

Potential Laboratory Cost-Savings for a Blastocyst Preimplantation Genetic Screening (PGS) Vitrification (VTF) Program

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Objective: We aimed to critically evaluate the cost benefits of a clinically proven non-commercial, aseptic closed VTF system to other commonly used open/hybrid VTF devices, and discuss the importance of cost-savings in today’s assisted reproductive technology (ART) industry.

Design: Theoretical modeling of 500 PGS/VTF-all cycles was prospectively evaluated to assess costs comparing the use of a non-commercial microSecure (μS) VTF device system to three common commercial systems: Cryolock (CL), Rapid-i (R-i) and High Security Straws (HSV) VTF devices. In the analysis, we assumed a mean of 5 blastocysts biopsied per cycle yielding 2 euploid embryos for 2 vitrified ET (VFET) cycles. Media and solution costs were excluded.

Materials and methods: Costs were calculated based on protocol and prices used within our laboratory network. The CL VTF procedure used: 5 x CLs (\$15.00x5=\$75.00), 2 x Stripper tips (\$6.17x2=\$12.34) and 2 x 4 well dishes (\$2.42x2=\$4.84). Conversely, the μS-VTF protocol used: 5 x CBS semen/embryo straws (\$2.75x5=\$13.75), flexipettes (\$4.00x6=\$24.00) and 2 x 100mm dishes (\$0.25x2=\$0.50). In considering the potential use of R-i or HSV devices commonly used in the industry, we simply replaced the CL model with higher device costs (\$22.50x5=\$112.50). Warming costs are particularly low with the μS-VTF technique as the embryo already resides in a flexipette, requiring only: 60 mm warming dishes (\$0.25x2=\$0.50) and 6-well dilution dishes (\$1.40x2=\$2.80). Cryolock warming costs required: Stripper tips (\$6.17x8=\$49.36), organ well dishes (\$1.70x2=\$3.40), and 4-well dishes (\$2.42x2=\$4.84).

Results: The application of the μS-VTF offers significant cost-savings compared to our commercial use of CL devices (see Table). Based on our theoretical model (500 cycles), a total savings of up to \$64,275 can be achieved depending on the commercial VTF device used.

Costs (\$) / VTF Devices:	μS	CL	R-i or HSV
VTF / cycle	38.25 ^a	92.18 ^b	112.50
Warming / 2 VFET	3.30 ^a	57.60 ^b	59.00
Subtotal / cycle	41.55 ^a	149.78 ^b	170.10
Total / 500 cycles	20,775 ^a	74,890 ^b	85,050
Cost Savings(-) or Increase(+) (\$)	- 54,115	0	+ 10,160

a, b – column values within rows with different superscripts are different (p<0.05; t-test).

Conclusion: Although VTF expenses represent a fraction (<10%) of a laboratory’s revenue gained from blastocyst biopsy and cryopreservation, the potential savings generated using μS-VTF could support an entry level Reproductive Biologist’s annual salary over 500 VFET cycles. Cost matters in today’s IVF business, as long as success is not compromised.

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