第三代试管婴儿治疗，新加坡不孕不育夫妻的一场昂贵、冒险和不必要的赌博?

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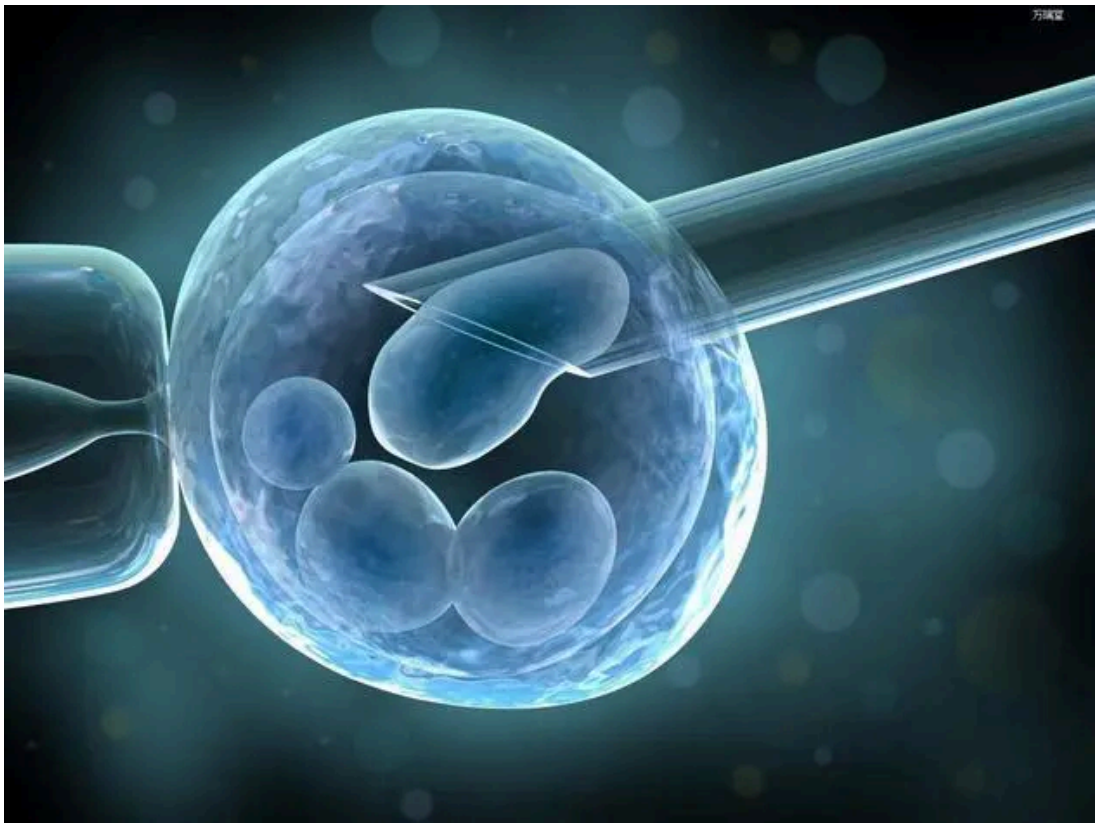
由于晚婚和高龄生育的趋势不断增加，新加坡不孕症的发病率不断上升。女性的生育能力在三十五岁后急剧下降，因为随着更年期的临近，卵巢内的活卵子迅速减少。此外，众所周知，随着产妇年龄的增加，遗传异常出生的发生率不断上升，特别是唐氏综合症。

在华人文化中，唐氏综合症等先天性残疾或许会被视为家庭、社会和国家的负担。因此，接受辅助生殖治疗的焦虑夫妇对基因检测的需求很高，以避免唐氏综合症等基因异常的出生。受孕后的无创产前检测（NIPT）并不能令人满意，因为这可能需要流产基因异常的胎儿，从而带来情感创伤和医疗风险。

因此，世界各地的许多辅助生殖诊所提供第三代试管婴儿治疗，包括在移植到子宫之前对胚胎进行基因检测。该程序称为植入前非整倍体基因检测（PGT-A）或胚胎植入前基因筛检(PGS)。



一个相当有说服力的推销说法是，在基因检测上进行少量额外投资可能是更明智的做法，以避免终止基因异常胎儿的潜在创伤，或者更糟糕的是，花更多的钱满足唐氏综合症儿童的教育和医疗保健需求。

另一个巧妙的营销花招是故意歪曲统计数据，夸大高龄妇女出生缺陷的风险，特别是“相对风险”的概念。例如，二十五岁左右的女性中唐氏综合症的患病率为 0.1%，三十多岁的女性中为 1.0%，四十岁出头的女性中为 3.0%。医疗保健营销中常见的“恐吓”策略是宣称当女性接近三十岁时，患唐氏综合症的风险会增加十倍，到四十岁出头时，患唐氏综合症的风险会增加三十倍。因此，对于对统计学知识较为浅薄的患者来说，仅通过对文字和数字数据的微妙操纵，就很容易夸大唐氏综合症的风险。

为了推动这项协议，外国辅助生殖诊所可能会谨慎地告诉患者，他们可以秘密选择婴儿的性别，尽管出于社会原因的性别选择可能在其国家管辖范围内被禁止或劝阻。

然而在新加坡，体外受精胚胎的基因检测受到严格限制。这不是常规临床服务，而是主要限于政府医院的临床试验，私人辅助生殖中心不提供。目前，胚胎基因检测程序仅对35岁及以上的女性开放，或者无论年龄大小，接受过两次以上试管受精失败或两次以上反复流产的女性。

因此，许多不孕不育的新加坡夫妻前往海外接受第三代试管婴儿治疗。这是一个令人震惊的趋势，因为这些患者不了解最新的科学和临床数据证明了第三代试管婴儿技术的众多缺陷和陷阱。古语云：无风不起浪。如果第三代试管婴儿技术真的那么好、那么有效，为什么新加坡卫生部如此严格限制这项技术呢?

事实上，英国和美国知名专业组织和医疗监管机构的最新声明和行动，让人们对第三代试管婴儿技术产生了一定的怀疑。例如，英国人类受精和胚胎管理局(HFEA)已将第三代试管婴儿技术评为“红灯”，反映了对误诊和缺乏提高受孕率确实证据的担忧。同样，美国生殖医学会（ASRM）在回顾了20年的现有临床数据后得出的结论是，第三代试管婴儿技术并不能提高妊娠率，其降低临床流产风险的有效性也尚不清楚。

此外，新加坡患者还必须警惕美国针对第三代试管婴儿技术正在进行的集体诉讼，该技术已被认为是辅助生殖领域最明显和最广泛的欺诈案例。这些诉讼由 Berger Montague LLC 等多家律师事务所、Constable Law LLC 和 Justice Law Collaborative LLC 发起，针对多家基因检测公司，包括 CooperGenomics Inc、CooperSurgical Inc、The Cooper Companies Inc、Reproductive Genetic Innovations LLC、Progenesis Inc和 Natera Inc。

在澳大利亚的一起类似诉讼中，Monash IVF生育公司 同意支付 5600 万澳元，以补偿 700 名前 IVF 患者，这些患者因第三代试管婴儿技术的误诊而导致其可存活胚胎被毁掉，该技术或许剥夺了许多人的生命。这些IVF患者曾有机会成为父母。

因此有必要了解第三代试管婴儿技术的各种弊端和陷阱，以及为何新加坡卫生部如此严格监管。

首先，患者必须意识到基因筛查可能会损害他们的胚胎。该技术具有高度侵入性，需要在胚胎中提取部分细胞进行活检。这可能会对胚胎产生一定的伤害，并且会损害其发育潜能。

专家指出，声称对胚胎进行基因检测不会产生不良影响的研究往往是基于对优秀的高质量胚胎进行检测，而不是对可能遭受更多影响的更“脆弱”的低质量胚胎进行检测。由于年龄较大的女性往往拥有较弱、质量较低的胚胎，因此在测试时这些胚胎可能更容易受到损坏。

其次，基因检测很容易出现误诊，这可能会导致患者丢弃能够产生健康婴儿的可行胚胎。这是因为测试仅从产生胎盘和脐带的外胚胎层中提取细胞，这并不代表产生婴儿本身的内胚胎层。

含有遗传正常和异常细胞混合物的“马赛克胚胎”(鑲嵌型胚胎)已被证明具有自我纠正和健康出生的能力。这种“自我纠正”机制涉及将遗传异常细胞推出外胚胎层，从而形成胎盘和脐带。

高龄女性在辅助生殖治疗期间的胚胎数量有限。因此，排除或丢弃有可能产生正常婴儿的镶嵌型胚胎，将大大降低体外受精成功的机会。一些高龄辅助生殖治疗患者在基因检测后可能没有剩余胚胎可供移植。

最后，多项大规模临床试验表明，胚胎基因检测并不能提高妊娠率。2019年，一项大型多中心随机临床试验，涉及美国、加拿大、英国和澳大利亚的34家辅助生殖诊所，包括661名年龄在24岁至40岁之间的患者，结果发现胚胎遗传学对妊娠率的总体改善没有显著性差异。2021年，中国的另一项大型临床试验涉及14家辅助生殖诊所，总共1,212名年龄在20至37岁之间的患者，报告了类似的不利结果，该结果发表在著名的《新英格兰医学杂志》上。

因此，根据最新的科学和临床数据，人们对第三代试管婴儿技术的医学益处产生了严重怀疑。因此，新加坡患者在出国旅行时应谨慎使用这种在本国受到严格限制的技术。

参考

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Is third-generation IVF treatment an expensive, risky and unnecessary gamble for infertile couples in Singapore?

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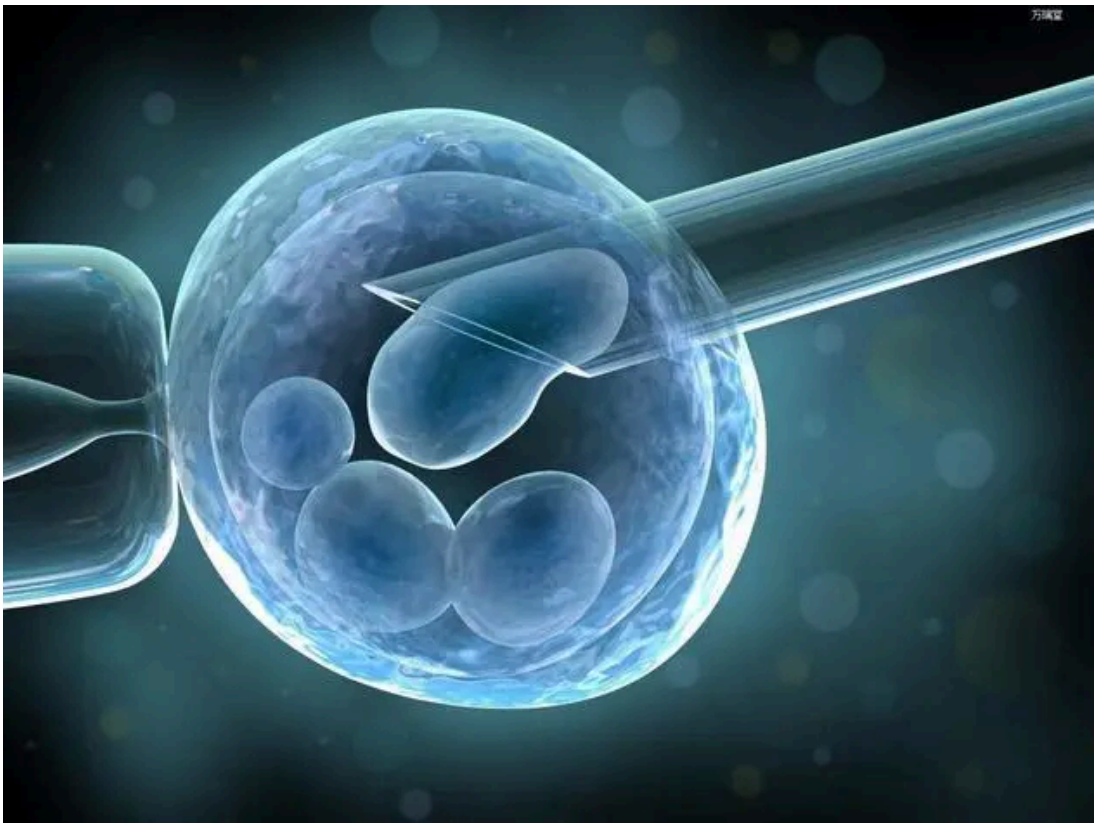
The incidence of infertility in Singapore is rising due to the increasing trend of late marriage and childbearing at an advanced age. Female fertility declines sharply after the age of thirty-five as the number of viable eggs in the ovaries decreases rapidly as menopause approaches. In addition, it is well known that the incidence of genetic abnormalities at birth, especially Down syndrome, increases with maternal age.

In Chinese culture, congenital disabilities such as Down syndrome may be seen as a burden to the family, society, and the country. Therefore, there is a high demand for genetic testing among anxious couples undergoing assisted reproductive treatment to avoid the birth of genetic abnormalities such as Down syndrome. Non-invasive prenatal testing (NIPT) after conception is not satisfactory because it may require aborting a fetus with genetic abnormalities, which brings emotional trauma and medical risks.

Therefore, many assisted reproduction clinics around the world offer third-generation IVF treatments that include genetic testing of the embryos before they are transferred to the uterus. This procedure is called preimplantation genetic testing for aneuploidy (PGT-A) or preimplantation genetic screening (PGS) .



A fairly convincing sales pitch is that a small additional investment in genetic testing might be wiser to avoid the potential trauma of terminating a fetus with a genetic abnormality or, worse, spending more money to meet the educational and health care needs of a child with Down syndrome.

Another clever marketing gimmick is to deliberately misrepresent statistics to exaggerate the risk of birth defects in older women, particularly the concept of "relative risk." For example, the prevalence of Down syndrome is 0.1% for women in their mid-twenties, 1.0% for women in their thirties, and 3.0% for women in their early forties. A common "scare" tactic in health care marketing is to claim that the risk of Down syndrome increases tenfold as women approach their thirties and thirtyfold by their early forties. Therefore, for patients with little knowledge of statistics, the risk of Down syndrome can be easily exaggerated through subtle manipulation of text and numerical data.

To facilitate this agreement, foreign assisted reproduction clinics may be careful to tell patients that they can confidentially choose the sex of their baby, even though sex selection for social reasons may be prohibited or discouraged in their national jurisdictions.

However, in Singapore, genetic testing of IVF embryos is strictly restricted. It is not a routine clinical service, but is mainly limited to clinical trials in government hospitals and is not available in private assisted reproductive centers. Currently, the embryo genetic testing procedure is only open to women aged 35 and above, or women of any age who have undergone more than two failed IVF attempts or more than two recurrent miscarriages.

As a result, many infertile Singaporean couples travel overseas for IVF treatment. This is an alarming trend as these patients are unaware of the latest scientific and clinical data proving the numerous flaws and pitfalls of IVF technology. As the old saying goes: There is no smoke without fire. If IVF technology is really that good and effective, why does the Singapore Ministry of Health restrict this technology so strictly?

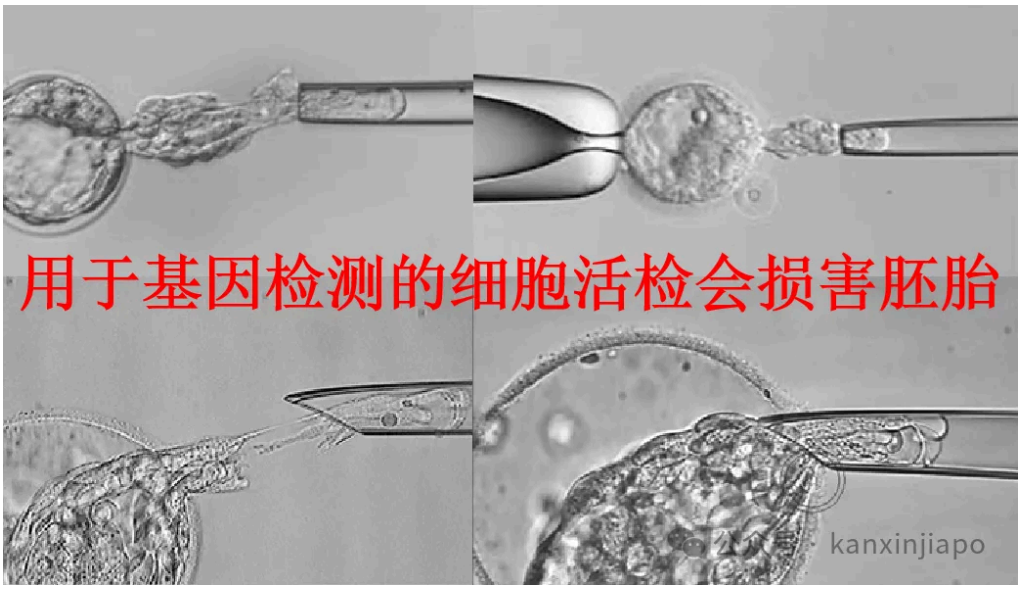
In fact, the latest statements and actions of well-known professional organizations and medical regulatory agencies in the UK and the US have cast some doubts on the third-generation IVF technology. For example, the UK Human Fertilization and Embryology Authority (HFEA) has rated the third-generation IVF technology as a "red light", reflecting concerns about misdiagnosis and lack of solid evidence to improve pregnancy rates. Similarly, the American Society for Reproductive Medicine (ASRM) concluded after reviewing 20 years of existing clinical data that the third-generation IVF technology does not improve pregnancy rates, and its effectiveness in reducing the risk of clinical miscarriage is also unclear.

In addition, Singaporean patients must also be wary of ongoing class action lawsuits in the United States against third-generation IVF technology, which has been considered the most obvious and widespread fraud case in the field of assisted reproduction. These lawsuits were initiated by several law firms including Berger Montague LLC, Constable Law LLC and Justice Law Collaborative LLC, against several genetic testing companies, including CooperGenomics Inc, CooperSurgical Inc, The Cooper Companies Inc, Reproductive Genetic Innovations LLC, Progenesis Inc and Natera Inc.

In a similar lawsuit in Australia, fertility company Monash IVF agreed to pay $56 million to compensate 700 former IVF patients who had the chance to become parents after a misdiagnosis led to the destruction of their viable embryos, potentially robbing many of their lives.

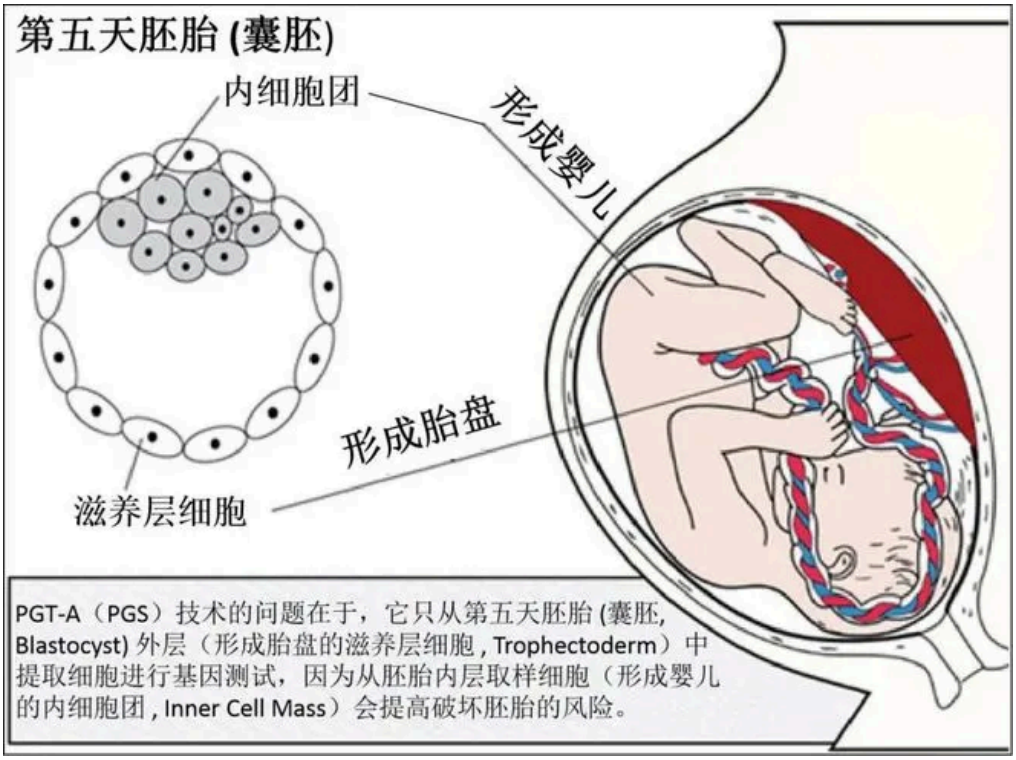
Therefore, it is necessary to understand the various disadvantages and pitfalls of third-generation IVF technology and why the Singapore Ministry of Health regulates it so strictly.

First, patients must be aware that genetic screening could harm their embryos. The technique is highly invasive and requires the extraction of a biopsy of cells from the embryo. This can cause some damage to the embryo and compromise its developmental potential.



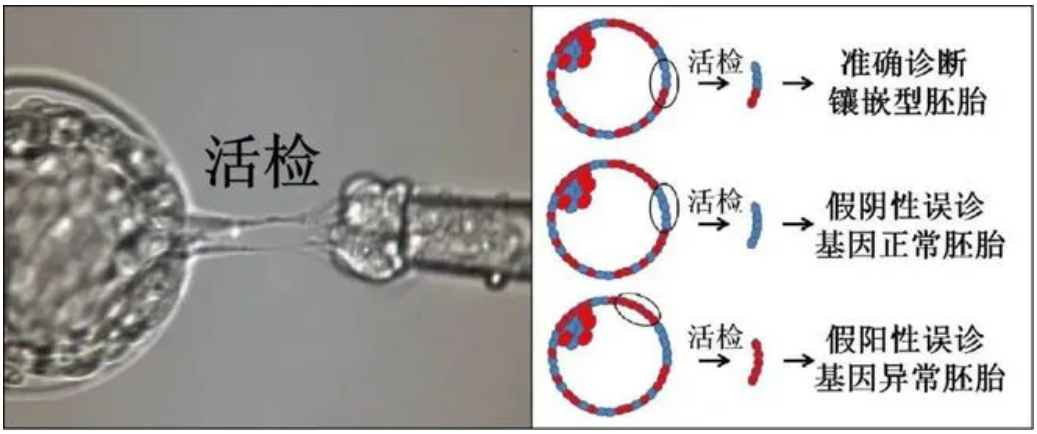
Experts point out that studies claiming that genetic testing of embryos has no adverse effects are often based on testing excellent, high-quality embryos, rather than more "fragile," lower-quality embryos that may suffer more effects. Because older women tend to have weaker, lower-quality embryos, these embryos may be more susceptible to damage when tested.

Second, genetic testing is prone to misdiagnosis, which could cause patients to discard viable embryos that could produce healthy babies. This is because the test only extracts cells from the outer embryonic layer, which produces the placenta and umbilical cord, and does not represent the inner embryonic layer, which produces the baby itself.



Mosaic embryos containing a mixture of genetically normal and abnormal cells have been shown to have the ability to self-correct and be born healthy. This "self-correction"

mechanism involves pushing the genetically abnormal cells out of the outer embryonic layer, which forms the placenta and umbilical cord.



The number of embryos available to older women during assisted reproductive treatment is limited. Therefore, excluding or discarding mosaic embryos that have the potential to produce normal babies will greatly reduce the chances of successful IVF. Some older patients undergoing assisted reproductive treatment may have no remaining embryos to transfer after genetic testing.

Finally, multiple large-scale clinical trials have shown that embryo genetic testing does not improve pregnancy rates. In 2019, a large multicenter randomized clinical trial involving 34 assisted reproductive clinics in the United States, Canada, the United Kingdom, and Australia, including 661 patients aged between 24 and 40, found that there was no significant difference in the overall improvement of pregnancy rates by embryo genetics. In 2021, another large clinical trial in China involving 14 assisted reproductive clinics and a total of 1,212 patients aged between 20 and 37 reported similar unfavorable results, which were published in the prestigious New England Journal of Medicine.

Therefore, based on the latest scientific and clinical data, serious doubts have been cast on the medical benefits of third-generation IVF technology. Therefore, Singaporean patients should be cautious when traveling abroad to use this technology, which is strictly restricted in their own country.

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