

2021 Gap Analysis and Educational Needs (Annual Meeting 2020)

Developed by the ASRM Continuing Medical Education Committee

TOPIC	GAP(S) IDENTIFIED	EDUCATIONAL NEED(S)
Access to care	Knowledge on how state laws and access to infertility care intersect and ways to influence/advocate for patients.	Provide education on how patients can access care and how state laws influence the ability to obtain said care.
	Skills for accessing and providing culturally appropriate care.	Training on skill development in providing culturally appropriate care.
	Reproductive rights	Discuss access to reproductive care disparities and landmark rulings that have shaped the current reproductive rights landscape.
	Legislative barriers to expanding insurance coverage.	Tools to stay aware of changes and effect change.
	Access to care for third world countries.	Education on improving access to fertility care in emerging countries.
Andrology / Male Infertility	In-depth workup and counseling of male partners with infertility.	Provide education on best practices for the in-depth workup and counseling of male partners with infertility.
	Optimizing IVF in the setting of severe male factor.	Educate on new and developing techniques to optimize sperm for ICSI.
	The role of nutrition and, specifically, antioxidants on male infertility.	Current knowledge on the role of nutrition and antioxidants on male infertility.
	Understanding effects of male age on outcomes.	Continued education on emerging evidence regarding paternal age.
	Advances in sperm testing.	Review of evidence on clinically used and novel tests to evaluate sperm quality including DNA fragmentation and genetic evaluation.
	Male infertility interventions.	Evidence based education on the outcomes of the different male infertility interventions.
	Testicular biopsy practices - clinical	Identification of REI and urology best practice integration, TESE outcomes and techniques, and frozen vs. fresh transfers.
	Testicular biopsy practices - laboratory	Identification of laboratory best practice to generate the best outcomes. Various techniques in handling tissues from PESA, TESE, etc. Cryostorage of testicular tissues.
	Male reproductive anatomy and physiology.	Education regarding male reproductive biology, current evaluation of male infertility, and treatment mechanisms in humans (not research or animal studies).

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	New technology in sperm selection.	New technologies in microfluidics, imaging, and other approaches to select top quality sperm for IVF and ICSI.
	Interactions between reproductive urologists and REIs.	Male fertility from viewpoints of REI and Urologist. Best practice model between REI and Urologists.
ART	Continued updates for learners on the details and changes to SART reporting.	SART reporting workshop for continued updates and learning regarding SART reporting.
	Knowledge of advances in reproductive immunology and the effects on patient outcomes.	Knowledge on how immunology affects patient outcomes in reproductive medicine.
	Limited tools for recurrent implantation failure (RIF).	Educating on the role of empiric treatment in RIF.
	Genetic and privacy issues in 3 rd party reproduction.	Continuing education on privacy and genetics.
	Ovarian tissue cryopreservation versus oocyte cryopreservation in cancer patients.	Research data on the comparative efficacy and safety of ovarian tissue cryopreservation versus oocyte cryopreservation.
	Mosaic embryos.	Discuss best practice on transfer or not to transfer mosaic embryos. Education on the techniques behind PGT and how mosaics are identified. Review the clinical implications of transferring mosaic embryos.
	Lack of knowledge of oncofertility treatments.	Training/education on fertility risks of common cancer treatments.
	Stimulation methods for oocyte and embryo cryopreservation.	Evidence based best practices of stimulation protocols for oocyte and embryo cryopreservation.
ART Laboratory	Lack of knowledge on current FDA regulations and how to incorporate those into standard operating practices to improve patient safety.	Provide an update on the FDA and incorporation of these tools to provide safe patient care.
	Cryostorage issues and ART.	Continuing education on foolproofing your cryogenic system, avoiding cryogenic mistakes/mishaps, quality control, and best hiring practices for embryologists.
	Consistency in the IVF lab.	Analyze the how and why of an embryology/andrology lab in terms of protocol, policies, QA/QC, personnel, equipment, and justification for the above.
	Oocyte freezing and thawing techniques.	Review current protocols to determine best practice techniques of oocyte freezing and thawing to improve patient outcomes.

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	Lack of or standardized proficiency in ICSI and embryo biopsy.	Hands on training to improve skills with ICSI and embryo biopsy.
	Factors associated with embryo selection.	Education session on current evidence of embryo selection issues and evidence-based algorithms on embryo selection to maximize patient outcomes.
	Lab design, technology adoption, and implementation.	Discuss laboratory technologies and revise current protocols to best fit various settings and needs in the design of a laboratory. Identify key criteria to assess potential lab purchases. Financial stewardship.
	Time-lapse imaging (TLI) and morphokinetics.	Debate on new technologies and upcoming new approaches to TLI.
	Extended embryo culture: practical and experimental.	Review on current Day 0-7 embryo culture methodology, experimental technologies in culturing embryos beyond Day 7, as well as technical and ethical concerns.
	Artificial embryo	Derivation from extended cultured embryonic and extraembryonic structures, as well as stem cells. Future utilization in translational research, testing platform, and therapeutic applications.
	Artificial gametes: female and male.	Derivation from embryonic and stem cell lineages. Current progress and future applications.
	In vitro maturation of gametes.	Oocyte, sperm, various protocols and applications, and feasibility for routine laboratory practice.
	Total solutions in laboratory environment control.	Air quality, toxicity detection, internal and external environment of the ART laboratory, and implementing new design/improvement for the laboratory.
	Humid versus dry incubators for embryo culture.	Discuss pros and cons of those two major incubator settings. How to optimize utilization of incubators in the ART laboratories.
	Embryo development and pH.	Education on what we should target and how do embryos respond to pH variations.
	Embryo quality assessment.	Evaluate the current status of embryos, other than morphology and PGT, what tools do we use and are they reliable. Discuss how to reduce the number of embryos cryopreserved and genetically tested.
	Laboratory risk and disaster management.	Review laboratory safety, monitoring and alarm systems, contingency plans, and patient material rescue to determine best practices. New developments and liability concerns.

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	Training new generations of clinical laboratory technologists.	Analyze the current status of educating staff, paradigm shift, available educational tools, and new learning technologies and trends.
	Recruiting and cultivating future leaders in the laboratory science.	Develop strategies to increase pipeline of laboratory professionals, and to cultivate junior staff with leadership skills.
	Laboratory staff wellness, professional development, and staffing.	Evaluation of job security, financial stability, mental health, employee-employer relationship, continuous development, and mentoring mechanism to meet high complexity of today's laboratory tasks. Guideline development to meet the needs.
	Embryo abandonment and disposition.	Guideline review and development to ensure best practices can be followed by labs to ensure proper disposition of embryos.
	Changing landscape of laboratory practice.	Evolving laboratory practice in franchised clinics, non-fertility specialty corporate management, etc.
	Communication between clinicians and the laboratory personnel.	Discuss clinical regimens and laboratory strategies on treating various types of patients.
	Laboratory quality management.	Discuss concept of QC/QA, KPI, staff evaluation, and how to implement these into the lab in a practical way.
	Best practice in utilizing laboratory quality improving tools.	Tools for tracking and improving performance, including key performance indicators (KPIs), checklists, root cause analysis, etc.
Biology of Reproduction	Role of environment on reproduction.	Continued updates on outcomes related to ART and environment.
	Endometrial receptivity, including the interaction between implantation and placentation.	Present the current state of knowledge on endometrial receptivity, how it affects pregnancy outcomes and ways to improve those outcomes.
	Emerging technology in embryo implantation and uterine receptivity.	Applicable and experimental methods in improving embryo implantation and embryo-uterine interaction. Using extended culture embryos and artificial embryos to study the window of implantation.
	Inner cell mass (ICM) and trophoctoderm (TE).	Review the mechanisms of differentiated ICM and TE lineages, and to explore technologies to examine and potentially repair defects during embryo implantation and the earliest stage of pregnancy initiation.
	Tissue engineering and modeling in reproduction.	Review and update research of engineering and modeling for use in reproduction.

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Cost Effectiveness	Measuring patient satisfaction outcomes.	Tools for gauging patient satisfaction.
	Cost of new technology.	Educate on financial barriers practices face when implementing new technology for best practice solutions. Evidence based best practices to overcome barriers.
Contraception	OCPs and their medical risks.	VTE and its prevention as it pertains to OCPs.
Counseling	How to learn mind-body techniques and incorporate them into routine patient care.	Setting up a mind-body program.
	Staff and provider training to improve empathy skills when interacting with patients.	Setting up a practice-wide training program on empathy.
	Counseling to support patients with complex diseases.	Counseling to support patients with POI, RPL, PCOS and infertility.
	Lack of knowledge on counseling of men with infertility.	Best practice of counseling men with infertility.
COVID-19	Knowledge and fertility treatment (surgical and medical) in the setting of the COVID pandemic.	Up to date information on surgical planning and infertility treatment given the COVID pandemic. Discuss current knowledge on the impact of vaccination on fertility and menstrual cycles.
	ART practice management in the COVID-19 pandemic: clinical and laboratory.	Examine effective laboratory practices, clinic practice management, and impact of COVID-19 on embryos or early pregnancy. Review guidelines, pathophysiology of disease, and risk assessment.
	Best laboratory practice during the time of COVID-19.	Emergency/short-term responses and long-term strategies to meet practical and financial challenges. Discuss how to prepare for future pandemics and disasters.
	Best practice in the post-COVID era.	How to safely operate the clinical practice and laboratory during and after COVID pandemic. Concerns and feasible approaches.
	Cross-border patient material transportation.	Handling and shipping patient materials among regions of different level of COVID transmission risk.
Early Human Development	Factors inherent to the fetus that impact recurrent pregnancy failure due to implantation.	Review current knowledge on early human development and its role in recurrent implantation failure.
Endometriosis	Management options for endometriosis in the setting of infertility.	Discussion regarding medical/surgical treatment for infertility patients. Best practices in endometriosis patients prior to IVF.

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	Improving diagnosis of adenomyosis via imaging techniques and evaluating the evidence for medical and surgical techniques for treatment.	Improve knowledge of adenomyosis diagnosis and treatment, specifically surgical skills.
Ethics/ Legal	Laboratory identification.	Educate on third- party witnessing software.
	Lack of knowledge in the ever-changing legal climate as it relates to REI practice.	Review legal aspects of care including international families and cross-border reproductive care. Minimize/mitigate legal risk with regards to advanced technology.
	Communication with patients about ethical concerns of genetic alteration.	Discuss ethical issues and education of open communication with patients and administration to address concerns regarding genetic alteration specifically.
	Embryo disposition and donation.	Education for staff, administration, and patients for donation of embryos to research versus destroyed. Explain ways to cope with moral and psychological aspects of our jobs.
	Research programs liability.	Discuss the liability of research programs with focus on IVF programs.
	Ethical perspectives of patients from different cultures.	Examine and discuss the ethical perspectives of patients from different cultures in relationship to IVF.
	Gamete and embryo donation.	Analyze the implications of being a donor and a recipient. Describe how to maintain and preserve anonymity in an age of social media and technical piracy. State to state differences in gamete donation laws, legal pitfalls of gamete donation, and standardization of legal consents.
Fertility Preservation	Maintaining up to date knowledge on advances in gamete preservation vs. frozen embryo preservation for patients with decreased ovarian reserve.	Review current data on gamete vs. frozen embryo preservation for patients with decreased ovarian reserve.
	Improvement in laparoscopic surgical skills for myomectomy.	Review surgical techniques for laparoscopic myomectomy.
	Counseling and intervention.	Educate on ovarian auto transplant and cryopreservation counseling, latest techniques for ovarian freezing, “Back-to-back” tips and tricks, and transgender patients and their unique preservation needs.
	Lack of knowledge on options for adolescents and children.	Continuing education on fertility options for adolescents and children.

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	Elective and oncology preservation.	Evidence based protocol selection and outcomes for elective and oncology patients. Protocols for ovarian stimulation in the fertility preservation patient.
	Ovarian tissue preservation/uterine transplant.	Review the technical aspects of ovarian tissue preservation and uterine transplant.
	Sperm cryopreservation for male cancer patients.	Educate on the best methods of sperm retrieval in male cancer patients.
	International issues in fertility preservation including restrictions.	Knowledge and expertise on international issues in fertility preservations, including discussion of country-specific restrictions and resources to aid providers and patients in achieving desired care.
	Oocyte preservation skills and best practice.	Skill development forum on oocyte preservation skills and a review of guidelines and best practices.
Leiomyomas	Lack of knowledge of uterine leiomyomas and minimally invasive treatment options.	Educate on current surgical and non-surgical management of uterine fibroids in patients who desire fertility (immediate and future). Tips/tricks to move from abdominal myomectomy to minimally invasive myomectomy.
	Alternative techniques for myoma treatment.	Review alternative and novel treatments for leiomyomas.
	Impact of myoma treatment on future fertility based on location of fibroids.	Update knowledge on the impact of myoma treatment on future fertility.
Genetics/PGT	Mosaicism	Best practice on interpretation of mosaic results, counseling couples about transferring mosaic embryos, and what level mosaic to transfer.
	“Noninvasive” vs “minimally invasive” PGT	Educate on the nuances and differences between the noninvasive and minimally invasive, and when to use one over the other in the embryology lab.
	Communicating genetic information to patients.	Review tools for effective counseling.

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	Genetic counseling.	Course taught by Genetic Counselor focused on genetics of different infertility diagnoses, interventions through ART, and relationship of genetic factors to outcomes.
	Lack of knowledge and best practice in utilizing non-invasive PGT.	Review of evidence on non-invasive genetic testing of embryos. Current progress, platforms, approaches (blastocoel sampling, spent medium, etc.), utilization, and timeframe for routine use.
	Counseling to support patients with mosaicism embryos and sub chromosomal variations.	Discuss best practice on transfer or not to transfer mosaic embryos. Education on the techniques behind PGT and how mosaics are identified. Review the clinical implications of transferring mosaic embryos.
	Gene editing to improve outcomes.	Provide learning opportunities on all aspects of PGT, including techniques, and clinical use of results. Provide comprehensive education on current state of gene editing and associated issues.
	Genetic workup for patients.	Review of different genetic workups, practice patterns, and best practices. Develop protocols for patients that should or should not receive PGT-A testing.
	Genetic mechanism in male and female gametes contributing to embryo aneuploidy and mosaicism.	Summarize common genetic conditions that have reproductive consequences for patients.
	New technologies in PGT and moving forward.	Discuss history of PGT, review accuracy of platforms, discuss new generations of PGT method, and barriers of implementing those technologies.
	PGT-A abnormal and mosaic embryos: lack of guidelines for the embryologists.	Review origins, detection, and communication on PGT-A of aneuploidy and mosaic embryos. Discuss issues in handling, transferring and discarding mosaic embryos. Consistency of data interpretation and reporting.

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	PGT-A technology information.	Course for MDs, nurses, and laboratory personnel to understand the key differences among various PGT technologies, as well as other ART-related genetic testing. Limitations of various platforms/methodologies.
	Impact of epigenetics on ART outcomes.	Review research on effect on the embryo and long-term offspring health. Discuss future applications.
	Time-lapse imaging (TLI) for aneuploidy.	Review data on TLI for aneuploidy interpretation.
	Communication on PGT-A mosaic embryo outcomes within the care team and with the patients.	Best approaches to discuss with clinicians and patients on mosaic embryos? Issues to consider before discarding mosaic 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?
	Good practice in embryo biopsy.	Guidelines in embryo biopsy and re-biopsy/vitrification for repeated PGT-A.
	Lack of knowledge in genetic stability regarding artificial embryos.	Genetic/epigenetic stability or instability in artificial embryos derived from embryonic structures or stem cells.
	Gene editing 101: what is available	Lecture on gene editing for clinicians, clinical laboratory, and other reproductive medicine professions.
	Non-invasive PGT reliability	Review of research on non-invasive genetic testing of embryos. Current approaches for testing (blastocoel sampling, spent medium, etc.).
Imaging	Use of 3D US and SIS.	Continued education on techniques and interpretation.
Infertility	CoVid and infertility	Educate on managing the potentially pregnant/expectant female patient in a CoVid era. CoVid protocols for your office/staff.

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Lesbian, Gay, Bisexual, and Transgender	Lack of knowledge of current treatment for gender non-conforming adolescents.	Review current knowledge on how to help gender non-conforming adolescents obtain appropriate treatment.
	Gay men parenting.	Discuss counseling of gay men for parenthood and when to know they are ready, making a safe and gay-friendly office environment, legalities of gay parenting.
	Transgender couples	Teach proper language/pronouns and identifiers, nuances of transgender couples, hormonal management for gamete retrieval.
	Reproductive needs before and after gender affirming medical and surgical treatment.	Continuing education regarding options and timing.
Menopause/Ovarian Insufficiency	Aging and infertility	Diagnosis and patient counseling in primary ovarian insufficiency (POI) and genetics of aging.
	Individualized, multidisciplinary treatment plans to improve future fertility.	Multidisciplinary course on PCOS. Education regarding what resources are needed and how to implement a multidisciplinary program for patients with PCOS, focused on long-term health and reproductive outcomes
PCOS/Androgen Excess	Obesity and infertility	Education on weight management and infertility, weight loss counseling, diet and nutrition as they pertain to infertility, and the role of weight loss on meds and bariatric surgery to improve fertility.
	Manifestations of PCOS in general health and infertility.	Multi-disciplinary approaches to PCOS.
Mental Health	Self-care for staff and practitioners during the pandemic.	Continuing education on counseling tools and information regarding mental health resources.
	Navigating patient stress and anxiety.	Educate on acupuncture and stress management and counseling techniques to help patients cope with infertility related stress and anxiety.
	Patient counseling during the COVID-19 pandemic.	Educate on how telehealth changed the face of counseling during a pandemic. Will

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		telehealth continue for mental health professionals post pandemic?
Practice/ Risk Management/ Team-based Care	Administrative/leadership functions of practice management.	Develop best practices for educating clinicians on leadership management.
	Tools for gathering patient experience data (patient surveys, apps, hardware, etc.)	Provide education on tools needed for gathering patient experience data such as patient survey instruments, apps, hardware and other resources.
	Clinical communication skills to enhance the patient experience in practice.	Learn about ways to enhance the patient experience by teaching clinical communication skills.
	Skill development programs for providing culturally appropriate care for patients of diverse backgrounds for providers and staff.	Learn about culturally appropriate care for patients of diverse backgrounds.
	Staff retention issues.	Teach best approaches to promote ideas to boost staff morale and retain staff and patients.
	Practice expansion.	Best practice as evidenced by staff retention during expansion and working within the confines of corporate structure (boards, HR, satisfaction metrics).
	EMR and record keeping.	Discuss best practice interface between EMR and SART data.
	Meeting accreditation and certification requirements: laboratory	Lectures and workshops focusing on a holistic strategy to meet requirements of CLIA, CAP, SART, etc, and manage inspections.
	Lack of knowledge and best practice in electronic health record (EHR) systems: laboratory.	Review available options and designs of EHR laboratory module. How to implement EHR in the laboratory.
	Lack of knowledge in non-conformance prevention: clinical and laboratory.	Root cause of non-conformance. Methods to prevent errors (checklist, witness system, etc.).
	Coding for maximizing reimbursement.	Provide coding workshop and resources for learners.
Pregnancy/ Pregnancy Loss	Recurrent pregnancy loss.	Continue education on endometritis (diagnosis and management), and endometrial microbiome (what is it and how do you manage patients).
Reproductive Surgery	Flexible hysteroscopy for evaluation of the infertile female.	Equipment considerations in office hysteroscopy, financial reimbursement as justification for equipment.

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	Minimally invasive reproductive surgery technique/skill set.	Hands-on course for laparoscopy and hysteroscopy (especially office hysteroscopy).
	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).
	Surgical management of Mullerian anomalies.	Preoperative preparation, imaging, and review of surgical treatment of anomalies.
	Surgical management of abnormal anatomy to improve outcomes.	Discussion on how to manage hydrosalpinges, endometriosis, septate uterus to improve outcomes. Discussion on IVF vs. reproductive surgery, and how they could integrate/augment each other. Review research studies on anomalies.
	How to maximize intraoperative surgical skills for the unexpected situation.	Review of ultrasound guidance, laparoscopic ultrasound use, treatment of cervical stenosis, cystoscopy, emergency management of surgical complications.
	Methods to optimize the difficult egg retrieval (abdominal) and embryo transfer.	Surgical application of abdominal egg retrieval and guidelines for embryo transfer technique (embryo transfer simulator hands-on)
	How to increase reproductive surgery training infrastructure in resource-poor areas of the globe	Provide strategies for providers in developed countries to assist in improving access to reproductive surgery in resource-poor areas of the globe
	Uterine transposition	Surgical techniques, indications, and pitfalls.
	Uterine transplantation	Techniques, indications, and viability.
Stem Cells	In vitro spermatogenesis	Teach techniques and feasibility.
	Therapeutic applications of stem cells in reproduction.	Review of current application of stem cell research as it applies to reproductive medicine and future application.
	Progress and outlook in utilizing artificial gametes and embryos.	Scientific studies on the current progress, limitations, ethical concerns, and potential

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		timeline for utilization of artificial gametes and embryos.
	Stem cell research and gene editing.	Summarize research studies and issues associated with gene editing of stem cells.
	Stem cell 101.	Review of pathophysiology of stem cells, types of stem cell, and applications.
	New frontiers and next innovative disruption(s) in reproductive and regenerative technology.	Discuss potential future innovative disruption(s) in reproductive and regenerative technology and impact on IVF.
	Long-term preservation of stem cell for clinical use.	Evaluating the efficacy of stem cell cryopreservation and storage relative to solution and container types used.
	Application of synthetic biology in reproductive medicine.	Using synthetic biology to regenerate and repair embryo, tissues and organs.
Technology	Automation, artificial intelligence (AI), and robotics in the laboratory.	Education on artificial intelligence systems and application for laboratory management and infertility treatment of patients.
	Artificial intelligence (AI) in ART.	Integration of technology and new office management tools to streamline and improve IVF. Application of AI in embryo selection and potential non-invasive PGT.
	Future of IVF and personalization of the process.	Refining the ovarian stimulation protocols and transfer protocols to allow for more personalization.
	Microfluidics and other technologies to improve gamete and embryo culture outcomes.	Utilize microfluidics and other technologies to fine tune gamete and embryo culture protocols, as well as in vitro maturation of gametes.
	Lack of knowledge in cybersecurity and safety of data storage.	Review information of clinical and laboratory data. Best practice in cybersecurity. hardware and software configurations for on-site and cloud-based solutions.
	Development of new technology.	Education on the process on new devices from development to FDA approval.
Miscellaneous	Impact of healthy diet, organic food, fat composition of food and lifestyle on the health of the patient, gametes and fertility outcomes	Education on healthy diet, organic food, fat composition of food and lifestyle on the health of the patient, gametes and fertility outcomes
	Inconsistency in orientation of REI personnel.	Develop bootcamps to educate staff in orientation and beyond to decrease turnover.