



Note from the Editor, Dr. Rony Elias

Dear SRS Members:

It is with mixed feelings that I bring you this Spring edition of the SRS newsletter.

On one hand, I am excited to take the torch from Dr. Mindy Christianson, who did an amazing job over the last few years.

On the other hand, I am starting this at an unprecedented time in all our lives and professional careers. While the novel COVID-19 is affecting every single person on the globe, it also is professionally affecting every healthcare professional, especially surgeons.

As usual, this issue starts with our Society's President's statement, a draft of recommendations regarding COVID-19, especially as it relates to our field.

We had another very exciting boot camp which was fortunately, was completed before the surge of the pandemic. Dr. Tess Chase was interviewed by Dr. Rebecca Flyckt about her award-winning research project using the data she collected from the bootcamp. I encourage everyone to read the interview, as well as the paper (once published), as the findings clearly highlight our

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Message from SRS President, Dr. Steven Lindheim

Dear Colleagues:

I am excited to write to you as the President of SRS, though these times with the pandemic of COVID-19 has placed a lot of uncertainty regarding pregnancy, fertility treatments, and elective reproductive surgery. We recommend that you review all CDC guidelines, particularly regarding pregnancy, on the CDC website and the ASRM guidance first released on March 17, 2020 and the update from March 30, 2020. In addition to these guidance documents, on April 1, 2020, the SRS released a joint message with ASRM specifically addressing reproductive surgeries.

For patient and staff-related COVID-19 issues, in general, it is recommended to

- 1. Follow state, local, and society guidelines.
2. Mitigate exposure, which is a key component.
3. Maintain social distancing, which is critical to keeping patients and staff safe.
4. Appropriately counsel patient about the risks associated with any surgical procedure (bleeding, infections, blood clots/PE ...). If these were to happen, not only would they put more strain on the healthcare system, but the patients will more than likely need to visit the

emergency room and/or be admitted to the hospital. Hospital COVID-19 exposure will be associated with high morbidity, especially in the presence of the above associated complications.

- 5. Deal with lost productivity and discuss this with your teams, but it should not be the sole reason you risk the health of patients, staff, and loved ones.
6. Most patients understand the risks and are grateful for everything you do to mitigate risks.
7. Have a plan in place to deal with the increased volume once you do start to ramp up services again.
8. Daily communication, transparency, calming those who tend to overreact, working from home when possible, working in shifts, etc. should all be things for which you strive.

Regarding our affiliated society, it is an honor to serve in this position and work with a great group of individuals who have guided me (thank you Drs. Ceana Nezhat, Samantha Pfeifer, and Bala Bhagavath!) and thank you to those who continue to carry the torch (Drs. John Petrozza, Kathleen Hwang, Pres Parry, and Mindy Christianson) and will serve the future and ensure the continued

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success of SRS. 'Surgery is Alive' is my mantra, as we have seen an increasing revival of Minimally Invasive Reproductive Surgery (MIRS), and it is my mission is to further the awareness of MIRS regarding the importance and utilization by our specialty. As ASRM has committed to global access to fertility care, it also will be our mission to identify ways for global access to reproductive surgery – and how important it is to educate and provide MIRS that often is able to treat infertility and gynecologic disorders. We plan to find tangible ways that we can develop relationships with centers and surgeons in resource-poor areas including Africa and our African colleague, Alfred Murage.

This past year has continued to see a lot of activities from our society.

1. The 5th SRS/SREI Surgical Boot Camp continues to be the highlight for many REI fellows, as our retreat met again in Houston where 41 fellows from REI programs around the country attended this two-day course. This year we included a new TED talk format from REI faculty, which was a very well-received, hands-on experience guided by our "fabulous" faculty in hysteroscopy (Drs. Parry and Pfeifer), pelvic trainers (Drs. Divya Shah and Linnea Goodman), embryo transfer (Dr. Schutt), laparoscopic surgery on cadavers (Drs. Stephanie Estes, Rebecca Flyckt, Zaraq Kahn, Ceana Nezhat, and myself), micro-surgical loops (Drs. Jeff Goldberg and Kathleen Hwang), GyneSim – tissue fibroid models (Dr. Bala Bhagavath), and robotic simulation (Dr. Mindy Christianson).

Almost all who attended planned on incorporating more advanced procedures into their clinical practices. Additionally, Tess Chase, an OB/GYN resident from Penn State (Mentor-Dr. Stephanie Estes), presented her findings from the previous year's boot camp on: "Surgical Simulation Supplements Reproductive Endocrinology and Infertility Fellowship Training" at the 2020 ASRM Scientific Congress, where she was awarded top resident research award. Her results described perceived and actual competencies in surgical skills amongst REI fellows, where a surgical boot camp appears to be useful in enhancing surgical skill among REI fellows. Improvements in laparoscopic suturing were most significant for first-year fellows and increasing IVF volume was not associated with less surgical skill. Tess and her co-authors have submitted these findings to *Fertility and Sterility* for hopeful publication.

The boot camp would not be possible without the support of many, including ASRM and SREI. We are grateful to our committed faculty, the admin team including Susanna Scarbrough, Dani Mosley, Michelle Austin, and Keith Ray, as well as the enormous generosity of our industry support. We plan to hold the next boot camp in January 2021 at the MITIE Center in Houston. Applications will be sent to REI program directors for their fellows and should be available in September 2020. Remember, enrollment is on a first come, first served basis, so don't be late!

2. A non-ACGME accredited fellowship in reproductive surgery remains in place with sites in Atlanta, Palo Alto, and Chicago. All sites are accepting fellow applicants. During this year-long training, fellows have extensive clinical training and exposure to common and uncommon pathologies in high volume programs. The fellowship is devoted to the management of endometriosis, myomas, and congenital abnormalities of the uterus.
3. We are pleased to say *The Society of Reproductive Surgeons Manual of Reproductive Surgery*, Cambridge University Press, has been published and is in distribution. The book has accompanying videos that can be accessed through the SRS website. It is an excellent reference for reproductive surgical procedures. Additionally, the book is set to be sponsored by an Indian multinational pharmaceutical company for distribution in India.
4. This year's ASRM Scientific Congress in Philadelphia was extremely well-received. The 75th Anniversary Gala was an incredible success and SRS was well-represented. It was exciting to have various topics presented, including a debate on "Cervical Agenesis- Hysterectomy vs Utero-Vaginal Anastomosis" in adolescents and long-term outcomes, a surgical tutorial on oncofertility pearls pre- and post-cancer treatment, and a series of roundtable lunch sessions on a variety of topics for the urologists and gynecologists interested in surgery. Our plenary speaker, Dr. Richard Satava, was outstanding and created a vivid glimpse into the future of surgery and surgical simulation when he spoke on "Innovation for Surgery: Surgical Robotics and the Fifth Generation – Non-Invasive Procedures". Finally, the SRS Members' Meeting and Reception was well-attended with a diverse group of REI surgeons as we presented the SRS Distinguished Surgeon Award to Dr. Mark Sigman!
5. The SRS website, under the direction of Dr. Pres Parry, has now been handed over to Dr. Zaraq Kahn. Our long-standing tradition of publishing literature reviews continues to evolve with monthly case reviews with surgical videos to continue to engage our members to generate academic debate on surgical techniques and share pearls of excellence.

The future looks bright as we continue to involve the younger generation in leadership positions within the SRS, including serving on the Board, as faculty in Pre-Congress courses and sessions at the ASRM Scientific Congress, the Surgical Boot Camp, and SRS committees. A special thanks to my mentors who have guided me, and to our future leaders who will continue to advocate for the need to teach the next generation to adequately implement REI surgery into our Infertility practices. I am so proud to be associated with the SRS and of what we have accomplished and continue to work towards.

Warm regards,  
Steven R. Lindheim, M.D., MMM  
President, Society of Reproductive Surgeons, 2020

# SRS Surgical Boot Camp

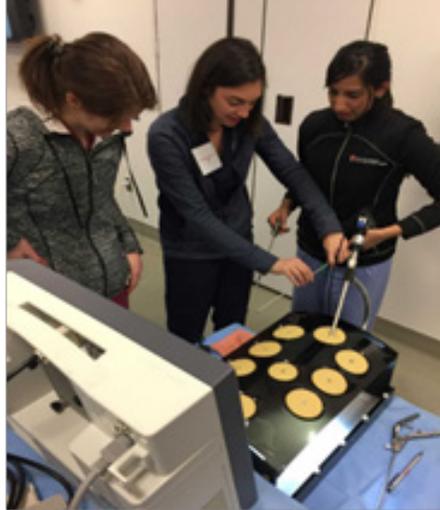
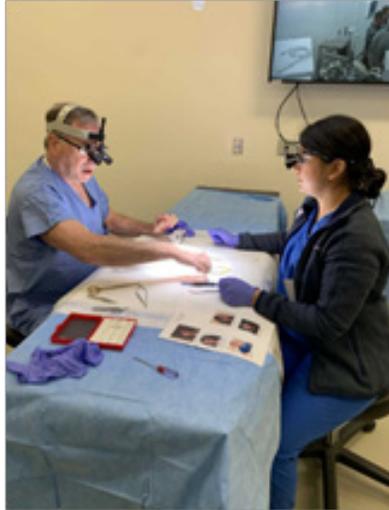
## Fifth Annual SRS-SREI Surgical Boot Camp

The 5th Annual SRS-SREI Surgical Boot Camp for REI fellows took place January 24-25, 2020 at the Houston Methodist Institute for Technology, Innovation & Education (MITIE) in Houston, Texas.

The course was directed by Drs. John Petrozza, Massachusetts General Fertility Center, and Kathleen Hwang, University of Pittsburgh School of Medicine. Dr. Steven Lindheim, SRS President, and Dr. Ricardo Azziz, ASRM CEO, were there to support the program as well. As Dr. Lindheim explains, “Many talented faculty members

provided their time and energy to make this boot camp an immensely educational and fun experience.”

The agenda of the boot camp was built on a comprehensive mix of lectures and hands-on activities. The hands-on activities included cadaveric dissection, laparoscopic suturing in the box trainer, multiple hysteroscopic training activities, and embryo transfer simulation. Experience from prior courses and feedback from previous participants were incorporated into the planning and execution. Changes included the addition of a TED talk



**Top left: Dr. Jeff Goldberg guides microsurgical training. Bottom left: Dr. Samantha Pfeifer provides hysteroscopy training. Top right: Dr. Linnea Goodman provides one-on-one instruction. Above: Dr. Bala Bhagavath leads the laparoscopic myomectomy training.**

At the laparoscopic cadaver station, trainees practiced dissection in the retroperitoneal space and performed suturing tasks mimicking myometrial closure. The fellows also enthusiastically participated in suturing tasks presented in the dry lab. An element of competition was introduced by timing participants, which allowed for self-evaluation and feedback.

At the many hysteroscopic stations, trainees practiced hysteroscope assembly with application of scissors and graspers to remove bell pepper seed “polyps,” resectoscopes to shave potato “fibroids,” and the hysteroscopic morcellator to remove model fibroids and polyps. The embryo transfer station was very popular, as well.

format for many of the lectures and enhanced opportunities for faculty and fellows to network.

This year, innovative new models and learning stations provided an enhanced educational and teaching experience. Uterine models from GyneSim provided very realistic fibroids that allowed fellows to hone their skills with both laparoscopic and robotic myomectomies. Additionally, a microsurgery station was added this year, with opportunity for fellows to practice tubal anastomosis.

In addition, a conscious effort by the faculty to mingle with fellows and rotate tables on a regular basis at the cocktail reception served as a great opportunity for the faculty and trainees to better socialize and interact, allowing each to learn about the other and the trainees to share their goals and aspirations. The two groups enjoyed each other’s company to well after the restaurant’s closing time. “This was a fantastic experience; love the TED talks and hands on

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## **SRS In-Training Award Recipient DR. TESS CHASE**

Tess Chase is a third-year Ob/Gyn resident at Penn State Hershey Medical Center who received the 2019 SRS In-Training Award at ASRM. She was interviewed on her award-winning research by Dr. Rebecca Flyckt.

### **This is a great study. What sparked your interest in surgical education?**

Chase: The OR can be an intimidating environment for trainees to ask questions and try out new skills. Participating in a surgery requires both knowledge of the anatomy and the steps of the procedure. This can be a real challenge for learners. Dr Estes was my mentor and she suggested that I take a look at data from the SRS bootcamp.

### **What was the major focus of the research?**

Chase: We studied the efficacy of the SRS surgical bootcamp in improving fellows' performance on timed surgical tasks. We also looked at fellows' reported comfort with various surgical tasks, as well as their likelihood of incorporating newly acquired surgical skills into their practice after the bootcamp. We also tried to determine whether surgical performance was correlated with IVF volume.

### **What were the take-home findings from your study? Was there anything that surprised you?**

Chase: The biggest surprise was the wide variation in levels of prior experience and overall comfort with surgery at the bootcamp. Although most participants expressed comfort with open surgery, hysteroscopy and laparoscopy, only a small minority of trainees felt prepared to do laparoscopic suturing, robotics, or tubal anastomosis. We also were surprised to find no correlation between IVF volume and surgical skills. One

other interesting finding was the timed portion of the skills training... although all fellows showed improvements, it was the first-year fellows who had the highest efficiency and showed the most improvement on timed surgical tasks.

### **So, the first-year fellows scored higher? Wow! How do you put that together?**

Chase: Perhaps the success of the first-year fellows was due to being newly graduated from residency with higher case volumes than some fellows are exposed to throughout their fellowship.

### **What were some of the limitations of the study?**

Chase: One limitation of the study was that it was self-reported data. It was hard to pinpoint prior case numbers from participants to determine whether this had impact on their results.

### **Congratulations on this excellent project, Tess. What are the next steps for your research?**

Chase: Well, Dr. Estes and I are writing the paper now. In the future, if I had time, I would design a follow-up study to see whether skills learned at bootcamp were maintained. I also wonder whether results from the bootcamp will translate to success with clinical skills in the operating room.

### **Any final thoughts? Or advice for future trainees?**

Chase: Dr. Estes has been an incredible mentor. And I was blown away by the bootcamp...the options for surgical simulation and the effort and energy that went into putting it on. I would tell future trainees to try to take advantage of every opportunity you have to improve and practice! Surgical simulation is not perfect, but it gives you a base of

comfort and a muscle memory that will help you in the OR!

Surgical Simulation Supplements Reproductive Endocrinology and Infertility (REI) Fellowship Training \*Tess Chase<sup>1</sup>, \*Divya K. Shah<sup>2</sup>, J. Preston Parry<sup>3</sup>, Bala Bhagavath<sup>4</sup>, Steven R. Lindheim<sup>5</sup>, John C. Petrozza<sup>6</sup>, Samantha Pfeifer<sup>7</sup>, Christina Stetter<sup>8</sup>, Allen Kunselman<sup>8</sup>, Stephanie J. Estes<sup>1</sup>

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### **ABSTRACT**

**Objective:** To: 1) assess efficacy of a surgical boot camp in improving Reproductive Endocrinology and Infertility (REI) fellow performance of timed surgical tasks, 2) determine

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whether a surgical boot camp increases the likelihood of REI fellows incorporating select surgical skills into practice, and 3) examine the correlation between a training program's in vitro fertilization (IVF) case volume and the surgical skill of the REI fellow.

**Design:** Prospective evaluation  
**Setting:** 2019 Society of Reproductive Surgeons-Society of Reproductive Endocrinology and Infertility two-day surgical boot camp, Methodist Institute of Technology, Innovation and Education (Houston, Texas)

**Participants:** 40 REI fellows

**Intervention:** Data on demographics, prior experience and simulation training in IVF and reproductive surgery, and perceived competency with reproductive surgery procedures were collected from REI fellows prior to the boot camp. During the boot camp, fellows were timed before and after training in laparoscopic suturing, intracorporeal knot tying and extracorporeal knot

tying. Fellows were also timed while performing a variety of laparoscopic and hysteroscopic simulations. Fellows were surveyed on their likelihood of incorporating select surgical skills into clinical practice immediately after the boot camp and again one month later.

**Main Outcome Measure(s):** Three main measures were assessed including improvement in laparoscopic suturing and knot tying efficiency; likelihood and persistence of REI fellows incorporating select surgical skills into clinical practice; and correlation between fellowship IVF case volume and surgical efficiency of REI fellows.

**Results:** Prior to the boot camp, most fellows felt comfortable performing operative hysteroscopy (100%), open surgery (85%), and operative laparoscopy (82%), but only a minority felt prepared to perform laparoscopic suturing (33%), robotic surgery (28%) or tubal anastomosis (10%). All fellows experienced significant improvement in laparoscopic running suture placement

(44 sec), intra-corporeal knots (82 sec) and extra-corporeal knots (71 sec) during the boot camp ( $p < 0.001$  for all comparisons). A majority of fellows reported a high likelihood of incorporating operative hysteroscopy (89%), operative laparoscopy (87%), and laparoscopic suturing (84%) into their practice immediately following the boot camp, a finding that persisted when reassessed one month later ( $p > 0.30$  for all comparisons). Reported likelihood of performing robotic surgery significantly increased from 54% immediately after the boot camp to 70% one-month later ( $p = 0.03$ ). There was no correlation between the IVF case volume and fellow efficiency in laparoscopic suturing or hysteroscopic polypectomy (Spearman correlation coefficients -0.14 and -0.03, respectively).

**Conclusion:** Given heterogeneous training in reproductive surgery among REI fellowship programs, an intensive surgical boot camp appears to be useful in enhancing surgical skill among REI fellows.

## NOTE FROM THE EDITOR, CONT.

important role in surgically training our future REI graduates.

If anything, this pandemic taught us, so far, how interdependent we are. To that end, we are looking to expand our international reach by having a new section dedicated to global practices. We encourage anyone who has global contacts to ask them to contribute to the upcoming newsletters, especially as their knowledge relates to different surgical practice.

I look forward to seeing and shaking hands with everyone in the not-too-distant future, but in the meantime, stay safe and #flattenthecurve.

Rony T. Elias, M.D.

## FIFTH ANNUAL SRS-SREI SURGICAL BOOT CAMP, CONT.

experience" is only one example of the many similar sentiments expressed by trainees in their evaluations of the boot camp experience.

John Petrozza summarizes the boot camp: "The boot camp has grown over the last five years into this synchronized ballet of surgical simulation, cadaveric work and didactics. There is no other surgical course that covers the spectrum of reproductive surgery in such a comprehensive way." The SRS-SREI Surgical Bootcamp is an invaluable experience for fellows that would not be possible without the enthusiastic and generous contributions of our industry supporters who share our focus of educating the surgeons of tomorrow. Their educational grants, provision of equipment, and onsite representatives who engaged in interactive dialogue will make the boot camp a positive learning experience for the next generation of reproductive surgeons. We appreciate our supporters and look forward to their continued involvement in future events.

# Urology Corner: Fertility Preservation and Klinefelter's Syndrome

Dr. Lucy Chen, MD, REI Fellow, Johns Hopkins University School of Medicine  
Dr. Amin Herati, MD, James Buchanan Brady Urological Institute,  
Johns Hopkins University School of Medicine

Klinefelter's syndrome (KS) is a chromosomal condition that affects physical and intellectual development in boys and men. Ninety percent of the cases are due to 47,XXY karyotype while the remaining 10% are mosaics (47, XY/47,XXY) or higher-grade X aneuploidies (1). KS affects about one in 600 newborn boys, however, because of the variable phenotype, only 25% of adult men with KS have been diagnosed and less than 10% are diagnosed before puberty (2). The typical phenotype of KS is related to the hypergonadotrophic hypogonadal state. Characteristic traits include tall stature, gynecomastia, psychosocial problems such as concentration and learning difficulties, and small testes and infertility (3). Though KS has a spectrum of presentation, approximately 90% of adult men diagnosed with KS suffer from non-obstructive azoospermia (NOA) with hypergonadotropic hypogonadism (4). One of the most common contexts in which men are diagnosed with KS is during work-up of infertility.

Previously, men with KS were categorized as hopelessly infertile due to rapidly deteriorating spermatogonia with involution of the seminiferous tubules to fibrotic scar. Spontaneous pregnancies resulting from KS fathers have been described, but these cases are rare and thought to be a result of mosaicism (5, 6). Though mosaic KS are less severely affected, they often have severe oligozoospermia and can still struggle with infertility. In order to achieve fatherhood, men with KS were previously limited to donor sperm or more rarely adoption. More recently, with the wide availability of assisted reproductive technology (ART) and advancements in the field of male reproductive microsurgery, such as microsurgical testicular sperm extraction (mTESE), the chance of fathering a biological offspring is possible and increasingly encouraging.

## Fertility evaluation of adult KS

The fertility work-up for men with KS should include a comprehensive fertility history and a medical history, physical examination and relevant laboratory values. It is important to review medications, with special attention to those that are endocrine disruptors, lifestyle factors (such as smoking, recreational drugs, excessive exercise or weight loss), as well as environmental toxin exposures. Physical examination should include evaluation of stature and body habitus, presence of gynecomastia, presence or absence of secondary sexual characteristics and masculinization. Tanner staging should be documented, presence and characterization of the epididymis,

vas deferens, and spermatic cord for varicocele. Testicular size should be measured with a Prader orchidometer or with ultrasonography. The diagnosis of KS should be confirmed with karyotype (gold standard) or X and Y chromosomal fluorescence in situ hybridization (FISH) on lymphocytes to detect low percentage mosaics.

The majority of men with KS have azoospermia (no evidence of sperm despite centrifugation) or severe oligozoospermia. At least two separate semen analyses with extended search of the centrifuged specimen should be performed. Laboratory evaluation includes early morning testosterone, estradiol, follicle stimulating hormone (FSH), luteinizing hormone (LH), prolactin, sex hormone binding globulin, and inhibin B (7). A comprehensive work-up, especially to detect for the presence of spermatozoa in ejaculate, is important prior to invasive procedures such as mTESE.

## Infertility treatment option in adults:

### Surgical treatment:

In 1996, successful recovery of spermatozoa by TESE in men with azoospermia and KS was reported, and the first pregnancies were reported in 1997 (8, 21). The combination of testicular sperm extraction and intracytoplasmic sperm injection (ICSI) has helped more than 100 people with KS become biological parents. Options include conventional testicular sperm extraction (TESE) or mTESE approach (Figure 1). The mTESE approach is recommended due to the improved success rate (5,6). Okada et al. reported a decrease in serum testosterone level after TESE or micro-TESE, and levels did not recover to baseline even at 12 months post operatively (9). Thus, KS patients often need post-operative initiation or re-initiation of their testosterone therapy. If spermatozoa are found, the specimen is processed and either used immediately for IVF/ICSI or cryopreserved for later use. Successful spermatozoa retrieval by mTESE has been reported to be as high as 66% (22). The implantation rate per embryo transfer in KS patients with ICSI was similar to success rates of patients with other causes of NOA azoospermia with normal karyotype: 28% vs 26% (11). A study by Sabbaghian et al. showed a higher fertilization rate, but no difference in live birth rate per embryo transfer when men with KS were compared to NOA men with normal karyotype (12). Surgical sperm retrieval method should be individualized to each KS patient. Surgery should be

## Urology Corner, cont.

performed by a Urologist and IVF team with expertise in sperm retrieval and tissue processing to increase success of recovery of extremely rare sperm.

### Medical treatment in men with KS:

Men with KS suffer from testosterone deficiency which results in impaired bone mineral density and skeletal muscle development in addition to infertility. The goal of medical management in men with KS is to normalize testosterone levels with androgen replacement therapy, which may be initiated in the peri-pubertal period. There are several preprocedural hormonal agents, such as antiestrogens (i.e. clomiphene citrate, tamoxifen), aromatase inhibitors (i.e. anastrozole, testolactone), and gonadotropics (i.e. recombinant FSH, hCG) that have been studied to test for potential positive effect on sperm retrieval outcomes. However, there is no agreement on whether preprocedural hormonal therapy has any significant effect on overall sperm retrieval, clinical pregnancy or live birth rates (13, 22).

In normal karyotype males, levels of FSH, inhibin B and inhibin B/FSH ratio are reliable predictive factors for fertility. FSH value over 7.6 IU/mL has been shown to be a strong predictor of spermatogenic failure and lower probability of sperm retrieval rates with TESE (7). However, studies investigating ICSI outcomes in KS patients show success independent of age, mean testis volume, LH, FSH, or total testosterone levels (14). Ramasamy et al. showed that among men with NOA, sperm retrieval rates using mTESE were higher in patients with FSH value of >15 IU/mL and three men with FSH >90 IU/mL had successful sperm extractions (14).

Bernie et al. reported successful mTESE rates similar to or better than all men with NOA and echoed prior findings that serum FSH, LH or testis volume had no predictive value for sperm retrieval in KS patients (15). Preimplantation genetic testing should be offered due to increased incidence of sex chromosomal and autosomal abnormalities in embryos of KS patients.

### **Fertility preservation consultation for peri-pubertal and adolescent Klinefelters**

Klinefelter's syndrome is one of the most common chromosomal abnormalities, and approximately 3,000 affected boys are born each year in the United States, affecting all racial and ethnic groups (2). Clinical presentation of KS may be subtle; thus, the majority of KS is not diagnosed until adulthood during work up of infertility. Up to 64% of KS patients are never diagnosed (16), 10% are diagnosed prenatally, and only 26% are diagnosed in pre-puberty. In the past, diagnosis of KS by karyotyping in school-aged children was often prompted

by physical exam findings of smaller and firmer testes than the normal peri-pubertal age range. However, the increasing use of prenatal testing such as maternal cell-free DNA and confirmatory genetic testing such as amniocentesis and chorionic villus sampling (CVS) has allowed earlier diagnosis of KS (2). Furthermore, increasing awareness of the prevalence of KS (1:600 male births) has led pediatricians to seek early genetic evaluation in boys with related conditions, i.e. those with neuro-developmental disorders or cryptorchidism, leading to a significant increase in boys diagnosed earlier in their lives.

This has led to the potential for beneficial interventions for this condition, as well as increased early desire of parents to fully understand all aspects of their KS son's future, including fertility. As a result, parents are now seeking information about KS very early on, even prior to birth in some instances. Advantages and disadvantages exist for families to know potential sequelae of KS from a young age; however, providing information may equip families to better prepare for potential future implications associated with KS.

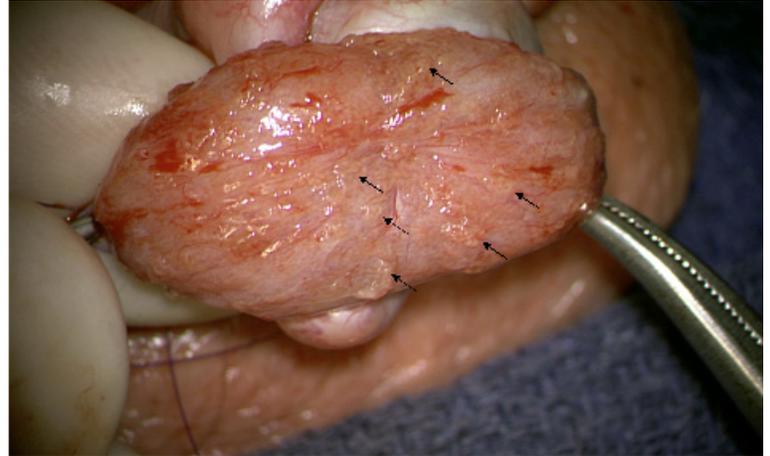
Testicular function in KS presents a story of progressive degeneration of normal testicular architecture resulting in small, firm testes and androgen deficiency. Testicular biopsies show tubular atrophy, sclerosis, and hyalinization of the seminiferous tubules (5,6). Though the precise time of onset and mechanisms are unknown, the degeneration of the germ cells in KS begins even in utero, progresses during childhood, and accelerates during puberty and adolescence (5). However, a recent study by Hirota et al (2017) suggests an escape mechanism may exist allowing spermatogonia to correct their aneuploidy and persist as islands of euploid progenitor cells (17). Activation of the hypothalamic-pituitary-gonadal (HPG) axis and stimulation of the gonadal tissue appears to accelerate the demise of trisomic spermatogonia during puberty. Despite this, sperm retrieval rates do appear to differ between peripubertal boys vs. men in their 30s (see review by Hawksworth et al 2018).

Sperm has been identified in 7% of ejaculate in semen specimen in adolescents with KS ages 12 to 20 years (7) thus offering a potential non-invasive method. Several studies have shown that spontaneous semen collection was possible in adolescents ranging from 15-19.5 years (5, 18) without the use of penile vibratory stimulation to provoke ejaculation (19). If younger patients are able and willing to provide an ejaculate specimen, they may ultimately avoid more invasive surgical interventions in their future.

Other more experimental approaches such as testicular tissue or spermatogonial stem cell cryopreservation with

## Urology Corner, cont.

subsequent goal of transplantation can be offered to patients only as part of an institutional research protocol. Currently there are no established guidelines for appropriate timing or harvesting technique choices. Parents of children with KS should be informed that prepubertal TESE is still considered highly experimental, and there is not clear data to support TESE in KS patients younger than 16 years of age (18, 20). It does not guarantee fertility later in life, and it could cause harm by causing further fibrosis and scarring. Additionally, a negative TESE outcome may cause long-term emotional and relational duress in peri-pubescent boys. At this time, only sperm cryopreservation is considered standard of care in children and adolescents. Given new technology, the chances of fathering a child by the use of ART are encouraging. Early recognition and awareness of KS will help to provide proper diagnosis and counseling on fertility preservation. Treatment and counseling should be discussed at all stages of diagnosis, and a multidisciplinary approach should be applied in caring



**Figure 1: Microsurgical Testicular Sperm Extraction in a male with 47XXY. Black arrows indicate representative areas of dilated seminiferous tubules.**

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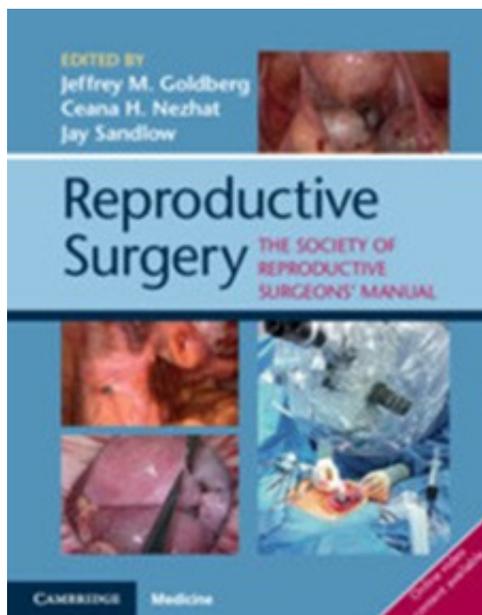
# SRS Website Update

## Zaraq Khan, M.D.

The SRS website has continued to deliver literature reviews and generate conversation regarding unique cases on the discussion boards. This year, literature reviews have focused on particular disease states, the last topic being adenomyosis with studies including surgical techniques, medical management and IVF outcomes. We are excited about our next round of literature reviews focused on endometriosis.

We are continuing to evolve with ongoing focus directed at generating monthly case reviews with surgical videos to continue to engage our members. Our hope is to generate academic debate on surgical technique and share pearls of excellence. If you are interested in contributing surgical videos or literature reviews please email me, Zaraq Khan (khan.zaraq@mayo.edu) or Dani Mosley (dmosley@asmr.org).

## **Reproductive Surgery: The Society of Reproductive Surgeons' Manual available now! Order your copy today!**



The Society of Reproductive Surgeons (SRS) is excited to announce the publication of a handbook on which the Society collaborated, *Reproductive Surgery: The Society of Reproductive Surgeons' Manual*. Authored by experts in operative gynecology and urology, the handbook serves as a key guide to understanding modern surgical procedures for female and male infertility.

Edited by SRS members, Drs. Jeffrey M. Goldberg, Ceana H. Nezhat and Jay Sandlow, the manual features step-by-step instructions illustrated with intra-operative photographs and surgical videos designed to increase physician confidence while providing readers with a comprehensive understanding of the indications, techniques, and outcomes of modern reproductive surgery in order to offer patients surgical options and avoid, or improve, IVF.

*Reproductive Surgery: The Society of Reproductive Surgeons' Manual* is available from the publisher, Cambridge University Press, at [www.cambridge.org](http://www.cambridge.org). SRS members will receive a 35% discount on the purchase price of the manual by entering the code "SRS19" at checkout.

# Minimally Invasive Reproductive Surgery Fellowship Update

## Jeffrey M. Goldberg, M.D.

SRS has established a one-year fellowship program in minimally-invasive reproductive surgery. The enthusiasm of REI fellows at the annual SRS Surgical Boot Camp and the favorable results of an online survey of REI fellows demonstrating their desire to obtain surgical training after REI fellowship were the impetus to develop this program. It is essentially a one-year preceptorship with a high volume, master reproductive surgeon.

The following are programs currently accepting applications for 2020-2021:

- Nezhat Medical Center, Atlanta, GA, Program Director: Ceana Nezhat, M.D.
- Camran Nezhat Institute, Palo Alto, CA, Program Director: Camran Nezhat, M.D.
- The Advanced Gynecologic Surgery Institute, Park Ridge, IL, Program Director: Charles Miller, M.D.

Since most REI fellows are not receiving adequate training in reproductive surgery, SRS has created this fellowship to provide them with the needed skills. It is our intention that graduates of the program will deliver excellent surgical care to their patients and will then teach these skills to their trainees to benefit the next generation of patients. Hopefully, they also will become actively involved with SRS to assure the future of reproductive surgery.

There is good evidence-based data showing that reproductive surgery is more cost-effective than IVF in many cases, and is often preferred by patients as it is more “natural” than IVF. Reproductive surgery also is complimentary to IVF, as the surgical management of pelvic pathology can improve IVF results. It is unfortunate that many REIs have abandoned reproductive surgery or relegated it to general or minimally-invasive gynecologic surgeons. Reproductive

surgeons have a different skill set and approach to surgery, which could lead to improved outcomes. REIs who can operate are more “complete” physicians who can offer their patients all of the available treatment options.

Interested applicants for the Minimally-Invasive Reproductive Surgery Fellowship can find information on the SRS website at <https://www.reprodsurgery.org/about/fellowship-1>. Interested preceptors can also find information on the website.

Jeffrey M. Goldberg, M.D.



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# New updates on repropsurgery.org!

The SRS website, [www.repropsurgery.org](http://www.repropsurgery.org), now hosts a variety of informative features and sections ONLY available to active SRS members!



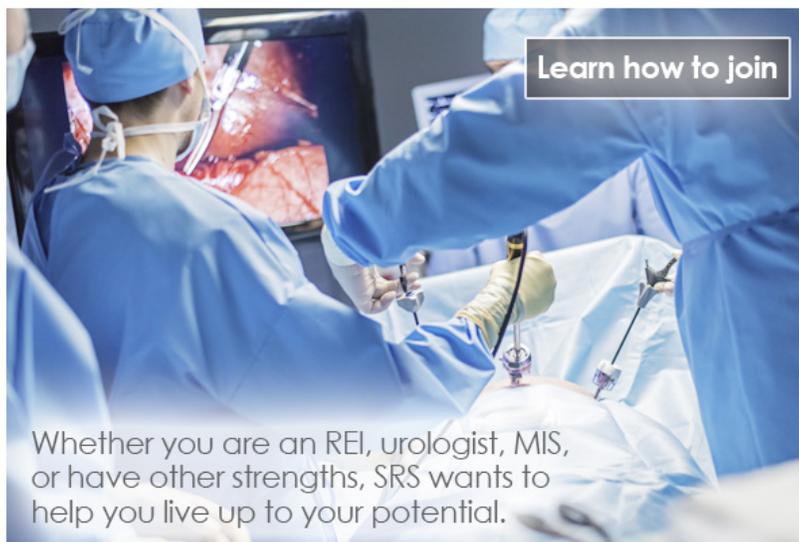
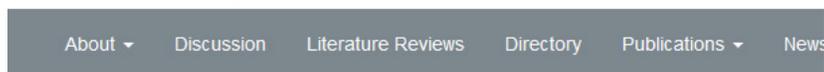
THE SOCIETY  
OF REPRODUCTIVE  
SURGEONS

The new update includes a password protected log-in section that includes the following information:

- SRS Email Discussion List
- SRS Literature Reviews
- SRS Newsletters
- Surgical Tutorials Uploaded by SRS Members

Please be sure to check the SRS website frequently to see the upcoming and ongoing changes. We value your input and suggestions.

*Feel free to contact the Website Chair, Dr. Zaraq Khan ([khan.zaraq@mayo.edu](mailto:khan.zaraq@mayo.edu)) or Dani Mosley at ASRM ([dmosley@asrm.org](mailto:dmosley@asrm.org)) with any comments or suggestions you may have regarding the SRS website.*



Whether you are an REI, urologist, MIS, or have other strengths, SRS wants to help you live up to your potential.

Latest Discussions

[Join the Conversation](#)

## Benefits of SRS Membership:

- **NEW! Secured access to SRS newsletters, literature reviews, surgical videos from SRS members, and the SRS Discussion forum! These benefits are only available to active SRS members.**
- Involvement in the only society that specifically addresses the issues of pelvic reconstructive surgery in women of reproductive age
- Interaction with a national and international group of surgeons who share an interest in reproductive surgery
- The opportunity to review research abstracts with a focus on reproductive surgery
- Participation in roundtable discussions at ASRM Scientific Congresses
- The discussion of novel surgical techniques through video sessions
- Participation in surgical hands-on courses at ASRM Scientific Congresses
- Access to participate in ASRM Pre-Congress courses on a variety of topics related to the field of reproductive surgery
- Participation in collaborative research projects addressing surgical outcomes