



# NOVEL IN-LINE GAS FILTER DEMONSTRATES IMPROVED BLASTOCYST DEVELOPMENT AND EXTENDED SERVICE LIFE - A MULTI-CENTER STUDY



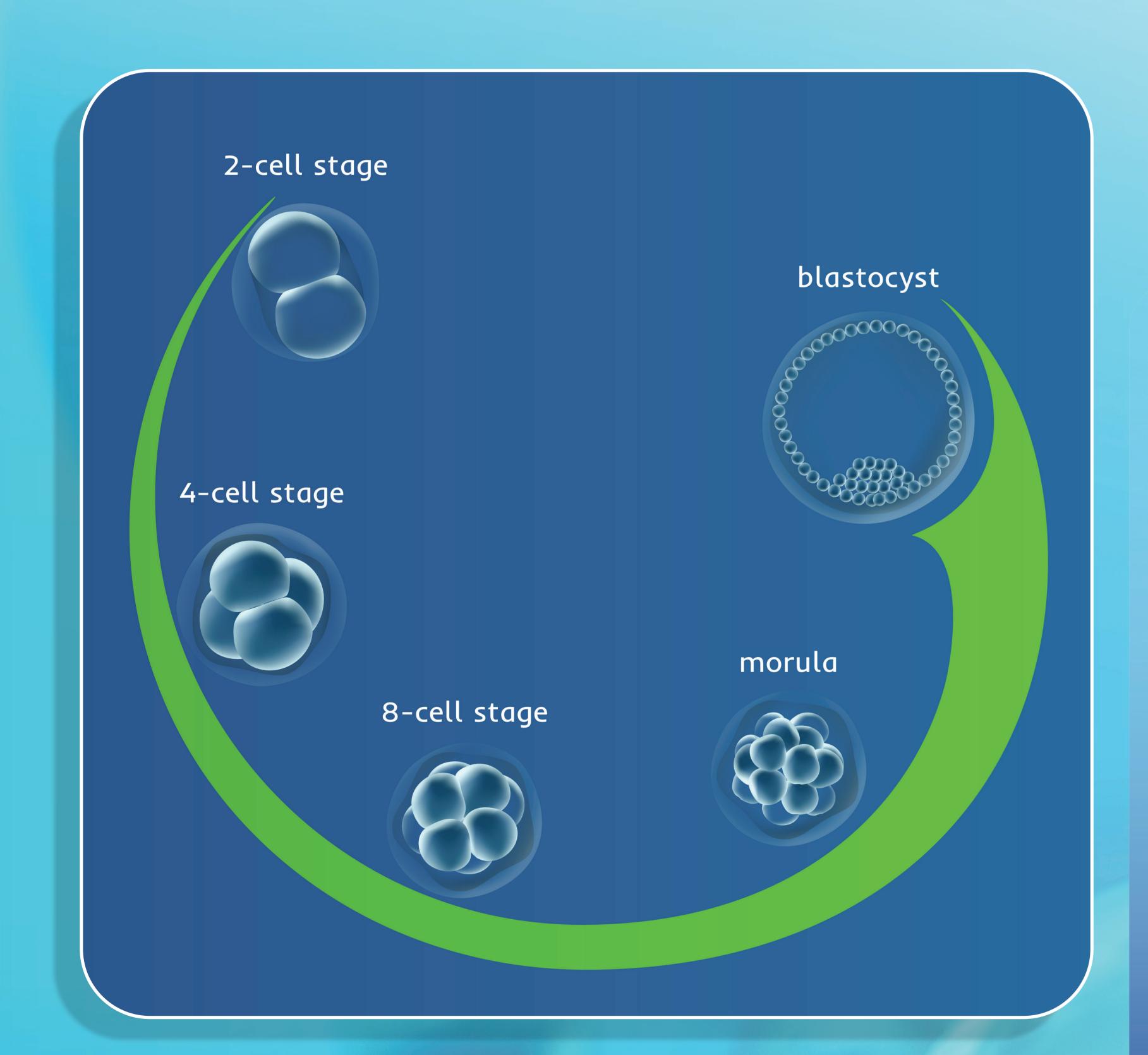


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#### **OBJECTIVE:**

To compare blastocyst development (BD) using two different commercially available inline gas filters (IGFs).



#### REFERENCES:

1. Mortimer D, Cohen J, Mortimer ST, et al. Cairo consensus on the IVF laboratory environment and air quality: report of an expert meeting. Reprod Biomed Online. 2018 Jun;36(6):658-674.

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5. Schimmel T, Gilligan A, Garrisi GJ, et al. Removal of volatile organic compounds from incubators used for gamete and embryo culture. Fertil Steril 1997; 68: S165.
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### MATERIALS AND METHODS:

Multicenter prospective randomized trial comparing BD during culture in atmospheres conditioned by two different gas supply IGFs. Pronuclear embryos were cultured to Days 5/6 using laboratory specific protocols with all programs employing low oxygen tension. Carbon dioxide concentrations varied (6.8-7.5%) depending on optimal pH requirements of the culture medium.

During a 6-month period in 4 independent laboratories, patients were randomly assigned for culture in benchtop or small box incubators supplied with gas filtered using either CODA Xtra or the Aire~LifeLine™ by LifeAire. Following each manufacturer's recommendations, CODA filters were changed after 3 months and LifeAire filters at 6 months. Blastocyst rate (BR) was defined as the total number of blastocysts by Day 6 per fertilized oocyte in each cohort and utilization rate (UR) defined as the total number of embryos used for transfer plus vitrification. Significance was determined with a two-tailed t-test.

Parameter	CODA Xtra  (n=326)	LifeAire Aire~LifeLine™ (n=300)	Significance
Mean Age (Range)	36.22 (24-48)	35.25 (23-50)	NS
BR (SD)	59.7 (31.6)	65.7 (28.8)	p=0.01
UR (SD)	42.9 (30.6)	43.4 (29.8)	NS

SD = standard deviation; NS = not significant

# IMPACT STATEMENT:

The Aire~LifeLine™ offers a pragmatic alternative for inline gas filtration that not only demonstrated an expanded window of use but significantly improved preimplantation development.

#### RESULTS:

There was no significant difference in mean age. The incidence of male factor was evenly distributed (data not shown). The BR in the LifeAire group was significantly higher than that of CODA. The difference in the UR was not significant, however, it may reflect the clinic specific subjectivity of the quality for transfer, biopsy or vitrification.

# CONCLUSIONS:

The results demonstrate the efficacy of the Aire~LifeLine,™ compared to the CODA Xtra, to support BD under multiple culture conditions. Increased BR and consistent UR between the groups, suggests an economic advantage of the LifeAire system due to its extended duty cycle.

The impact of air quality on implantation and pregnancy rates is well established (1-4). Although medical grade or higher gases are the standards for use in the IVF laboratory, VOCs in the tank represent a poorly controlled variable. Differences in VOC levels from gas cylinders may have an impact on BD. Recognition that tank gases may contain harmful VOCs has led to the evolution of IGFs (5,6). To further determine the impact of these conditions on implantation and live birth rates an extended study period is warranted.