

2023 Gap Analysis and Educational Needs (Annual Meeting 2022)

Developed by ASRM Continuing Medical Education Committee

TOPIC	GAP(S) IDENTIFIED	EDUCATIONAL NEED(S)
Access to care	Barriers to care beyond financial	How to encourage patients with infertility to present for care; enhancing public knowledge of fertility and infertility.
Andrology / Male Infertility	Appropriate applications of sperm testing methods beyond the basic semen analysis.	Evidence-based, cost-effective techniques to improve fertilization in male infertility.
	Improvement in identifying optimal sperm for ICSI	Scientific criteria for application of ICSI: evidence-based vs. practice-based.
	Implementing WHO 6 th Edition Semen Analysis Recommendations	How to interpret WHO 6 th Edition, and transit from previous WHO editions to WHO 6 th .
	Recent advances in sperm testing: parameters and functions.	Review of evidence on clinically used and novel tests to evaluate sperm quality, including DNA fragmentation and genetic evaluation.
	Are there new methods we can do to optimize sperm preps than current protocols?	Density gradient centrifugation, re-visit swim-up, "new" sperm separation methods including different types of microfluidic sporting.
	Address when ejaculated sperm is preferred over TESE in severe male factor.	Evidence-based real-world application.
	In NOA, how to overcome logistical challenges for utilization of fresh TESE	Evidence-based real-world application with practice management/laboratory liaison coordination.
	In severe male factor, when/if donor sperm is the best option	Evidence-based real-world application and reproductive psychology to address the emotional impact on males.
	Genetics of male factor	Understanding genetics of male factor and risks with utilization of sperm
	How low is too low for IUI?	Evidence-based education on pregnancy outcomes.
	Continued education on emerging techniques to evaluate male fertility.	Update the current curriculum to include new data.
ART	Artificial Intelligence (AI) in andrology and embryology. How long are we going to wait till the technology is mature for daily use?	Evaluation of the current progress of artificial intelligence in ART. Is AI for ART ready to use in the near future?
	Hands-on vitrification training.	Continue vitrification course
	Impacts of cryo devices on outcomes.	Data and literature review of devices.
	Education regarding biopsy technique and outcomes.	Understand data and best practices for biopsy.

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	Use of AI in embryo assessment.	Develop content to understand the emerging role and limitations of AI in the embryo lab.
	Legal and ethical considerations regarding in vitro gametogenesis	Legal and ethical considerations regarding in vitro gametogenesis; necessary steps in research prior to human use
	Utility of AI in ART	Clear definition of the potential benefits of AI, realistic assessment of the magnitude of those benefits
ART Laboratory	Lack of understanding and unbiased education on artificial intelligence (AI) applications in the ART laboratory, including equipment and training needed. Current promotions are mainly driven by vendors and developers.	Clinical studies with proven data and real-world scenarios using AI; analysis on cost-benefit and effectiveness
	How to build the pipeline (including DEI) to meet the evolving demand of IVF laboratory staffing.	Develop a well-balanced and inclusive task force in the laboratory.
	Recruiting and cultivating future leaders in laboratory science.	Develop strategies to increase the pipeline of laboratory professionals and cultivate junior staff with leadership skills. Mentoring services provided by professional societies.
	Improve embryo biopsy techniques.	Continue to review these topics within the context of IVF lab techniques.
	Optimize oocyte and embryo vitrification.	Continue to review these topics within the context of IVF lab techniques.
	Good practice in embryo biopsy.	Guidelines in embryo biopsy and re-biopsy/vitrification for repeated PGT-A.
	Artificial intelligence is an evolving resource in ART without mature product development and clearly defined clinical use.	Provide education on the current state and potential uses of artificial intelligence in the ART lab and for patient management.
	Common practices in high-performing IVF programs: the laboratory	Define high-performing laboratories; evidence-based approach to best practices
	Optimal utilization of cryopreserved oocytes incorporating the patient's perspective	Approach to thaw – should all oocytes be thawed? Pros and cons from the patient perspective
	Use of AI for selection among frozen embryos	Evidence supporting the use of AI for selection among frozen embryos; approach to frozen embryo transfer in patients desiring more than one child.
	Legal and ethical considerations in artificial embryo research	Legal and ethical considerations in artificial embryo research
	Legal and ethical considerations regarding in vitro gametogenesis	Legal and ethical considerations regarding in vitro gametogenesis; necessary steps in research prior to human use

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	The current state of in vitro maturation of gametes	Which patients may benefit from in vitro maturation, risks and benefits relative to conventional IVF with mature gametes
	Embryo abandonment and disposition.	Management of very old embryos (e.g., >20 years). Updating embryo inventories and managing “found” embryos.
	Communication of lab findings and outcomes with patients	Documentation of communication; lab and physician communication with patients
	How to assess the research behind marketed new technologies	Identifying technologies not supported by adequate evidence. Approach to patient education regarding untested treatments and technology. Addressing these as a field.
Biology of Reproduction	Role of environmental factors and toxicity on reproduction	Continued updates on outcomes related to ART and environment.
	Tissue engineering and modeling in reproduction	Review and update research of engineering and modeling for use in reproduction.
Counseling	Providers continue to struggle with communication techniques and strategies in order to meet patients where they are.	Provide training to improve communication skills that are empathic and culturally appropriate.
	Providers can find it difficult to communicate realistic expectations for patient outcomes.	Provide education on setting realistic expectations with patients on outcomes in an empathic and supportive manner.
	Access to counseling and mental health support	Providing counseling support; navigating insurance considerations for counseling and mental health support for fertility patients.
Endometriosis	MD imaging training and interpreting radiology reports	Gain skills in interpreting images and radiology reports, as well as addressing the next steps in management
	When imaging findings warrant surgery before IVF	Evidence-based education to present post-operative pregnancy outcomes vs. IVF
	Optimal surgical management to enhance fertility.	Address best surgical approaches, including methods of preparation to incorporate other surgical specialties.
	Fertility preservation – surgical technique and impact on IVF	Discuss options for fertility preservation in endometriosis and timing of surgeries in relation to IVF, particularly involved diminished ovarian reserve.
	Endometriomas/DIE	Noninvasive diagnosis of endometriosis and suppression protocols for IVF/FET. Diagnosis of DIE (MRI) and management of endometriomas
	Selection of treatments	Integration of medical and surgical approaches in patients with endometriosis and infertility Endometriosis across the reproductive lifespan

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Ethics/ Legal	Diversity, Equity & Inclusion (Laboratory)	How to create a diverse and equitable environment for laboratory staff
	Diversity in the field of REI	Diverse patients benefit from the care given by diverse providers; how to recruit and provide a diverse care team.
	Use of social media in practice	Benefits and risks of social media in medicine and for patient education
	Risk Mitigation in ART	Present legal risks in ART and options to mitigate
	Data security risks as practices introduce new technologies to evolve their operations.	Guidance on optimizing patient data, particularly utilizing online patient portals and AI
	Risk of data and security breaches with telemedicine	Practice management course with IT specialists
	Best practices for identifying security risks	Present guidance on developing SOPs to mitigate legal/security risks.
	Impact of the Dobbs decision on REI practice	State-specific impact on REI practice, cases in the courts relevant to REI practice Status and impact of personhood law
Fertility Preservation	Options in genetic cases, e.g., Turner Syndrome, galactosemia, auto-immune oophoritis, and others.	Genetic counseling in cooperation with fertility preservation.
	Options for the prepubertal male facing gonadotoxic treatment	Evidence-based outcomes regarding testicular tissue cryopreservation
	Knowledge of fertility preservation surgical options in the setting of gender-affirming care	How to counsel for fertility preservation options in the setting of gender-affirming care. Is there a need to stop hormonal management for egg/sperm freezing, and how to do so efficiently and effectively
	Ovarian tissue cryopreservation	Justice and ethical implications, counseling, cost-effectiveness, future implications for treatment of pre-pubertal pediatric hematology/oncology patients.
	Rates and predictors of utilization of cryopreserved gametes and tissues	Counseling for patients regarding the likelihood of use of cryopreserved gamete and tissues
Genetics/PGT	Lack of knowledge and best practices in utilizing non-invasive PGT, including cell-free DNA (cfDNA) analysis. Non-invasive PGT (niPGT) benefits remain unclear.	Review of evidence on non-invasive genetic testing of embryos. Current progress, platforms, cfDNA approaches (blastocoe sampling, spent medium, etc.), utilization,

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		and timeframe for routine use. Pros and cons of niPGT vs. traditional PGT
	Define and interpret mosaic embryo – low/high grade. What to consider for mosaic embryo transfer. Consistent reporting and labeling. Agreement of counseling between genetic counselors and healthcare providers. Understanding the potential use and risk of transferring mosaic and aneuploidy embryos. Communication on PGT-A mosaic and aneuploid embryo outcomes within the care team and with the patients.	Large clinical studies to provide safety and outcomes of transferring mosaic embryos; Train healthcare providers (MDs/lab/RNs) to counsel patients accurately. Best approaches to discuss with clinicians and patients on transferring mosaic and aneuploid embryos? What issues to consider before discarding those embryos? How does the program interpret the data and report it, and does that make a difference in how we feel about discarding an embryo? How do we deal with this aspect of our jobs morally and psychologically?
	Learners expressed the need for more knowledge on how to use genetic evaluation, including PGT-A, for embryo selection.	Continue educational efforts on PGT, genetic evaluation, and embryo selection.
	Recognize clinicians' expressed discomfort and confusion when faced with PGT counseling and genetics.	Education on communicating genetic results to patients with PG course and/or promote dual fellowship in REI/Medical Genetics.
	Explain inheritance, age-related aneuploidy, and PGT-A.	Practice management incorporation of experienced genetic counselor, nurse, and physician
	Transfer of low vs. high mosaic; distinguish latter from complete aneuploidy.	Provide evidence-based pregnancy outcomes.
	Embryo mosaicism- follow up after embryo transfer	Guidance on prenatal testing after mosaic embryo transfer
	Good practice in embryo biopsy.	Best practice for embryos with no result from PGT-A
	Impact of age on the risk/benefit ratio of PGT-A	Age-specific models to predict outcomes and the impact of PGT-A
Leiomyomas	Knowledge of uterine leiomyomas and minimally invasive treatment options	Current surgical and non-surgical management of uterine fibroids in patients

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		who desire fertility (immediate and future). Tips/tricks to move from abdominal myomectomy to minimally invasive myomectomy
	Fibroids	Non-surgical management of uterine fibroids in patients who desire pregnancy
	Knowledge of uterine leiomyomas and minimally invasive treatment options	Include a talk on basic research on uterine fibroids
Menopause/ Ovarian Insufficiency	Fertility in women with POI	Approaches to enhance fertility in women on the POI spectrum.
Practice/ Risk Management/ Team-based Care	Lack of knowledge on optimizing clinic procedures	More ultrasound training
	Lack of knowledge on optimizing clinic procedures	Myomectomy course using traditional and newer RFA methods
	Time management	Time management skills
	Employee engagement and retention in a virtual world	Education on “The Physician as Leader” to address - Work/life balance, marketing insights; workflow; balance the integration of AI and emerging technologies.
	Improving patient conversions and financial challenges	Educate on strategic operations and leadership, Marketing, and Practice management solutions to increase patient engagement, understand patient expectations, and leverage robust technology, including AI
	New area: optimal patient communication in team-based care	What outcomes/results can be effectively and appropriately communicated by nursing or embryology, and which require physician communication?
Pregnancy/ Pregnancy Loss	Identify which genetic markers/tests impact RPL for both male and female, separate from the karyotype.	Evidence-based review of genetic testing of RPL, in addition to karyotype. Address the value of cytogenetic studies of products of conception and IVF-PGT-a.
	Application of male testing, including DNA fragmentation testing	Evidence for male testing and sperm testing, including DFI, on the impact of RPL
	Immunology and RPL	Present evidence-based outcomes involving immunology testing and treatment
	Pregnancy outcomes in PCOS	Include in education on PCOS.
Reproductive Surgery	Office procedures for evaluation of patients with infertility	Bringing hysteroscopy to the office setting. Outcomes, economic implications, patient satisfaction, equipment considerations in-office hysteroscopy, sonohsg updates.

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	Ectopic pregnancies	Diagnosis and management of all types of unusual ectopic pregnancies. Management of eccentric pregnancies
	Whether cesarean section scar isthmoceles need to be treated	Surgical approaches to cesarean section scar separation (isthmocele) and when they are indicated.
	Effect of adenomyosis on fertility	Overview of adenomyosis and its relationship to the biology of reproduction with a focus on current techniques for treatment (medical and surgical)
	Diagnosis and surgical management of Mullerian anomalies	Review of MAC2021 Mullerian Anomalies Classification system and the app. Preoperative preparation, imaging, and review of surgical treatment of uterine/vaginal anomalies
	Tubal surgery to optimize fertility.	Discussion on how to address hydrosalpinges and the role of fimbrioplasty. Tubal function, evaluation, and impact for fertility patients (especially those that cannot move forward with IVF); when to remove or retain fallopian tubes
	Methods to optimize the difficult egg retrieval (abdominal) and embryo transfer and implications for patients with obesity	Surgical application of abdominal egg retrieval and guidelines for embryo transfer technique
	Uterine transplantation/transposition/transgender uterus transplantation	Candidates, indications, and techniques for continually evolving uterine procedures
Stem Cells	Germ cell regeneration, gene editing, repairing genetic defects	Update on current technology and timetable for potential clinical application
	Identifying clinical application and limitations of stem cell technology to bridge early investigation to clinical practice	Addressing the training necessary to employ the technology
	Addressing risk/benefit/safety/ethics	Present debate with physicians, biologists, ethicists
	Counseling patients	Education on providing the patient with the current status of stem cell usage
	Replacing donor egg/sperm	Address realistic expectations of application.
	Role of oocyte IVM, ovarian tissue cryopreservation, and PRP	Identify laboratory equipment and training

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Technology	How developments in tissue engineering, microfluidics, and stem cell technology can transform assisted reproductive technologies.	Present current laboratory techniques and updated technology to integrate into laboratory and clinical practice.
	Utilizing artificial gametes and embryos	Education on appropriate clinical and laboratory applications addressing the challenges from a laboratory training, equipment, clinical and ethical standpoint.
	Constructing artificial environments in the laboratory	Present the laboratory changes and realistic applications.
Journal Editors	How to prepare journal manuscripts and go through the review process – need guidance for clinical and laboratory providers.	Develop a series of manuscript writing and submission/review techniques.
	The pool of journal reviewers is shrinking fast due to various reasons.	Cultivate new generations of journal reviewers.
Oncofertility	Options for fertility preservation in adolescents and children Improved prediction in ovarian function following gonadotoxic therapy.	Ovarian tissue cryopreservation in the prepubertal female Evidenced-based calculation on gonadotoxicity of medications.