

### Use of Miniature Sanyo Tri-gas Incubators: Clinical Validation for Human ART.

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**Objective:** To validate the clinical use of the miniaturized Sanyo MCO-5M (Sanyo, Bensenville, IL) incubators in human IVF, and evaluate their performance and merits.

**Materials & Methods:** Following a six week set-up, aeration, aseptic cleaning/sterilization and quality control period, 12 Sanyo tri-gas incubators (3 per stack) were implemented into routine clinical use in September 2007 (TG grp). The gas environment of all incubators was supplied by a single 100% CO<sub>2</sub> tank (H-type), and a 176L LN<sub>2</sub> vapor tank, both using a gas guard back-up. Incubators were set to 4.5 to 5.5%CO<sub>2</sub>/5%O<sub>2</sub>/balance N<sub>2</sub> gas, to achieve a desired pH with different media Lot #'s. Oocytes were recovered under controlled temperature and gas conditions over a 6 mo interval, following individualized COH protocols by one of four physicians. All oocytes were maintained in P-1 medium + 5% HSA (Irvine Sci., Santa Ana, CA) until ICSI. Eggs were injected in Hepes buffered -LG medium (Life Global, IVF Online, Guilford, CT) + HSA/SS and then cultured in 25 µl droplets of LG medium + 5%HSA/5%SS, with Nunc dish replacement on D1, D3 and D5. Embryos were transferred on D3 (100% of CO<sub>2</sub> grp) or D5 (TG grp: 15% for 41-43 yo's to 79% for Donor eggs) by vaginal ultrasound guidance, primarily using a SureView-Wallace catheter. Data from the TG grp was contrast to the old CO<sub>2</sub> gas system (6 x Forma incubators; 5-6% CO<sub>2</sub>) culturing in P-1 /MBM sequential media + 10% SS (Irv Sci) over the first 6 mo of 2007.

**Results:** Overall, high normal fertilization rates (77%-82%/age grp) and high quality embryo/blastocyst production was achieved using the Sanyo mini-incubators. These units have proven to be very gas efficient, only requiring tank replacement about every 12 to 14 days. Pregnancy rates were higher (P<0.05), with fewer embryos transferred, for the TG grp in most age groups, especially in regards to Live birth/Ongoing pregnancies. The latter finding is due to fewer (P<0.05) biochemical and SAB pregnancies, consistent with published advantages of the TG/low oxygen tension system.

	Trt	Donor Egg	≤ 34 yo	35-37 yo	38-40 yo	41-43 yo
# Patients	TG	29	69	38	49	41
	CO <sub>2</sub>	17	65	47	51	31
Mean # ET	TG	2.3	2.6	3.0	3.4	2.8
	CO <sub>2</sub>	2.7	3.0	3.8	4.0	4.0
# + β-hCG	TG	25 (86%)*	53 (77%)	25 (66%)*	24 (47%)*	13 (32%)
	CO <sub>2</sub>	12 (77%)	47 (72%)	23 (49%)	18 (35%)	9 (29%)
# LB/Ong. Preg.	TG	22 (76%)*	50 (73%)*	23 (61%)*	21 (43%)*	7 (17%)
	CO <sub>2</sub>	11 (65%)	38 (59%)	19 (40%)	11 (22%)	6 (19%)

\*Pregnancy rates were different (P<0.05) within column subgroups.

**Discussion:** The new mini-Sanyo incubators are space efficient and have proven to be clinically effective. Outstanding pregnancy rates were achieved using a reduced oxygen tension/LG medium culture system. The incubators did an excellent job maintaining their set temperature and %O<sub>2</sub> demand, while some temporary, random drift in CO<sub>2</sub> levels was experienced. The inCu saFe™ stainless steel and SafeCell™ UV contamination control features also were highly effective and not harmful to embryo development. The control panel is simple to adjust, as needed, and the water pan/level alert indicator is a helpful element in its User-friendly design. (Disclosure: None, no investigator(s) affiliation to the Sanyo product)