

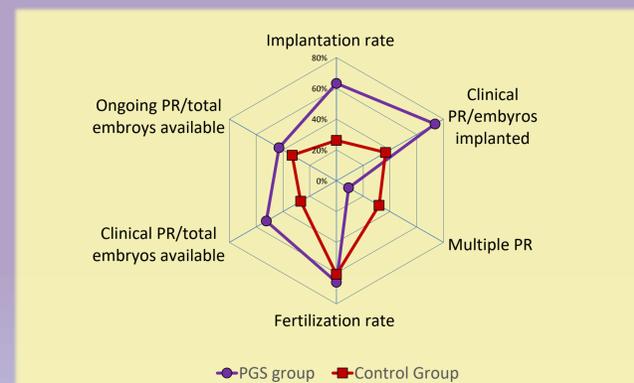
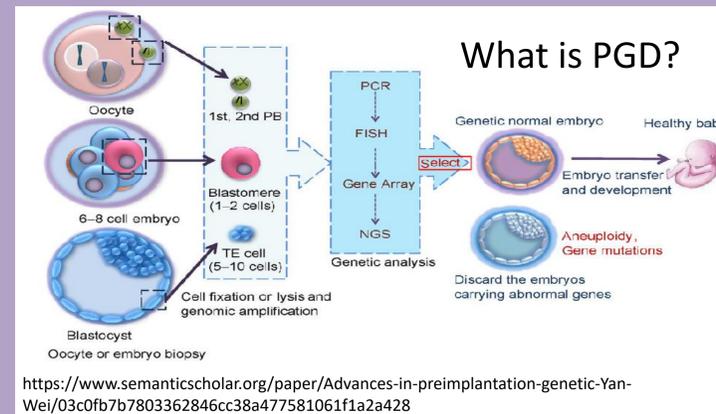
# Ethical Considerations of Preimplantation Genetic Diagnosis

Emily Ferre and Austin Ewell (Olga R. Kopp)  
Utah Valley University, Department of Biology

## Abstract

As In Vitro fertilization (IVF) and preimplantation genetic diagnosis (PGD) becomes more widely available, the determination of which embryo to implant has abounding ethical considerations that must be addressed by doctors, patients and society. The majority of the public support PGD for screening of serious abnormalities. It is morally obligatory to then consider the ethics of screening for other traits; which include aneuploidy of embryos, genetic diseases, hemoglobinopathies, and matching organ type to current family members for future beneficence. The health considerations continue to proceed into the realm of convenience and not necessity. In this research we address the questions: When making ethical considerations related to the future health and survival of the child, what should the deciding factors be? What are the valid and necessary concerns? And should any unnecessary elements be eliminated, or should a line be drawn at all? This research discusses the ethical implications of the use of PGD with IVF and the stakeholders in these processes and proposes guidelines when making these decisions.

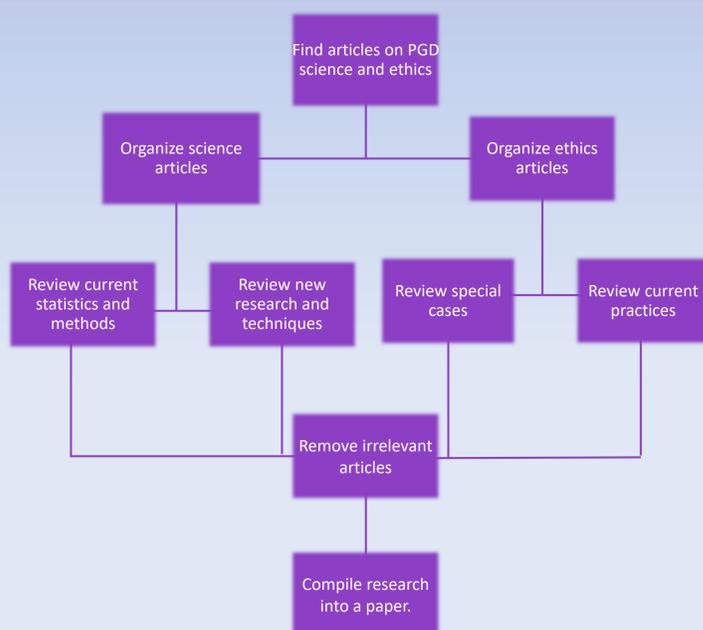
## Discussion



## Conclusion

- Embryos with lethal genetic abnormalities should not be used in IVF.
- Aneuploidy embryos should be considered for implantation for those who have no other choice of embryos.
- Embryos with genetic disorders such as Huntington's and achondroplasia should also be considered for implantation.
  - Uphold adult autonomy in the future
- Embryos with hemoglobinopathies should be considered for implantation.
- The option of organ matching should be available for early life disease, not for future precautions that would violate adults autonomy
- Multi Genetic traits such as intelligence and athleticism are not an issue because they cannot be accurately screened for.
- More discussion is necessary for the ethical considerations of selecting physical traits
  - eye color
  - hair color

## Methodology



## Use of PGD for Embryo Selection

Stakeholders	Beneficence/non-maleficence	Autonomy	Justice
<b>Parents</b>	-Reduced hardship -Prevents physical and emotional pain	-The parents have the most autonomy out of all the stakeholders	- Are generally free to choose as best suits them. Need to follow their own principles and guidelines to make a fair decision
<b>Embryo</b>	-Unfertilized embryos do not feel pain or have self awareness and will not benefit by being implanted while in the embryo state	-None, not self aware	- unjust to allow embryo to develop into a child that could only live a few hours out of the womb (pain) - unjust to prevent the life of an embryo that would form a disabled adult (non-lethal disorders)
<b>Adult individual selected</b>	-More fit according to society norms	-No autonomy because they are being selected	-Have full rights as they become sentient
<b>Health providers</b>	-No benefit in selecting an embryo that will cause distress to the patient -Cannot do harm to either the mother or be biased to potential life	-Don't Have some autonomy in giving advice on what would be the best outcome in their opinion, but not the ultimate choice	-The health care provider is bound by the law and the hippocratic oath
<b>Society</b>	-Would not have to provide care and financial support to disabled individuals	-Society as a whole does not have the autonomy, mainly the mothers do on an individual basis	-Society as a whole does not have the right to restrict parents decisions in IVF

## Future Implications

As the use of PGS and IVF technologies increase, they will become more accessible to people and the ethical considerations will become even more important. When using PGS and IVF, many of the decision fall within the scope of the ethical implication and usually the burden falls on the parents<sup>1</sup>. It is important to consider those ethical consequences. As of now due to the need of IVF/PGD for couples to have children a lot of these decisions are thought of and fretted over by the parents<sup>1</sup>. This may change when IVF is no longer the last option. To be prepared for this change it is prudent to consider the ethical implications now to be prepared.

## Literature Cited

- Cunningham J, Goldsmith L, Skirton H. 2015. The evidence base regarding the experiences of and attitudes to preimplantation genetic diagnosis in prospective parents. *Midwifery*. 31(2):288-296.
- Gaurav M, Abha M, Meena L, Ishwar CV, Kailash CU. 2016. Preimplantation genetic screening for all 24 chromosomes by microarray comparative genomic hybridization significantly increases implantation rates and clinical pregnancy rates in patients undergoing in vitro fertilization with poor prognosis. *Journal of Human Reproductive Sciences*, Vol 9, Iss 2, Pp 94-100 (2016). (2):94.