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</table>
1. INTRODUCTION

Welcome to the Summer Internship Course in Reproductive Medicine. This Course will provide basic knowledge in four core areas of scientific research, namely up-to-date theoretical knowledge on and around the chosen area of research, the hands-on conduct of bench research, actual scientific writing and oral communication of scientific research findings.

2. GENERAL LEARNING OUTCOMES

From this course, the Interns should be able to understand and

1. Discover the Science of Medicine from top notch speakers selected for their expertise in clinical, surgical, research and scientific fields
2. Discover the art and science of how research is conducted
3. Recognize cutting edge science (proteomics, genomics, molecular biotechnology, imaging)
4. Identify skills assembled through the daily mentoring of research work by experienced scientists
5. Apply skills of data compilation and analysis
6. Apply statistical methods in basic and clinical reproductive science research
7. Synthesize research findings into a formal oral/power point presentation
8. Discuss and defend research findings to a team of experienced scientists
9. Construct a solid foundation for a clinical or research career in reproductive medicine/biology
10. Compose the writing of scientific articles and reviews in reproductive biology and human infertility

Specific Learning Objectives
From this course, the Interns should be able to understand and

Knowledge:
1. Explain the anatomy and normal physiological functioning of the male reproductive system
2. Explain the anatomy and normal physiological functioning of the female reproduction system
3. Classify the common reproductive pathologies in males and females
4. Discuss reactive oxygen species and correlate it to oxidative stress and the role it plays in reproductive pathologies
5. Discuss the different fertility treatment options available
6. Acknowledge research opportunities, and the process of planning and conducting a research project.
7. Practice familiarity with the basic and advanced techniques employed in an andrology laboratory
8. Demonstrate team work in conducting a research project and presenting the results
9. Identify the different types of scientific manuscripts
10. Outline the various steps involved in preparing a manuscript for publication purposes
11. Explain the structure of an oral presentation
12. Explain how to master the art of public speaking and list some pointers.
Skills:
1. Apply basic laboratory skills such as using a balance, micropipette and microscope
2. Demonstrate mastery of techniques used in an andrology laboratory, such as sperm count, motility, viability, morphology
3. Extend participation as part of a team working on a hands-on cutting-edge bench research project in Reproductive Medicine
4. Generate an oral presentation using PowerPoint of results procured from the research project
5. Demonstrate the ability to communicate key findings of the research project
6. Prepare an electronic database search, literature review and scientific writing of a research report

Attitude:
1. Express an interest in a career in medicine, be it in the reproductive sciences or in any other specialty
2. Develop a higher level of professionalism from exposure to a state-of-the-art research environment
3. Recognize the benefits of direct mentoring from experienced researchers at a world-renowned medical institution
4. Distinguish the characteristics of successful physician-scientists from various specialties from direct interaction with these researchers
3. TEACHING-LEARNING METHODS

This Internship course encompasses the basic concepts of anatomy, physiology and selected pathologies pertaining to human reproduction and certain associated topics. It also introduces the Intern to the art and science of basic research, with heavy emphasis on the core principles of scientific research, both in writing and bench research. This information and knowledge components will be delivered through interactive lectures, small group sessions (tutorials, demonstrations and presentations), workshops and a mini symposium. Bench research training is provided using practical demonstration and hands-on training under the daily supervision and direct mentorship of selected Mentors. Scientific writing training is developed under the direct mentorship of selected Mentors. Presentation skills are honed during training sessions amongst all the Mentors and Interns, to maximize peer-learning.

4. SUMMARY OF TEACHING LEARNING

<table>
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<tr>
<th>Topics</th>
<th>Lectures</th>
<th>Workshop / Mini-Symposium</th>
<th>Practical / Hands-On Training / Mentoring &amp; Research Work</th>
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<td>5 Bench Research and Training</td>
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<td>6 Public Speaking and Training</td>
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<td>Total Hours</td>
<td>43</td>
<td>10</td>
<td>227</td>
<td>280</td>
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5. ASSESSMENT

Continuous assessment will be used to evaluate the different core components of the Internship. These components will be assessed in various manners on a continuous basis throughout the 7 weeks by the Mentors.

1. Theoretical Lectures:
Criteria to be evaluated include:
- Compulsory class attendance

2. Scientific Writing
   - Three evaluation opportunities
Criteria to be evaluated include:
- Completion of 1st draft
- Plagiarism report
- Use of Figures, Tables, Diagrams
- Reference list and Endnote Library
- Innovative writing skills
- Quality of manuscript

3. Bench Research
   - Three evaluation opportunities
Criteria to be evaluated include:
- Training skills
- Project knowledge
- Teamwork
- Data Entry
- Interpretation of Data

4. Presentation Skills
   - Three evaluation opportunities
Criteria to be evaluated include:
- Delivery style
- Organization
- Clarity/Knowledge
- Slide quality
- Time management

The Interns’ scores in the main components of the Internship course, namely Scientific Writing, Bench Research and Presentation Skills, will be recorded in a Grading Certificate which will be presented to the Intern at the end of the Internship (refer to PDF #81: Grading Certificate).

Interns who complete the Internship with full attendance and have obtained an overall score of >70% (Grades B- and above) will be awarded an Internship Certificate (refer to PDF #80: Internship Certificate).
### ASSESSMENT COMPONENT

<table>
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<tr>
<th>ASSESSMENT</th>
<th>SCIENTIFIC WRITING</th>
<th>BENCH RESEARCH</th>
<th>PRESENTATION SKILLS</th>
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| **1st Evaluation**  
(20% goes towards the Final Score) | Week 3  
25 marks | End of Week 2  
100 marks | Week 4  
25 marks |
| **Criteria:** | | | |
| 1. Keywords | 1. Number of techniques  
trained in and completed (15m) | 1. Delivery Style |
| 2. Literature search, reading list, review of key articles | 2. Number of repeats  
performed per technique (15m) | 2. Organization |
| 3. Outline | 3. Accuracy of results  
obtained (20m) | 3. Clarity & Knowledge |
| 4. Writing progress | 4. Reporting of results  
(15m) | 4. Responses to Questions |
| 5. Regular written updates to Mentor | 5. Initiative and dedication (15m) | 5. Time Management |
| **2nd Evaluation**  
(30% goes towards the Final Score) | Week 5  
25 marks | Week 5  
25 marks | Weeks 5 & 6  
25 marks |
| **Criteria:** | | | |
| 1. Keywords, literature search, outline, review of key articles | 1. Skills and Accuracy  
2. Project Knowledge  
3. Teamwork  
4. Data Entry  
5. Interpretation of Data | 1. Delivery Style |
| 2. Writing progress | 2. Organization | 2. Organization |
| 3. Figures and diagrams | 3. Clarity & Knowledge | 3. Clarity & Knowledge |
| 5. Regular written updates to Mentor | 5. Time Management | 5. Time Management |
| **Final Evaluation**  
(50% goes towards the Final Score) | Early Week 7  
25 marks | Early Week 7  
25 marks | End of Week 7  
25 marks |
| **Criteria:** | | | |
| 1. Completion of 1st draft & Plagiarism report | 1. Skills and Accuracy  
2. Project Knowledge  
3. Teamwork  
4. Data Entry  
5. Interpretation of Data | 1. Delivery Style |
| 3. Complete References & Endnote library | 3. Clarity & Knowledge | 3. Clarity & Knowledge |
| 5. Quality of Article | 5. Time Management | 5. Time Management |

**Grading Scale:**  
A+ (>96%), A (91-95%), A- (86-90%), B+ (81-85%),  
B (76-80%), B- (71-75%), C (<70% is a fail)
6. REFERENCES and TEACHING-LEARNING RESOURCES

Recommended Textbooks:

3. **Strategies to Ameliorate Oxidative Stress During Assisted Reproduction.** Authors: Ashok Agarwal, Damayanti Durairajanayagam, Gurpriya Virk, Stefan Du Plessis, 2015, ISBN 978-3-319-10258-0


- Refer to PDF #44 Agarwal Book Publications 2015 for the entire list of Books Published by Dr Agarwal and his team.

**Manuals and Guides:**

1. Andrology Center Laboratory Handbook

**Websites:**

5. ASRM Practice Committee Reports https://www.asrm.org/Guidelines/
6. ASRM Fact Sheets and Info Booklets https://www.asrm.org/FactSheetsandBooklets/
7. Eunice Kennedy Shriver National Institute of Child Health and Human Development: Reproductive Medicine Network https://www.nichd.nih.gov/research/supported/Pages/rmn.aspx
## 7. CRM & COURSE ORGANIZATION

<table>
<thead>
<tr>
<th>FACULTY</th>
<th>CONTACT NO.</th>
<th>EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
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<tr>
<th></th>
<th>Name</th>
<th>Contact Information</th>
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<tbody>
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</table>

- For the detailed contact info of the Preceptors, refer to PDF #69 CRM Internship Preceptors Contact Info.
- To read the bios of the Preceptors, refer to PDF #66 Speakers and Preceptors Bio respectively.
## 8. COURSE FACULTY

<table>
<thead>
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- For the detailed contact info of the Speakers, refer to PDF #68 CRM Internship Speakers Contact Info.
- To read the bios of the Guest Speakers and Speakers, refer to PDF #64 Guest Speakers Bios and PDF #66 Speakers and Preceptors Bio respectively.
9. INTERNSHIP COURSE TOPICS

9.1 MALE INFERTILITY

<table>
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<th>Teaching-Learning Method</th>
<th>Speaker</th>
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<td>: Introduction to Male Reproductive System: Sex Determination and the Physiology of Male Reproduction</td>
<td>Lecture</td>
<td>Stefan du Plessis, PhD</td>
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Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe the anatomy of the male reproductive system
2. Describe the hypothalamus-pituitary-gonadal axis in the male
3. Outline the blood-testis-barrier
4. Discuss temperature regulation of the testis
5. Describe in brief the process of spermatogenesis
6. Describe the function and regulation of the male reproductive system

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Anatomy of the male reproductive system
2. How the structure of the male reproductive system contributes to formation of the blood-testis barrier and testicular temperature regulation
3. Spermatogenesis
4. Physiology of the hypothalamus-pituitary-testicular axis and the role it plays in regulating reproductive function

<table>
<thead>
<tr>
<th>Topic 2</th>
<th>Teaching-Learning Method</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>: Spermatogenesis</td>
<td>Lecture</td>
<td>Rakesh Sharma, PhD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe spermatogenesis and sperm maturation
2. Describe the processes of capacitation, hyperactivation and acrosome reaction
3. Describe sperm-oocyte fusion
4. Describe the role of testosterone and other androgens on spermatogenesis

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Anatomy of the male reproductive system
2. Physiology of spermatogenesis and sperm maturation
2. Physiology of capacitation, hyperactivation and acrosome reaction
3. Sperm-oocyte fusion

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Define the prevalence of male infertility
2. Describe the male reproductive system overview anatomy and physiology
3. Differentiate the definitions for male infertility diagnosis
4. Identify the 5 first steps in male infertility evaluation
5. Describe how to do history taking during male infertility evaluation
6. Describe how to perform physical examination during male infertility evaluation
7. Describe how to conduct semen analysis
8. Describe what endocrine tests are recommended for male infertility evaluation
9. Describe what genetic tests are recommended for male infertility evaluation
10. Explain the infertility evaluation flowchart

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Prevalence of male infertility
2. Male reproductive system overview anatomy and physiology
3. Definitions of male infertility diagnosis

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4. Male infertility evaluation – history taking
5. Male infertility evaluation physical examination
6. Male infertility evaluation – semen analysis
7. Male infertility evaluation – endocrine testing
8. Male infertility evaluation – genetic tests
9. Male infertility evaluation flowchart

| Topic 4 | : Physiological & Pathological Role of Reactive Oxygen Species in Sperm Function |
| Teaching-Learning Method | : Lecture |
| Speaker | : Stefan du Plessis, PhD, Rakesh Sharma, PhD |

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Define free radicals, reactive oxygen species (ROS), reactive nitrogen species (RNS)
2. Describe the sources of ROS
3. Describe the physiological role of ROS in male reproduction
4. Describe the condition of oxidative stress (OS) and its consequences
5. Discuss the pathological role of high levels of ROS in male reproduction
6. Explain why spermatozoa is susceptible to ROS
7. Discuss the mechanism of DNA damage
8. Describe the sentinel signs of ROS
9. Discuss the clinical relevance of ROS
10. Describe the role of antioxidants
11. Outline the measurement of ROS by chemiluminescence assay
12. Outline the types of semen samples for ROS measurement
13. Outline the measurement of total antioxidant capacity
14. Discuss OS and male infertility
15. Describe the clinical management of OS

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Free radicals and sources of ROS
2. Physiological role of ROS in male reproduction
3. OS and the pathological role of high levels of ROS in male reproduction
4. Susceptibility of spermatozoa to ROS
5. Mechanism of DNA damage
6. Sentinel signs of ROS
7. Clinical relevance of ROS
8. Role of antioxidants
9. Measurement of ROS by chemiluminescence assay
10. Types of semen samples for ROS measurement
11. Measurement of total antioxidant capacity
12. Oxidative stress and male infertility
13. Clinical management of OS

| Topic 5 | : Advances in Microsurgical Techniques in Male Infertility |
| Speaker | : Edmund Sabanegh Jr, MD |

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Identify contemporary candidates for microsurgery (e.g. infertile men with obstruction (primary and secondary, varicocele, non-obstructive azoospermia))
2. Explain surgical techniques such as vaso-vasostomy and vaso-epididymostomy
3. Outline new developments in microsurgical techniques
4. Appreciate the use of robotics in microsurgery
5. Outline the use of tissue adhesives (fibrin sealant/glue)
6. Appreciate the use of lasers in microsurgery
7. Explain the factors that are considered in surgical decision making
8. Describe the contribution of microsurgery in assisted reproduction
9. Discuss the techniques of testicular sperm extraction (TESE) and micro-TESE
10. Outline the methods for cryopreservation of small quantities of sperm

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Contemporary candidates for microsurgery (e.g. infertile men with obstruction (primary and secondary, varicocele, non-obstructive azoospermia))
2. Surgical techniques such as vaso-vasostomy and vaso-epididymostomy
3. New developments in microsurgical techniques
4. Use of robotics in microsurgery
5. Use of tissue adhesives (fibrin sealant/glue)
6. Use of lasers in microsurgery
7. Factors considered in surgical decision making
8. Contribution of microsurgery in assisted reproduction
9. Techniques of testicular sperm extraction (TESE) and micro-TESE
10. Methods for cryopreservation of small quantities of sperm

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<thead>
<tr>
<th>Topic 6</th>
<th>: Impact of Sexually Transmitted Diseases in Male Fertility</th>
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<tbody>
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<td>Teaching-Learning Method</td>
<td>: Lecture</td>
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<tr>
<td>Speaker</td>
<td>: Gulfam Ahmad, PhD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Outline the sexually transmitted infections (STIs) that are on the priority list of the World Health Organization (WHO)
2. Understand the specific etiology and transmission of the different types of STIs to the male partner
3. Describe the various diagnostic approaches for early detection of the disease
4. Explain the impact of STIs specifically on the sperm (including motility, count, morphology, viability and DNA damage) and as a whole on male fertility
5. The importance of prevention and hygiene measures to be adopted during daily life

**Skills:**
Ability to apply the knowledge to prevent the transmission of STI's

**Attitude:**
None

**Contents / Content Synopsis:**
1. Implementation of STI screening in males to offer long-term advantage for the male patient;
2. Impact of early STI detection on healthcare costs, and decreased co-infection with other STI's such as HIV
3. Implementing of advanced detection techniques, such as a proteomic and molecular level approach, can improve patient management
4. Prevention strategies (e.g. abstinence, protected intercourse, vaccination)
5. Proper vaccination must be ensured in cases where it is required and available (e.g. HBV, HIV)

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<th>Topic 7</th>
<th>: Effect of Heavy Metals and Pesticides on Male Fertility</th>
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<td>Teaching-Learning Method</td>
<td>: Lecture</td>
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<tr>
<td>Speaker</td>
<td>: Shubhadeep Roychoudhury, PhD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:
Knowledge:
1. Importance of toxicology in general and with respect to heavy metals and pesticides in particular
2. Heavy metals and pesticides in environment and their effect on living system, especially male reproduction
3. Mechanism of their toxicity

Skills:
Basic idea about the toxicity of heavy metals and pesticides, and their role in physiology

Attitude:
Learn more about heavy metals and pesticides pollution and their effect on male fertility

Contents / Content Synopsis:
1. Spectrum of heavy metals and pesticides with adverse effects on male fertility
2. Sources and routes of exposure
3. Mechanism of their toxic effects on male reproduction with examples

<table>
<thead>
<tr>
<th>Topic 8</th>
<th>Of Flies and Men: Causes and Consequences of Ejaculate Composition Variation</th>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Laura Sirot, PhD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe normal ejaculate composition
2. Discuss the causes for variation in ejaculate composition
3. Discuss the consequences of variation in ejaculate composition
4. Describe how the quality of the ejaculate can affect male fertility

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Composition of normal ejaculate
2. Causes for variation in ejaculate composition
3. Consequences of variation in ejaculate composition
4. Quality of the ejaculate and its effect on male fertility
**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Define chronic orchialgia
2. Discuss the epidemiology of chronic orchialgia
3. Describe current theories regarding chronic orchialgia
4. Describe the pathologic basis of chronic orchialgia
5. Discuss targeted therapies of chronic orchialgia
6. Discuss the use of Robotic Assisted Microsurgical Targeted Denervation
7. Describe the micro-cryoablation technique
8. Describe the Botox Ablation technique
9. Describe the Amniofix ablation technique
10. Discuss future perspectives in robotic microsurgery

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Definition of chronic orchialgia
2. Epidemiology of chronic orchialgia
3. Current theories of chronic orchialgia
4. Pathologic basis of chronic orchialgia
5. Targeted therapies of chronic orchialgia
6. Use of Robotic Assisted Microsurgical Targeted Denervation
7. Micro-cryoablation technique
8. Botox Ablation technique
9. Amniofix ablation technique
10. Future perspectives in robotic microsurgery
Topic 10: Men’s Health: What’s a Car Got to Do With It?
Teaching-Learning Method: Lecture
Speaker: Sijo J. Parekattil, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe the current scope of men’s health disparity
2. Discuss ideologies for engagement with men
3. Discuss the impact of social media
4. Review the 2014 drive for mens health
5. Review the 2015 drive for mens health
6. Discuss future perspectives in men’s health

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Current scope of men’s health disparity
2. Ideologies for engagement with men
3. Impact of social media
4. Review of 2014 drive for men’s health
5. Review of 2015 drive for men’s health
6. Future perspectives in men’s health
9.2 FEMALE INFERTILITY

<table>
<thead>
<tr>
<th>Topic 1</th>
<th>Introduction to Infertility: Definitions, Epidemiology, Physiology of Female Reproduction</th>
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<tbody>
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<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Avraham Harlev, MD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe infertility definition
2. Define the prevalence of infertility
3. Describe the female reproductive system overview anatomy and physiology
4. Identify the major 4 female infertility factors
5. Describe how to evaluate female mechanical factor
6. Describe how to evaluate menstrual cycle
7. Describe how to evaluate the ovarian reserve
8. Explain the infertility evaluation flowchart

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Infertility Definition
2. Prevalence of infertility
3. Female reproductive system overview anatomy and physiology
4. Female infertility factors
5. Evaluation of mechanical factor
6. Cycle evaluation
7. Ovarian reserve evaluation
8. Infertility evaluation flowchart


**Topic 2**: Sexually Transmitted Infections  
**Teaching-Learning Method**: Lecture  
**Speaker**: Margaret McKenzie, MD

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Identify the prevalence and common causes of various sexually-transmitted infections (STIs)
2. Describe the common or pathognomonic signs of these STIs
3. Describe the pathology and diagnosis of different types of STIs
4. Discuss the transmission of STIs, its treatment and preventive measures
5. Discuss the impact of STIs on reproductive health

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Prevalence and common causes of various STIs  
2. Common or pathognomonic signs of these STIs  
3. Pathology and diagnosis of different types of STIs  
4. Transmission of STIs, its treatment and preventive measures  
5. Impact of STIs on reproductive health

**Topic 3**: Contraception  
**Teaching-Learning Method**: Lecture  
**Speaker**: Margaret McKenzie, MD

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe methods of contraception  
2. Explain the mechanism of action of hormonal contraception  
3. Discuss the advances in hormonal contraceptives  
4. Describe the side effects of hormonal contraception  
5. Explain the checklist for prescribing contraceptives
6. Discuss fears associated with the use of contraception
7. Hypertension and contraception
8. Diabetes and contraception
9. Dyslipidemia and contraception
10. List the non-contraceptive benefits of contraception
11. Explain about emergency contraception
12. Discuss other forms of contraception - IUCD and the barrier method

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Methods of contraception
2. Mechanism of action of hormonal contraception
3. Advances in hormonal contraceptives
4. Side effects of hormonal contraception
5. Checklist for prescribing contraceptives
6. Fears associated with the use of contraception
7. Hypertension and contraception
8. Diabetes and contraception
9. Dyslipidemia and contraception
10. Non-contraceptive benefits of contraception
11. Emergency contraception
12. IUCD and the barrier method

<table>
<thead>
<tr>
<th>Topic 4</th>
<th>: Sexuality, Female Sexual Dysfunction and Hypoactive Sexual Desire Disorder</th>
</tr>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
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<tr>
<td>Speaker</td>
<td>: Sheryl Kingsberg, PhD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Define sexuality in women
2. Discuss female sexual health and wellness
3. Explain the female sexual response cycle
4. Describe types of female sexual dysfunction/disorders
5. Describe hypoactive sexual desire disorder
6. Evaluation/diagnosis of female sexual disorders
7. Causes of female sexual disorders
8. Discuss the prevalence and co-morbidities of FSD and HSDD
9. Discuss the diagnosis and treatment of FSD and HSDD
10. Discuss the pharmacological treatment of FSD and HSDD

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Sexuality in women
2. Female sexual health and wellness
3. Female sexual dysfunction/disorders – disorders of sexual desire, arousal, orgasmic and sexual pain – dyspareunia and vaginismus
4. Hypoactive sexual desire disorder
5. Sexual aversion disorder
6. Evaluation/diagnosis of female sexual disorders
7. Causes of female sexual disorders
8. Prevalence and co-morbidities
9. Diagnosis and treatment
10. Pharmacological treatment

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<th>Topic 5</th>
<th>Metabolic Complications of Pregnancy</th>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Adi Mehta, MD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe physiological changes in pregnancy
2. Describe metabolic changes in pregnancy
3. Discuss clinical implications of diabetes in pregnancy
4. Describe the epidemiology and types of gestational diabetes
5. Discuss the screening and diagnosis of diabetes in pregnancy
6. Describe the management of diabetes in pregnancy

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Physiological changes in pregnancy
2. Metabolic changes in pregnancy
3. Clinical implications of diabetes in pregnancy
4. Epidemiology and types of gestational diabetes
5. Screening and diagnosis of diabetes in pregnancy
6. Management of diabetes in pregnancy

| Topic 6 | : History of Gonadotropins-from Prolan A and B to Follitropins, Lutotropins and Corifollitropins |
| Teaching-Learning Method | : Lecture |
| Speaker | : Hassan N Sallam, MD, PhD |

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Early understanding of the hypothalamic–pituitary–ovarian axis
2. Bernard Zondek and the discovery of Prolan A and Prolan B
3. The discovery of HCG
4. The two-step protocol and the G-club
5. Human pituitary gonadotrophins (hPG)
6. Human menopausal gonadotrophins (hMG)
7. Purified and highly purified hMG
8. Recombinant preparations (recFSH, recLH and recHCG)
9. The two-cell, two-gonadotropin theory of follicular development
10. Combined preparations (recFSH + recLH)
11. Long-acting FSH (Corifollitropin alfa)
12. The future of gonadotrophins

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Early understanding of the hypothalamic–pituitary–ovarian axis
2. Bernard Zondek and the discovery of Prolan A and Prolan B
3. The discovery of HCG
4. The two-step protocol and the G-club
5. Human pituitary gonadotrophins (hPG)
6. Human menopausal gonadotrophins (hMG)
7. Purified and highly purified hMG
8. Recombinant preparations (recFSH, recLH and recHCG)
9. The two-cell, two-gonadotropin theory of follicular development
10. Combined preparations (recFSH + recLH)
11. Long-acting FSH (Corifollitropin alfa)
12. The future of gonadotrophins

Mini Symposium Topic 1: Initial Assessment of the Female
Teaching-Learning Method: Lecture
Speaker: Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe endometriosis classification and its impact on fertility (mild, moderate, severe)
2. Discuss the role of laparoscopy assessment in female infertility
3. Provide an overview of assessment of infertile female with fertiloscopy
4. Provide understanding of evaluation of the endometrial cavity with ultrasound
5. Discuss the diagnostic role of sonosalpingogram in infertility

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Endometriosis (mild, moderate, severe) and its role in infertility
2. Overview of role of Fertiloscopy in female partner assessment in infertility
3. Ultrasound evaluation in infertility: endometrial cavity assessment
4. Diagnostic role of sonosalpingogram

Mini Symposium Topic 2: Pathology and Treatment of PCOS
Teaching-Learning Method: Lecture
Speaker: Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Provide understanding of PCOS with focus on the disease epidemiology,
2. Discuss the diagnostic criteria,
3. Describe the pathogenesis of PCOS,
4. Discuss the long term complications and
5. Management of PCOS
6. Explain the interaction between insulin resistance and hyperandrogenism in Polycystic Ovarian Syndrome.
7. Understand the manifestations and management of Congenital Adrenal Hyperplasia

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Diagnosis of PCOS
2. Critique of various diagnostic criteria
3. Clinical manifestations of PCOS
4. Pathogenesis and mechanistic pathways underlying PCOS
5. Goals of management at different stages of manifestation of PCOS: adolescence, reproductive age group and post reproductive age group or pre-menopausal and menopausal

Mini Symposium Topic 3: Ultrasound in Infertility
Teaching-Learning Method: Lecture
Speaker: Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Differentiate between the use of ultrasound imaging before, during and after ART
2. Describe uterine anomalies
3. Describe the evaluation of the endometrial cavity
4. Discuss ovarian endometrioma and cysts

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Ultrasound imaging before, during and after ART
2. Role of Ultrasound in diagnosis of congenital uterine anomalies
3. Evaluation of the endometrial cavity by ultrasound

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4. Diagnostic role of USG in Ovarian endometrioma and cysts

Mini Symposium Topic 4: Endometriosis - Associated Infertility
Teaching-Learning Method: Lecture
Speaker: Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe endometriosis (mild, moderate, severe)
2. Describe the evaluation and diagnosis of endometriosis
3. Provide knowledge of endometriosis associated infertility
4. Discuss the mechanistic pathways underlying infertility in women with endometriosis
5. Describe the management of endometriosis
6. Discuss ovarian stimulation protocol and IVF outcome in endometriosis patients
7. Explain the clinical guidelines and management goals for the treatment of endometriosis-associated infertility

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Classification of Endometriosis (mild, moderate, severe)
2. Diagnostic evaluation of endometriosis
3. Endometriosis-associated infertility
4. Mechanisms of infertility in women with endometriosis
5. Management of endometriosis
6. Ovarian stimulation protocol and IVF outcome in endometriosis patients
7. Clinical guidelines for the treatment of endometriosis-associated infertility
8. Management of recurrent disease

Mini Symposium Topic 5: Assisted Reproductive Techniques
Teaching-Learning Method: Lecture
Speaker: Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:
Knowledge:
1. Provide a background and historical evolution of ART procedures
2. Discuss the Indications of ART
3. Describe the Selection of appropriate ART procedure to treat infertility
4. Provide knowledge of Common ART procedures
5. Enumerate the Success rates of ART procedure
6. Discuss the recent trends in embryo selection
7. Describe the procedures to maximize ART success rates
8. Complications of ART

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Introduction to ART
2. Indications of ART
3. Selection of appropriate ART procedure to treat infertility
4. Common ART procedures
5. Success rates of ART procedure
6. Complications of ART
7. Long term complications in children born of ICSI
8. Maximizing success rates with ART

Mini Symposium Topic 6 : Ovarian Hyperstimulation Syndrome
Teaching-Learning Method : Lecture
Speaker : Botros Rizk, MD

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Discuss the physiological principles of fluid management of patients with OHSS
2. Explain the protocols for the prevention of OHSS
3. Discuss the role of anticoagulants and fluid management in OHSS patients
4. Discuss surgical and anesthetic complications in OHSS patients
5. Discuss potential treatments that reverse the pathophysiology of OHSS

Skills:
None

Attitude:
None

**Contents / Content Synopsis:**
1. Physiological principles of fluid management of patients with OHSS
2. Protocols for the prevention of OHSS
3. Role of anticoagulants and fluid management in OHSS patients
4. Surgical and anesthetic complications in OHSS patients
5. Potential treatments that reverse the pathophysiology of OHSS
**9.3 HUMAN REPRODUCTION & OTHERS**

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<th>Topic 1</th>
<th>: Endometriosis, Marijuana, Cancer and Male Infertility</th>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
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<tr>
<td>Speaker</td>
<td>: Avraham Harlev, MD; Stefan du Plessis, PhD; Gulfam Ahmad, PhD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Discuss the latest research on endometriosis and how it impacts on female infertility
2. Discuss the impact of marijuana and endocannabinoids on male reproduction
3. Discuss the link between cancer and male infertility

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Classification and diagnostic evaluation of endometriosis
2. Mechanisms of infertility due to endometriosis
3. Latest management of endometriosis
4. Endocannabinoids and physiological role in reproduction
5. Marijuana and its impact on male fertility through the ECS
6. Classification of cancers affecting male reproduction
7. Mechanisms of cancer related infertility
8. Fertility preservation of male cancer patients

<table>
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<tr>
<th>Topic 2</th>
<th>: Kidney Transplantation: Indications, Patient Preparation, Operative Technique and Postoperative Care</th>
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<td>Teaching-Learning Method</td>
<td>: Lecture</td>
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<tr>
<td>Speaker</td>
<td>: Charles Modlin, MD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe the anatomy and physiology of the renal system
2. Discuss the inclusion criteria for kidney transplantation
3. Explain the indications for kidney transplantation
4. Discuss the exclusion criteria for kidney transplantation
5. Describe the statistics of organ transplantation in USA
6. Describe the disparities in organ donation in USA
7. Describe an overview of the kidney transplant procedure – pre-during and post-procedure
8. Discuss about post-operative care and potential complications

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Anatomy and physiology of the renal system
2. Inclusion criteria for kidney transplantation
3. Indications for kidney transplantation
4. Exclusion criteria for kidney transplantation
5. Statistics of organ transplantation
6. Disparities in organ donation
7. Overview of the kidney transplant procedure – pre-during and post-procedure
8. Post-operative care and potential complications
9.4 SCIENTIFIC WRITING & TRAINING

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<td>Lecture/Demonstration</td>
</tr>
<tr>
<td>Speaker</td>
<td>Sindhuja Tatagari</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Create awareness of the range of online research databases and resources available
2. Identify the free-access and the subscription-based search engines
3. Demonstrate how to perform basic searches using the CCAlumni Library online catalog and online subscription databases
4. Demonstrate how to perform advanced searches using the CCAlumni Library online catalog and online subscription databases
5. How to do a Medical Subject Heading (MeSH) / keyword search on PubMed
6. How to conduct a Boolean search on PubMed
7. How to retrieve an article using CCFLink, ILLiad and PubMed
8. How to retrieve Full Text when searching PubMed
9. Demonstrate how to use the internet search engines such as Google Scholar to search and retrieve articles

**Skills:**
1. Able to select keywords and use the Boolean operators while conducting an online search
2. Able to search and retrieve articles through online research databases
3. Able to perform a thorough search for research articles on selected topics

**Attitude:**
None

Contents / Content Synopsis:
1. Online research databases and resources available
2. Free-access and subscription-based search engines
3. Perform basic and advanced searches
4. MeSH and Boolean searches
5. Retrieving an article through the Cleveland Clinic Online Library
6. Research Database guidelines

Resources:
CCF Alumni Library YouTube Channel [https://www.youtube.com/user/CCAlumniLibrary](https://www.youtube.com/user/CCAlumniLibrary)
NCBI YouTube Channel [https://www.youtube.com/user/NCBINLM](https://www.youtube.com/user/NCBINLM)
PubMed [http://my.clevelandclinic.libguides.com/pubmed](http://my.clevelandclinic.libguides.com/pubmed)
Cleveland Clinic Author Database  http://my.clevelandclinic.libguides.com/ccauthors

<table>
<thead>
<tr>
<th>Topic 2</th>
<th>The Resources Available to Help Authors Write</th>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Amy Moore, BA</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe the fundamental resources that are necessary to begin a writing project
2. Know where to find these resources within the Cleveland Clinic Library Intranet and elsewhere on the Internet

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Target journals and instructions for authors
2. Impact factors
3. Writing guidelines
4. Authorship guidelines
5. Helpful articles on writing
6. Helpful books on writing
7. Scientific Writing Resources (refer to PDF #87 Scientific Writing Resources)

<table>
<thead>
<tr>
<th>Topic 3</th>
<th>How to Effectively Read Articles and Make Sense of the Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Amy Moore, BA</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Describe types of scientific papers
2. Explain the organization of a research paper
3. Discuss how to approach each section of a research paper
4. Recognize useful hints when reading a research paper
5. Identify common difficulties faced when reading papers

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Types of scientific papers
2. Organization of a research paper
3. How to approach each section of a research paper
4. Useful hints when reading a research paper
5. Common difficulties faced when reading papers

---

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Craft an interesting title
2. Choose an appropriate abstract format
3. Know how to write an abstract that meets a 250-300 word limit
4. Know how to structure an introduction for original research and review articles
5.

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Overview of title writing
2. Overview of abstract writing
3. Overview of introduction writing
<table>
<thead>
<tr>
<th>Topic 5</th>
<th>: Ethical Issues in Publication: Authorship and Plagiarism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Amy Moore, BA</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Define plagiarism
2. Understand the prevalence of plagiarism
3. Appreciate the consequences of plagiarism
4. Understand how journals detect plagiarism
5. Describe the steps authors can take to avoid plagiarism

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. AMA definition of plagiarism
2. Review of literature
3. Overview of CrossRef
4. 7 steps to avoiding plagiarism

<table>
<thead>
<tr>
<th>Topic 6</th>
<th>: Writing a Systematic Review versus a General Literature Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Amy Moore, BA</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. List the differences between a systematic and narrative review
2. Describe the overall structure of a narrative review
3. Identify any writing resources that are specific to writing review articles

**Skills:**
None
Attitude:
None

Contents / Content Synopsis:
1. Define systematic and narrative reviews
2. View examples of both types
3. Review assigned topics

<table>
<thead>
<tr>
<th>Topic 7</th>
<th>Writing Exercises for Clarity and Concision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Amy Moore, BA</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Apply writing techniques that increase clarity and concision

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Avoid excessive use of nominalizations
2. Get to the verb quickly
3. Eliminate unnecessary words
4. Minimize use of technical jargon, abbreviations and acronyms
5. Abbreviate wisely
6. Avoid vague antecedents

<table>
<thead>
<tr>
<th>Topic 8</th>
<th>Writers Workshop 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Workshop</td>
</tr>
<tr>
<td>Speaker</td>
<td>Amy Moore, BA</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Write a rough draft of their reviews/book chapters incorporating information from the first 6 lectures in this series

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. In-class review of rough drafts with Amy Moore

| Topic 9 | : Writers Workshop 2 |
| Teaching-Learning Method | : Workshop |
| Speaker | : Amy Moore, BA |

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Write a rough draft of their reviews/book chapters incorporating information from the first 6 lectures in this series

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. In-class review of rough drafts with Amy Moore

| Topic 10 | : EndNote* |
| Teaching-Learning Method | : Demonstration |
| Speaker | : Ahmet Ayaz, MS |

*EndNote is a software program that helps manage references, and format bibliographies and manuscripts

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:
Knowledge:
1. Use EndNote to store details of reference material
2. Online searching of references in Library databases using EndNote
3. Import records from Library databases using EndNote
4. Insert citations from EndNote into a Word document
5. Insert references manually into EndNote
6. Insert and edit references in a Word document
7. Change the format of the citation style of a Word document
8. Remove EndNote field codes to obtain a plain Word document
9. Create a bibliography from EndNote
10. Import/export an EndNote library
11. Use the group options to manage references

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Use EndNote to store details of reference material
2. Online searching of references in Library databases using EndNote
3. Import records from Library databases using EndNote
4. Insert citations from EndNote into a Word document
5. Insert references manually into EndNote
6. Insert and edit references in a Word document
7. Change the format of the citation style of a Word document
8. Remove EndNote field codes to obtain a plain Word document
9. Create a bibliography from EndNote
10. Import/export an EndNote library
11. Use the group options to manage references

Resources:
EndNote http://my.clevelandclinic.libguides.com/endnote
EndNote Online User Guide http://endnote.com/support/online-user-manual/x6

| Topic 11 | : Writing Tips - Personal Perspective and Interactive Discussion |
| Teaching-Learning Method | : Lecture |
| Speaker | : Avraham Harlev, MD, Stefan du Plessis, PhD |

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
Ability to initiate and proceed with a scientific writing assignment

**Skills:**
Ability to disseminate scientific ideas through manuscript writing

**Attitude:**
Feelings of encouragement, positivity and confidence pertaining to the writing process

**Contents / Content Synopsis:**
Sharing of personal experiences and foundational knowledge and skills needed to comprehend the topic of successful scientific writing
Open ended question and answer session

<table>
<thead>
<tr>
<th>Topic</th>
<th>Scientific Writing Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Individual Work Under Direct Mentorship</td>
</tr>
<tr>
<td>Speaker</td>
<td>CRM Research Fellows</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**

From this hands-on practical experience, Interns should be able to understand and:

**Knowledge:**
Define the principles and participate in the writing of scientific research projects for two SpringerBriefs books in reproductive medicine topics:

**Book 1: Oxidative Stress In Human Reproduction – Sheding Light On A Complicated Phenomenon**
1. Overview & sources of reactive oxygen species in the reproductive system
2. Methods to measure reactive oxygen species (and TAC) in the reproductive system
3. Physiological role of reactive oxygen species in the reproductive system
4. Negative effects of oxidative stress in the reproductive system
5. Extrinsic factors inducing oxidative stress in the reproductive system
6. Pathological role of reactive oxygen species in complications/diseases related to the reproductive system
7. Therapeutic role of antioxidants (AOX) in the treatment of infertility

**Book 2: Non-Communicable Diseases and Their Impact On Fertility**
1. Cardiovascular diseases
2. Cancers
3. Diabetes
4. Obesity
5. Pituitary, thyroid and adrenal disorders
6. Mental health
7. Gastrointestinal diseases
Skills:
1. Conducting proper scientific writing
2. Functioning effectively as a member of a research team
3. Processing and analyzing data obtained from prior research papers
4. Comprehending and disseminating research information

Attitude:
1. Develop respect for others
2. Ability to communicate and collaborate with others
3. Understand the relationship between science and society
4. Ability to communicate science and present evidence

Contents / Content Synopsis:
1. Scientific writing research projects (refer to PDF #73: Scientific Writing Projects)
9.5 BENCH RESEARCH & TRAINING

**Topic 1**

: The Basic Semen Analysis: Interpretation of Results by WHO 5th Edition

**Teaching-Learning Method**

: Lecture

**Speaker**

: Stefan du Plessis, PhD

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**

1. Appreciate the reasons for establishing WHO reference values
2. Define the different sperm parameters to be measured
3. Explain the reference values and discuss the interpretation thereof

**Skills:**

Basic idea as to how to interpret a spermiogram

**Attitude:**

None

**Contents / Content Synopsis:**

1. Techniques and parameters forming part of the basic semen analysis
2. WHO reference values for semen analysis

---

**Topic 2**

: Use and Care of the Microscope

**Teaching-Learning Method**

: Lecture

**Speaker**

: Kevin Ryan

**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**

1. Define different types of microscopes and microscope techniques used during the normal semen analysis.
2. State the basic components of a light microscope
3. Describe the basic setup for analyzing an unstained semen sample
4. Describe the basic setup for analyzing a stained semen sample

**Skills:**

1. Basic understanding of light microscopy
2. Ability to set up and focus a microscope for phase contrast and bright-field microscopy
Attitude:
None

Contents / Content Synopsis:
1. Differences between microscopes and microscopy techniques
2. Components of a microscope
3. Handling and care of microscopes

<table>
<thead>
<tr>
<th>Topic 3</th>
<th>: Antibody Development &amp; the Hybridoma Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture, Tour</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Earl Poptic, PhD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Discuss antibodies, antigens
2. Describe types of antibodies
3. Discuss the differences between monoclonal and polyclonal antibodies
4. Describe the uses of antibodies
5. Define hybridoma
6. Describe the uses of hybridoma technology

Skills:
Appreciate the uses of hybridoma technology

Attitude:
None

Contents / Content Synopsis:
1. Antibodies, antigens
2. Types of antibodies
3. Differences between monoclonal and polyclonal antibodies
4. Uses of antibodies
5. Hybridoma
6. Uses of hybridoma technology

<table>
<thead>
<tr>
<th>Topic 4</th>
<th>: Introducing Oxidation Reduction Potential (ORP): A Global Measure of Oxidative Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Josh Disbrow, MBA</td>
</tr>
</tbody>
</table>
Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Define reactive oxygen species and antioxidants
2. Explain oxidative stress
3. Describe oxidation reduction potential and how it can be used as a measure of global oxidative stress

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Reactive oxygen species, antioxidants and oxidative stress
2. Oxidation reduction potential as a measure of global oxidative stress
BENCH RESEARCH TRAINING (PRACTICAL)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Basic Training in Core Bench Skills (Use of Balance, Micropipettes and Microscope)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Small Group Tutorial</td>
</tr>
<tr>
<td>Speaker</td>
<td>CRM Research Fellows</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:

From this lecture, Interns should be able to understand and:

Knowledge:
1. Define laboratory safety
2. Identify the basic components of an electronic micro balance
3. Describe how to operate an electronic micro balance correctly
4. Explain the correct procedure to use a micro-pipette
5. Describe how to accurately pipette different volumes
6. Explain the basic methods of using a balance, micropipettes and microscope

Skills:
Demonstrate the ability to correctly use a balance, different micro-pipettes and a microscope

Attitude:
None

Contents / Content Synopsis:
1. The basic components of an electronic micro balance.
2. How to operate an electronic micro balance correctly
3. The correct procedure to use a micro-pipette
4. How to accurately pipette different volumes
5. The correct procedure to use a microscope

Specific Learning Outcomes:

From this hands-on practical experience, Interns should be able to understand and:

Knowledge:
1. The methods used in an Andrology Laboratory to perform a basic semen analysis
Skills:
1. Handling and treating of a semen sample after collection
2. Recording macroscopic andrology parameters (including the measuring of volume, pH, viscosity, liquefaction)
3. Measuring microscopic andrology parameters (including concentration, motility, viability and morphology)

Attitude:
None

Contents / Content Synopsis:
1. The basic semen analysis

<table>
<thead>
<tr>
<th>Topic</th>
<th>: Bench Research Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Group Work &amp; Practical Experience Under Direct Mentorship</td>
</tr>
<tr>
<td>Speaker</td>
<td>: CRM Research Fellows</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:

From this hands-on practical experience, Interns should be able to understand and:

Knowledge:
Define the principles of andrology research projects:
1. *In Vitro Protective Effects Of Ascorbate On Heat Induced Generation Of Reactive Oxygen Species On Sperm Functions*
2. Reactive Oxygen Species-Induced Post Translational Modifications In Spermatozoa Proteins And Its Effect On Sperm Function
3. Establish The Levels Of Oxidative Degradation Of Natural And Synthetic Oils Used In Personal Care Products Using Human Sperm As A Biological Screen
4. The Impact Of Methylphenidate Hydrochloride, The Active Ingredient Of Ritalin, On Sperm Viability, Motility And Oxidative Stress – An In Vitro Study
5. Validating Oxidation-Reduction Potential In Fresh And Frozen Semen Samples With The Redoxsys® Diagnostic System

Skills:
5. Conducting proper bench research
6. Functioning effectively as a member of a research team
7. Processing and analyzing data
8. Comprehending and disseminating research information

Attitude:
5. Develop respect for others
6. Ability to communicate and collaborate with others
7. Understand the relationship between science and society
8. Ability to apply the process of science

Contents / Content Synopsis:
2. Research project protocol (refer to PDF #76: Final Master Bench Research Projects)
9.6 PUBLIC SPEAKING & TRAINING

<table>
<thead>
<tr>
<th>Topic 1</th>
<th>Public Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Sylvia Morrison, BA</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe the general steps for successful public speaking
2. Discuss how to generate content ideas quickly
3. Discuss how to prepare and organize content
4. Describe how to enhance a talk with creative sizzle
5. Discuss how to control nervousness/convey confidence
6. Describe how to create exciting visual aids
7. Discuss how to be enthusiastic, interesting and knowledgeable
8. Describe how to captivate with steak (information), sizzle (stories, humor, examples) and style (gestures, appearance, voice)
9. Discuss the 10 terrible turn-offs
10. Explain how to connect with the audience
11. Explain how to use a presentation planner

Skills:
1. Employ professional communication methods
2. Use proper presentation techniques

Attitude:
1. Demonstrate awareness of formal communication and presentation techniques

Contents / Content Synopsis:
1. General steps for successful public speaking
2. Quick generation of content ideas
3. Preparation and organization of content
4. Enhancing the presentation with creativity
5. Controlling nervousness/conveying confidence
6. Creating exciting visual aids
7. Being enthusiastic, interesting and knowledgeable
8. Captivating with steak (information), sizzle (stories, humor, examples) and style (gestures, appearance, voice)
9. The 10 terrible turn-offs
10. Connecting with your audience
11. Using a presentation planner
Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Display the knowledge acquired during Topic 1 Public Speaking lecture

Skills:
1. Use proper presentation techniques
2. Employ slides that enhance the presentation
3. Display adequate subject knowledge
4. Ability to utilize time adequately

Attitude:
1. Demonstrate confidence, enthusiasm and connecting with the audience.

Contents / Content Synopsis:
1. Material received during Topic 1: Public Speaking lecture
9.7 PERSONAL AND PROFESSIONAL DEVELOPMENT

<table>
<thead>
<tr>
<th>Topic 1</th>
<th>Overview of Diversity and Cultural Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Donna Skurzak, MA, LSW, CDP</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Define diversity and inclusion
2. Describe the layers of diversity
3. Differentiate between types of communication
4. Identify unconscious bias
5. Discuss cultural perspectives and how it impacts the workplace
6. Differentiate between good decisions and quality decisions
7. Describe healthcare disparities
8. Discuss national CLAS standards
9. Explain culturally competent characteristics

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Layers of diversity
2. Communication – intent vs. impact
3. Unconscious bias
4. Cultural perspective and how it impacts the workplace
5. Decisions – good vs quality
6. Healthcare disparities
7. National CLAS standards
8. Culturally competent characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Sgt. Stanley Kaczynski &amp; Officer Derrick Dark</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Discuss the mentality of a criminal
2. Discuss factors that go into the selection of a victim
3. Describe the common types of crime against women, seniors
4. Explain the prevention of violent crimes
5. Identify techniques of self-protection
6. Describe the different categories of suspiciousness
7. Recognize intuition and self defense
8. Identify crime prevention methods
9. Describe A.L.I.C.E.
10. Discuss workplace violence
11. Discuss safety tips and being 'streetwise'

Skills:
1. Self-awareness and self-protection

Attitude:
None

Contents / Content Synopsis:
1. Mentality of a criminal
2. Selection of a victim
3. Common types of crime against women, seniors
4. Prevention of violent crimes
5. Self-protection
6. Categories of suspiciousness
7. Intuition and self defense
8. Crime prevention
9. A.L.I.C.E.
10. Workplace violence
11. Safety tips and being 'streetwise'

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Discuss the causes and impact of chronic diseases
2. Describe the management of chronic diseases
3. Identify employee health costs
4. Discuss the incentives Cleveland Clinic provide their employees to help themselves
5. Describe the steps to sustaining a younger you
6. Discuss how to change your environment to change your life

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Causes and impact of chronic diseases
2. Management of chronic diseases
3. Employee health costs
4. Incentives to help employees help themselves
5. Steps to sustaining a younger you
6. Changing your environment to change your life

<table>
<thead>
<tr>
<th>Topic 4</th>
<th>: My Life as a 2010 Summer Intern: A Personal Journey of Challenges and Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Interactive Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Anthony H. Kashou, BS</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Discuss tips to minimize ‘culture’ shock
2. Describe how Cleveland Clinic differs from previous experiences
3. Discuss the struggles and challenges faced
4. Discuss the joys and rewards reaped
5. Recognize why the Interns efforts are all worth it

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. Personal academic path
2. Personal journey to the Summer Internship program
3. Anthony shares some pointers from his personal experience as a past Intern and in having served previously as an Internship Coordinator, on the various steps of the Internship.
<table>
<thead>
<tr>
<th>Topic 5</th>
<th>Tips On Getting Into US Medical Schools and Residency Programs</th>
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</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Interactive Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Botros Rizk, MD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Identify the various application procedures and steps involved in applying for Medical School and Residency programs
2. Discuss how to prioritize the skills and proficiencies to emphasize in the application process
3. Discuss how to compose a meaningful personal statement that makes a lasting impression
4. Describe how to develop a strategy for applying to different programs and schools

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
Dr. Rizk shares some pointers from his personal experience serving as a selection committee member, on the various application processes.

<table>
<thead>
<tr>
<th>Topic 6</th>
<th>So You Want To Do Research and Get Published</th>
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</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Interactive Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Stefan du Plessis, PhD, Rakesh Sharma, PhD, Ashok Agarwal, PhD, Avraham Harlev, MD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. List the different steps of the lifecycle of scientific research
2. Discuss the pitfalls and important pointers to take cognizance of when planning and conducting research
3. Classify the different types of scientific manuscripts that can be published
4. Describe the lifecycle of a scientific publication

**Skills:**
1. Design a basic research project containing all the elements involved
2. Prepare and submit a manuscript for publication

**Attitude:**
None

**Contents / Content Synopsis:**
1. The steps and processes involved in designing and conducting a research product
2. The steps and processes involved in preparing different types of manuscripts for publication

<table>
<thead>
<tr>
<th>Topic 7</th>
<th>Aristotle - Godfather of Evidence Based Medicine</th>
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</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>Hassan N Sallam, MD, PhD</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes:**
From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Discuss medicine in ancient Egypt
2. Discuss medicine in ancient Greece
3. Identify Aristotle and the birth of logic
4. Discuss the old Alexandria school of medicine
5. Discuss the fall of Alexandria
6. Describe Arabian medicine in the middle ages
7. Describe Medicine in Europe during the Renaissance
8. Describe Medicine in Europe in the age of reason
9. Describe Modern western medicine
10. Discuss Archie Cochrane and evidence-based medicine (EBM)
11. Describe EBM and the logic of Aristotelis

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. Medicine in ancient Egypt
2. Medicine in ancient Greece
3. Aristotle – the birth of logic
4. The old Alexandria school of medicine
5. The fall of Alexandria
6. Arabian medicine in the middle ages
7. Medicine in Europe during the Renaissance
8. Medicine in Europe in the age of reason
9. Modern western medicine
10. Archie Cochrane and evidence-based medicine (EBM)
11. EBM and the logic of Aristotlis
9.8 CLEVELAND CLINIC & CENTER FOR REPRODUCTIVE MEDICINE

<table>
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<tr>
<th>Topic 1</th>
<th>: Twenty Years Of CRM - Research &amp; Accomplishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Ashok Agarwal, PhD; Rakesh Sharma, PhD; Sajal Gupta, MD</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Outline the 22 year history of Cleveland Clinic’s Center of Reproductive Medicine (CRM)
2. Identify the key research focus areas of CRM throughout the years
3. Describe the current research activities of the CRM
4. Recognize the future direction for research in CRM

Skills:
None

Attitude:
None

Contents / Content Synopsis:
1. 22 year history of Cleveland Clinic’s CRM
2. Key research focus areas of CRM throughout the years
3. Current research activities of the CRM
4. Future direction for research in CRM

<table>
<thead>
<tr>
<th>Topic 2</th>
<th>: Innovations at Cleveland Clinic</th>
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<tbody>
<tr>
<td>Teaching-Learning Method</td>
<td>: Lecture</td>
</tr>
<tr>
<td>Speaker</td>
<td>: Jeffrey Marshall, PhD</td>
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</table>

Specific Learning Outcomes:
From this lecture, Interns should be able to understand and:

Knowledge:
1. Describe the Cleveland Clinic culture of quality, innovation, teamwork, service, integrity, and compassion
2. Describe how to promote innovation via commercialization
3. Identify Cleveland Clinic’s past clinical innovations
4. Discuss the different types of innovations: medical devices, health IT, therapeutics and diagnostics
5. Describe the comprehensive approach to innovations - idea submission, need assessment, viability assessment, enhancement, negotiation, and translation
6. Discuss value proposition and outcomes

**Skills:**
None

**Attitude:**
None

**Contents / Content Synopsis:**
1. The Cleveland Clinic culture: quality, innovation, teamwork, service, integrity, compassion
2. How to promote innovation via commercialization
3. Cleveland Clinic’s past clinical innovations
4. Types of Innovations: medical devices, health IT, therapeutics and diagnostics
5. A comprehensive approach to innovations - idea submission, need assessment, viability assessment, enhancement, negotiation, and translation
6. Value proposition and outcomes

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<th>Topic 3</th>
<th>Cleveland Clinic Model of Practice in the 21st Century</th>
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<tr>
<td>Teaching-Learning Method</td>
<td>Lecture</td>
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<tr>
<td>Speaker</td>
<td>James Young, MD</td>
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**Specific Learning Outcomes:**

From this lecture, Interns should be able to understand and:

**Knowledge:**
1. Discuss the current dynamic state of the healthcare environment
2. Explain the need for creating a fully integrated healthcare delivery system
3. Describe the new integrated, patient-centered Cleveland Clinic model of healthcare practice
4. Discuss how the model drives efficiency by providing a continuum of care delivery model based on a tiered system
5. Discuss how the model emphasizes accountable care by putting patients at the center of an interlinked network that gives patients access to a full range of services
6. Discuss how the model upholds quality by practicing honest, transparent self-evaluation to measure outcomes and identify problem areas
7. Discuss how the model employs a staff structure where the emphasis is on teamwork, and by a patient needs-oriented approach of an institute structure, promotes innovation and efficient use of resources

**Skills:**
None

**Attitude:**
None
Contents / Content Synopsis:
1. The current dynamic state of the healthcare environment
2. Creating a fully integrated healthcare delivery system
3. The new integrated, patient-centered Cleveland Clinic model of healthcare practice
4. Driving efficiency: a continuum of care delivery model based on a tiered system
5. Emphasizing accountable care: putting the patient at the center of an interlinked network that gives patients access to a full range of services
6. Upholding quality: honest, transparent self-evaluation to measure outcomes and identify problem areas
7. Employing a staff structure: emphasis is on teamwork, patient needs-oriented approach of the institute structure promotes innovation and efficient use of resources

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<th>Topic 4</th>
<th>: Introduction to Glickman Urological and Kidney Institute (GUKI)</th>
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<tr>
<td>Teaching-Learning Method</td>
<td>: Interactive Discussion</td>
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<td>Speaker</td>
<td>: Eric Klein, MD</td>
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Contents / Content Synopsis:
Dr Klein is the Chariman of the Glickman Urological & Kidney Institute (GUKI). He will provide information on the service delivery of the institute and share his personal journey in clinical medicine
10. INTERNSHIP DAILY SCHEDULE

Refer to PDF #67: Master Daily Schedule