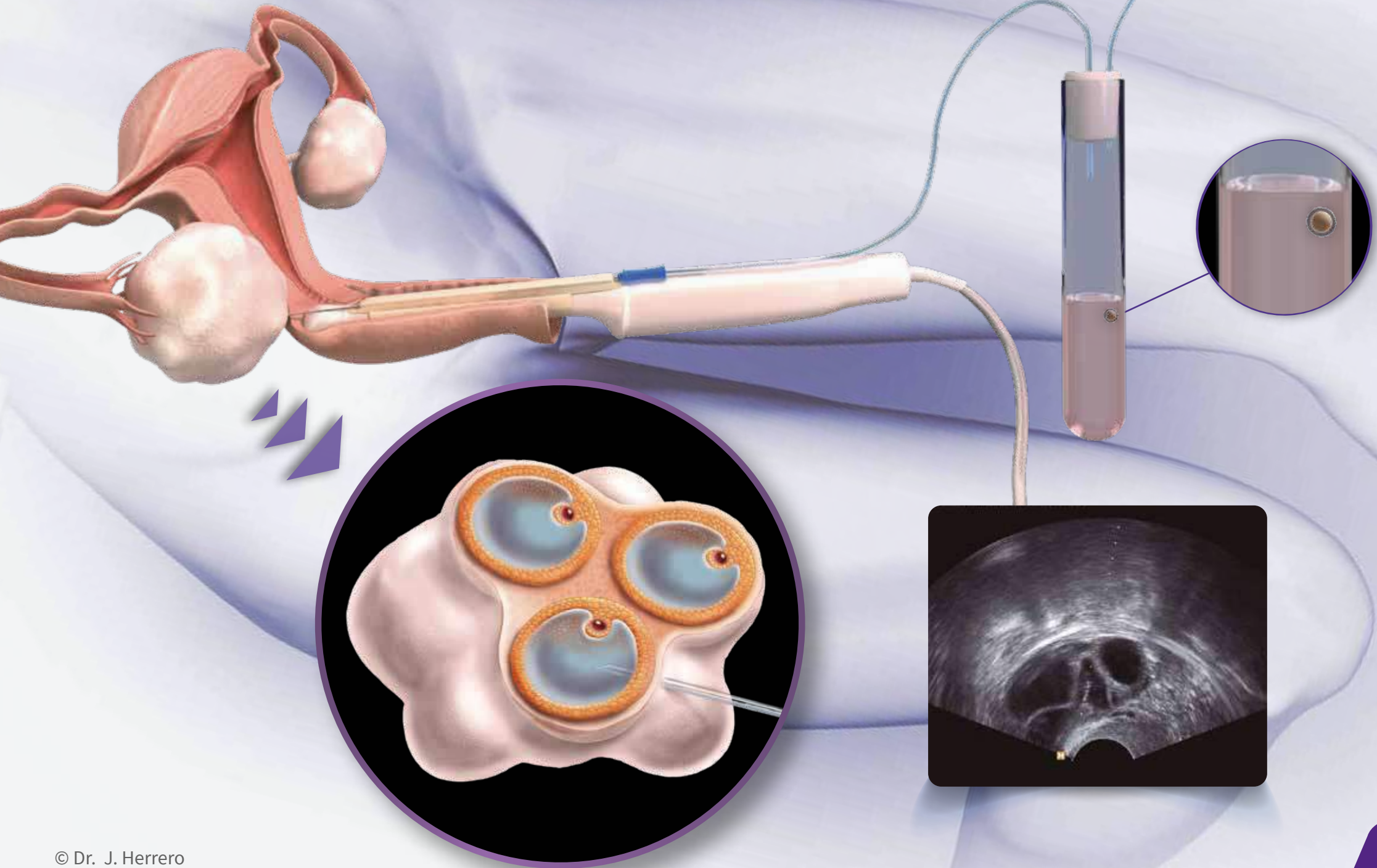
Ovarian stimulation. Long Agonist protocol





10

Oocyte pick-up



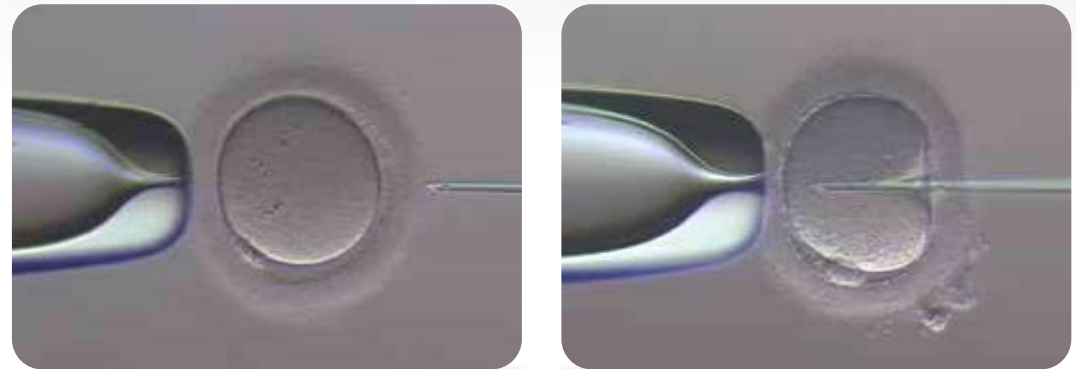
Artificial insemination



Conventional Insemination



Intracytoplasmic Sperm Injection (ICSI)



Embryo development



Day +1
Pronuclear stage



Day +2
4 Cells



Day +3
8 Cells



Day +4
Compact morula



Day +5
Blastocyst

Conventional incubation

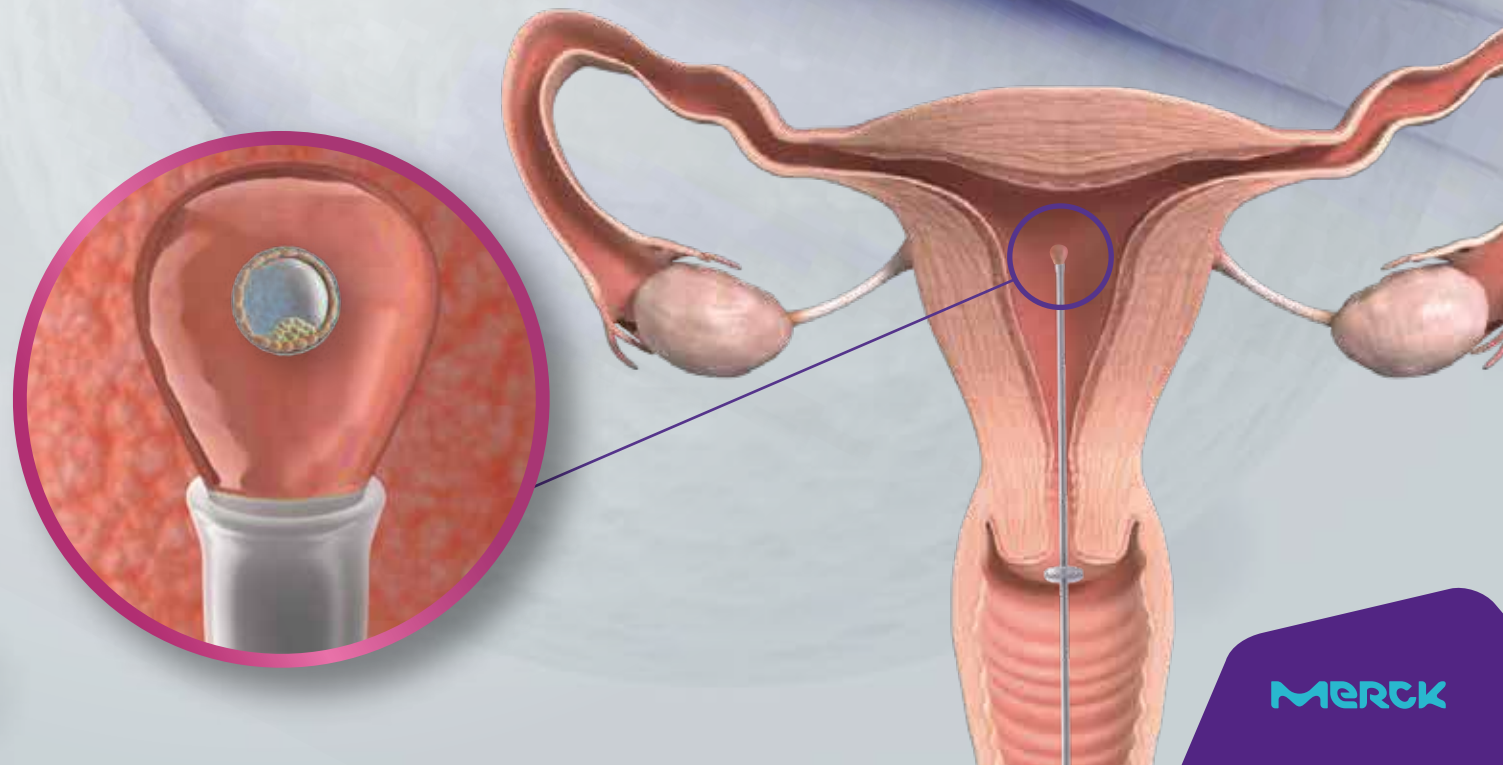
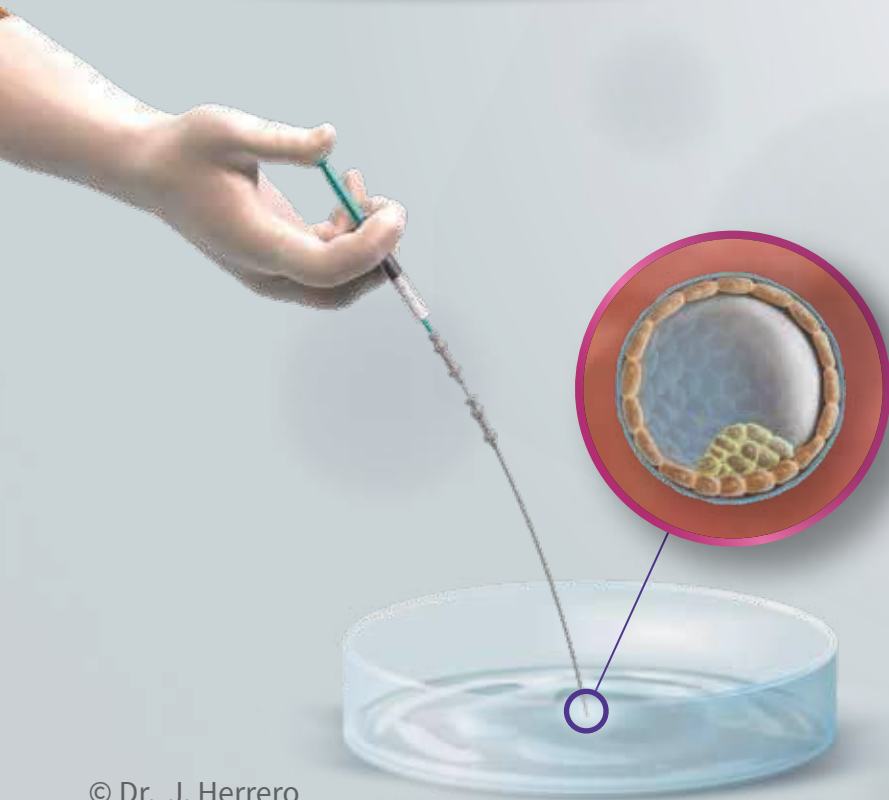
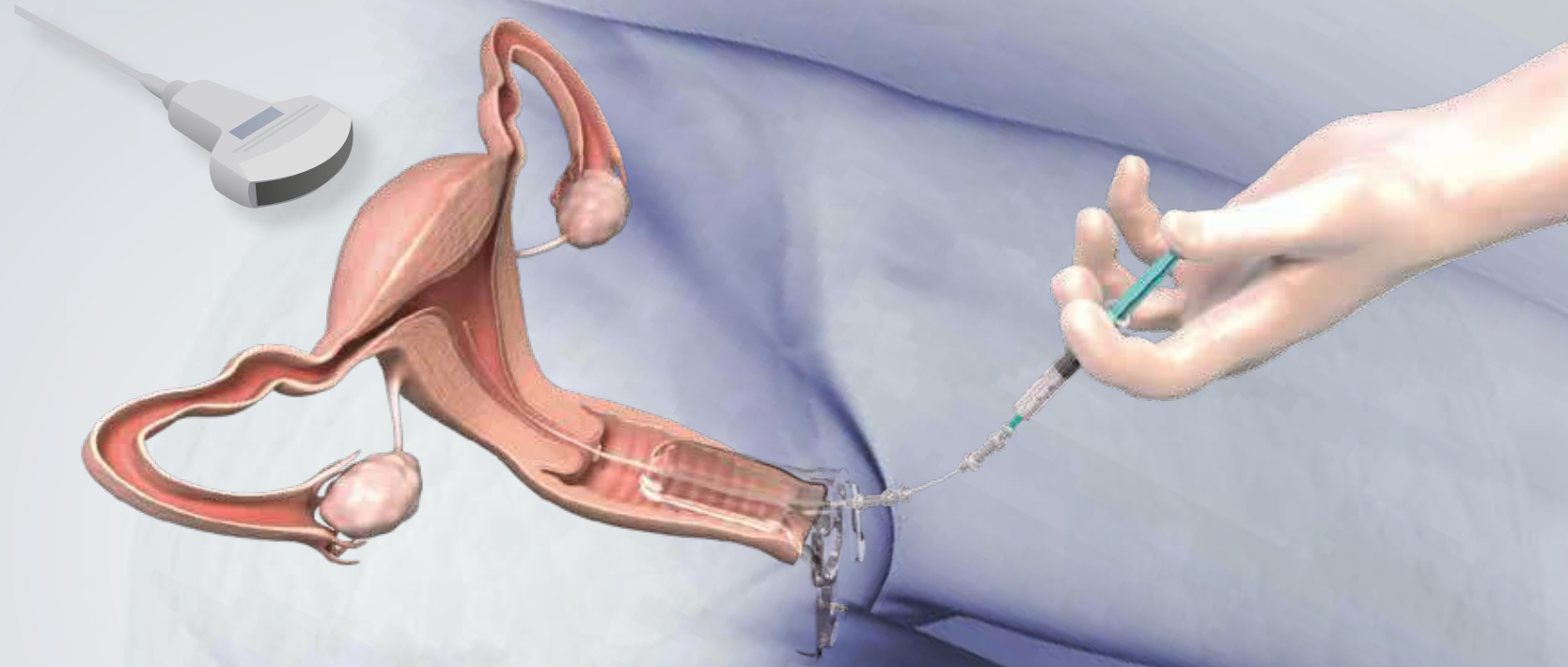
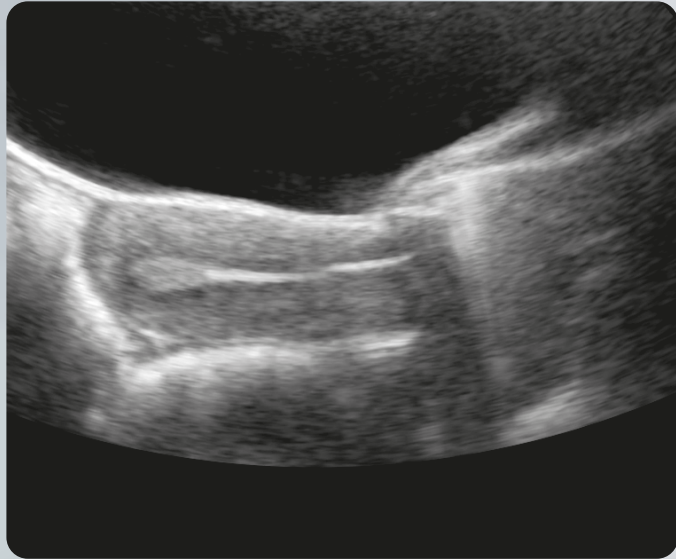


Advanced monitored incubation



13

Embryo transfer



Oocyte/Embryos: examples of morphological phenotypes

Germinal vesicle



Oocyte in metaphase I



Fertilization with
3 pronucleus



Fragmented embryo



Oocyte with vacuoles

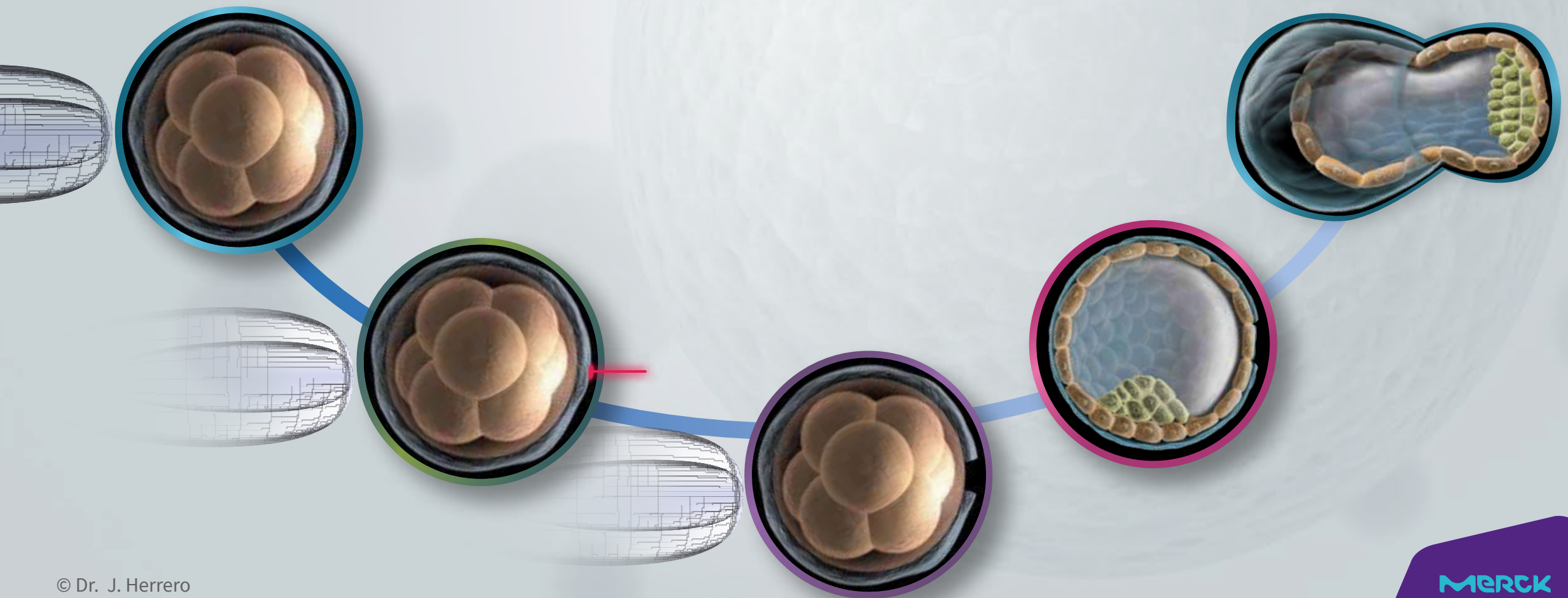
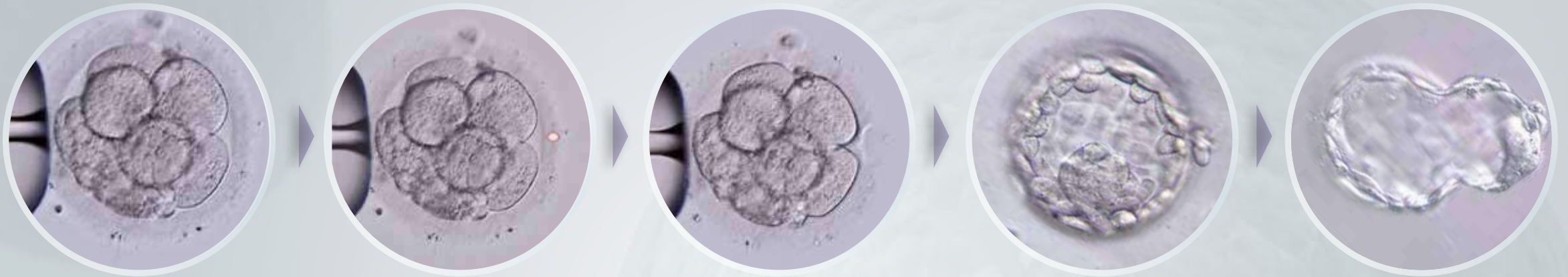


Day +2 embryo
with multi-nucleation



15

Assisted hatching



Genetic compatibility test

Father carrier



Mother carrier



Healthy
25%



Carriers
50%

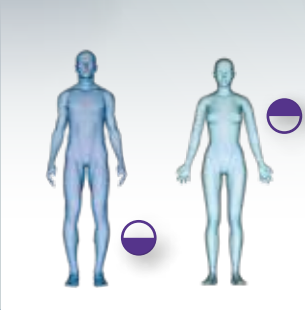
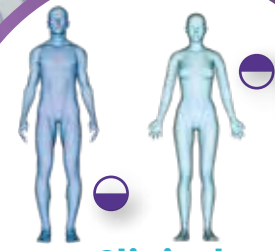


Affected
25%

The estimated global prevalence of these disorders is approximately **10/1000 births**



5-8%
Clinical Incompatibility



We are all carriers of at least **2-3 genetic variants** that can potentially generate a disease.

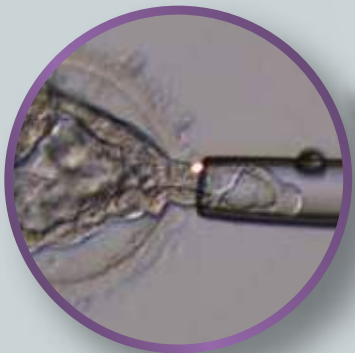
17 Preimplantation genetic diagnosis

Embryo biopsy

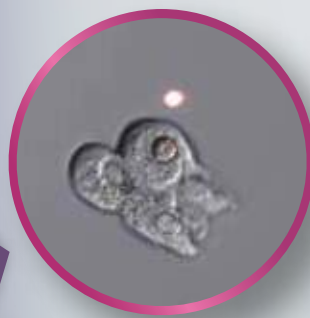
Cell lysis and
DNA amplification

PGD type

Analysis



Blastocyst
(Day +5/+6)

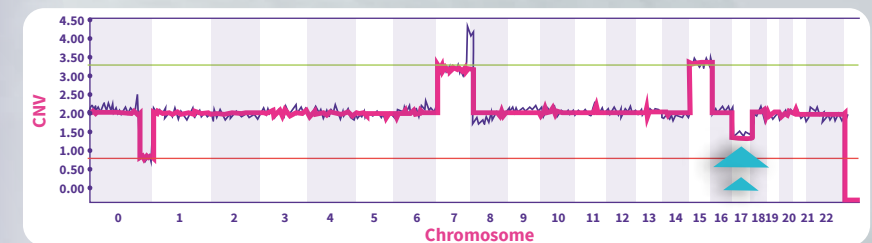


Risk of chromosomal
abnormalities

Aneuploidy test

Hereditary genetics
diseases

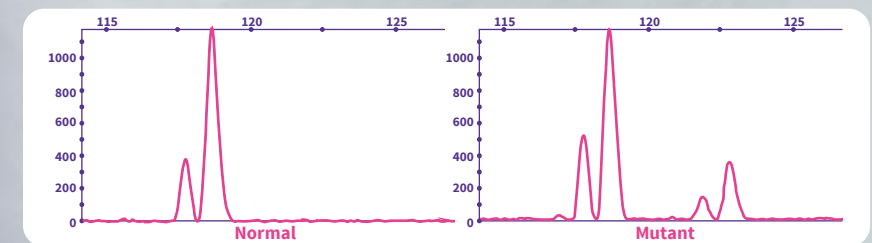
PGD Molecular



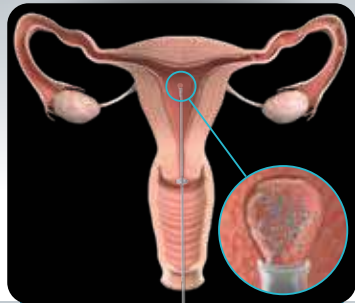
Next generation sequencing



Karyomapping



PCR classic



Transfer



Blastocyst



Blastocyst collapsing



Hatching



Hatched

Day +5

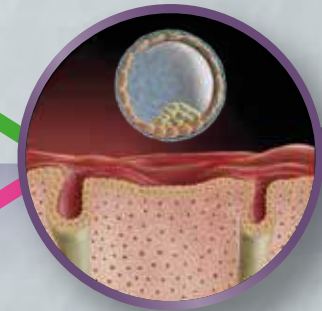
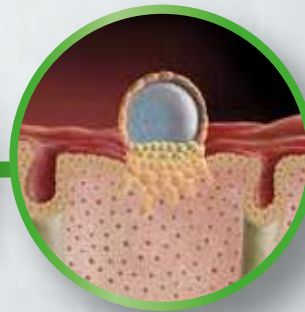
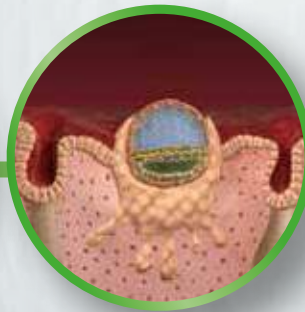
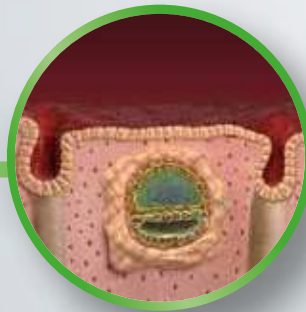
Day +6

Pregnancy test

Invasion

Implantation

Apposition



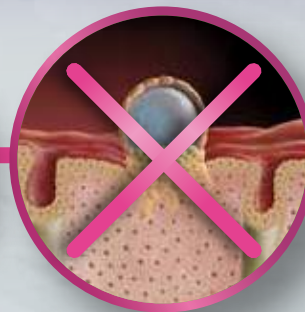
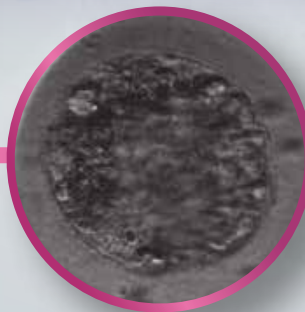
Day +14

Day +9/ +10

Day +8/ +9

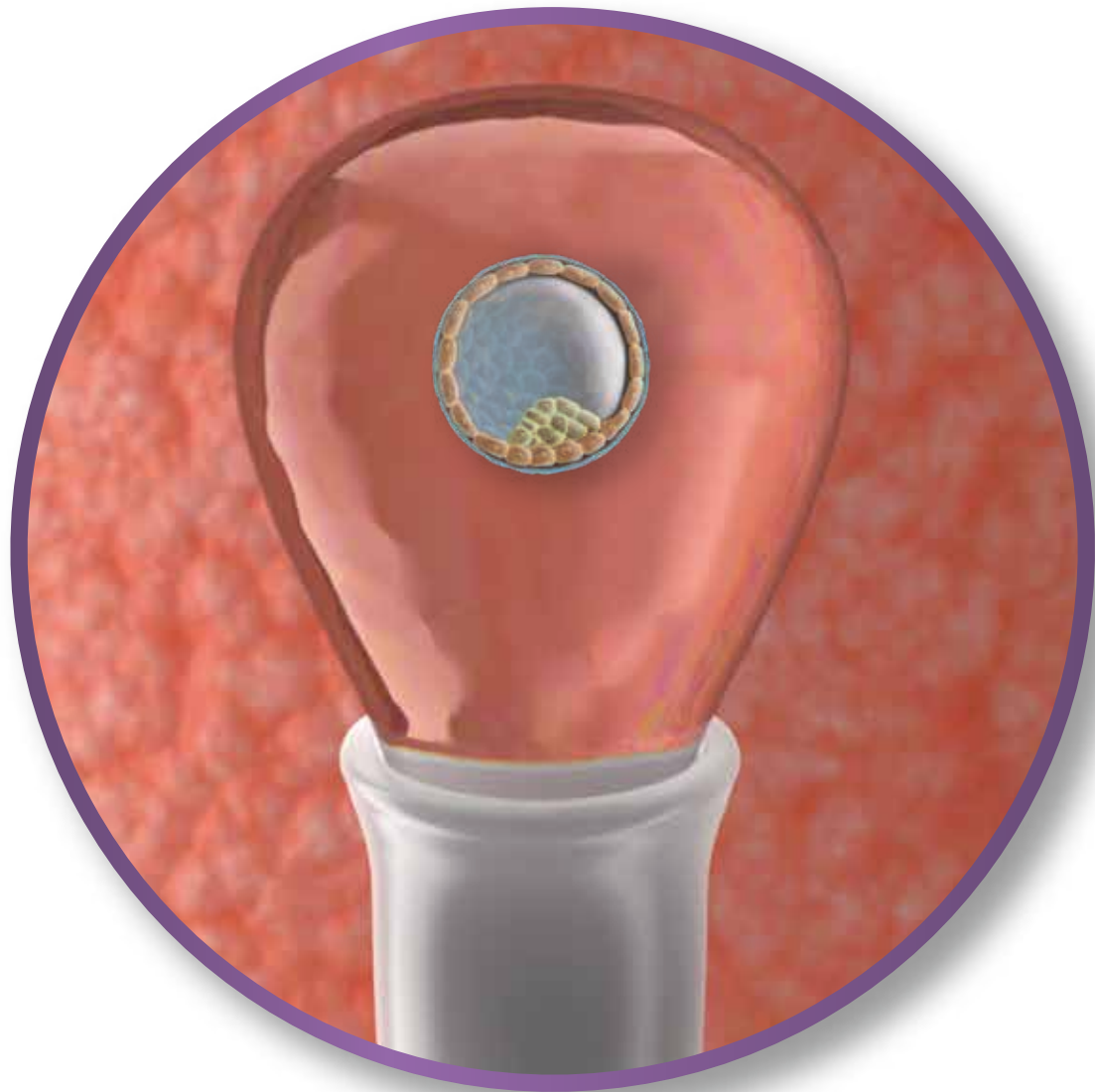
Day +7/ +8

Day +6/ +7



Menstruation

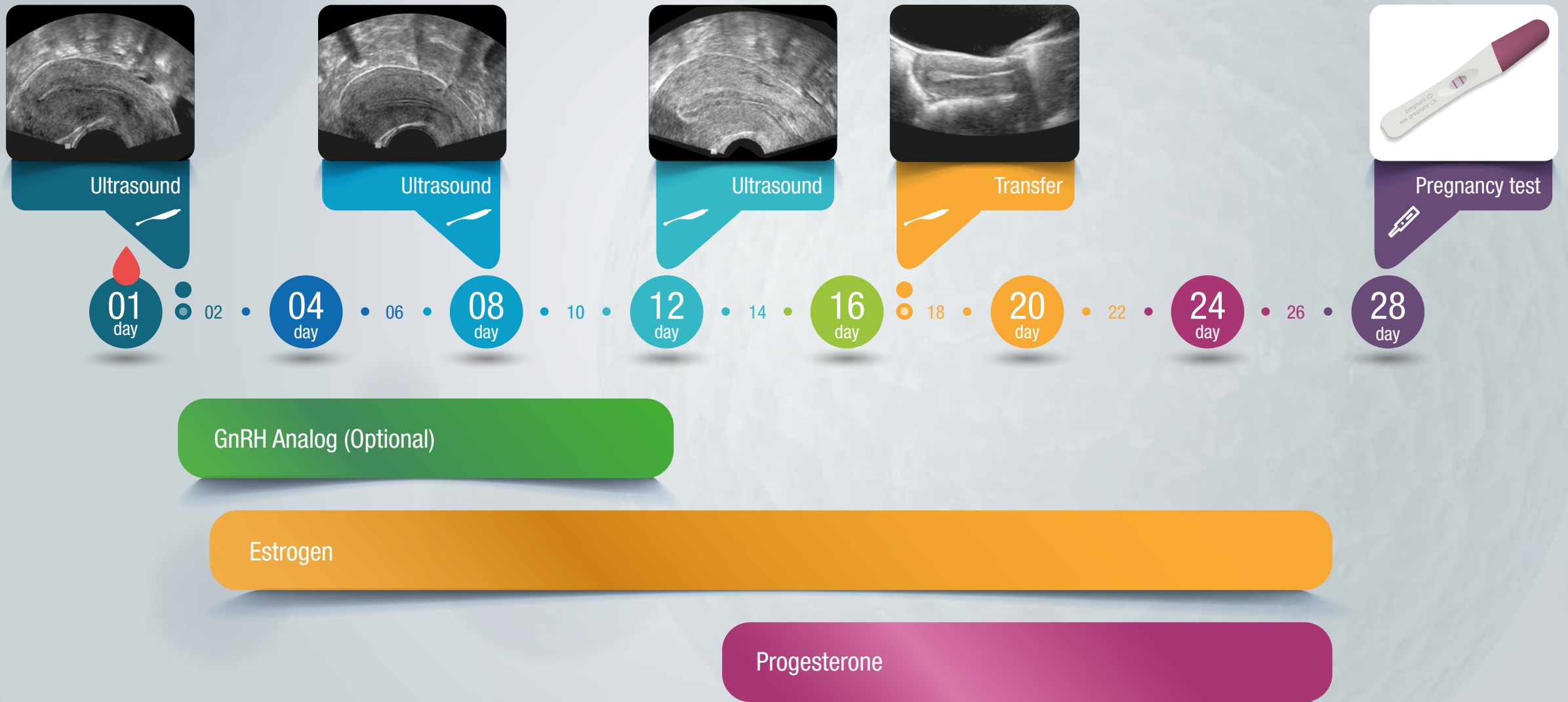
Degenerated blastocyst



cryotransfer

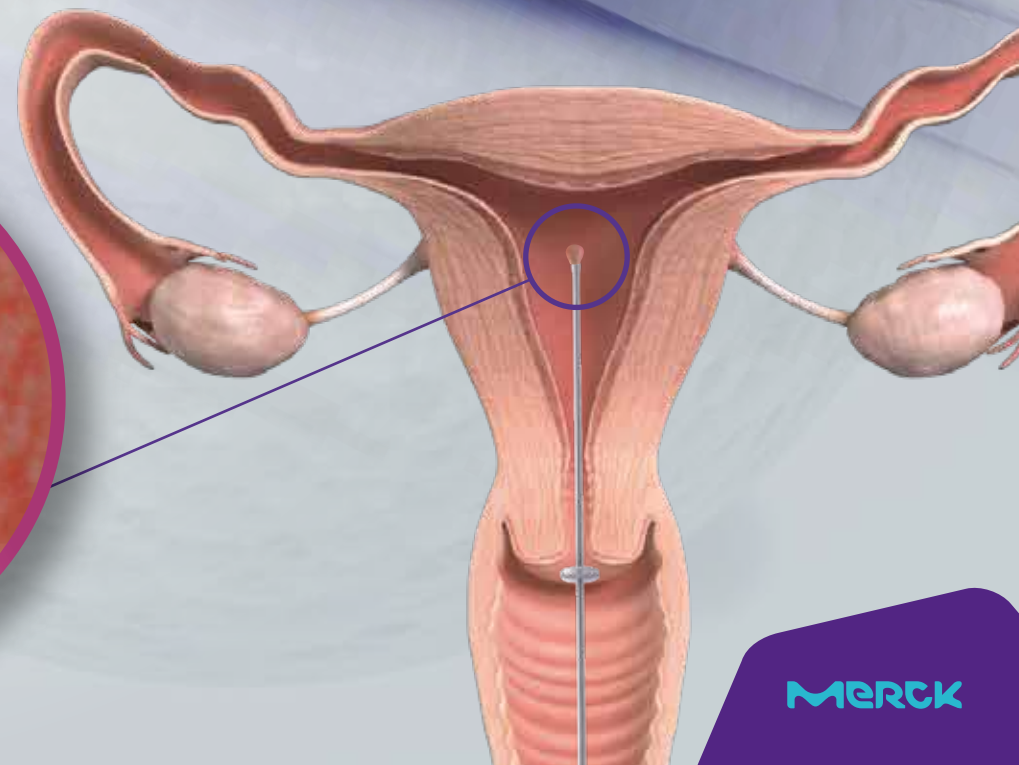
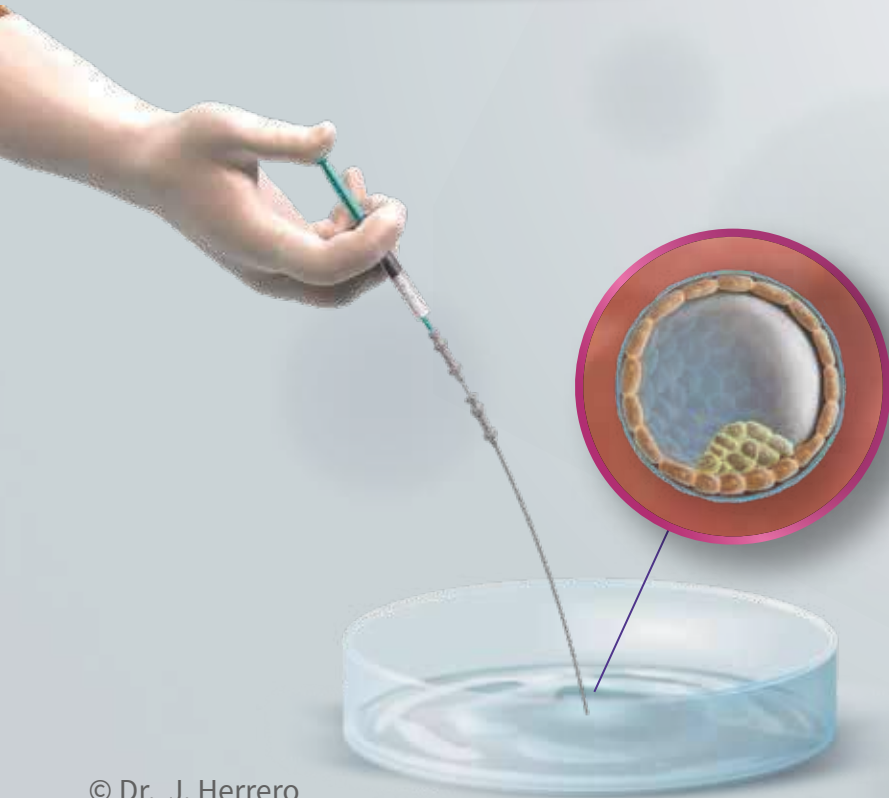
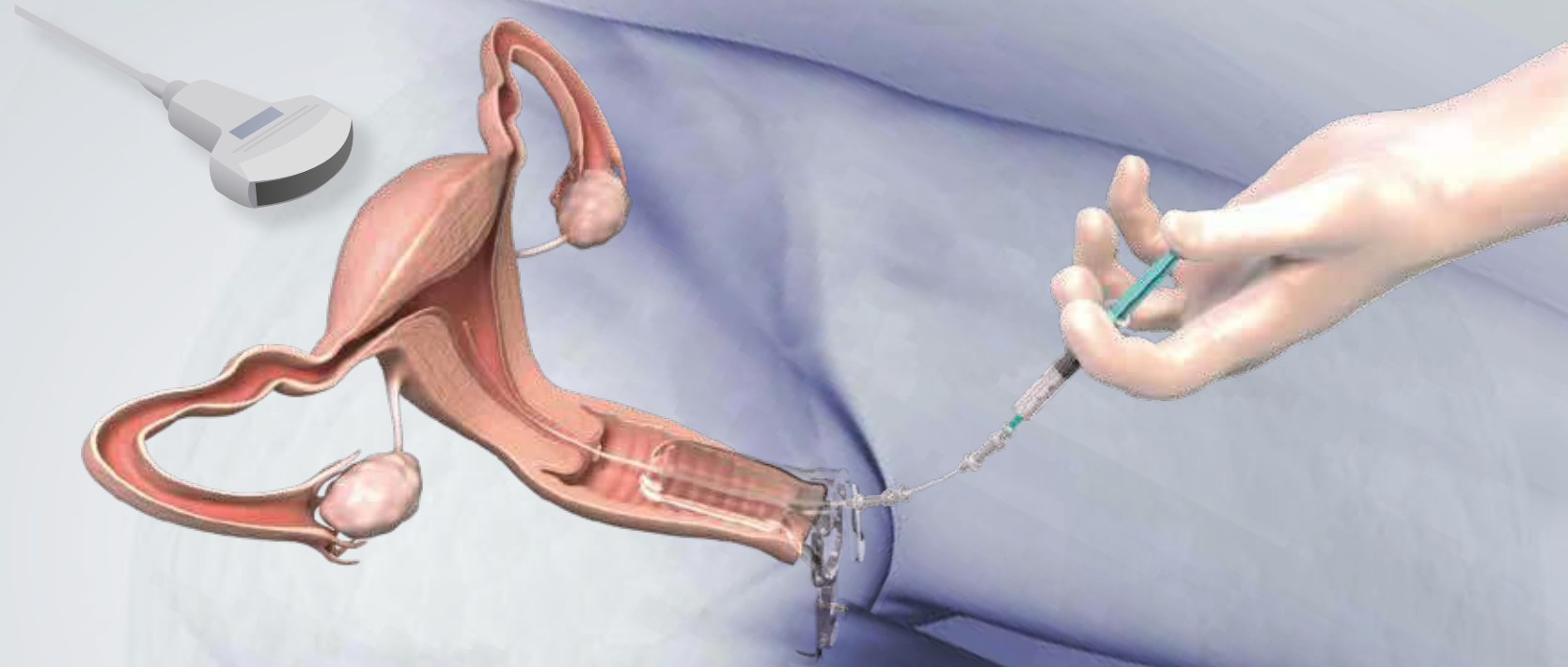
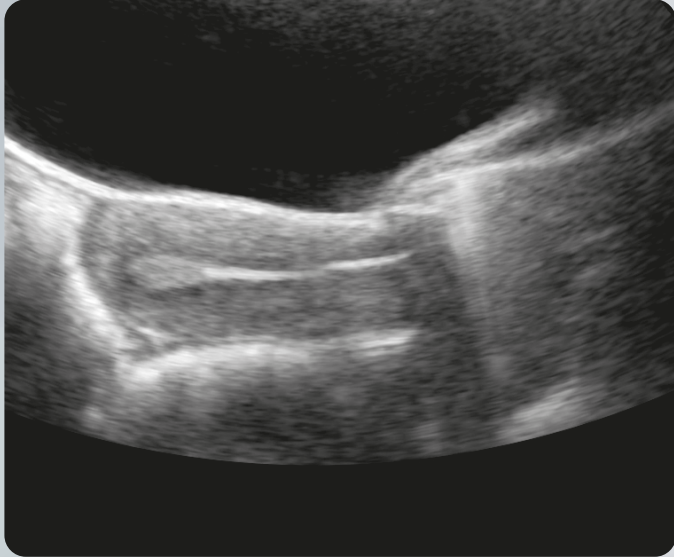


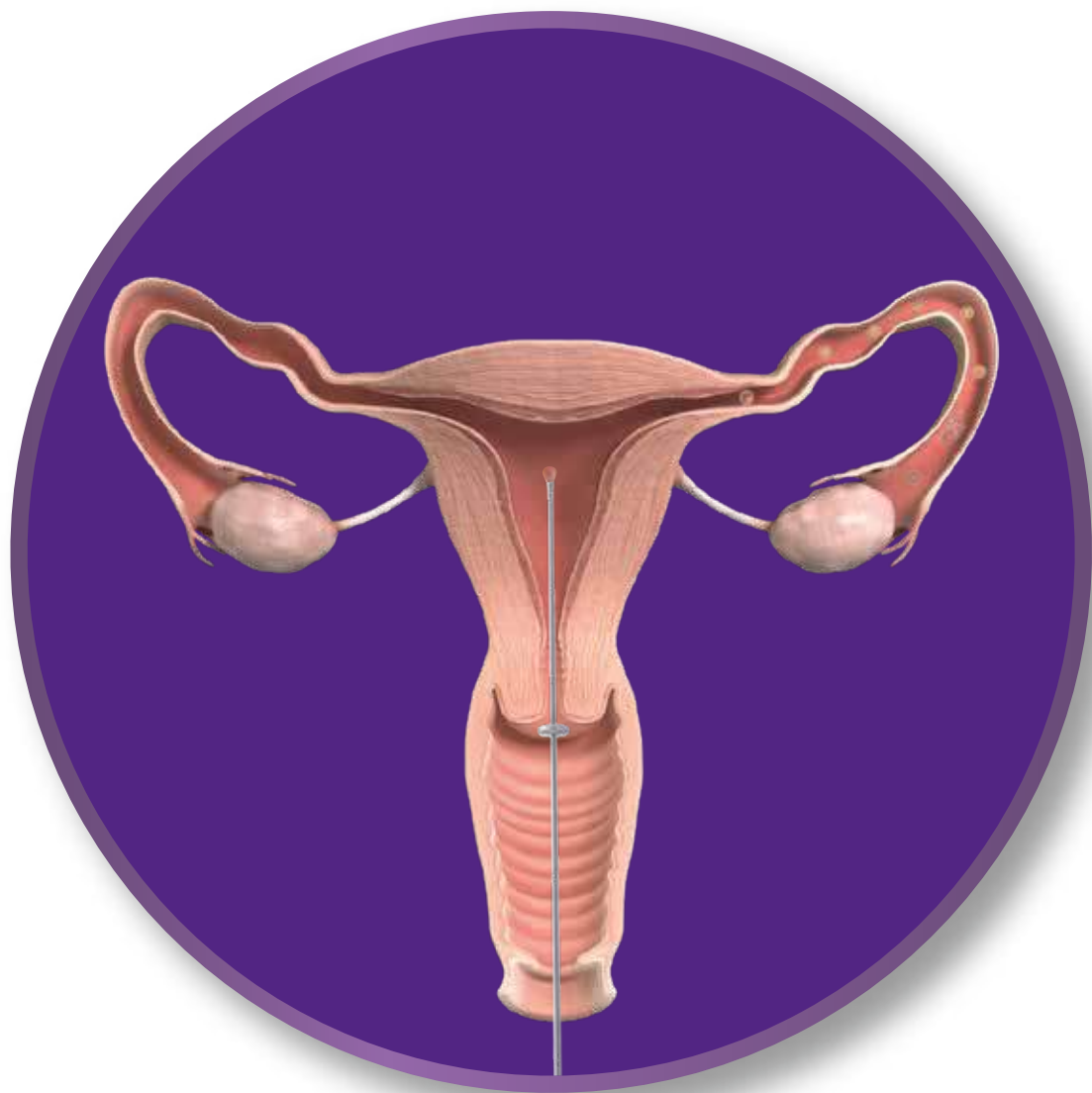
Atlas
of assisted
reproduction



20

Embryo transfer





oocyte donation

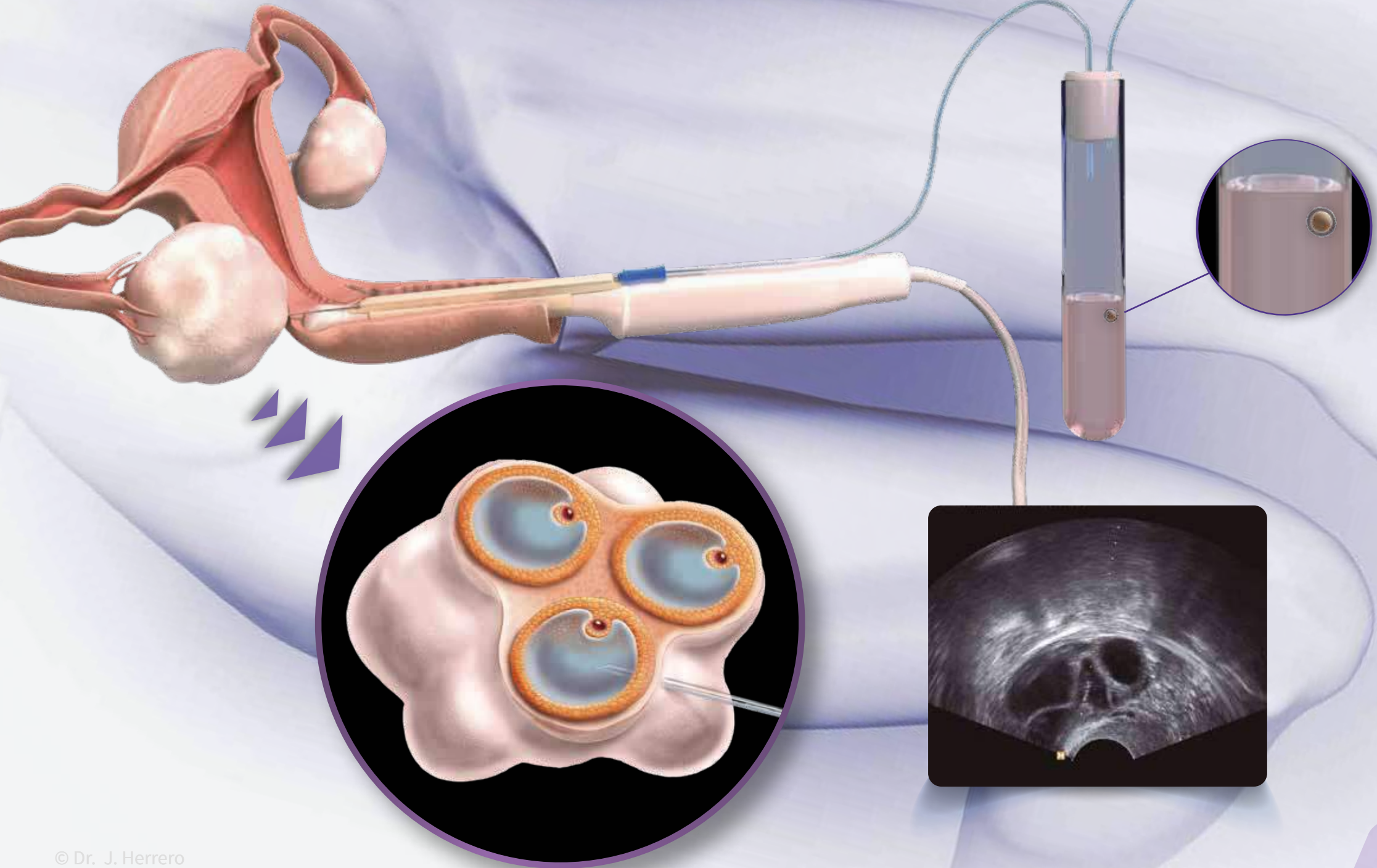


Atlas
of assisted
reproduction

Stimulation of Donor/Recipient

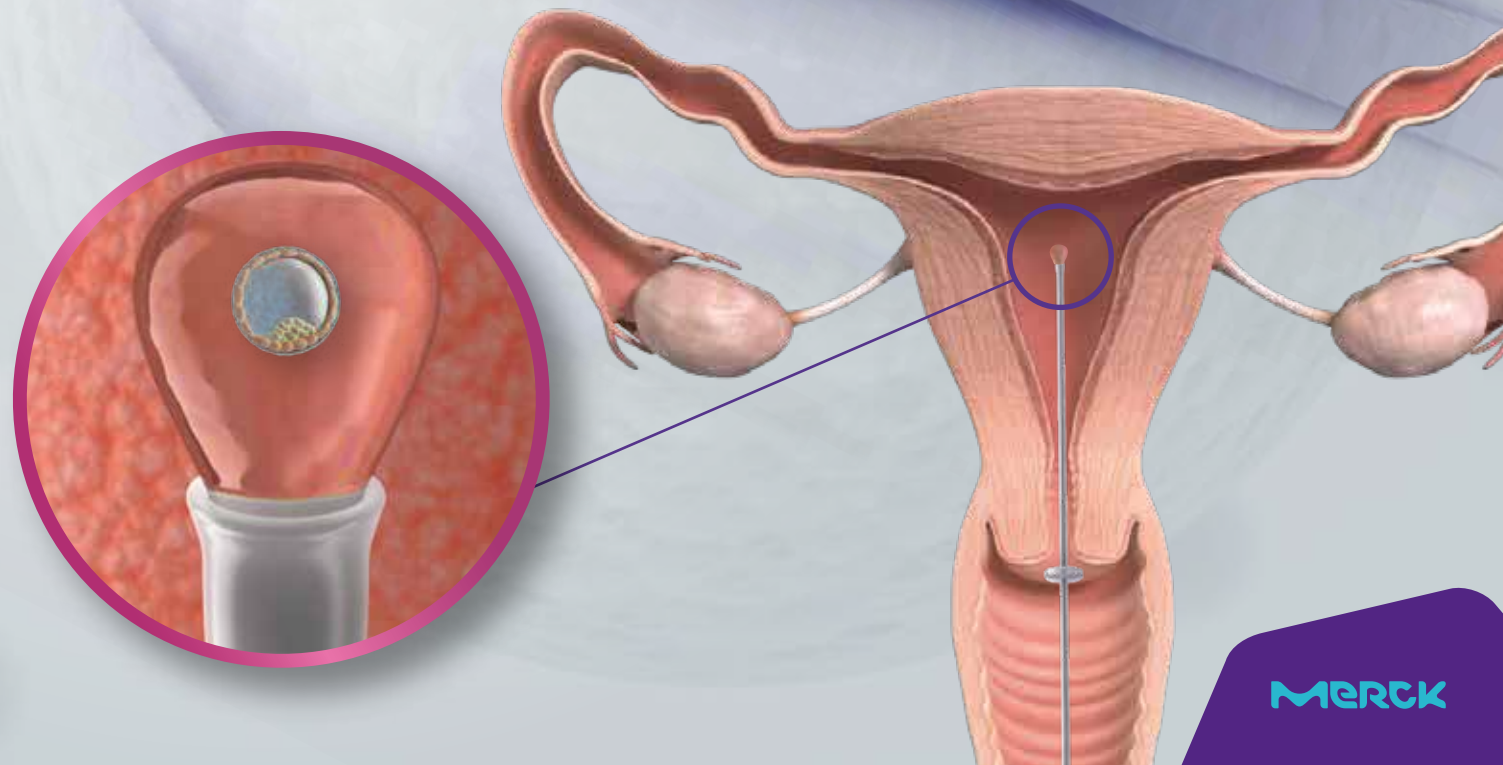
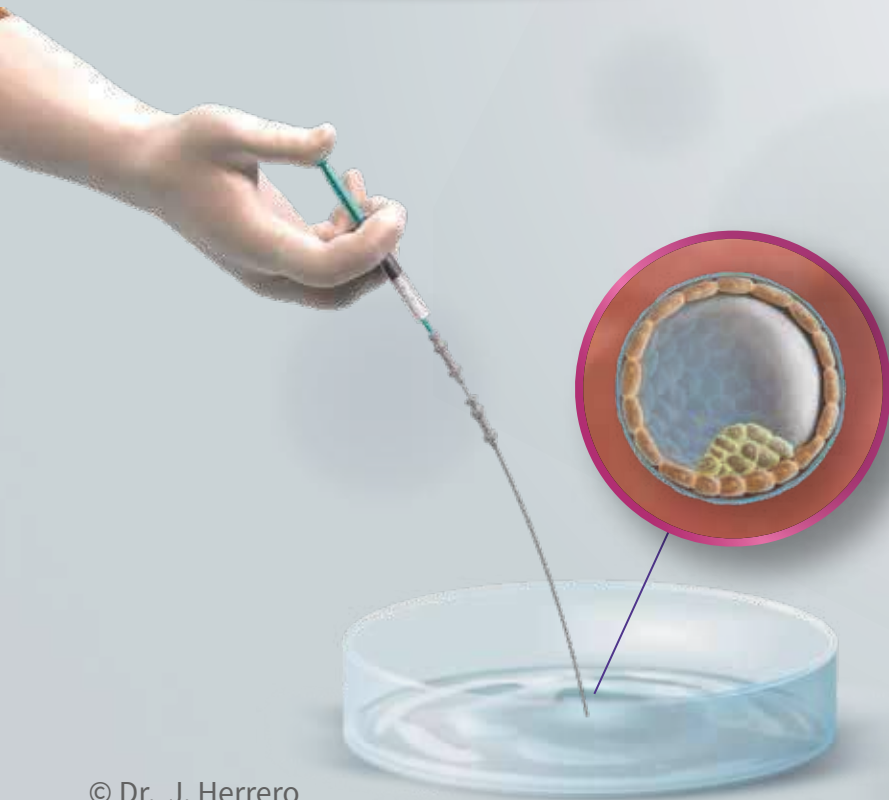
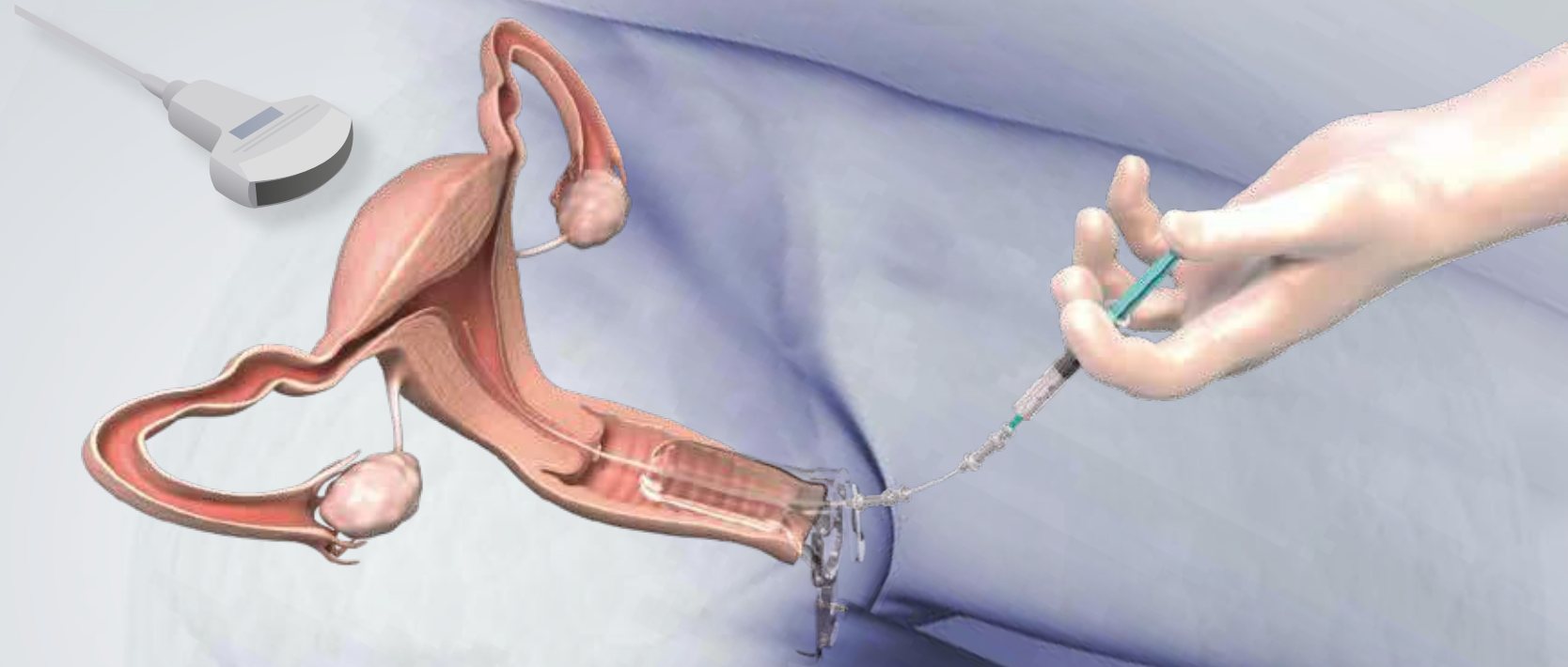
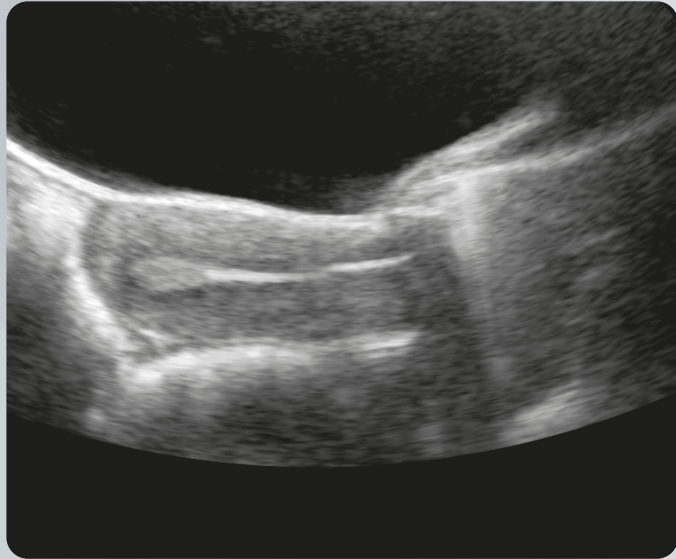


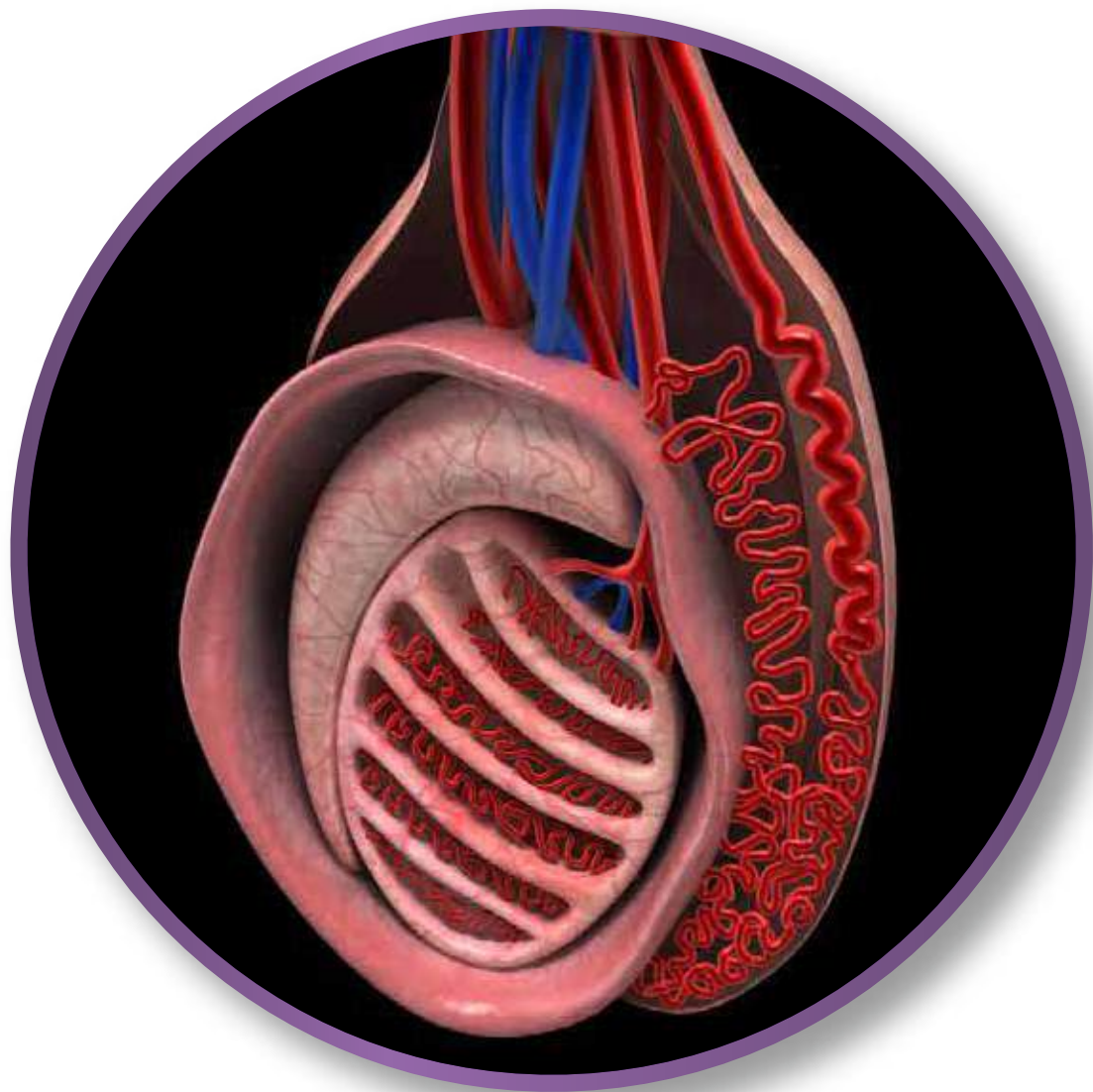
Oocyte pick-up (OPU)



23

Embryo transfer



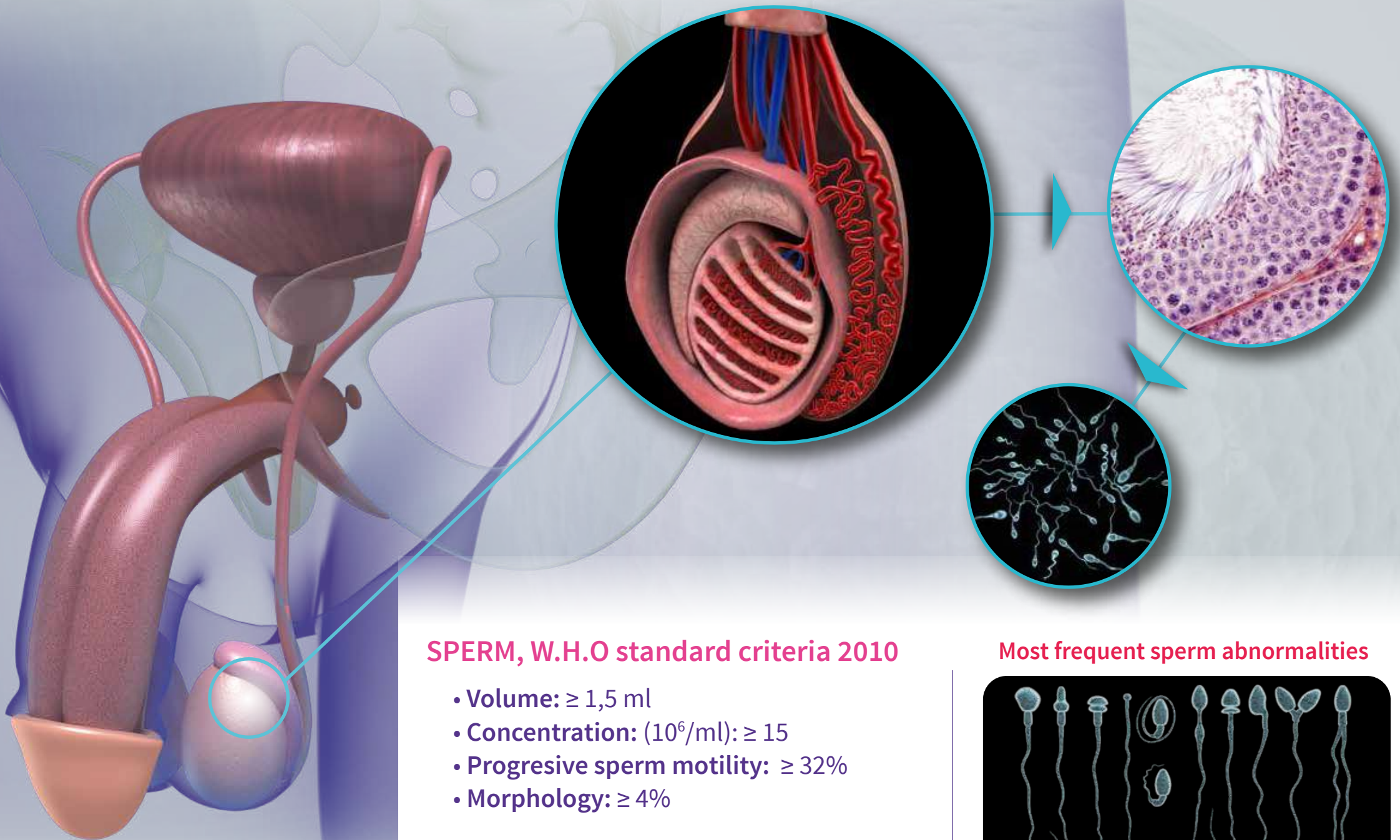


Andrology



Atlas
of assisted
reproduction

Anatomy and physiology of the male reproductive system



SPERM, W.H.O standard criteria 2010

- **Volume:** $\geq 1,5$ ml
- **Concentration:** (10^6 /ml): ≥ 15
- **Progressive sperm motility:** $\geq 32\%$
- **Morphology:** $\geq 4\%$

Most frequent sperm abnormalities

