Performance indicators (PIs) for ART clinical practice

A standard ART process:

Diagnosis of infertility and indications for ART treatment	Ovarian stimulation	Monitoring of ovarian stimulation, trigger, and OPU	Culture + Fertilization (laboratory process)	Embryo transfer and pregnancy

Perform a diagnostic workup
- Estimate the chance of natural conception
- Identify causal factors for infertility
- Predict the chance of success of ART
- Detect risk factors for complications during ART or pregnancy.

Consider in decision-making for ART
- Burden
- Effectiveness
- Safety
- Costs
- Health of the subsequent pregnancy and the child.

ART laboratory KPIs

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Performance indicator		Calculation		Competence value[1]	Benchmark value[1]
Cycle cancellation rate (before OPU)	%CCR	Nr of cycles cancelled before OPU x 100 / Nr of started cycles		6 (PR: 40, NR: 20, HR: 3)	3,5 (PR: 20, NR: 7, HR: 1,5)
Rate of cycles with moderate/ severe OHSS	% mosOHSS	Nr of cycles with moderate to severe OHSS x 100 / Nr of started cycles	Antagonist protocol	1,5 (NR: 3, HR: 3)	0,5 (NR: 0,5, HR: 1,5)
			Agonist protocol	2,5 (NR: 6, HR: 11)	1 (NR: 2, HR: 5,5)
Proportion of MII oocytes at ICSI	%MII	Nr of MII oocytes at ICSI x 100 / Nr of cumulus-oocyte complexes retrieved		74	75-90
Complication rate after OPU	%CoOPU	Nr of complications (any) that require an (additional) medical intervention or hospital admission (apart from OHSS) x 100 / Nr of OPUs performed		0,5	0,1
Clinical pregnancy rate	%CPR	Nr of pregnancies (diagnosed by US of one or more gestational sacs or definitive clinical signs of pregnancy) x 100 / Nr of embryo transfer cycles		**Values to be set for a specific local context, for instance based on the data reported to the EIM**	
Multiple pregnancy rate	%MPR	Nr of pregnancies with more than one embryo or foetus x 100 / Nr of pregnancies		13	7,5

Reference population

Female patients <40 years old, using own fresh oocytes, ejaculated spermatozoa (fresh or frozen), any insemination method (i.e. routine IVF and ICSI, and no preimplantation genetic testing (PGT).

Where relevant: stratified according to ovarian response (poor (PR), normal (NR), and high responders (HR))

For PIs related to ET and pregnancy, subgroups can be considered:
- Fresh and frozen ET
- Own oocytes and oocyte donation
- Cleavage and blastocyst embryo transfers

Individual clinics should decide whether it is relevant and practical to subdivide their results into specific patient groups for PI determination and which indicators are key to the success in their organization (their individual KPIs)

Performance indicator	Suggested frequency of analysis
Cycle cancellation rate (before OPU) Rate of cycles with moderate/severe OHSS Proportion of MII oocytes at ICSI Complication rate after OPU	**Calculate every 6 months, or per 100 cycles, whichever comes first.**
Clinical pregnancy rate Multiple pregnancy rate	**Calculate every 3 months, or per 50 cycles, whichever comes first.**

	Ovarian stimulation and trigger	Oocyte collection (OPU)	Embryo transfer (ET)
TRAINING	Number of procedures to be completed:		
	100 cycles*	75*	75*
COMPETENCE	Monitor PIs to check competence and skills Take appropriate action when there is a gap between actual and expected performance		

**The numbers are those proposed by the working group, and should be applied in consideration that they were challenged*

Terms and abbreviations

ART: Assisted reproductive technology; EIM: European IVF monitoring consortium; ET: embryo transfer; HR: high responder; ICSI: intracytoplasmic sperm injection; MII: mature oocyte; NR: normal responder; OHSS: ovarian hyperstimulation syndrome; OPU: oocyte pick up; PI: performance indicator; PR: poor responder;

Competence value = minimum expected
Benchmark value = aspirational goal

[1]Values are derived from published data and consensus

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More information:

ESHRE clinic PI working group, *et al*. The Maribor consensus: report of an expert meeting on the development of performance indicators for clinical practice in ART. Hum Reprod Open 2021, https://doi.org/10.1093/hropen/hoab022.

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