Introducing a G185 incubator into the IVF lab: a practical perspective

Simon Phillips M.Sc
OVO FERTILITÉ

K-Systems
ASRM
Atlanta
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INTRODUCTION- WHO WE ARE?

CLINIQUE OVO

- OVO Fertility
- OVO Labo
- OVO Biosurance
- OVO Prenatal
- OVO R&D
- OVO Consulting
- OVO Foundation

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INTRODUCTION - WHO WE ARE?

- OVO Fertility
  - Opened in 2003
  - 800 cycles IVF / ICSI per year
    - Fresh and Frozen IVF
    - Natural cycle IVF
    - Egg donation cycles
    - Surgical sperm retrieval
    - PGD

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INTRODUCTION – Fertility Laboratory

- 5 Embryologists, 1 Andrologist
- 6 Hereaus Heracell 240 incubators

- Laboratory restructure in August 2008
  - Improve layout
  - Increase cycle capacity
  - Improve results

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INTRODUCTION – Fertility Laboratory

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PRODUCT REQUIREMENT

- Need additional incubators

- Considerations
  - Space
  - Usable internal area
  - Efficiency for IVF
  - Cost

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PRODUCT REQUIREMENT

- Available space for 2 Hereaus Heracell 240
- Is this the best option?

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PRODUCT REQUIREMENT

- Heracell 240

  - Large capacity but don’t use this volume
  - Large capacity incubators associated with increased loss of gas and temperature

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PRODUCT REQUIREMENT

- Space efficient tri-gas incubator
- Equivalent or improved embryo culture conditions
- Use of 100% gas
  - CO_2
  - N_2
  - Use of current gas lines

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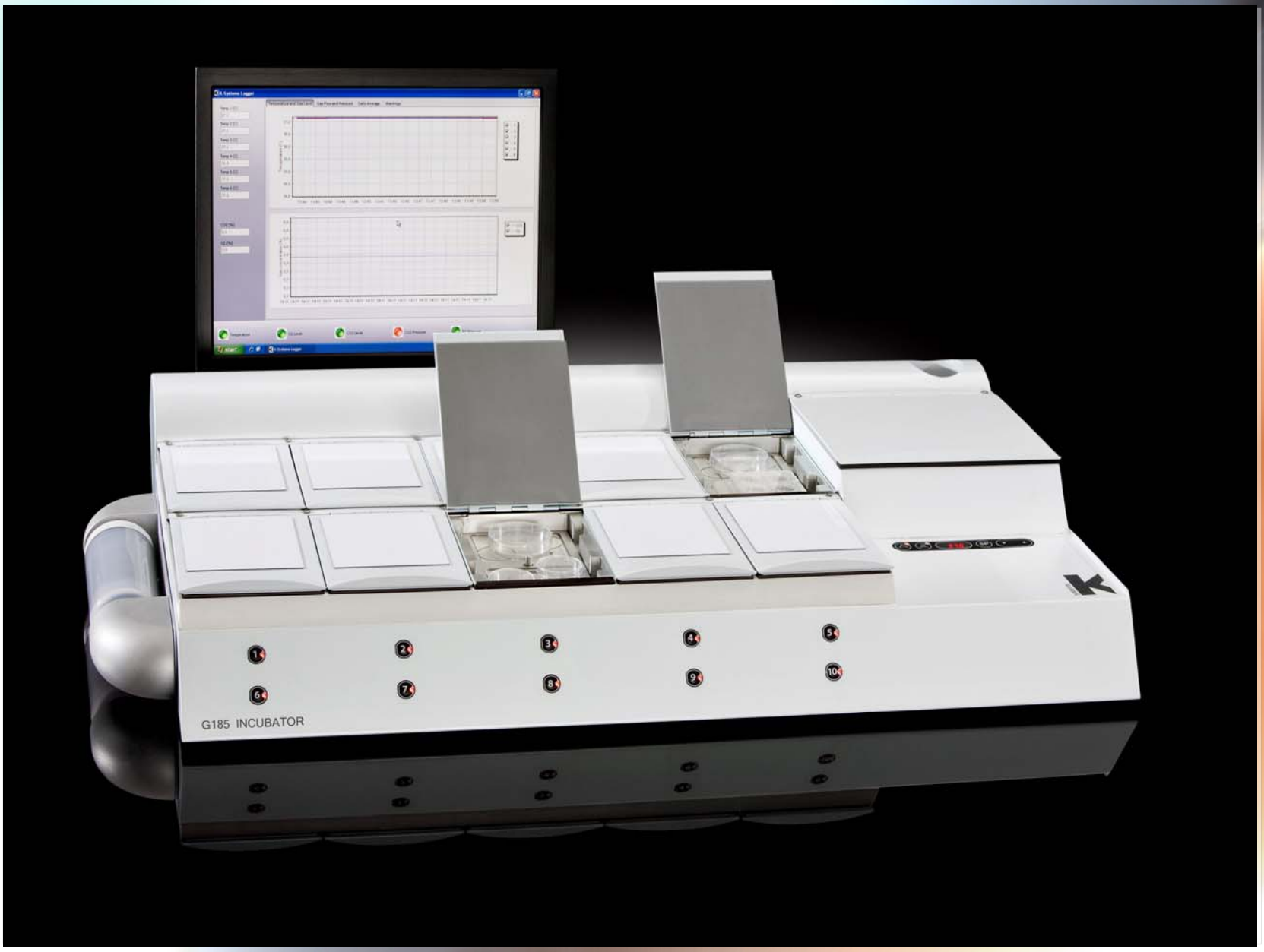
PRODUCT REQUIREMENT



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PRODUCT SELECTION

- Temperature recovery time
  - –Chamber opened for specific time
  - –Chamber closed and recovery monitored every minute
  - –Minimum measurement 1 minute

Time chamber opened	Recovery Time
10 seconds	No effect seen
20 seconds	No effect seen
40 seconds	No effect seen
60 seconds	2 minutes
120 seconds	3 minutes

- Ronny Janssen – unpublished data

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PRODUCT SELECTION

- Gas recovery
  - –Chamber opened
  - –Repeated every 10 minutes
  - –Chamber closed and recovery monitored every minute
  - –Minimum measurement 1 minute

Gas	Recovery Time
Carbon Dioxide	3 minutes
Oxygen	3 minutes

- Ronny Janssen – unpublished data

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PRODUCT SELECTION

	G185			Reference Incubator		
Particle Size	0.3µm	0.5µm	5.0µm	0.3µm	0.5µm	5.0µm
Particle Count	17380	472	0	205700	24510	192

•Ronny Janssen – unpublished data

Maximum permitted particles per m^3 equal or greater than tabulated size				
	At rest		In operation	
Grade	0.5µm	5.0µm	0.5µm	5.0µm
A	3520	20	3520	20
B	3520	29	352000	2900
C	352000	2900	3520000	29000
D	3520000	29000	Not defined	Not defined

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PRODUCT SELECTION

- Janssen's data demonstrated
  - Faster recovery of chamber gas and temperature
  - No significant impact on other chambers when opening
  - No significant difference in % fertilization rate in sibling oocyte study (vs. Heracell 240)
  - Increase in % 'good quality' embryos

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INITIAL SETUP

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INITIAL SETUP

- Used existing gas line (100% CO_2 and N_2)
- No increase in gas usage
  - One x 6.24m^3 N_2 /1.5 days
  - Addition of Heracell incubators had seen gradual increase in gas use from 1 x N_2 / 5 days up to 1 x N_2 / 1.5 days
- No need for pre-mixed gas
  - Cost and order issues
  - Additional gas line requirement

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INITIAL SETUP

- Considerations and Concerns
  - External validation of temperature, gas levels
  - Lack of humidification
  - ‘User Comfort’

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VALIDATION

- External temperature and gas validation

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VALIDATION

- Lack of Humidification
  - Evaporation of media?
  - Changes in media osmolarity?
  - Use of water dish in each chamber?
  - Use of oil overlay sufficient?

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VALIDATION

- Mouse embryo assay
  - 1 cell mouse embryos
  - Compare results with Heracell
  - Average %blasts in G185 = 91%
  - Average %blasts in Heracell = 84%
  - Subjective blast scoring

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VALIDATION

- Sibling Oocyte Study (n=20)
  - IVF / ICSI
  - G185 vs. Heracell (2 units)
  - %2PN 63.9% vs. 65.6% (NS)

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CLINICAL USE

- G185 included in rotation of incubators
- Recent media study necessitated different $\%CO_2$
  - G185 used for specific CO_2 requirement

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CLINICAL USE

- Future considerations
  - Additional 2x G185 planned
  - Cabinet for three units
  - Gradual replacement of Heracell units

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CLINICAL USE

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CONCLUSION

- Easy integration of benchtop incubator into established IVF lab
- Minimal learning curve for use of benchtop incubator

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