

Good Practice Recommendations for Ultrasound in ART : Oocyte Pick-Up

Review report



Set-up

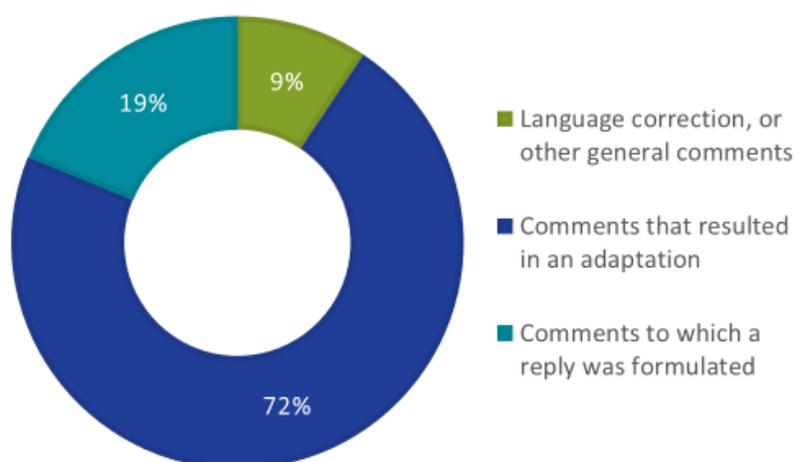
The invitation to review was sent to the members of ESHRE (n= 12365 email addresses). In addition, the invitation was mailed to the members of the ESHRE Executive Committee and the Committee of National Representatives (n=74), to colleagues of WG members (n=3), and to representatives of National and international societies (n=42).

The stakeholder review started on 25 March 2019, and was closed after 4 weeks, on 24 April 2019.

Summary

85
comments
from 17
reviewers

IMPACT OF THE COMMENTS



This report comprises of the list of reviewers, and the overview of comments, with a reply from the working group.

List of reviewers

Name	Country	Organisation
Marieke Lambers	The Netherlands	NVOG (Nederlandse Vereniging voor Obstetrie & Gynaecologie
Ashish Modi	India	Shivani Scientific Industries (P) Ltd.
Edgar Mocanu	Ireland	RCSI and Rotunda Hospital
Amr Hamdy	Egypt	
anis obadi	Egypt and Jemen	
Dr. Monica Varma	India	
Nicel Tasdemir	Turkey	Acibadem Eskisehir Hospital, IVF Center
Valentina Mauro	UK	Bourn Hall Clinic – Cambridge
Dr Aswathy Kumaran	India	
Ying Cheong	UK	Complete Fertility, Southampton UK
Dr Partha Sarathi Das	UAE	Orchid IVF
Howaida Hashim	Saudi Arabia	
Dr Fabian Lorenzo	Argentina	
Thomas Strowitzki	Germany	
Dr Nalini Mahajan	India	
Dr. Ahmed Samy Saad	Egypt	
Georgi Nikolov		

List of comments from the reviewers with reply of the working group

Reviewer	Page	Line	Comment	Reply
GENERAL COMMENTS				
Ying Cheong	0	0	There could be some pictorial illustrations of equipment and positioning of probe/needle etc as described. Some learners are more visual and a lot of what is described may be easier visualizing. I have some chapters in Practical problems in assisted conception https://www.cambridge.org/core/books/practical-problems-in-assisted-conception/E34D269486C3F5AA27CF37C19492DF68 if that is of any help.	Thank you for this suggestion. We aim at developing some support to implement the recommendations like pictorial illustrations.
Ying Cheong	0	0	Congratulations! Well done for writing this. Most helpful.	Thank you for this positive feedback
Valentina Mauro	1	2	Vaginal Oocyte Retrieval ?	We have adapted the title to “transvaginal oocyte pick-up” (line 2)
INTRODUCTION				
Edgar Mocanu	3	Comment	Was the laparoscopic OPU excluded? If so needs to be mentioned.	Laparoscopic OPU was indeed excluded. We have clarified this in the introduction (line 113)
Valentina Mauro	3	103	“it could be easily learned in operators fully trained in ultrasound technologies”	We have modified the sentence as suggested in the comment: (advantages of OPU: can it be easily learned, especially by operators trained in US)
Marieke Lambers	5	173	BOX A, point 1: why standing? Many doctors prefer sitting during procedure. Suggestion to replace by ‘standing or sitting’. NB see line 324!!	Thank you for alerting us of this inconsistency? We have corrected this to “standing or sitting”
Valentina Mauro	BOX A	A	The operator is standing or sitting	Thank you for alerting us of this inconsistency? We have corrected this to “standing or sitting”
Edgar Mocanu	5	Box A	Third phrase is confusing. Please review	We have rephrased the sentence to clarify the content.
Valentina Mauro	BOX A	G	Following the needle guide on the screen is useful (not essential – many experienced consultants do not use it) - perhaps to add “keep the needle in good view in the centre of the follicle as the follicular walls collapse around it.	We have changed this sentence based on this comment.
Edgar Mocanu	6	Box A	Ideally the needle should be inserted in the middle of the ovary to prevent the ovary from moving and needle to cause injury to adjacent organs.	We have added the suggested sentence.
Marieke Lambers	6	173	BOX A, first point this page, puncture manoeuvres through vaginal wall or ovarian edge?	The sentence should have read “punctures puncture through the vaginal wall. This was adapted in the paper

Marieke Lambers	6	173	BOX A, fourth point, puncture all follicles, <u>especially</u> if there is risk of OHSS	We have added ‘especially’ as suggested.
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1 Prior to OPU

Valentina Mauro	6	178/188/195/214	OPU – should be before treatment? OPU is just 1 element of the IVF treatment.	We have corrected in line 179: “An ultrasound evaluation should be performed before starting an ART treatment”
Marieke Lambers	6	178	You Probably mean that this ultrasound examination should be <u>performed before start of IVF stimulation</u> , not before OPU, seems a bit late in the treatment to decide whether or not situation is good for IVF....	We have corrected in line 179: “An ultrasound evaluation should be performed before starting an ART treatment”
Marieke Lambers	6	188-190	What is the basis for this recommendation? What is the clinical value of 3D ultrasound or Doppler?	All these procedures are to become familiar with anatomy of the patient. This is a safety and quality issue. Before starting the procedures, the operator should be familiar with the anatomy of the patient, so the OPU can be done safely. Doppler USG is also useful to prevent (vascular) complications that could be dramatic. The sentence was rephrased to highlight that pre-OPU 3D Ultrasound and Doppler investigation are considered helpful.
Fabian Lorenzo	6	200	how much time in advance of the OPU must be done the Vaginal infection screening? It could be useful to mention it.	As is mentioned in the paper, there is very little knowledge of the relevance of vaginal infection screening. Therefore, the working group decided on a broad recommendation, refraining from providing (non-evidence based) specifications
Marieke Lambers	6	200-205	What is the basis for this recommendation? Meaning: Is there prove that bacterial vaginosis should be treated before start IVF? Is there relation between GBS infection after OPU? Does screening lower the incidence of infection? Etc?	As is mentioned in the paper, there is very little knowledge of the relevance and value of vaginal infection screening in asymptomatic patients, although it is often performed based on local regulations or other considerations. The WG feels that they have explained this sufficiently in the paper.
Marieke Lambers	6	207	Appropriate action? Antibiotics? No OPU?	The action will depend on the microorganism, the moment when the diagnosis has been made, and associate conditions, therefore, the WG decided not to further specify the “action”.
Marieke Lambers	6	210	Here most OPU are performed without sedation or general anesthetics. Suggestion: <u>If OPU is performed under sedation....</u>	Thank you for this comment. The recommendation already stated “depending on local regulations”. Furthermore, recommending FBC before the OPU procedure is to prevent complications from anesthesia, but also to check that there are no undiagnosed blood disorders that could lead to serious bleeding

Edgar Mocanu	7	214	Where blood disorders are present advice from a haematologist must be thought in advance.	complications. Therefore, we did not modify the recommendations.
Valentina Mauro	7	215-7	Patients ... IX deficiency – suggest delete – what about previous surgical history, medications etc?	The paper states “take actions to prevent any possible associated complications”. The WG feels it is not needed to expand on this for each of the potential comorbidities. The sentence was rephrased to be more inclusive. However, bleeding complications are the most prevalent and most dramatic complications of OPU; and as such a focus on bleeding disorders may be relevant. We deleted “factor IX deficiency”
Marieke Lambers	7	220	Here patients don't have to give written informed consent. So very much depending on local practice. Better state that patients should give their consent for the treatment	We have changed this sentence, stating that IC should be obtained according to local legislation.

2 Equipment and consumables

Marieke Lambers	7	231-235	Suggestion: should be in near proximity. As it is written now it would only be possible in theater, and as already stated in Holland we mostly perform OPU in poli clinical setting.	We have inserted “in the near proximity” for some of the required equipment.
Valentina Mauro	7	230	Culture medium for flushing could (not should) be prepared if it is anticipated that follicular flushing – not everybody flushes the follicles. We use heparinized normal saline – we do not flush, we only run through before insertion of the needle.	We have checked your suggestion, and based on expert opinion, would recommend the use of culture medium, rather than saline, also for rinsing the needle before the start of the procedure. Therefore, we did not adapt the recommendations.
Marieke Lambers	8	271	Needs should be Needles	Thank you for pointing out this error. We have corrected it.
Howaida Hashim	8	Line 277	reusable needle guide could be used with maximum care of cleaning and sterilization (appropriate protocol for washing and sterilizing of the reusable needle guide should be established).	The WG feels that that needle guide should “ideally” be disposable, leaving the option of using a reusable needle guide (but not recommending it); It was decided not to modify this in the paper.
Marieke Lambers	8	279	Strange recommendation, it reads like a point of information	The sentence on Double-lumen needles was rephrased to be a recommendation rather than a statement
Edgar Mocanu	8	279	Under “Needle” there is no mention of the need to check the needle patency and aspiration ability before insertion into the guide and prior to OPU. This is an important step and needs mentioning.	The suggested sentence was added to the needle section.
Ashish Modi	8	282	The suggestion that the 'suction pump has to maintain a constant pressure' is meaningful and true with the concern to avoid turbulence. With the turbulence phenomenon in view, which is directly related to the oocyte care, the other factors directly related to the turbulence should also be looked into. One of these factors is the rate at which the vacuum pressure is attained and	The WG has assessed this comment and believes that the “The pressure should be maintained stable” includes also the rise and fall in pressure without going too much in detail.

withdrawn. In other words, how quickly is the vacuum level reaches to the set value, when the foot pedal is pressed and how quick the vacuum pressure returns back to zero. A speedy rise and fall is sure to cause turbulence in the tubing due to its varying diameter along its path. No doubt that the pressure wave stabilization period is very small, but it does exist. It's important to pay attention to the vacuum attack and diminishing rate at all times to avoid turbulence. A full control on the vacuum build up and withdrawal is essential along with its stability while in operation.

Ying Cheong	8	282	Suction machine should be validated prior to use; a spare suction pump should in available in case one does not work	The suggested sentence was added to the suction pump section.
Dr. Ahmed Samy Saad	8 14	287 534	The rate of flow of the follicular fluid in my humble opinion is more important than the suction pressure itself. The suction pressure can't be the same in all the system and the pressure generated in the suction pump is not necessarily the same inside the follicle as many variables exist such as the internal diameter of the aspiration needle that we use and its length, the length and the diameter of the tubing system and the filter. All of this in addition to the vacuum pressure are very important for the flow rate at the end according to Poiseuille's law. For this particular reason, there is a certain company that used a flow rate of 20-25 ml/min as a reference for optimal cumulus-oocyte complex with minimal damage. This is concept had been also in the following publication. Horne R, Bishop CJ, Reeves G, Wood C, Kovacs GT. Aspiration of oocytes for in-vitro fertilization. Hum Reprod Update 1996; 2: 77–85.	Thank you for this comment. We added a statement on this, and referred to the publication in reply to comment "The needle should be gently withdrawn without negative suction pressure to avoid sudden forward flow of follicular fluid towards the collection tube {Horne, 1996 #1253}."
Partha Sarathi Das	8	292	Prior to OPU, patient is fasting for 6 hours (NBM)	A recommendation on fasting was already mentioned in the sedation section, line 371, but we have now copied it also to the patient preparation section

3. OPU preparation

Howaida Hashim	8	Line 299;	a circulating nurse should be available (depending of the size of the procedure room and the position of the gynecology chair and the distance between the OR or procedure room and the laboratory) to hand over the tubes to laboratory and also giving any needed equipment, consumables during the procedure. Also she will be helpful if assistance needed in case of external abdominal pressure required.	The WG already formulated the following recommendation covering the need of a nurse/assistant; "The team performing the OPU should at least consist of the operator and one assistant or nurse." It was decided not to expand on this.
Valentina Mauro	8	304	What "thoughtfully" means in this context?	We have changed thoughtfully to specifically, which is probably more clear to the readers. We think "specifically" is more appropriate because this is such an

				important piece of info that if wrong can affect the whole procedure.
Thomas Strowitzki	8-9	304-307	I would fully omit the hcg test to check for appropriate hcg ovulation induction. Completely inappropriate for routine clinical use.	We have changed the wording to make it more clear that hCG testing is not for routine use.
Thomas Strowitzki	9	308 -311	See comments above	same
Nicel Tasdemir	9	310-311	If LH levels are below 0,5 mIU/mL, the trigger should be repeated with recombinant hCG instead of GnRH antagonists (Meyer et al., 2015) In this statement 'GnRH agonist' should be used instead of 'GnRH antagonist'.	Thank you for pointing out this error. This was corrected in the paper.
Dr Nalini Mahajan	9	310-311	HCG should be used instead of GnRH agonist. Document says antagonist	Thank you for pointing out this error. This was corrected in the paper.
Dr. Monica Varma	9	311	GnRH agonists (language error)	Thank you for pointing out this error. This was corrected in the paper.
Partha Sarathi Das	9	316	Just before OPU, no IV fluids should be given as that fills up the bladder and could be a concern during OPU increasing OPU complications. As a result, sometimes Bladder has to be drained using Foley's catheter and that unduly prolongs the operative and anaesthesia time. Only in cases wherein patient is dehydrated and has hypovolemic status or has low sugars due to hypoglycemia secondary to fasting status, patient can be infused with dehydration correction fluids like Normal saline or Ringer lactate.	A sentence was added on the topic of IV fluids.
Dr Nalini Mahajan	9	327	check for leucorrhoea and polyps should be done before starting COS and/or during follicular monitoring. Detection at time of OPU does not allow for management.	This comment was addressed by adding "to exclude any new leucorrhoea, polyp, or other conditions that could interfere with the procedure
Dr. Monica Varma	9	331	(? Warm) normal saline	We added "(warmed)" to the paper
Edgar Mocanu	9	334	'safe" rather than "save"	Thank you for pointing out this error. We have corrected it.
Dr Nalini Mahajan	9	336	In case of vaginal discharge vagina can be cleaned with povidone iodine and then with saline to prevent infection.	We have stated that other vaginal preparations are used, but the WG decided not to recommend any, as we found no evidence on safety or superiority to normal saline. It was decided not to modify the recommendations
Ying Cheong	9	354	Sedation: what happens if the patient moves or coughs during TVOR?	We have rephrased and clarified the sentences on sedation
Dr Nalini Mahajan	10	356	patients with endometriosis or pelvic adhesions – access to ovaries is difficult. Large sausage shaped PCOS ovaries where needle has to be repositioned multiple times	We have rephrased and clarified the sentences on sedation
Valentina Mauro	10	371	Re. Conscious sedation – this is helpful, but every Unit should have their own policy agreed with local anaesthetists.	We have included a statement that overall, evidence does not support on method over another. This statement was moved up to emphasize it.
Marieke Lambers	11	421-424	Why in all times? Not needed if performed under local anesthetics. Available yes.	We have changes this sentence, as this is only to be checked when IV drugs have been administered.

Valentina Mauro	11	422	Three lead ECG – not necessary a 12 lead – instead of CO2 monitoring capnography?	We have assessed this comment, but it was decided not to change the sentence in the paper, as we considered the sentence okay as it was written.
Valentina Mauro	12	436	Has faster onset of action – not slower	We have corrected this in the paper. Thank you for indicating this error
Thomas Strowitzki	12	438-448	I wonder why there is a paragraph on sperm collection. This is out of the scope of this recommendation.	This is a valid point. The reason for this paragraph is the need to counsel the patients before starting OPU, rather than to explain and prioritise the options for sperm collection. Therefore, we have condensed the paragraph to make this message more clear.
Georgi Nikolov	12	450	Ciprofloxacin 200 mg (iv) is a good choice for intravenous profilactic since it covers gram negatives, chlamidia, Ureaplasma, mycoplasma spp and many other pathogens.	We have stated that antibiotic prophylaxis should be performed according to local protocols. After revising your comment, we stick with the decision not to make any statements on which antibiotics to use.
Marieke Lambers	12	452	Why IV medication , is oral no option? Hwat basis for this recommendation?	We have changed the sentence slightly, n ow stating that “administration of antibiotics” is recommended, without detailing the methods.
Dr. Ahmed Samy Saad	12	466	In box B, I would like to add to the check list is to check the aspiration needle itself. I had some problems before in the plastic part connecting the metal needle with the tubing system in some commercial follicular aspiration system. Although the tubing system itself was ok, but this connecting part had a tiny hole in it disturbing the closed aspiration system and introducing air in the system which lowers the suction pressure and introducing air into the collecting tube.	Thank you for this comment. We have added some further details and tips for checking the system before the procedure to the box.
Dr. Monica Varma	12	BOX B	All the system is tested by aspirating some culture medium (Null Aspiration) and the maximum pressure set for the suction pump is rechecked	Thank you for this comment. We have added some further details and tips for checking the system before the procedure to the box.
Dr Aswathy Kumaran	13	BOX B	The appropriate needle guide placement and ensuring that it allows easy transit of needle ensuring that the needle will be going along the biopsy line is important.	Thank you for this comment. We have added some further details and tips for checking the system before the procedure to the box.
Dr Aswathy Kumaran	13	BOX B	We have encountered situations where the needle is not visualized because the needle gauge slipped from its position on the TVS probe where the needle tends to go outside the direction of the US beam and hence is not visualized even though it has entered the pelvic cavity... a very hazardous situation. This is a risk that can occur when the needle director or gauge is a fit on rather than inbuilt into the probe.	Thank you for this comment. We have added some further details and tips for checking the system before the procedure to the box.

4 OPU procedure

Valentina Mauro	13	488	Intra-pelvic not abdominal	We corrected this as suggested.
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Edgar Mocanu	14	526-533	What is the value of “Curreting” of the follicle in clinical practice? No discussion about the risks of rotating the needs in an empty follicle???	The paragraph on follicle curreting was checked and modified. The comments on the effect on OHSS risk were deleted indeed. The working group decided it was not necessary to expand on any risks of rotating the needle inside an empty follicle
Marieke Lambers	14	526	What is follicle curetting?	The definition was included a few sentences down, but to clarify, the definition was moved to the beginning of the paragraph
Edgar Mocanu	14	534-537	Phrases are repeated.	This was corrected, thank you for pointing it out.
Dr. Monica Varma	14	540	The needle should be gently withdrawn without negative suction pressure to avoid sudden forward flow of follicular fluid towards the collection tube. (R Horne, et al Hum Repro Update 1996 Jan-Feb;2(1):77-85)	The WG agreed with this comment and the sentence was added to the paper.
Edgar Mocanu	14	541	“Inter-ovarian” is the wrong word. Intra-ovarian or inter-follicular	This was corrected, thank you for pointing it out.
Dr. Monica Varma	14	541	The movement of the hand holding the transducer should be minimal when the needle is in the ovary	The WG agreed with this comment and the sentence was added to the paper.
Edgar Mocanu	14	544	What is the “posterior wall”???	We have adapted the sentence, and changed ‘posterior wall’ to “vaginal probe”
Nicel Tasdemir	14	544	The anatomic location of starting point for OPU is not clear with the ‘posterior wall’ phrase.	We have adapted the sentence, and changed ‘posterior wall’ to “vaginal probe”
Dr. Monica Varma	14	557	The follicular fluid should be collected in preheated (37°C) collecting tubes held in a block calibrated at 37°C	The suggested sentence was added to the subsection on Oocyte recovery
Thomas Strowitzki	15	570-578	I doubt that this procedure reflects standard clinical use. I would omit it completely.	We have reviewed the section, and decided to delete the first bullet. However, the working group decided to keep the sentence on aspiration of peritoneal fluid in case of suspected premature ovulation
Georgi Nikolov	15	580	Tranexamic acid 1-2 g (iv) can be a perfect choice for suspected intraabdominal bleeding.	Treatments for intraabdominal bleeding are not specifically discussed in the paper, hence we did not add the suggested treatment choice.
Edgar Mocanu	15	586	Should compression using the ultrasound probe at the end of each ovarian OPU be mentioned also?	After some discussion in the working group, it was decided not to add this as a good practice recommendation.
Edgar Mocanu	16	Box C	It does not segregate for single and double lumen? One can flush the needle without taking the needle out of the ovary.	The suggested sentence was added to the BOX C
Edgar Mocanu	16	Box C	Should consideration be given, after aspiration of a few follicles with clear fluid, to stop and test follicular fluid for hCG presence and ask all the questions rather than emptying the rest of the follicles from that first ovary??	We have slightly rephrased the sentence so that troubleshooting can already start after the first follicles are aspirated.
Dr Aswathy Kumaran	16	BOX C	When a needle that was seen easily during OPU is suddenly not visualized especially after some amount of pre needle penetration probe manipulation, withdraw the needle and ensure that the	The suggested sentence was added to the BOX C

needle director/gauge is in place allowing the needle to move in the same sector as the ultrasound beam ensuring it's visualization. Even a slight tilt of the Needle beyond the outer edge of the beam transmitter of the probe will prevent the needle tip from being seen.

Thomas Strowitzki	16	BOX C	Second part of Box C see comment above.	Based on this comment, the working group has reconsidered the section. They acknowledge that the procedure is not "standard clinical use" and therefore not a recommendation but they feel it could be included in a box on troubleshooting.
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5-post procedure care

Marieke Lambers	16	595	Why for 2 hours? With local anesthetics patients recover more quickly and usually leave within 1 hour. Suggestion: should be able to stay for recovery.	We rephrased the sentence, still mentioning 2 hours, or less if the procedure was performed with local anaesthetics only)
Marieke Lambers	16	601	Same here, <u>should be able</u> to eat, drink, urinate...	The sentence was changed as suggested
Thomas Strowitzki	16	608-610	Ectopic pregnancy? This should have been known BEFORE stimulation starts. Doesn't make sense here!	The comment was checked and discussed by the working group. They decided not to modify the statement.
Edgar Mocanu	17	Point 5	There is no mention of a list to check patient is "physically and anesthesia" suitable for discharge. Awareness, orientation, respiratory rate, etc are all important to me mentioned here. Also what is to be done when a severe complication occurs: hospital admission arrangements, specialist responsibility and continued care, physical transfer to another facility!	The suggested information on checking the patient was added to the section, and a recommendation was added on procedures for dealing with severe complications

6-Associated pathologies and cautions during OPU

Dr. Monica Varma	17	629	If an endometrioma or a hemorrhagic follicle is inadvertently punctured then the needle should be immediately withdrawn and flushed with media and the collecting tube to be changed	The suggested recommendation was added to the paper
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7-Complications and risks

Valentina Mauro	17	644	The patient with Aortic dissection should not be included as a Turner's syndrome patient – I would be very surprised if she had an OPU – they usually are egg recipients as ovarian dysgenesis.	We have checked the EIM data collection report, supplementary table SXVI. The maternal deaths listed in the table seemed to have been included as complications of OPU, but in fact they were reported separately as complications of ART, not OPU. This was corrected in the paper, and will also be corrected in future EIM data collection reports.
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8-Future developments

Amr Hamdy	18	683	For the future research , the need of artificial intelligence and 3d ultrasound to classify the follicles during the process of growth and ovum pick up according to the Priority of growth and maturation , the hypothesis is that the early growing follicles are expected to be the most powerful for fertilization from the physiological and genetic point of view . Using 3D ultrasound to detect the exact site of the early growing follicles (In which ovary and which site of the ovary) These few pioneer follicles would be classified as 1st class follicles after egg collection and their embryos would be given the advantage to be chosen for ET . Aiming to have the best results on short and long term aspects	This is an interesting point. We have added “ranking of follicles” as another use of Artificial intelligence.
anis obadi	1	6	For further research, do we need to classify the follicles during the process of OPT, according to the priority of maturation; the hypothesis is that early growing follicles are thought to be most physiological and genetically powerful for fertilization. Early growing follicles are determined in which ovary and which site of ovary, by 3D US, and if it’s possible to detect it, and determine expected position of one early determine follicles to be closer to the physiological process, aiming to have better short and long term benefit.	Thank you for this remark. Based on this and another comment, we have added a sentence in the section on future perspectives on the use of biological parameters and artificial intelligence to rank the follicles and embryos.

9- Training and competence

10- Quality assurance and performance

Edgar Mocanu	10	Comment	One recommendation is the need for a formal admission form, operating notes and discharge form. This is about safety and quality of care. These forms can be standardised and used by practitioners globally. Happy to provide examples if needed.	Documentation was already addressed in section 10 (quality assurance and performance), but the WG added more details.
Ying Cheong	10	0	There should be an emphasis on documentation esp. when TVOR has been difficult	Documentation was already addressed in section 10 (quality assurance and performance), but the WG added more details.