

Genetics and ART - the Swiss perspective -

Christian De Geyter
Reproductive Medicine and Gyn. Endocrinology (RME)
Vogesenstrasse 134
Universitätsspital Basel
University of Basel, Switzerland



Conflict of interests

- I have been a member of ESHRE since 1986.
- Associate Editor Human Reproduction 2009 to 2012.
- President of FIVNAT (CH) from 2010 to 2013.
- President of the Swiss Society of Human Reproduction (SGRM) from 2013 to 2015
- Current Chair of the European IVF-monitoring consortium (EIM) of ESHRE
- Since 2018 Deputy Editor of Human Reproduction

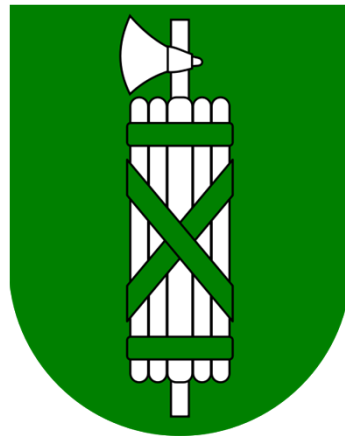


The difficult history of ART in Switzerland

Ban on IVF from 1990 to 1994



Basel-Stadt



St. Gallen

Referendum March 12, 2000



72.1% majority **against** ban!

Very restrictive law in ART instituted since January 1, 2001



Bundesgesetz über die medizinisch unterstützte Fortpflanzung (Fortpflanzungsmedizingesetz, FMedG)

814.90

vom 18. Dezember 1998 (Stand am 14. Oktober 2003)

*Die Bundesversammlung der Schweizerischen Eidgenossenschaft,
gestützt auf die Artikel 24^{novies} Absätze 1 und 2, 64 und 64^{bis} der
Bundesverfassung¹,
nach Einsicht in die Botschaft des Bundesrates vom 26. Juni 1996²,*



- Ban on PGD
- All measures preventing severe ailment to the offspring are allowed

Cross border reproductive care in six European countries

F. Shenfield^{1,*}, J. de Mouzon², G. Pennings³, A.P. Ferraretti⁴,
A. Nyboe Andersen⁵, G. de Wert⁶, and V. Goossens⁷ the ESHRE
Taskforce on Cross Border Reproductive Care[†]

Human Reproduction, Vol.25, No.6 pp. 1361–1368, 2010

Table V Sought treatment according to the country of patients' residence.

	Infertility treatment*		Specific treatments			
	ART	IUI	PGD-PGS	Donation**		
				Semen	Oocyte	Embryo
Italy	76.5	32.6	2.1	17.4	17.9	2.3
Germany	90.5	10.3	8.5	10.2	44.6	6.2
Netherlands	78.1	27.4	3.4	11.4	9.4	0.7
France	46.7	61.7	2.8	43.0	20.6	5.6
Norway	62.7	41.8	1.5	38.8	1.5	1.5
UK	90.6	9.4	3.8	15.1	62.3	11.3
Sweden	37.7	62.3	0.0	43.4	5.7	1.9
Total	77.9	27.1	3.2	18.3	22.8	3.4

Percentages are computed among the total number of women coming from each country.

*The sum of ART and IUI is over 100% because some patients (4.9%) sought both.

**Some patients sought more than one type donation.

Escape technologies (1)

SMW Established in 1871
Swiss Medical Weekly
Formerly: Schweizerische Medizinische Wochenschrift
The European Journal of Medical Sciences

Short communication | Published 15 February 2013, doi:10.4414/smw.2013.13718
Cite this as: Swiss Med Wkly. 2013;143:w13718

First successful pregnancy in Switzerland after prospective sex determination of the embryo through the separation of X-chromosome bearing spermatozoa

Christian De Geyter^a, Oliver Sterthaus^a, Peter Miny^b, Friedel Wenzel^b, Olav Lapaire^c, Maria De Geyter^a, Gideon Sartorius^a

^aClinic of Gynaecological Endocrinology and Reproductive Medicine, University Hospital, University of Basel, Switzerland

^bDivision of Human Genetics, Children's Hospital, University of Basel, Switzerland

^cClinic of Fetal Maternal Medicine and Obstetrics, University Hospital, University of Basel, Switzerland



Escape technologies (2)

Preimplantation diagnosis in Switzerland – birth of a healthy child after polar body biopsy

Bruno Imthurn^a, Josef Achermann^b, Marianne Klug Arter^b, Ervin Macas^a

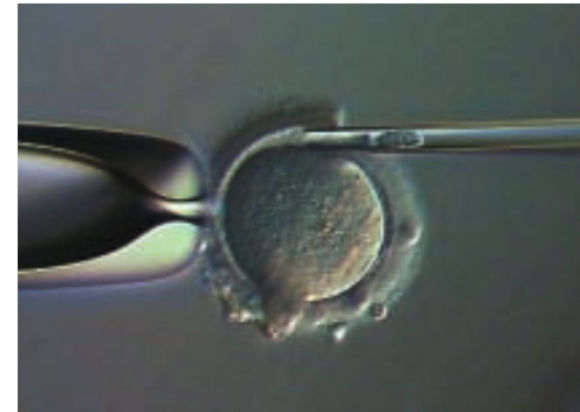
^a Clinic of Endocrinology, Department of Obstetrics and Gynaecology, University Hospital Zurich, Switzerland

^b Genetica AG, Zurich, Switzerland

SWISS MED WKLY 2004;134:259–261 · www.smw.ch

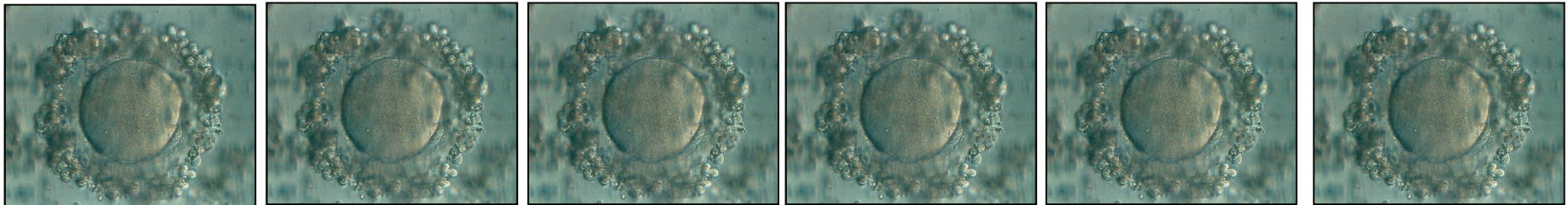
Figure 1

Removal of the first polar body.

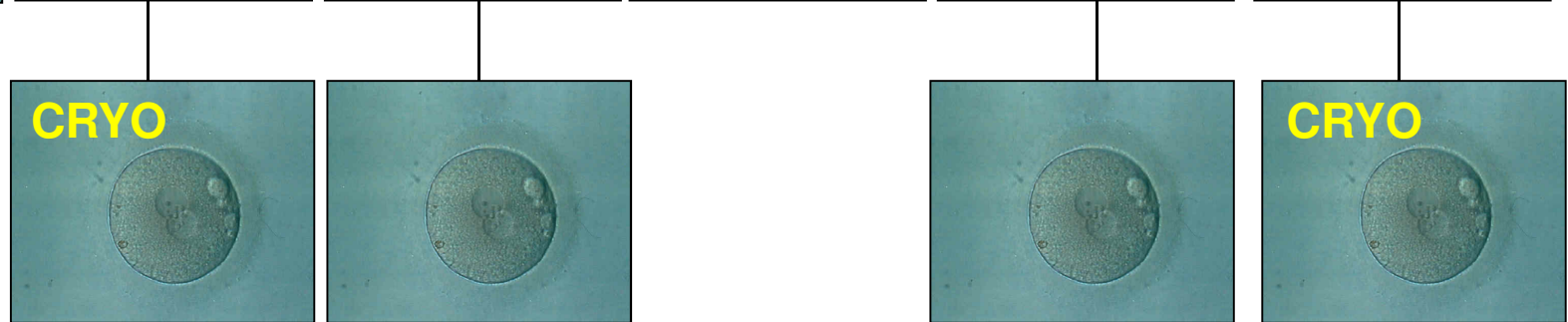


resulting usual practice in ART in Switzerland - 2001 to 2017 -

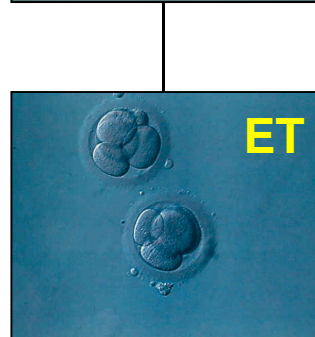
day 0



day 1

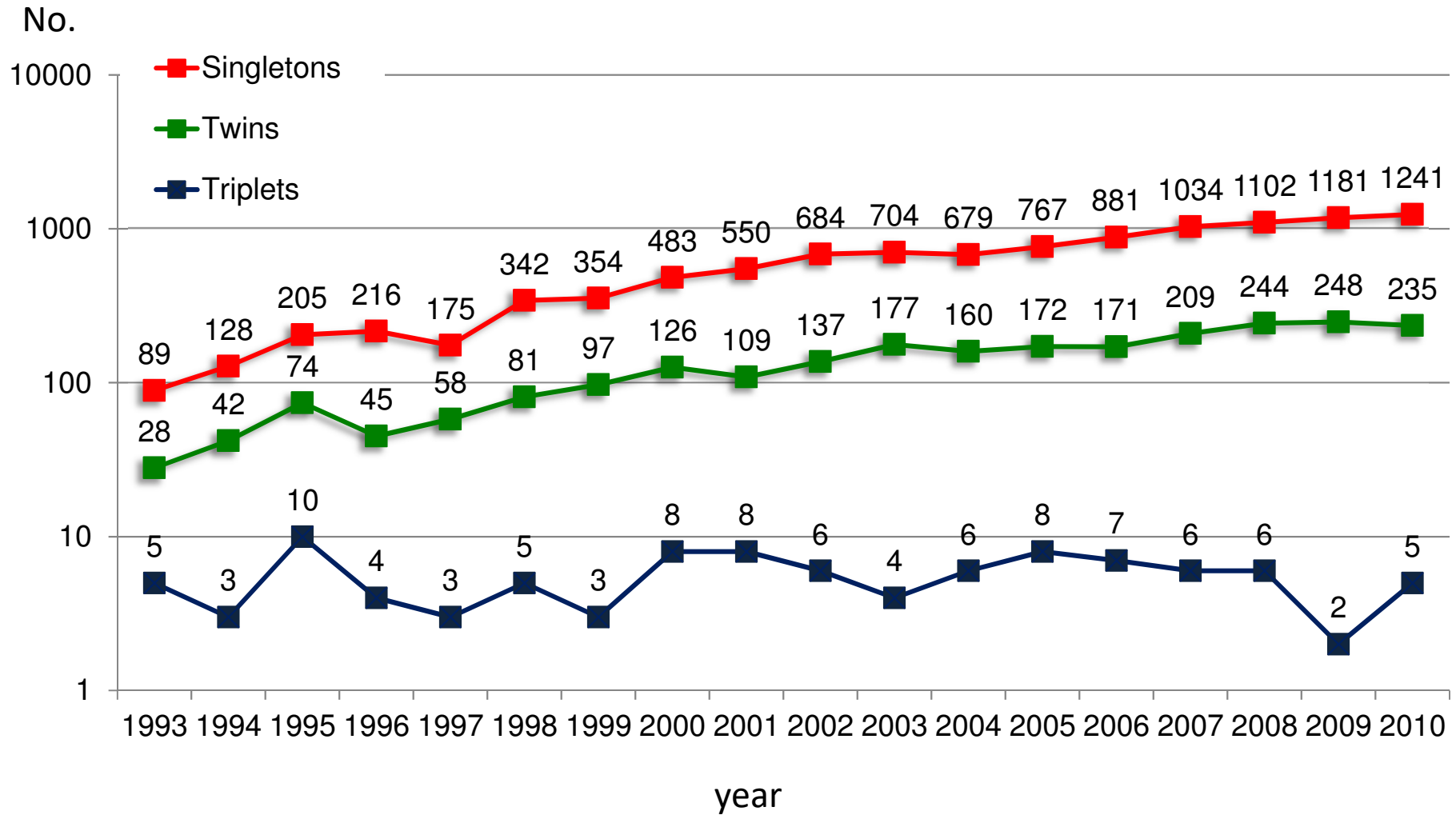


day 2



No embryo selection!
No embryo cryostorage!
No preimplantation genetic diagnostics!

No. of singleton and multiple deliveries in Switzerland, 1993 - 2010



Many little steps towards a new legislation	Date
Submission of PGD to the parliament	September 2, 2004
Acceptance of PGD as a principle in both chambers	June 15, 2005, 13. Dec., 13 2005
First consultation by the Swiss Government in Berne	February 18, 2009
Publication of the results of these first consultations	May 26, 2010
Initiation of first public debate by Swiss Government	June 29, 2011
Publication of the results (Art. 119 BV, FMedG)	June 27, 2012
Consultations of one dedicated commission in the Parliament	August 15, 2013 Until January 28, 2014
Ongoing consultations in one chamber of the Parliament	March 2014
Consultations in another dedicated commission of the Parliament	March – May 2014
Consultations in the other chamber of the Parliament	June 2014
Decision making in the Parliament	September 8, 2014
Final votation in the Parliament	December 12, 2014
Votation of the Swiss People about Art. 199 BV	June 14, 2015



June 14, 2015

**Change in the Federal Constitution
(119c BV)**

61.9% yes in favour of PGD

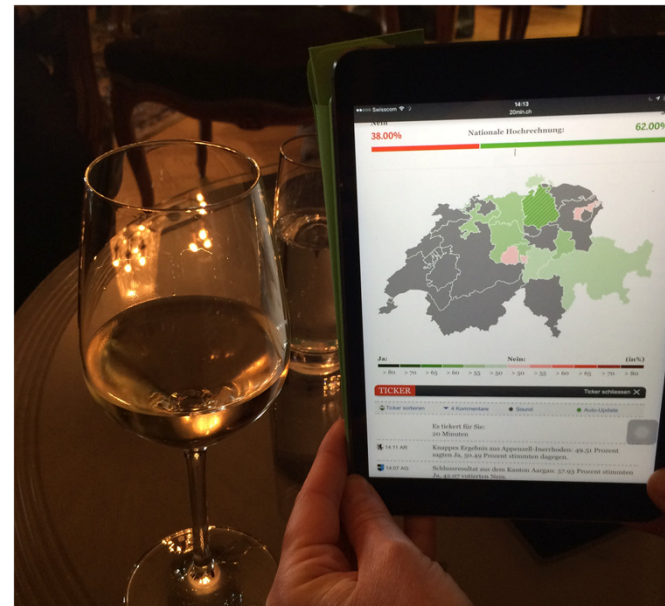


June 5, 2016

**revised law on ART
(FMedG)**

62.4% in favour of PGD

Politics in and around the Swiss Parliament



New legal framework in Switzerland



Bundesgesetz über die medizinisch unterstützte Fortpflanzung (Fortpflanzungsmedizingesetz, FMedG)

810.11

vom 18. Dezember 1998 (Stand am 1. September 2017)

*Die Bundesversammlung der Schweizerischen Eidgenossenschaft,
gestützt auf die Artikel 119 Absatz 2 und 122 Absatz 1 der Bundesverfassung^{1,2}
nach Einsicht in die Botschaft des Bundesrates vom 26. Juni 1996³,
beschliesst:*

Fortpflanzungsmedizinverordnung (FMedV)

810.112.2

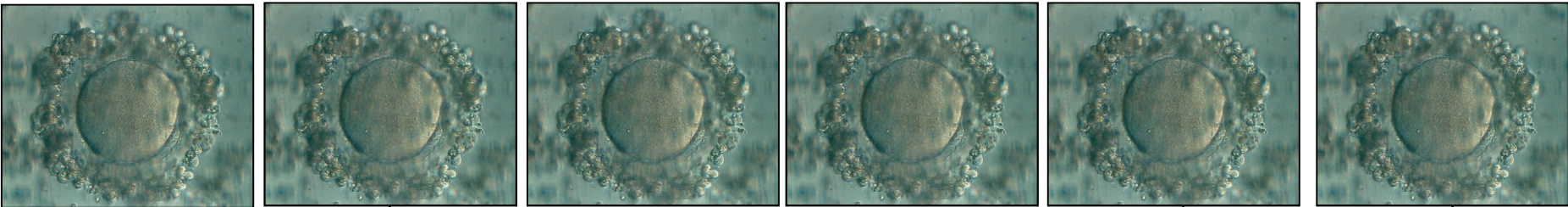
vom 4. Dezember 2000 (Stand am 1. September 2017)

*Der Schweizerische Bundesrat,
gestützt auf die Artikel 14 und 25 Absatz 3 des Fortpflanzungsmedizingesetzes
vom 18. Dezember 1998¹ (Gesetz),
verordnet:*

- Cryostorage of up to 12 embryos is allowed.
- Duration of storage: 5 y., can be prolonged up to 10 y.
- PGT for monogenetic diseases is allowed.
- PGT-A is also allowed.
- Oocyte donation remains prohibited.

Elective single embryo transfer (eSET)

day 0



day 1



day 5

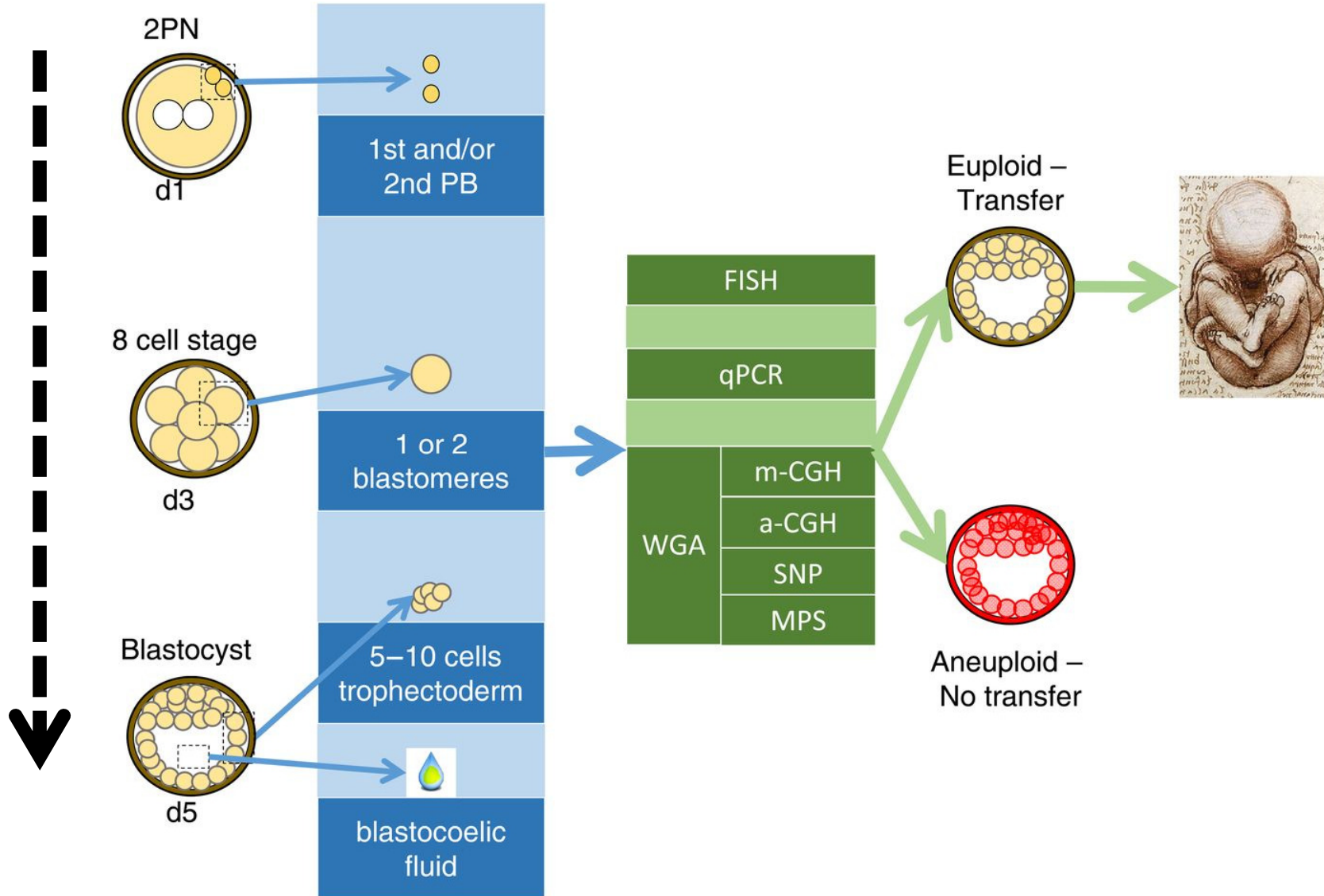


PGT-T is allowed but still very strictly regulated

- ◆ Each canton needs to allow activities.
- ◆ Quality management systems need to be in place.
- ◆ Indicated only in severe genetic disease, that can not be treated conventionally.
- ◆ The outbreak of the disease must be predicted with a probability of at least 25%.
- ◆ The genetic condition must lead to disease until the age of 50.
- ◆ The indications for PGT-T will be assessed in retrospect by the authorities.

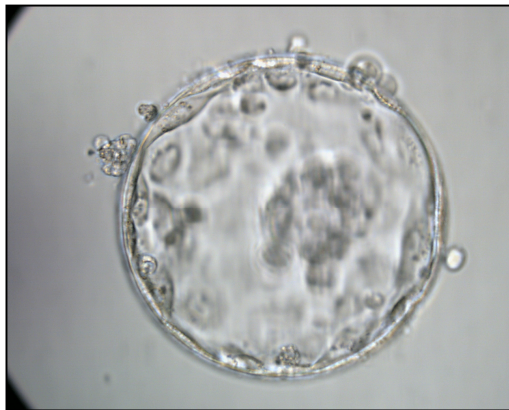
Preimplantation genetic screening 2.0: the theory

Joep Geraedts^{1,*} and Karen Sermon²

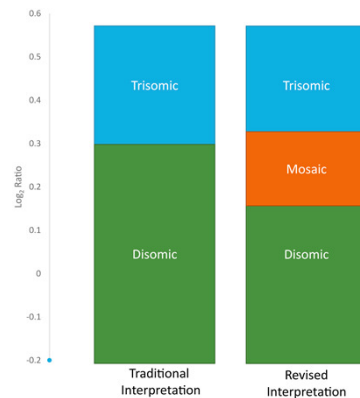


Problems with PGT-A

- ◆ The method still lacks the scientific evidence (no RCT's).
- ◆ Despite that, there is some pressure from the patients to use this technology.
- ◆ Problem of mosaicism....



Greco *et al.* (2015) NEJM: 6 healthy babies resulting from the transfer of 18 aneuploid embryos.



Scott & Galliano (2016) Fertil. Steril.

- ◆ We also discuss ranking of embryos according to the severeness of the chromosomal defect.



Schweizerische Akademie der Medizinischen Wissenschaften
Académie Suisse des Sciences Médicales
Accademia Svizzera delle Scienze Mediche
Swiss Academy of Medical Sciences

Richtlinien zu ethischen und praktischen Aspekten bei der Umsetzung des revidierten Fortpflanzungsmedizingesetzes (Arbeitstitel)

Start: Januar 2018

PD Dr. med. Sibil Tschudin , Basel, VORSITZ	Gynäkologie/Psychosomatik
lic. theol., Dipl.-Biol. Sibylle Ackermann , SAMW	ex officio
PD Dr. med. Deborah Bartholdi , Bern	Genetik
Susanne Brauer , PhD, Zürich, Vizepräsidentin ZEK	Ethik
Prof. Dr. iur. Andrea Büchler , Zürich	Recht
Prof. Dr. med. Christian De Geyter , Basel (Vertretung SGRM)	Reproduktionsmedizin
Prof. Dr. iur. Christina Fountoulakis , Fribourg	Recht
Dr. rer. nat. Nicole Gusset , Heimberg (SMA Schweiz)	PatientInnen-Vertretung
Dr. phil. Elisabeth Kurth , Basel	Hebamme / Elternbegleitung
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Dr. phil. Daniela Ritzenthaler , Bern	Ethik / Heilpädagogik
Prof. Dr. med. Daniel Surbek , Bern (Vertretung SGGG)	Geburtshilfe
Prof. Dr. med. Michael von Wolff , Bern	Reproduktionsmedizin
Dr. med. Nicolas Vulliemoz , Lausanne	Reproduktionsmedizin
PD Dr. med. Dorothea Wunder , Lausanne	Reproduktionsmedizin