Imperial Andrology Centre
London, UK

EUROPEAN ACADEMY OF ANDROLOGY

EAA Andrology Training Center

Centre Report

2020

Imperial Andrology
Department of Urology,
Imperial Healthcare Trust
Fulham Palace road
Hammersmith
London
W6 8RF
Tel: 020 3311 1234
Email: Suks.Minhas@nhs.net

Director & Head of Surgery: Mr. Suks Minhas, Consultant Andrologist
Co-Director, Head of Reproductive Endocrinology & Andrology Laboratory: Dr Channa Jayasena
Head of Sexual Medicine: Dr David Goldmeier
Head of Reproductive Medicine: Mr Rajendra Rai
Head of IVF: Mr Rehim Selim

CENTRE REPORT

Charing Cross Hospital
Fulham Palace Road
London W6 8RF
020 3311 1234

Hammersmith Hospital
Du Cane Road
London W12 0HS
020 3313 1000

Queen Charlotte's & Chelsea Hospital
Du Cane Road
London W12 0HS
020 3313 1111

St Mary's Hospital
Praed Street
London W2 1NY
020 3312 6666

Western Eye Hospital
Marylebone Road
London NW1 5QH
020 3312 6666

History of the Centre

The Wolfson Fertility Centre at Hammersmith Hospital was established by Professor Lord Robert Winston in 1982. It provided one of the first and largest fertility services in the UK. It became quickly obvious that a strong partnership to this world-renowned service was required and therefore an equally durable andrology service was developed at the Hammersmith Hospital, by a clinical scientist Dr Kevin Lindsay. The service derived from a fertility clinic at the gynaecology unit of Queen Charlotte's hospital, The Chelsea Hospital for Women, which from the 1970s recognised the need for the investigation of male partners by specialists. Urologist William "Bill" Hendry and Dr Louis Hughes offered investigation of male partners and treatment with donor sperm, which was subsequently expanded by the addition of IVF by Mr Keith Edmonds and Dr Lindsay.

Relocated to Hammersmith Hospital, the Andrology laboratory subsequently worked in collaboration with Urologists Mr Paul Abel, Mr Gordon Williams and Mr Jonathan Ramsay. It continues to provide an excellent service by internationally acclaimed Mr Jonathan Ramsay male fertility specialist. Further collaboration with another internationally renowned andrological specialist Mr Suks Minhas, previously from University College London, has led to the rapid expansion of the unit as a tertiary referral centre. Adjacent to the IVF unit is the Andrology unit based at the Hammersmith Hospital.

By the mid 90's Mr Jonathan Ramsay joined the team and took over as HFEA license holder. He further developed the service to carry out testicular biopsy and subsequently FNA testicular mapping and microTESE.

The main unit remains at the Hammersmith site. However, the team now includes andrological endocrine specialist Dr Channa Jayasena who is an international expert and key opinion leader. He is head of the laboratory unit and is a critically acclaimed academic who has initiated and leads several national and international trials. Dr Channa Jayasena was initially trained by Sir Stephen Bloom and subsequently by Jonathan Ramsay, now leads the Hammersmith site. A large laboratory team, including embryologists, is led by Lia Joannou, an extremely experienced embryologist. There is stringent adherence to regular audit and national guidelines, as it is one of the highest volume centres in the UK and a large number of semen analyses pass through the department a year. Mr Suks Minhas has continued in this line of pioneering work in male fertility having extensively published in peer reviewed, high impact journals, written chapters and books on the area, as well as being an invited speaker, and chair throughout the world. He has further developed the surgical Andrology service and has attracted considerable research funding. He specialises in andrology and genital reconstructive surgery and is one of the only full-time andrological surgeons in the UK. He was awarded the prestigious Karl Storz Telescope award. The award is given to urologists within ten years of their first consultant appointment, who have made a significant and lasting contribution to British Urology.

The Andrology Laboratory provides the service for all oncological patients throughout the South of the UK. It adheres to HFEA standards and is the lead in tissue banking, genetics and endocrinological research in male fertility. Under the supervision of Monica Filipa de Brito Figueiredo a dedicated outpatient session with follow up at 1, 2, 3 and 5 years for oncological patients seeking sperm cryopreservation has been established. Since 2016 and under strict guidelines, sperm has been transported to other IVF units.

Mr Suks Minhas and the team offer a surgical service for male infertility and andrological conditions including hormone stimulation, sperm analysis, diagnostic imaging in Andrology, with expert radiologists. There is also a similar service for erectile dysfunction, penile curvature, varicocele and other inguino-scrotal pathology. The unit also provides penile reconstructive surgery and is a regional and tertiary referral centre for penile implants and penile reconstruction. The unit is also works closely with the germ cell tumour service at Imperial College Healthcare. Services developed and offered include testis sparing surgery and Onco mTESE with published outcomes. Furthermore an emergency surgical service is offered for surgical sperm retrieval for adults and children with cancers. Our sperm bank was established in 1976.

Under the supervision of Dr Channa Jayasena, endocrinological investigation and treatment service, dietician, hormone stimulation and specialist prolactinoma service has been established for a number of years. Dr David Goldmeier and Specialist Nurse Agnes Mosobela provide a specialist service to male infertility (psychological support), penile curvature, premature ejaculation, erectile dysfunction, body

dysmorphia, as well as substance misuse men. There is also close collaboration with the functional urologists and gender reassignment specialists (Mr Roland Morley and Ms Tina Rashid), pediatricians and genetic experts (Dr Harry Leitch), cancer specialist (Professor Michael Seckl, Professor David Nicol, Professor Nicolas Watkin and Mr Declan Cahill), Genetic counselors (Professor Kate Brown), Neurophysiologist, and Uro-radiologist (Professor Adrian Lim).

There is a fully integrated service with the Sexual health and Psychological support colleagues on a cross-site basis. This includes patients with body dysmorphia, psychological sexual dysfunction, premature ejaculation as well as other psychosexual disorders.

The IVF service is led by Mr Rehan Salim, consultant gynaecologist and head of reproductive medicine, and supported by consultants Mr Stuart Lavery, Miss Lisa Webber, Miss Monica Mittal and Mr Raj Rai. The doctors are all internationally renowned in their field.

The Sperm Bank is recognised as the main bank for all pre oncological sperm banking prior to treatment for the South of England. It is also the site for sperm banking for chronic systemic illness, and assisted conception for both self-funding and NHS patients.
The Wolfson Fertility Centre at Hammersmith Hospital, established by Professor Lord Robert Winston in 1982, provides one of the first and largest fertility services in the UK. The IVF centre is recognised as a national centre but is also used as an international facility by patients. It works in unison and close collaboration with the reproductive endocrinologists and Urologists. Sperm cryopreservation, diagnostic semen analysis and treatment of couples with ART occurs at the Hammersmith site. There are joint clinics occurring in Queen Charlotte Hospital with both gynaecologists and andrologists; there are also joint clinics with the Endocrine team to support expert management. The unit offers a comprehensive range of fertility options including in-vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI) and reproductive surgery. Since the Centre opened it has been at the cutting edge of reproductive medicine and fertility treatments, having been the first to perform many of the treatments that are now standard across the world, such as pre-implantation genetic diagnosis (PGD). The close association with Imperial College London allows the team to offer our patients pioneering treatments and technology. The range of specialist fertility services includes treatment for medically complex cases and fertility preservation prior to chemotherapy.

The laboratory is under stringent control and adheres to the highest standards. All HFEA forms are completed prior to banking and guidelines are followed. It is open to random external auditing and is formally audited twice a year.

Psychological support for men, women and couples is under the supervision of David Goldmeier, an international expert in sexual dysfunction. This is a high volume centre, which was established in the 1980s. The team consists of names Dr David Goldmeier (sexual health), Dr Ali Mears (consultant), Agnes Mosobela (Specialist Nurse), Sasha Whaley, Agnes Kocsis, and John Helps (Psychologists), Mauro Prospero (Psychologist) and Sarah Wolujewicz (Senior pelvic floor physiotherapist). The unit hosts many

international fellows, and Dr Goldmeier regularly lectures both nationally and internationally as an invited guest. It is currently the principle UK centre in 2 randomised controlled trials. All the clinicians have an extended role to provide an award winning service.

In the future there will be closer collaboration with the formation of joint clinics between endocrinology and andrology (Hammersmith Site) as well as sexual medicine and andrology (Charing Cross Site), directed by Mr Suks Minhas.

The EAA training centre (Imperial Andrology Centre) is supported by 4 integrated sub-specialty units:

1. **Department of Urology and Andrology**

The urology service provides expert diagnosis and treatment for a wide range of urological conditions at Charing Cross Hospital, Hammersmith Hospital and St Mary's Hospital. The service has the country's leading Clinicians in terms of outcomes and are at the forefront of research and innovation in Urology. We try to run our clinics in a one-stop model wherever possible to reduce the number of times patients have to attend the hospital, and we have a designated outpatient diagnostic unit for urology.

Charing Cross Hospital's urology department is the designated centre for urological malignancy in the West London Cancer network and is home to the West London Cystectomy Centre for bladder cancer. It is also the supra-regional testis cancer centre and offers retroperitoneal lymph node dissection for post-chemotherapy residual masses, fertility preservation, testis sparing surgery and Onco-TESE.

Imperial urology is the lead provider of urology specialist training for registrar grade doctors in North London. It is a supra-regional centre for Andrology, focal therapy, urological malignancy and testis cancer.

The Andrology surgical service has been established for almost 30 years and offers state of the art diagnostic treatments. There are currently 3 surgeons across the sites offering a comprehensive service in Male fertility, penile and genital reconstructive surgery (incl Peyronie's disease) and penile prosthetics. The unit is at the forefront of technical innovation and research in Andrology in the UK and internationally.

2. **The Wolfson Fertility Centre**

The centre was established by Professor Lord Robert Winston in 1982, provides one of the first and largest fertility services in the UK. We offer a comprehensive range of fertility options including in-vitro fertilisation (IVF), intracytoplasmic sperm injection (ICSI) and reproductive surgery. Since the Centre opened we have been at the cutting edge of reproductive medicine and fertility treatments, having been the first to perform many of the treatments that are now standard across the world, such as pre-implantation genetic diagnosis (PGD). Our close association with Imperial College London allows us to offer our patients pioneering treatments and technology.

Our services are available for NHS patients as well as those who are self-funding their IVF treatment. We work closely with colleagues in other specialties at the Trust and our range of specialist fertility services includes treatment for medically complex cases and fertility preservation prior to chemotherapy.

The service is led by Mr Rehan Salim, consultant gynaecologist and head of reproductive medicine,- Mr Raj Rai. and supported by consultants Dr Stuart Lavery, Miss Lisa Webber, Miss Monica Mittal and The doctors are internationally renowned in their field.

3. Sexual Medicine Clinic

The Jefferiss Wing at St Mary's Hospital is an internationally renowned centre of excellence for the diagnosis, treatment and care of people with problems in sexual health and function, offering both outpatient and inpatient services. The clinical lead Dr Goldmeier and his team offer treatments for all sexual medicine related problems including erectile dysfunction, ejaculatory disorders, psychosexual therapy and genital pain service.

The service also provides a comprehensive range of specialist consultant-led clinics, to which GP referrals are welcome. We offer diagnosis and treatment for all sexual medicine problems, sexually transmitted infections and related sexual health issues. There is also a specialised clinic for female sexual dysfunction.

The Jefferiss Wing clinical trials centre is one of the few purpose-built centres in the UK for undertaking clinical trials as well as conducting research in sexual health and HIV, including testing new treatments diagnostics and prevention strategies. The sexual medicine clinic is lead by Dr David Goldmeier.

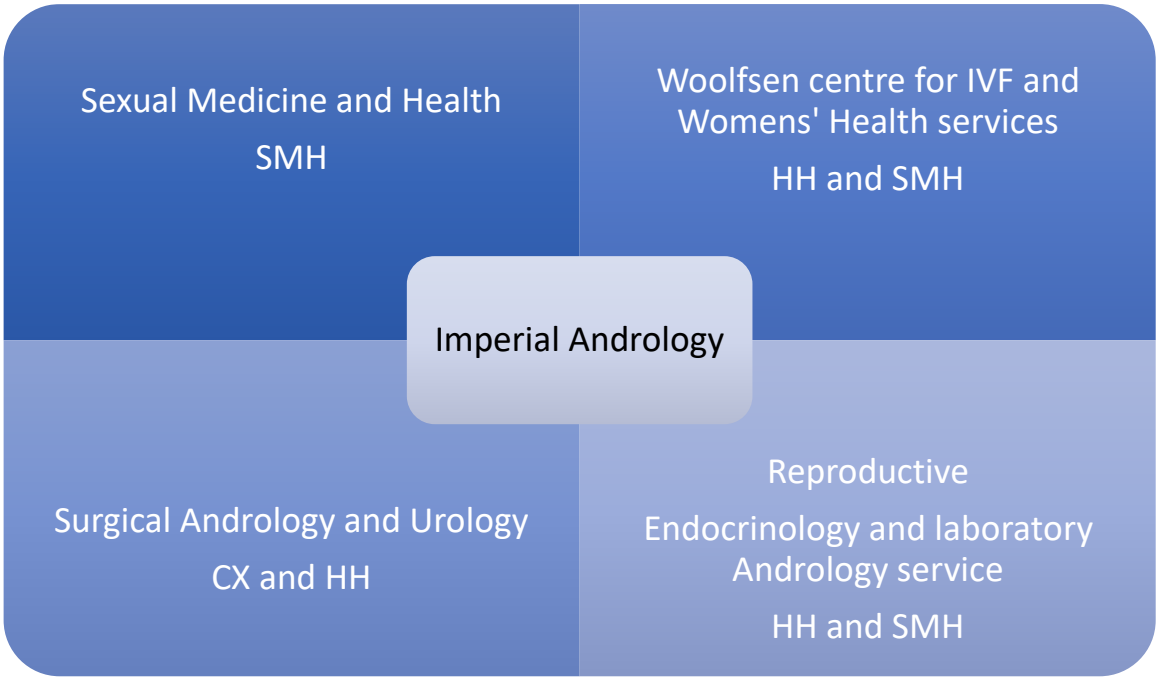
4. Reproductive Endocrinology and Laboratory Andrology

Imperial has an internationally leading endocrinology department, which has conducted some of the top research trials in reproductive endocrinology in the current decade (Jayasena et al. J Clin Investigation 2014; Prague et all Lancet 2018). It is led by Dr Channa Jayasena, who has national expertise in testosterone replacement, male infertility, Kallmann syndrome and normosmic congenital hypogonadotrophic hypogonadism, pituitary failure, obesity and diabetes related male infertility and congenital adrenal hyperplasia. Imperial is the UKs largest centre for spermatogenesis induction for men with hypogonadotrophic hypogonadism. The service also treats female reproductive endocrine problems including infrequent or absent menses, menopausal problems related to disorders of the hypothalamic-pituitary-ovarian axis, including polycystic ovary syndrome (PCOS), hypothalamic amenorrhoea and premature ovarian insufficiency. The reproductive endocrine service closely works with the Imperial Weight Centre and Imperial's, pituitary, neuroendocrine, endocrine oncology, thyroid, parathyroid, and molecular endocrinology services which serve a 2 million people in the South-East of England and London.

The Andrology Laboratory conducts sperm cryopreservation for cancer, inflammatory disorders, gender reassignment, and infertility, and currently holds approximately 30,000 samples in its sperm bank. The lab is one of the only UK labs in the country to offer WHO diagnostic semen analysis, semen reactive oxygen species (ROS) and sperm DNA fragmentation assays. Furthermore, the lab has led pioneering clinical research studies suggesting that male partners of women with recurrent pregnancy loss (RPL) have substantially increased risk of abnormal sperm DNA fragmentation and elevated semen ROS when compared with unaffected men (Jayasena et al. Clin Chem 2019).

Imperial Andrology and services

CX- Charing Cross Hospital
HH-Hammersmith Hospital
SMH- St Marys Hospital



Organization of Centre

Organization charts legend: Department / Unit Structure

Unit name
Imperial Andrology, Imperial College Healthcare Trust, Fulham Palace Road London W6 8PE,

Director: Mr Suks Minhas – **Co-Director:** Dr Channa Jayasena

Staff:

Andrology and Urology
Mr Suks Minhas
Mr Jonathan Ramsay
Ms L Vyas

Reproductive Endocrinology
Dr Channa Jayasena

Sexual Medicine
Dr David Goldmeier
Alison Mears

Reproductive fertility and

IVF Services
Mr Rehan Salim
Rajendra Rai
Mr Stuart Lavery
Lisa Webber
Monica Mittal

Clinical Fellows in Andrology
Mr Tharu Tharakan
Mr Musaab Yassim
Mr. Michael Ager
Mr William Maynard
Dr Emad Sindhi
Dr Aditi Sharma
Dr Linda Farahani
Dr Saifi Shaghayegh
Dr VanEyk

Nurses:
Roisin Warden
Martina Zurli
Monica Figueiredo
Agnes Mosobela

Psychologists:
Sasha Whaley
Agnes Kocsis
John Helps

Embryologists and lab:
Lia Joanniou
Dalia Khalifa
Ivy Floyd
Michelyn Duldulayo

Senior Physiotherapist:
Sarah Wolujewicz

Managers:
Lia Joannou
Lydia Salice
Harry Monaghan

Personal Assistants:
Alison Lenny
Jenna Heggaton

Clinical Services

Outpatient Clinics for all andrological conditions, Infertility, Sexual Medicine, couple, psychopathology of Sexual Dysfunction, Psychological counselling and Behavioural therapy, Female sexual dysfunction, Fertility surveillance clinic for oncology patients offering post treatment (chemotherapy/radiotherapy) semen analysis at 2, 3, & 5 years and Nurse led fertility surveillance clinic and Medical practitioner's consultation for HFEA 10 year extension of gamete storage.

Laboratory services offered:
Diagnostic Semen Analysis/ Retrograde analysis
Post vasectomy semen analysis
Cryopreservation of surgically retrieved specimens after surgery
Semen Cryopreservation/ Retrograde cryopreservation

Radiology: Ultrasound Doppler penis, scrotal and internal male genital tract, MRI penis and pelvic imaging, and embolisation of varicoceles.

Surgery: FNA, PESA, MESA, mTESE, micro surgical ligation of varicoceles, plication and grafting procedures for penile straightening procedures, scrotal surgery, penile prosthesis and penile reconstruction, testis sparing surgery and OncoTESE.

Contribution to EAA training Program
Diagnosis of Male Infertility
Ultrasound of male genital tract
Doppler ultrasound of male genital tract
MRI of penis with intracorporeal prostaglandin
Counselling of the infertile couple
Cryopreservation of sperm
Semen analysis
Genetics of Male infertility
Facilitate andrology rotations for embryologists on STP clinical scientist course
IBMS state registration portfolio
Ethics in Andrology
Surgical Andrology and reconstruction

Educational activities

The unit leads on several PhD, MD, and BSc programmes with an academic focus in medicine, biochemistry, genetics and embryology. The record in 2019 for the BSc students is 100% first class for their degrees with best prize for one student of 350 students. In 2020, there are currently 4 BSc students for 2 MSc students and 5 PhD students.
There are 2 clinical fellows and one national fellowship programme sponsored by industry.

The unit is involved in the Residency program of the School of Endocrinology for post graduates in Medicine, School of Urology for post graduate in Medicine and School of Paediatrics and Genetics. More recently, the Urology unit has developed an MSc and BSc in surgical innovation.
Suks Minhas is Co-chair of the EAU guidelines on Sexual and reproductive health and therefore the unit is at the forefront of evidenced based Andrology.
Suks Minhas has trained 15 Andrologists over the last 17 years, all who have become consultants in Andrology in the UK and beyond. The lead clinicians have facilitated post- graduate Masters, PhD and Masters courses. They have also co-facilitated and organised national and international courses on Andrology, Sexual Medicine and Endocrinology. The unit also provides specialist training to endocrinologists, urologists, gynaecologists, and general practitioners under the direction of Suks Minhas, Channa Jayasena, Jonathan Ramsay and David Goldmeier and Rehim Selim. The educational program of the post-graduate courses lasts at least 3 months but often can be up to 18 months. This includes weekly high quality teaching, journal club, tutored outpatients and surgical exposure to microTESE and penoscrotal complex procedures. The Surgical service has a national post CCT fellow and two surgical registrars. There are currently 5 doctorate fellows and a new BSc and MSc programmes commencing in 2019/2020 in surgical innovation.
The centre is also training psychologists and psychotherapists with an interest in sexual medicine, gender identity disorder and sexual dysfunction. Furthermore, the centre regularly trains undergraduate and postgraduate students in embryology, biotechnology and laboratory technical assistance and students in Medicine for their thesis. It also accommodates international fellows who routinely attend for education and training.
Dr. Jayasena is a Reader in Reproductive Endocrinology at Imperial College London. He is Academic Director of the Health Education England Foundation Programme for NW London, and was formerly Director of Clinical Studies (lead for undergraduate training) at Hammersmith Hospital between 2014-18.

The EAA centre status will facilitate the further development of EAA national and international courses and teaching programmes. It would also enable closer co-ordination with educational activities at other EAA centres.

Research activities

Studies and research play a significant role in the department. There are ongoing studies in endocrine, genetic, biochemical and pharmacological effects on male infertility as well as using novel technologies to enhance assessment and diagnosis. The unit is at the forefront of both clinical and laboratory trials.

Current Studies and Trials

Investigating the effects of caloric restriction of sperm gene expression and DNA methylation in obese men

Investigating the effects of weight loss on male fertility.

Investigating novel markers in male infertility: A prospective cohort study to identify the role of seminal microbiome, reactive oxygen species and sperm DNA fragmentation in male infertility

Investigating infertility in patients with loss of gonadal function.

Sperm Retrieval and Semen testing

Utilizing a novel method of semen oxidation-reduction potential measurement to assess male reproductive function.

Investigating whether genetic sequencing can be used to predict successful sperm retrieval following microsurgical testicular sperm extraction (mTESE) in men with non-obstructive azoospermia.

Investigating the clinical significance of genetic variants in men with non-obstructive azoospermia undergoing sperm retrieval following microsurgical testicular sperm extraction (mTESE).

Improving the care pathway for young men with infertility following cancer treatment.

Age, ethnicity, BMI, and other lifestyle factors effect on IVF outcomes from Lister Hospital, London.

Effects of different types of cancer on semen parameters, before newly diagnosed men with cancer receive oncological treatment in Hammersmith Hospital

Endocrine

Effects and Safety of Testosterone in Men with Low Testosterone levels: an evidence synthesis and economic evaluation. The TESTES (Testosterone Effects and Safety) Consortium.

Targeted caloric restriction to improve sperm quality in obese men with infertility.

Does the novel myeloperoxidase (MPO) inhibitor AZD5904 improve sperm function by reducing reactive oxidative stress (ROS) during obesity-induced male infertility?

Investigating the metabolic regulation of male fertility

Investigating the effects of diabetes on male fertility

Hormonal induction of spermatogenesis in Azoospermic patients i.e. use of Tamoxifen, clomid, gonadotrophins, testosterone gel.

Technology

Improving the care pathway for young men with infertility following cancer treatment.

DNA fragmentation and COMET in pregnancy outcomes

Psychological

Investigating the clinical impact of fertility surveillance on psychosexual support experienced by survivors of cancer.

Previous Research and Clinical trials

Previously conducted trials by the clinicians within the unit:

Reduced testicular steroidogenesis and elevated semen oxidative stress in male partners as novel markers of recurrent miscarriage

Prevalence of abnormal semen analysis and levels of adherence with fertility preservation in men undergoing therapy for newly diagnosed cancer: A retrospective study in 2906 patients

Prevalence of abnormal semen analysis and levels of adherence with fertility preservation in men undergoing therapy for newly diagnosed cancer: A retrospective study in 2906 patients

Increasing LH pulsatility in women with hypothalamic amenorrhoea using intravenous infusion of kisspeptin-54

Increasing LH pulsatility in women with hypothalamic amenorrhoea using intravenous infusion of kisspeptin-54

Increasing LH pulsatility in women with hypothalamic amenorrhoea using intravenous infusion of kisspeptin-54

Molecular biology of Penile Cancer

Clinical activities

Andrology and Sexology

In 2018, a total of 1,593, new referrals across 3 sites and 2,400 follow-up visits were performed in the centre. The outpatient activity and surgical throughput in increasing year on year and the surgical outpatient activity is tabulated below for 2019.

Clinical activities are divided into:

1) Andrological consultations, accounting for 72% of clinical activity. The remaining 28% is combined psychosexual together with andrological pathology.
2) A further reproductive endocrine team runs a weekly clinic.
3) Consultations for male infertility at the Centre of Reproductive Medicine, approximate 12% of the entire IVF activity.
4) A smaller portion of Gender dysphoria and female sexual dysfunction, account for clinical activity in the Sexual medicine department
5) Consultations for oncological patients who wish to preserve fertility, accounting for a large proportion of activity on the Hammersmith site.

The sexual dysfunction unit sees 450 (SMH) new patients annually. The team works with a biopsychosocial model, a multidisciplinary team meeting occurs twice a week and a range of complex cases are discussed. These include male sexual disorders, erectile dysfunction, decreased sexual desire, premature ejaculation, delayed ejaculation, Peyronies Disease, Hypogonadism and body dysmorphia.

In the Sexual Medicine and Andrology Unit, an ultrasound service is well established. Ultrasound is performed in the clinical management of patients referred to the Unit. In the centre, penile colour-doppler ultrasound, transrectal colour Doppler ultrasound of the male genital tract, testis colour-Doppler ultrasound, male mammary gland and thyroid ultrasounds are performed. Over 2000 ultrasounds have been completed in the last year. Furthermore, specialist MRI of the reproductive system is undertaken.

Since 2019/20, the following new clinical activities were introduced:
We are developing a one stop service for ED and male infertility patients aimed at completing during a morning session, the diagnostic workup (including andrological visit, penile colour Doppler ultrasound, blood sampling for evaluation of metabolic and hormonal status).
Outpatient clinics dedicated to men with malignancies take place daily, before starting treatments for cancer, all men in the South of England are referred to our Unit for sperm cryopreservation. Since 2018, a clinical andrological assessment is performed before sperm cryopreservation. In depth counselling is provided, assessment of risk for infertility, eligibility for fertility preservation method, methods and indications for assisted reproductive technology that might be needed in the future and, finally prognosis in terms of recovery of spermatogenesis after anti-cancer therapies. This is a service complimentary to sperm cryopreservation activated for supporting patients in obtaining correct information on fertility consequences of cancer.
A novel urgent Onco-TESE has also been developed as a semi-elective procedure within 48 hours of referral. Testis sparing surgery is routinely offered to our patients who are eligible for the procedure.
A patient support group is being developed for both oncological and benign patients suffering from ED or male infertility in both the adult and adolescent men. This will be launched this autumn.

The Centre takes advantage of the collaboration with psychiatrists, who had, during 2018, 180 new referrals and 540 follow up visits for psychiatric diseases in patients with sexual disorders and for the diagnostic assessment of the patients evaluated for gender dysphoria.

Furthermore, in the Unit, a service with psychologists for couple therapy of sexual problems or for real life experience in gender dysphoria subjects is available. In 2018 the psychologists performed over 400 visits.

Moreover, the Unit is involved in several international clinical trials dealing with male hypogonadal patients, erectile dysfunction patients and infertile patients (see above).

Assisted Reproduction Program

The Centre of Human Reproduction is well established (see above) to provide simultaneous andrological and gynaecological consultations for infertile couples. There are also further andrological consultations separate on both the Hammersmith and Charing cross site. 320 consultations were completed in 2018 for couples with male infertility in the assisted conception unit. Patients are also referred from the Sexual medicine unit as well as 3 other geographical units for male infertility and gametes extracted are transported to each of these units. There are international patients who seek consultations and surgery at the Hammersmith unit. This is under the strict guidance and authority of the HFEA, Human Fertilisation and Embryology Authority.

When assisted reproductive technology with male gamete donation is planned, the andrologist assesses and identifies men suitable for surgery after extensive investigations. In case that assisted reproductive technology with female gamete donation is planned, the andrologist evaluates the fertility health of the male partner.

Oncological patients

Oncological patients attending the clinic for cryopreservation of semen prior chemo/radiotherapy undergo to a complete andrological clinical assessment including standardized questionnaire, physical exam, hormone profile, and semen analysis prior to cryopreservation. A yearly andrological follow up is performed with semen analysis at 2, 3 and 5 years, firstly to ensure that cryopreservation is still required and also to address fertility questions. Patients who are affected by testis cancer, haematological as well as non haematolgical malignancies are invited to participate in the research programme (see in the dedicated paragraph in research section before).

Sperm Donation

We do not have a sperm donation facility.

Female Sexual Dysfunction

Dr Goldmeier has a particular interest in Female sexual dysfunction and therefore has an outpatient clinic dedicated to this. The service was first developed in the late 1980s. The team comprises of two sexual medicine clinicians, an endocrinologist, gynaecologists, two specialist nurses, psychologists, a pelvic physiotherapist and a pelvic neurophysiologist. Patients are referred both from primary care settings (general practitioner) and from other specialists (i.e. psychiatrist, neurologists, urologists). As a part of an active collaboration with the Female reconstruction urologist and Gynecology Unit, and in order to meet the growing demands of users, a service dedicated to the management of sexual dysfunction as well as a new medical treatment trial for these patients. Other prominent activities include evaluation of sexual symptoms in patients with eating disorders, severe obesity, neurologic diseases (i.e. multiple sclerosis), and sexually adverse effects of hormonal contraceptive therapy. Whenever appropriate in order to complete the diagnostic work-up, Doppler ultrasound of external genitals is performed, with evaluation of clitoral vascularization and EMG when indicated.

In addition to clinical activity, the Female Sexual Dysfunctions clinic members are involved in research, trials, teaching and training of medical and postgraduate students (see before).

Diagnostic Molecular Genetics

All diagnostic molecular genetic tests are requested at Great Ormond Street Hospital is the reference laboratory for London Genetics network and our local London centre.

It provides characterisation of cell lines for Y chromosome microdeletions, CFTR genes mutations and other chromosomal abnormalities. It undergoes annual validation of selected samples for external quality control.

Sperm analysis & Cryobanking

The laboratory is a Regional Reference Centre for Semen Cryopreservation with a total of more than 2000 samples currently cryopreserved. See above

The centre is of the highest quality and undergoes Quality Control under the hospital governance and GCP process as well as national External Quality Control for sperm concentration, morphology and motility; in line with HFEA standards.

Type of Centre

University	X
University Hospital	X
Private Centre	

Other (please specify)

1a. Director Suks Minhas

Academician [X] Affiliated Member [ ] Clinical Andrologist [ ]

1b. Co-Director Channa Jayasena

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

2a. Clinical responsible

Rehim Selim , Consultant Gynaecologist

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

2b. Clinical responsible

Rajendra Rai, Consultant Gynaecologist

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

2c. Clinical responsible

David Goldmeier, Consultant in Sexual Medicine

Academician [ ] Affiliated Member [ ] Clinical Andrologist [ ]

3. Present Staff *(Senior Scientists)*

1) Name Lia Joannu
Degree BSc
Speciality Embryology

Academician ☐ Affiliated Member ☐ Clinical Andrologist ☐

Insert any additional staff below *(if required)*

MD/Biologists/Chemists

1) Name Dalia Khalifa
Degree Researcher BSc
Speciality Embryologist
Full time/part time Full time

Academician ☐ Affiliated Member ☐ Clinical Andrologist ☐

Insert any additional staff below *(if required)*

Specialists

1) Name
2) Name
3) Name
4) Name
5) Name

PhD Students

1) Name Tharu Tharakan - MD – Clinical
2) Name Emad Sindhi, - MD – Medical doctor
3) Name Linda Farahani – MD Gynaecologist
4) Name Aditi Sharma – MD Endocrinologist
5) Name Saifi Shaghayegh – MSc Scientist

Resident Students

1) Name Musaab Yassin

2) Name Michael Ager
3) Name William Maynard

Nurses

1) Name Roisin Warden
2) Name Monica Figueiredo
3) Name Martina Zurli
4) Name Agnes Mobosala

Laboratory Technicians Ivy Floyd

1) Name
2) Name

Administrative Personnel

1) Name Sarah Stevens
Jenna Heggaton

2) Name

4. Clinical Activity

IVF

In 2018, there were 890 fresh egg collections and 492 frozen embryo transfers.

The following statistics relate to the period April 2018 to September 2018.

Fresh embryo transfer: ICSI

Age	Wolfson fertility centre rate	National rate
Under 38	41%	38.4%
38 and over	30.4%	21.6%

Fresh embryo transfer: IVF

Age	Wolfson fertility centre rate	National rate
Under 38	31.5%	34.2%
38 and over	21.6%	19%

Frozen embryo transfer

Age	Wolfson fertility centre rate	National rate
Under 40	46.4%	32.2%
40 and over	27%	23.6%

A. Outpatients: Consultations per year in the last year for **Surgical Andrology** consultants 2019 (this does not include SMH and HH sites for reproductive medicine or Womens Health).

	2018 Qtr4 Oct	Nov	Dec	2019 Qtr1 Jan	Feb	Mar	Qtr2 Apr	May	Jun	Qtr3 Jul	Aug	Sep	Qtr4 Oct	Nov	Dec	2020 Qtr1 Jan	Grand Total
Follow_Up	**81**	**97**	**93**	**129**	**101**	**114**	**144**	**146**	**155**	**160**	**157**	**158**	**126**	**153**	**201**	**195**	**2210**
Urology Andrology F/Up	16	17	17	31	25	21	29	10	31	32	15	16	9	11	17	19	316
Urology CNS F/Up														3	1	1	5
Urology ED F/Up	39	50	30	40	32	37	34	21	33	33	44	45	43	59	66	58	664
Urology F/Up	6	5	13	10		5	6	4		1	1	1	1		8	5	66
Urology General TestesErectileDysfunc Fu			1			1											2
Urology Nurse F/Up	12	16	16	20	20	41	49	80	64	44	54	73	50	63	87	74	763
Urology Nurse Telephone F/Up		2	5	3	2	2	3	2	4	8	11	1	2	3	3	2	53
Urology SPR Telephone F/Up			1							2	4	1	4	4	3	6	25
Urology Telephone F/Up	8	7	10	25	22	7	23	29	23	40	28	21	17	10	16	30	316
New	**57**	**90**	**82**	**69**	**41**	**66**	**91**	**31**	**45**	**80**	**84**	**70**	**43**	**97**	**99**	**103**	**1148**
Repro Male Fertility New																2	2
Urology Andrology New	20	44	41	26	18	17	20	11	4	12	7	15	7	43	15	19	319
Urology ED New	36	37	35	40	22	48	71	20	38	67	70	51	35	44	67	72	753
Urology General TestesErectileDysfunc Ne	1	4		1		1			2	1		1					11
Urology New		5	6	2	1				1		6	3	1	10	17	10	62
Urology Telephone New											1						1
Grand Total	**138**	**187**	**175**	**198**	**142**	**180**	**235**	**177**	**200**	**240**	**241**	**228**	**169**	**250**	**300**	**298**	**3358**

B. Outpatients: Types of consultations for Surgical Andrology (see below)

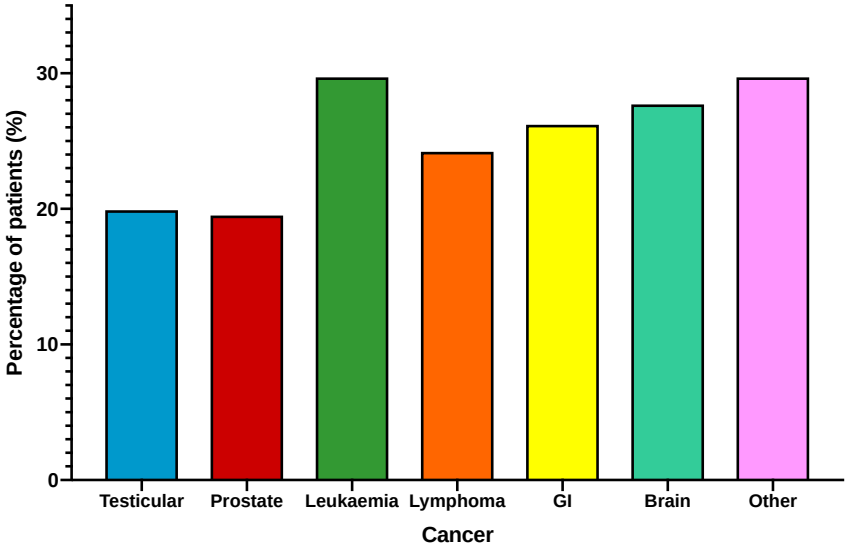
Type of patients by pathology	
Infertility (includes varicocele, cryptorchidism and Klinefelters)	30%
Erectile dysfunction	20%
Endocrine disorders	10%
Male sex accessory gland infections and pelvic pain	10%
Testicular Tumours	5%
Disorders of gender identity	5%
Penile Reconstruction and Peyronie's disease	20%

Surgical Andrology Procedures performed 2019 (approximate- does not include emergency surgery)

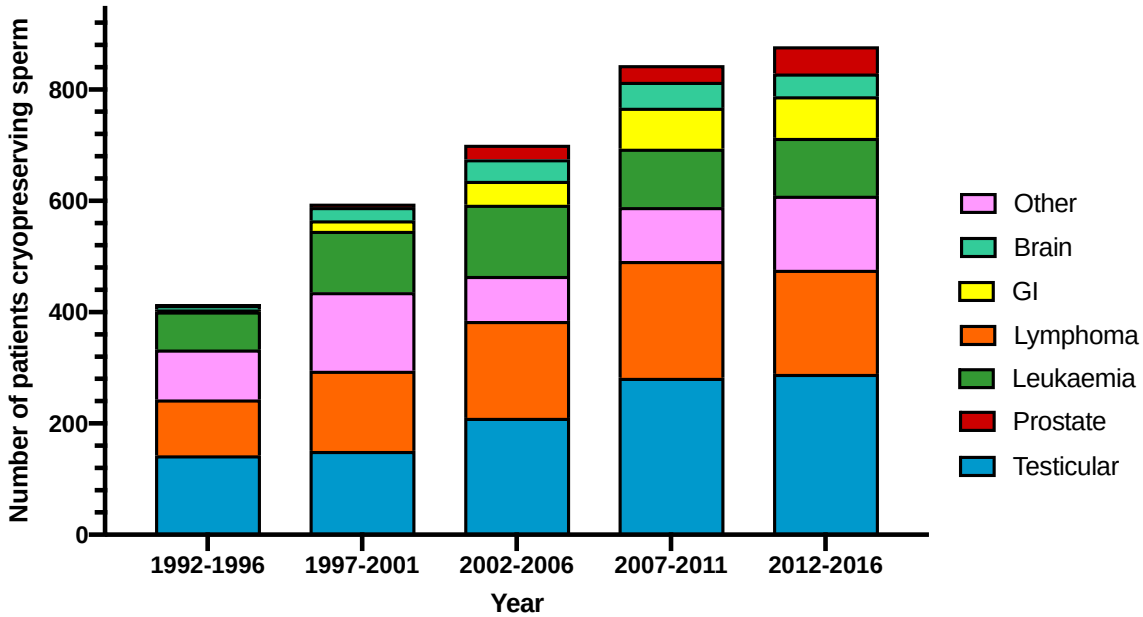
Vasectomy	28
Circumcision	55
Penille biopsy	9
Hydrocele repair	10
Biopsy of lesion of subcutaneous tissue	10
Excision of epididymal cyst	7
Urethral dilatation	2
Inflatable implants	34
Semi inflatable penile implant	11
Surgical varicocele ligation and embolisation	90
MESA/PESA	42
Radical Orchidectomy	16
Epididymo-vasostomy	3
mTESE	135
Testis sparing Surgery and USS guided biopsy	10
Peyronie's Surgery (plication and grafting)	32
Penile reconstruction including skin grafting	10

Total number of patients attending for sperm cryopreservation categorised by diagnosis

Type of Patients in attending to cryopreserve samples in Andrology Laboratory	
Testicular Cancer	1075
Prostate Cancer	113
Leukaemia's and Lymphomas	1330
Other cancers	915
Other non- cancer	271



Audit of sperm cryopreservation over 25 years at the Andrology department



C. Ultrasound (testis, penile, prostate)

Performed by Radiologists at all sites of the Trust: routine USS testis, penis doppler and prostat. In addition MRI of the genital region is performed in selected cases.
Approximately 1500 are undertaken in total at Charring Cross hospital.

5. **A**. Andrology laboratory activity (results for 2019 pending)

	2016	2017	2018
Semen analyses	3670	3575	4143
Sperm antibodies	1700	1700	1850
Seminal markers	TUNEL will be available 2020		

5. B. Andrology laboratory activity

Sperm banking donors	Yes	X
Sperm banking cancer patients	X	

5. C. Histopathological evaluation of biopsies Yes [X] No [ ]

5. D. Reproductive Hormones Assays Yes [X] No [ ]

If yes please specify type of assays and number of samples in the last year
Reproductive Hormones Assays
(FSH, LH, testosterone, SHBG, prolactin) All reproductive hormone assays are undertaken including FSH, LH, testosterone, SHBG, prolactin. Within surgical Andrology, we would estimate that 2500 assays are performed per year.

---

5. E.Y chromosome microdeletions according to EAA/EMQN guidelines Yes [X] No [ ]

If yes number of tests in the past year 200

Participation to the EAA quality control scheme? Yes [X] No [ ]

If no, specify if available in another lab of the same hospital Yes [ ] No [ ]

Blood karyotyping	Yes	X	No	
If no, specify if available in another lab of the same hospital	Yes		No	

6. Collaborations with other Clinical Units of the University/Hospital

IVF Unit	Yes	X	No	
Urology Clinic	Yes	X	No	
Endocrine Clinic	Yes	X	No	
Genetics Lab/Unit	Yes	X	No	
Paediatric Unit	Yes	X	No	
Central Hospital Laboratory	Yes	X	No	
Private Centres	Yes	X	No	

If yes please specify:

- The Lister Hospital. London UK
- The Cromwell Hospital. London UK
- Queen Charlotte and Chelsea Womens Hospital. London. UK
- St Georges Hospital. London UK (Professor N Watkin, Mr B Ayres)
- Kings Hospital. London UK (Mr G Muir)
- Guys Hospital. London UK (Mr M Shabbir and Mr T Yap)
- Chelsea and Westminister. London UK
- St James Hospital. Leeds UK (Mr I Eardley)
- University College Hospital London
- Great Ormond Street Hospital for sick Children. London UK (Professor Cuckow)

International units:

- Department of Urology Weill Cornell Medicine. New York (Professor Schlegel)
- The Turek Clinic. San Francisco (Dr Paul Turek)

7. Clinical teaching activity Duration of training (years): 2

	Number
A: Trainees in the last five years	200 for the AGOUR Master Course in Andrology and Male Infertility (10 courses in the last 5 years) 16 for the Post Graduate Course on Fertility (2 course in the last 4 years)
B: Trainees who passed EAA-ESAU\exam for Clinical Andrologist in the last 5yrs	NA-application for new centre
C: Trainees working in the centre preparing to pass the EAA-ESAU examination	2 (currently)
D: PhD Students	5
E: Medical Students	4
F: Other students (MSc)	2

8. Formal Andrology teaching program Yes X No

If yes: specify duration (years/months): Years Months 2

	Hours of formal teaching per year	**Professional training (weeks/months)**
Medical Students	160 hours/year	7 hours/week
PhD Students	80 hours/year	38 hours/week
Post Graduate students	80 hours/year	38 hours/week
Trainees	150 hours/year	40 hours/week
Other degrees (please specify)		

9. Research Activity

Studies and research play a significant role in the Andrology centre. There are studies ongoing in endocrine, genetic, biochemical and pharmacological effects on male infertility as well as using novel technologies to enhance assessment and diagnosis. The unit is at the forefront of both clinical and laboratory trials.
For further details please see the sections above and below.

The focus of our research at Imperial is improving our understanding of male reproductive disorders, Men's Health and focusing on novel translational research to improve fertility outcomes in male patients.
All the units work closely together which is reflected in our extensive research portfolio and publications. We are working on the following research projects:

Investigating the role of DNA fragmentation in predicting the outcomes from assisted reproductive technologies and natural conception: We have recently led a study identifying that sperm DNA fragmentation is a predictive biomarker of outcomes from IVF/ICSI. Patients can be stratified into risk groups for success (Human Reproduction 2019). One of the causes of DNA fragmentation is oxidative stress and the future focus (see below) is to identify how male factors cause DNA damage and be therapeutically modified.
An ongoing study is analysing the outcomes of ICSI using testicular sperm in men with raised DNA fragmentation and determine the clinical utility of a novel biomarker-the neutral Comet assay.

Investigating novel biomarkers in male infertility. This prospective study will determine the pathophysiological association of the seminal microbiome and infertility; using NGS, measuring reactive oxygen species and sperm DNA fragmentation- we are investigating their inter-relationship in infertile men and is the first study to evaluate the effects of the seminal microbiome on male fertility. Comparisons will be made of semen analysis, DNA fragmentation and ROS levels in unexplained infertility, male fertility and fertile controls.

Investigating the effects of weight loss on male fertility. This randomised controlled study will investigate the effects of weight loss on sperm quality and cardio-metabolic health comparing a low energy diet versus control in obese men. We are also investigating the mechanisms underlying improvements in fertility during weight loss eg oxidative stress in obese infertile men by measuring DNA fragmentation and oxidative stress levels.

I**nvestigating the effects of caloric restriction of sperm gene expression and DNA methylation in obese men**
This study will improve our understanding of the epigenetic effects of weight loss on sperm and potentially develop novel pharmacological approaches for treatment of infertile men. Pilot data suggests that weight loss using low energy diet (LED) may increase sperm function in obese men. Weight loss remodels the epigenetic signature of spermatozoa in obese men and targeted caloric restriction may alter the DNA methylation profile and gene expression. This study will investigate the effect of weight loss on the histone positioning of sperm and how RNA expression profile is altered by weight loss. We will also determine the DNA methylation profile of sperm at weight loss interventions.

Investigating the genetic basis of azoospermia: We are using next generation sequencing to identify novel genes causing non-obstructive azoospermia aiming to identify novel biomarkers predictive of spermatogenesis. We will also study the in vitro effects of specific gene mutations on germ cell function using a novel human pluripotent stem cell like cell (PGCLCs) model.

10. Research Funding
2018-2020

Year: 2019-20
Amount (€): 55000
Funding Source: National Institute of Healthcare Research (NIHR) Clinical Research Network (CRN)
Activity based funding to support studies adopted onto the NIHR CRN Portfolio.

Year: 2018-20
Total Amount (€): 182000
Funding Source: Imperial College Healthcare Charity
Utilizing a novel method of semen oxidation-reduction potential measurement to assess male reproductive function

Year: 2018-21
Total Amount (€): 244000
Funding Source: Imperial College Healthcare Private Services
Investigating the clinical significance of genetic variants in men with non-obstructive azoospermia undergoing sperm retrieval following microsurgical testicular sperm extraction (mTESE)

Year: 2018-20
Total Amount (€): 577000
Funding Source: National Institute of Healthcare Research (NIHR)
Effects and Safety of Testosterone in Men with Low Testosterone levels: an evidence synthesis and economic evaluation. The TESTES (Testosterone Effects and Safety) Consortium.

Year: 2018-21
Total Amount (€): 197000
Funding Source: Saudi Cultural Bureau, UK
Investigating whether genetic sequencing can be used to predict successful sperm retrieval following microsurgical testicular sperm extraction (mTESE) in men with non-obstructive azoospermia

Year: 2018-2022
Total Amount (€): 553000
Funding Source: National Institute of Healthcare Research (NIHR)
Targeted caloric restriction to improve sperm quality in obese men with infertility.

Year: 2017
Total Amount (€): 45000
Funding Source: Imperial College / Astra Zeneca Confidence in Concept Scheme
Does the novel myeloperoxidase (MPO) inhibitor AZD5904 improve sperm function by reducing reactive oxidative stress (ROS) during obesity-induced male infertility?

Year: 2016-19
Total Amount (€): 213000
Funding Source: Imperial College Healthcare Private Services

Investigating the metabolic regulation of male fertility

Year: 2016-17
Total Amount (€): 57000
Funding Source: Imperial NIHR Imperial Biomedical Research Centre (BRC)
Investigating the clinical impact of fertility surveillance on psychosexual support experienced by survivors of cancer.

Year: 2015-16
Total Amount (€): 14000
Funding Source: Saudi Cultural Bureau, UK
Investigating the effects of diabetes on male fertility

Year: 2015-18
Total Amount (€): 568000
Funding Source: Medical Research Council Developmental Funding Pathway Scheme (DPFS)
Neurokinin 3 Receptor Antagonism as a Novel Treatment for Menopausal Hot Flushes.

Year: 2014-15
Total Amount (€): 107000
Funding Source: Imperial College Healthcare Charity
Improving the care pathway for young men with infertility following cancer treatment.

Year: 2013-14
Total Amount (€): 57000
Funding Source: Imperial College Healthcare Charity
Restoring fertility in young women without periods using the hormone kisspeptin

Year: 2012-2015
Total Amount (€): 34000
Funding Source: Academy of Medical Sciences
Does kisspeptin administration stimulate activity of the human GnRH pulse generator which is vital for reproductive function?

Year: 2011
Total Amount (€): 38000
Funding Source: Engineering & Physical Sciences Research Council
Development of a minimally invasive sensor to improve the diagnosis and treatment of patients with infertility

Year: 2009-10
Total Amount (€): 11000
Funding Source: Society for Endocrinology (UK)
The effect of targeted suppression of kisspeptin signalling within the hypothalamic ARC and AVPV on pubertal activation in juvenile rodents

Year: 2006-9
Total Amount (€): 326000
Funding Source: Welcome Trust
The effect of targeted suppression of kisspeptin signalling within the hypothalamic ARC and AVPV on pubertal activation in juvenile rodents

FULL LIST OF PUBLICATIONS (with IF) of staff members from the last 5 years up to 2019

1. Investigating the basis of sexual dysfunction during late-onset hypogonadism. Tharakan T, Miah S, Jayasena C, **Minhas S**. 2019 Mar 25;8. pii: F1000 Faculty Rev-331.

2. **Should the current guidelines for the treatment of varicoceles in infertile men be re-evaluated?** Yan S, Shabbir M, Yap T, Homa S, Ramsay J, McEleny K, **Minhas S**. Hum Fertil (Camb). 2019 Mar 23:1-15.

3. **The effects of testosterone replacement therapy on the prostate: a clinical perspective.** Miah S, Tharakan T, Gallagher KA, Shah TT, Winkler M, Jayasena CN, Ahmed HU, **Minhas S**. F1000Res. 2019 Feb 25;8.

4. .**Early-Medium-Term Outcomes of Primary Focal Cryotherapy to Treat Nonmetastatic Clinically Significant Prostate Cancer from a Prospective Multicentre Registry.** Shah TT, Peters M, Eldred-Evans D, Miah S, Yap T, Faure-Walker NA, Hosking-Jervis F, Thomas B, Dudderidge T, Hindley RG, McCracken S, Greene D, Nigam R, Valerio M, **Minhas S**, Winkler M, Arya M, Ahmed HU.. Eur Urol. 2019 Jan 8. pii: S0302-2838(18)31036-4.

5. **Late-onset Hypogonadism and Testosterone Therapy - A Summary of Guidelines from the American Urological Association and the European Association of Urology.** Fode M, Salonia A, **Minhas S**, Burnett AL, Shindel AW. Eur Urol Focus. 2019 Mar 8. pii: S2405-4569(19)30056-2.

6. **Benefits of Empiric Nutritional and Medical Therapy for Semen Parameters and Pregnancy and Live Birth Rates in Couples with Idiopathic Infertility: A Systematic Review and Meta-analysis.** Omar MI, Pal RP, Kelly BD, Bruins HM, Yuan Y, Diemer T, Krausz C, Tournaye H, Kopa Z, Jungwirth A, **Minhas S**. Eur Urol. 2019 Jan 7. pii: S0302-2838(18)31027-3. doi:

7. **The role of artery-preserving varicocelectomy in subfertile men with severe oligozoospermia: a randomized controlled study.** Almekaty K, Zahran MH, Zoeir A, **Minhas S**, Salem K. Andrology. 2019 Jan 7. doi: 10.1111/andr.12580.

8. **Penile lymphoedema: approach to investigation and management.** Shim TN, Doiron PR, Francis N, **Minhas S**, Muneer A, Hawkins D, Dinneen M, Bunker CB. Clin Exp Dermatol. 2019 Jul 15. doi: 10.1111/ced.13609.

9. **Fertility management in testicular cancer- The need for establishing a standardised and evidenced based patient centric pathway.** Moody JA, Ahmed K, Yap T, **Minhas S**, Shabbir M. BJU Int. 2018 Jun 19. doi: 10.1111/bju.14455.

10. **Reporting on longitudinal live birth rates and cumulative delivery rates are more realistic outcome measures than sperm retrieval rates in couples undergoing mTESE-ICSI.** Almekaty K, Abomelha S, Thum Y, Nicopoullos J, Bracewell-Milnes T, Yap T, **Minhas S**. Hum Fertil (Camb). 2018 May 10:1-6. doi: 10.1080/14647273.2018.1472396.

11. **Risks and Benefits of Adjuvant Radiotherapy After Inguinal Lymphadenectomy in Node-positive Penile Cancer: A Systematic Review by the European Association of Urology Penile Cancer Guidelines Panel.** Robinson R, Marconi L, MacPepple E, Hakenberg OW, Watkin N, Yuan Y, Lam T, MacLennan S, Adewuyi TE, Coscione A, **Minhas S**, Compérat EM, Necchi A. Eur Urol. 2018 Apr 24. pii: S0302-2838(18)30261-6. doi: 10.1016/j.eururo.2018

12. **The diagnosis and management of male genital lichen sclerosus: a retrospective review of 301 patients**. Kravvas G, Shim TN, Doiron PR, Freeman A, Jameson C, **Minhas S**, Muneer A, Bunker CB.J Eur Acad Dermatol Venereol. J Eur Acad Dermatol Venereol. 2018 Jan;32(1):91-95.

13. **A comparison of time taken to return to baseline erectile function following focal and whole gland ablative therapies for localized prostate cancer: A systematic review.** Faure Walker NA, Norris JM, Shah TT, Yap T, Cathcart P, Moore CM, Ahmed HU, Emberton M, **Minhas S**. Urol Oncol. 2018 Feb; 36(2):67-76. doi: 10.1016/j.urolonc.2017.12.002.

14. **Organ-sparing treatment for penile cancer**. European Urology -Update Series. **Minhas S.** Volume 17, Issue 6, August 2018, Pages 146–153, 2018.

15. **Premature ejaculation: challenging new and the old concepts.** Kalejaiye O, Almekaty K, Blecher G, **Minhas S**. F1000Res. 2017 Dec 4; 6:2084. doi: 10.12688/f1000research.12150.1.

16. **Does penile rehabilitation have a role in the treatment of erectile dysfunction following radical prostatectomy?** Blecher G, Almekaty K, Kalejaiye O, **Minhas S**. F1000Res. 2017 Oct 31;6:1923. doi: 10.12688/f1000research.12066.1.

17. **Maximum Venous Diameter is a Simple and Objective Measurement to Characterize Clinical Varicoceles**. Sujenthiran A, Abumelha S, Yap T, Al Mashat F, Kirkham A, Walkden M, **Minhas S.** Ann Urol Res. 2017; 1(1): 1003.

18. **Predictive factors for local recurrence after glansectomy and neoglans reconstruction for penile squamous cell carcinoma.** Albersen M, Parnham A, Joniau S, Sahdev V, Christodoulidou M, Castiglione F, Nigam R, Malone P, Freeman A, Jameson C, **Minhas S,** Ralph DJ, Muneer A. Urol Oncol. 2017 Sep 4. pii: S1078-1439(17)30387-3

19. **Urethral Perforation During Penile Implant Surgery: What to Do?**
Minhas S. J Sex Med. 2017 Jul;14(7):867-869.

20. **Mean velocity and peak systolic velocity can help determine ischaemic and non-ischaemic priapism.** von Stempel C, Zacharakis E, Allen C, Ramachandran N, Walkden M, **Minhas S**, Muneer A, Ralph D, Freeman A, Kirkham A. Clin Radiol. 2017 Jul;72(7):611.e9-611

21. **Infections of the genital tract HPV-related infections.** Yap T, Watkin N, **Minhas S**. European Urology Update Series. Volume 16, Issue 4, April 2017, Pages 149-162 2017.

22. **Collagenase clostridium histolyticum intralesional injections for the treatment of Peyronie's disease: a safety profile.** Yan S, Yap T, **Minhas S.** Transl Androl Urol. 2017 Feb;6(1):123-126.

23. **Penile self-injection with foreign materials.** Ann R Coll Surg Engl. 2016. Ahmed U, Freeman A Kirkham A, Ralph DJ[1], **Minhas S**, Muneer A.

24. **Minimal Invasive Management of Lymph Nodes.** Horenblas S, **Minhas S**. Urol Clin North Am. Urol Clin North Am. 2016 Nov;43(4):449-456.

25. **Recovery of Baseline Erectile Function in Men Following Radical Prostatectomy for High-Risk Prostate Cancer: A Prospective Analysis Using Validated Measures.** Sridhar AN, Cathcart PJ, Yap T, Hines J, Nathan S, Briggs TP, Kelly JD, **Minhas S**. J Sex Med. 2016 Mar; 13(3):435-43.

26. **Focal Therapy Preserves Erectile Function in Men with Prostate Cancer.** Yap T, Ahmed HU, Hindley RG, Guillaumier S, McCartan N, Dickinson L, Emberton M, **Minhas S.** Eur Urol. 2015 Dec.

27. **Clostridium Histolyticum Collagenase - Is this revolutionary medical treatment for Peyronie's disease?** Poullis C, Shabbir M, Eardley I, Mulhall J, **Minhas S.** BJU Int. 2015 Dec.

28. **The Effects of Focal Therapy for Prostate Cancer on Sexual Function: A Combined Analysis of Three Prospective Trials.** Yap T, Ahmed HU, Hindley RG, Guillaumier S, McCartan N, Dickinson L, Emberton M, **Minhas S**. Eur Urol. 2015 Oct 30.

29. **Science and society: The influence of charities in the field of men's health.**Wood D**, Minhas S.** Nat Rev Urol. 2015 Nov;12(11):599-600. doi: 10.1038/nrurol.2015.256. Epub 2015 Oct.

30. **Distribution analysis of the putative cancer marver S100A4 across invasive squamous cell carcinoma penile tissue.** Brian Flatley, Chris Quaye, Elizabeth Johnson, Alex Freeman, Asif Muneer, **Suks Minhas,** Jennifer C. Paterson, Fawaz Musa, Peter Malone, Rainer Cramer. EuPA Proteomics. 2015. June; (7); 1-10.

31. J Urol. 2015 May 29. pii: S0022-5347(15)04101-4. doi: 10.1016/j.juro.2015.03.136. **Minhas S**

32. **EAU guidelines on penile cancer: 2014 update.** Hakenberg OW, Compérat EM, **Minhas S**, Necchi A, Protzel C, Watkin N. Eur Urol. 2015 Jan;67(1):142-50. doi: 10.1016/j.eururo.2014.10.017.

33. **Challenges and controversies in the management of penile cancer.** Shabbir M, Kayes O, Minhas S.Nat Rev Urol. 2014 Dec;11(12):702-11. doi: 10.1038/nrurol.2014.307. Epub 2014 Nov 18

34. **Salvage micro-dissection testicular sperm extraction; outcome in men with non-obstructive azoospermia with previous failed sperm retrievals**. Kalsi JS, Shah P, Thum Y, Muneer A, Ralph DJ, **Minhas S**. BJU Int. 2014 Sep 15. doi: 10.1111/bju.12932.

35. **Distribution analysis of the putative cancer marker S100A4 across invasive squamous cell carcinoma penile tissue.** Brian Flatley, Chris Quaye, Elizabeth Johnson, Alex Freeman, Asif Muneer, Suks Minhas, Jennifer C. Paterson, Fawaz Musa, Peter Malone, Rainer Cramer. EuPa. Proteonomics. Vol 7; 1-10. 2015.

36. **Squamous cell carcinoma of the penis. Therapeutic targeting of the EGFR receptor. Minhas S.** BJU Int. Jun;113(6):845-6. 2014.

37. **A Clinical Trial Strategy for Penis Cancer**. Nicholson S, Kayes O, **Minhas S.** BJU Int. 2014 Jun;113(6):852-3.

38. **Reduced testicular steroidogenesis and elevated semen oxidative stress in male partners as novel markers of recurrent miscarriage.** Clinical Chemistry. **Jayasena CN**, Radia UK, Figueiredo M, Franklin Revill L, Dimakopoulou A, Osagie M, Vessey W, Regan L, Rai R & Dhillo WS. Jan *2019.*

39. **Modulations of human resting brain connectivity by kisspeptin enhance sexual and emotional functions.** Comninos AN, Demetriou L, Wall MB, Shah AJ, Clarke SA, Narayanaswamy S, Nesbitt A, Izzi-Engbeaya C, Prague JK, Abbara A, Ratnasabapathy R, Yang L, Salem V, Nijher GM, **Jayasena CN**, Tanner M, Bassett P, Mehta A, McGonigle J, Rabiner EA, Bloom SR, Dhillo WS. JCI Insight. 2018:18;3:121958.

40. **Male Factor Infertility**. Wall J & **Jayasena CN**. BMJ. 2018:363:k3202

41. **Prevalence of abnormal semen analysis and levels of adherence with fertility preservation in men undergoing therapy for newly diagnosed cancer: A retrospective study in 2906 patients Jayasena CN**, Rong L, Dimakopoulou, A, Dearing C, Clarke H, Patel N, Stroud T, Seyani L, Ramsay L, Dhillo WS... Clinical Endocrinology. E-pub ahead of print Sept 7th 2018.

42. **Hypothalamic Response to Kisspeptin-54 and Pituitary Response to Gonadotropin-Releasing Hormone Are Preserved in Healthy Older Men** Abbara A, Narayanaswamy S, Izzi-Engbeaya C, Comninos AN, Clarke SA, Malik Z, Papadopoulou D, Clobentz A, Sarang Z, Bassett P, **Jayasena CN**, Dhillo WS. Neuroendocrinology. 2018;106(4):401-410.

43. **Neurokinin 3 receptor antagonism rapidly improves vasomotor symptoms with sustained duration of action.** Prague JK, Roberts RE, Comninos AN, Clarke S,

Jayasena CN, Mohideen P, Lin VH, Stern TP, Panay N, Hunter MS, Webber LC, Dhillo WS. Menopause. 2018;25(8):862-869.

44. **Which patients with gynaecomastia require more detailed investigation?** Ali SN, **Jayasena CN**, Sam AH. Clin Endocrinol (Oxf). 2018 Mar;88(3):360-363.

45. **Testosterone therapy for sexual dysfunction in men with Type 2 diabetes: a systematic review and meta-analysis of randomized controlled trials. Jayasena CN**, Algeffari M, MacKeith P, Thapar A, Dhillo WS, Oliver N. Diabet Med. 2018 Feb;35(2):195-202.

46. **Multiple primary malignancies and prolonged survival in a patient with widespread metastatic cutaneous melanoma**. Rose AM, Radia UK, Luo R, Kalirai H, **Jayasena CN**, Luthert P, Coupland SE, Rose GE. Melanoma Res. 2018 Jan 17.

47. **Primary Orbital Melanoma: Presentation, Treatment, and Long-term Outcomes for 13 Patients.** Rose AM, Luthert PJ, **Jayasena CN**, Verity DH, Rose GE. Front Oncol. 2017 Dec 18;7:316.

48. **The emergence of sarcopenia as an important entity in older people.** Lal V, **Jayasena CN**, Quinton R. Clin Med (Lond). 2017 Dec;17(6):590.

49. **Human sperm cryopreservation in cancer patients: Links with deprivation and mortality**. Dearing CG, **Jayasena CN**, Lindsay KS. Cryobiology. 2017:12. pii: S0011-2240(17)30272-9

50. **Process and Pitfalls of Sperm Cryopreservation.** Rozati H, Handley T, **Jayasena CN**. J Clin Med. 2017 Sep 19;6(9). pii: E89.

51. **Presentation, Treatment, and Prognosis of Secondary Melanoma within the Orbit**. Rose AM, Cowen S, **Jayasena CN**, Verity DH, Rose GE. Front Oncol. 2017:23;7:125.

52. **Mechanistic insights into the more potent effect of KP-54 compared to KP-10 in vivo.** D'Anglemont de Tassigny X, **Jayasena CN**, Murphy KG, Dhillo WS, Colledge WH. PLoS One. 2017 May 2;12(5):e0176821.

53. **Neurokinin 3 receptor antagonism as a novel treatment for menopausal hot flushes: a phase 2, randomised, double-blind, placebo-controlled trial.** Prague JK, Roberts RE, Comninos AN, Clarke S, **Jayasena CN**, Nash Z, Doyle C, Papadopoulou DA, Bloom SR, Mohideen P, Panay N, Hunter MS, Veldhuis JD, Webber LC, Huson L, Dhillo WS. Lancet. 2017 e-pub Apr 3.

54. **Kisspeptin modulates sexual and emotional brain processing in humans.** Comninos AN, Wall MB, Demetriou L, Shah AJ, Clarke SA, Narayanaswamy S, Nesbitt A, Izzi-Engbeaya C, Prague JK, Abbara A, Ratnasabapathy R, Salem V, Nijher GM, **Jayasena CN**, Tanner M, Bassett P, Mehta A, Rabiner EA, Hönigsperger C, Silva MR, Brandtzaeg OK, Lundanes E, Wilson SR, Brown RC, Thomas SA, Bloom SR, Dhillo WS. J Clin Invest. 2017 Feb 1;127(2):709-719.

55. **Society for Endocrinology UK guidance on the evaluation of suspected disorders of sexual development: emphasizing the opportunity to predict adolescent pubertal failure through a neonatal diagnosis of absent minipuberty.** Quinton R, Mamoojee Y, **Jayasena CN**, Young J, Howard S, Dunkel L, Cheetham T, Smith N, Dwyer AA. Clin Endocrinol (Oxf). 2016 e-pub Oct 17.

56. **Novel circulating placental markers prokineticin-1, soluble fms-like tyrosine kinase-1, soluble endoglin and placental growth factor and association with late miscarriage Jayasena CN**, Abbara A, Comninos AN, Narayanaswamy S, Gonzalez Maffe J, Izzi-Engbeaya C, Oldham J, Lee TT, Sarang Z, Malik Z, Dhanjal MK, Williamson C, Regan L, Bloom SR, Dhillo WS..Hum Reprod. 2016 Dec;31(12):2681-2688.

57. Narayanaswamy S, Prague JK, **Jayasena CN**, Papadopoulou DA, Mizamtsidi M, Shah AJ, Bassett P, Comninos AN, Abbara A, Bloom SR, Veldhuis JD, Dhillo WS. J Clin Endocrinol Metab. 2016 e-pub Jul 5

58. **Investigating the KNDy hypothesis in humans by co-administration of kisspeptin, neurokinin B and naltrexone in men.** Dwyer AA, **Jayasena CN**, Quinton R. Congenital hypogonadotropic hypogonadism: implications of absent mini-puberty. Minerva Endocrinol. 2016 Jun;41(2):188-95.

59. **Microdissection testicular sperm extraction for men undergoing cancer treatment.** Thomas J, Radia U, Ramsay JW, **Jayasena CN**. Expert Review of Quality of Life in Cancer Care. 2016 e-pub Apr 26.

60. **Subcutaneous infusion of kisspeptin-54 stimulates gonadotrophin release in women and the response correlates with basal oestradiol levels**. Narayanaswamy S, **Jayasena CN**, Ng N, Ratnasabapathy R, Prague JK, Papadopoulou D, Abbara A, Comninos AN, Bassett P, Bloom SR, Veldhuis JD, Dhillo WS. Clin Endocrinol (Oxf). 2016 Jun;84(6):939-45.

61. **Comprehensive Review on Kisspeptin and Its Role in Reproductive Disorders.** Clarke H, Dhillo WS, **Jayasena CN.** Endocrinol Metab (Seoul). 2015 Jun;30(2):124-41

62. **Efficacy of Kisspeptin-54 to Trigger Oocyte Maturation in Women at High Risk of Ovarian Hyperstimulation Syndrome (OHSS) During In Vitro Fertilization (IVF) Therapy.** Abbara A, **Jayasena CN,** Christopoulos G, Narayanaswamy S, Izzi-Engbeaya C, Nijher GM, Comninos AN, Peters D, Buckley A, Ratnasabapathy R, Prague JK, Salim R, Lavery SA, Bloom SR, Szigeti M, Ashby DA, Trew GH, Dhillo WS. J Clin Endocrinol Metab. 2015 Sep;100(9):3322-31.

63. **Comparison of the effects of intravenous kisspeptin-10, kisspeptin-54 and GnRH on gonadotrophin secretion in healthy men. Jayasena CN,** Abbara A, Narayanaswamy S, Comninos AN, Ratnasabapathy R, Bassett P, Mogford JT, Malik Z, Calley J, Ghatei MA, Bloom SR, Dhillo WS. Direct Hum Reprod. 2015 Aug;30(8):1934-41.

64. **Kisspeptin signalling in the amygdala modulates reproductive hormone secretion.** Comninos AN, Anastasovska J, Sahuri-Arisoylu M, Li X, Li S, Hu M,

Jayasena CN, Ghatei MA, Bloom SR, Matthews PM, O'Byrne KT, Bell JD, Dhillo WS. Brain Struct Funct. 2015 epub Mar 11.

65. **Neurokinin B administration induces hot flushes in women. Jayasena CN**, Comninos AN, Stefanopoulou E, Buckley A, Narayanaswamy S, Izzi-Engbeaya C, Abbara A, Ratnasabapathy R, Mogford J, Ng N, Sarang Z, Ghatei MA, Bloom SR, Hunter MS, Dhillo WS. Scientific Reports (Nature Publishing Group). 2015;16;5:8466.

66. **Reduced levels of plasma kisspeptin during the antenatal booking visit are associated with increased risk of miscarriage. Jayasena CN**, Abbara A, Izzi-Engbeaya C, Comninos AN, Harvey RA, Gonzalez Maffe J, Sarang Z, Ganiyu-Dada Z, Padilha AI, Dhanjal M, Williamson C, Regan L, Ghatei MA, Bloom SR, Dhillo WS. J Clin Endocrinol Metab. 2014 Dec;99(12):E2652-60.

67. **Associations of coefficient of variation of serum GH with previous radiotherapy, hypopituitarism and cardiac disease in patients with treated acromegaly**. **Jayasena CN**, Izzi-Engbeaya C, Narayanaswamy S, Modi M, Clarke H, Nijher GM, Meeran K, Dhillo WS. Clin Endocrinol (Oxf). 2014. e-pub ahead of print Dec 1

68. **Kisspeptin-54 triggers egg maturation in women undergoing in vitro fertilization. Jayasena CN**, Abbara A, Comninos AN, Nijher GMK, Christopoulos G, Narayanaswamy S, Izzi-Engbeaya C, Sridharan M, Mason A, Warwick J, Ashby D, Ghatei MA, Bloom SR, Carby A, Trew G, Dhillo WS. Journal of Clinical Investigation. 2014;124(8):3667-77.

69. **The identification of elevated urinary kisspeptin immunoreactivity during pregnancy. Jayasena CN**, Comninos AN, Narayanaswamy S, Abbara A, Nijher GM, Cheema M, Malik Z, Ghatei MA, Bloom SR, Dhillo WS. Ann Clin Biochem. 2015 May;52(Pt 3):395-398.

70. **The management of patients with polycystic ovary syndrome. Jayasena CN**, Franks S. Nat Rev Endocrinol. 2014 Oct;10(10):624-36.

71. **Acute and chronic effects of kisspeptin-54 administration on GH, prolactin and TSH secretion in healthy women. Jayasena CN**, Comninos AN, Narayanaswamy S, Bhalla S, Abbara A, Ganiyu-Dada Z, Busbridge M, Ghatei MA, Bloom SR, Dhillo WS. Clinical Endocrinology. 2014;81(6):891-8.

72. **Increasing LH pulsatility in women with hypothalamic amenorrhoea using intravenous infusion of kisspeptin-54. Jayasena CN**, Abbara A, Veldhuis JD, Comninos AN, Ratnasabapathy R, De Silva A, Nijher GM, Ganiyu-Dada Z, Mehta A, Todd C, Ghatei MA, Bloom SR, Dhillo WS. J Clin Endocrinol Metab. 2014;99(6):E953-61

73. **The relationship between gut and adipose hormones, and reproduction.** Comninos AN, **Jayasena CN**, Dhillo WS. Hum Reprod Update. 2014; 20:153-74.

74. **Effects of neurokinin B administration on reproductive hormone secretion in healthy men. Jayasena CN**, Comninos AN, De Silva A, Abbara A, Veldhuis JD, Nijher

GMK, Ganiyu-Dada Z, Vaal M, Stamp G, Ghatei MA, Bloom SR & Dhillo WS Journal of Clinical Endocrinology & Metabolism. 2014 Jan;99(1):E19-27.

BOOKS AND CHAPTERS

- **Female endocrinology and pregnancy: Clinical Evaluation.** Roberts RE, Franks S, **Jayasena CN**. In: Oxford Textbook of Endocrinology and Diabetes; 3rd Edition. Ed: J Wass, W Arlt, R Semple. Oxford University Press. Due 2019.

- **Male Infertility.** McCredie R, Brenton T, Ramsay JW, **Jayasena CN**. Chapter: In: Recent Advances in Endocrinology and Diabetes; 1st Edition. Ed: Sam AH, Hameed S. JP Medical Publishing Group. 2017.

- Diagnosis and Management of the Buried Penis. Vyas L and Kayes O. BJUI Knowledge 2019.

- Follow-up of Penile Cancer: Contemporary Recommendations for Primary Disease and Inguinal Lymph Nodes. Vyas L and O Kayes 2019.

JOURNAL	IMPACT FACTOR 2019	
J Sex Med	3.649	2
Andrology	3.106	1
Hum Reprod	5.506	1
Eur Urol	17.298	7
J Clin Endocr Metab	6.310	3
Fertil Steril	5.411	1
PLOS One	3.057	1
J Androl	3.106	
Best Pract Res Clin Endocrinol Metab	5.605	
J Endocrinol	4.498	1
Nat Rev Urol	7.335	2
BJU Int	4.524	5
Journal of Clinical Investigation	14.434	1

Clinical Chemistry	8.600	1
Front Biosci (Landmark)	2.497	
Hum Reprod Update	11.852	1
Eur J Obstet Gynecol Reprod Biol	2.024	
Int J Clin Pract	2.140	
Lancet Diab Endo	24.540	
Minerva Endocrinol	1.817	1
Lancet	59.102	1
BMJ	23.259	2

F1000 faculty review	-	4
Human Fertility	1.803	2
Pharmacological reviews	17.099	1
European Urol	17.581	2
Exp dermatol	2.868	1
J Eur Acad Dermatol Venereol	5.113	1
J urol onc	2.863	2
Ann Urol Res	-	1
Clin Radiol	2.082	1
European Urol update	NA	1
Trans Androl Urol	1.861	1
Ann R col Surg Eng	1.470	1
JCI insight	6.014	1

Neurendocrinology	3.040	2
Menopause	3.654	2
Clinical Endocrinology	3.296	6
Diabetic Med	3.132	2
Melanoma Res	4.172	2
Front Oncol	2.358	3
Clin Med	5.688	3
Neuroendocrinology	3.040	1
J Urol	5.381	1
Cryobiolology	2.050	1
J Clin invest	13.251	2
Endocrinol metab	5.455	3
Direct Human Reprod	5.506	1
Scientific Reports nature publishing	4.011	1
Ann Clin Biochem	1.893	1


Imperial College
London

Appendix

Imperial College Healthcare NHS Trust provides acute and specialist healthcare in north west London for around a million and a half people every year. Formed in 2007, it is one of the largest NHS trusts in the country, with nearly 11,000 staff.

There are five hospitals – Charing Cross, Hammersmith, Queen Charlotte's & Chelsea, St Mary's and The Western Eye have a long track record in research and education, influencing clinical practice nationally and worldwide. We also have a number of community services and provide private healthcare in dedicated facilities on all of our sites, including at the Lindo Wing at St Mary's.

With our partners, Imperial College London, The Royal Marsden NHS Foundation Trust and The Royal Brompton & Harefield NHS Foundation Trust, we form the Imperial College Academic Health Science Centre. This is one of 11 academic health science centres in the UK, working to ensure the rapid translation of research for better patient care and excellence in education. We are also part of Imperial College Health Partners – the academic health science network for north west London – spreading innovation and best practice in healthcare more widely across our region.

The Trust, with Imperial College London, hosts one of 20 National Institute for Health Research (NIHR) biomedical research centres (BRC). This designation is given to the most outstanding NHS and university research partnerships in the country, leaders in scientific translation, and early adopters of new insights in technologies, techniques and treatments for improving health.

The Trust is also part of the NIHR Health Informatics Collaborative (HIC) together with Oxford University Hospitals, Cambridge University Hospitals, University College London Hospitals and Guy's and St Thomas' NHS foundation trusts. This collaboration enables NHS clinical data to be linked and shared to allow new insights into care and treatment through research.

In 2017, we were recognised as a leader in the adoption of digital technologies to improve patient care by being selected by NHS England as one of 16 global exemplars of acute care. With our partner, Chelsea and Westminster Hospital NHS Foundation Trust, we received funding and support to drive the use of digital technology to innovate for better patient care and to create products and approaches that can be used by other organisations.

We are a major provider of education and training for doctors, nurses, midwives and allied health professionals including therapists, pharmacists, radiographers and healthcare scientists. In 2017/18, 900 Imperial College London medical undergraduates trained with us. We had over 450 student nurses and midwives in training in the year, many of whom gained their first job or qualification with us.

Biography of the EAA centre directors:

Dr Suks Minhas: He has chaired and lectured over 300 scientific meetings both nationally and internationally in the field of andrological surgery. He is also referee and on the editorial board to a number of scientific journals.
He was past Chairman of the British Association of Urological Surgeons, Section of Andrology and Trustee of BAUS.

He is an EAU guidelines committee member for Male Infertility and Penile Cancer and is a board member of the European Society of Andrological Urology (ESAU).
He is also a faculty member of the European School of Urology (ESU) and European residents training programme in Urology (EUREP) and Co-Chair of the EAU guidelines group on Male Sexual and reproductive Health. He has over 180 peer reviewed papers and co-supervises an active research programme in Andrology and Men's health. Suks Minhas is the organiser of AGOUR a national training course in andrology. He is also an honorary Senior Lecturer at Imperial College London. Suks Minhas has organized and been faculty on several national and international teaching courses including: European School of Urology ESU course, Faculty- Weill Cornell Msasterclass in General Urology. 2019, European Academy of Andrology./ESAU- 2017/2018/2019, European Society of Andrological Urology- Course organiser, European School of Urology (ESU), European Residents Training programme in Urology. (EUREP), Boston Scientific. Masterclass in Penile Implants. World Mens Health Meeting- 2018, International Society of Sexual Medicine amongst many others.

Mr Channa Jayasenna: has delivered invited lectures and debates organized by the European Society of Endocrinology (ESE) and UK Society for Endocrinology, and Royal College of Physicians of Edinburgh. He is also faculty on the ESE Clinical Update and the SFE Clinical Updates. Dr. Jayasena leads the Year 1 Genetics Course on the Imperial MBBS Course and is Deputy Lead for the Year 4 BSc Imperial. Dr. Jayasena is a member of educational governance committees including the Health Education England Foundation Academic Leads (Foundation) Group and Clinical Academic Training Board for Imperial College Faculty of Medicine. He has written several educational articles including a chapter in the forthcoming (3rd Edition) of the Oxford Textbook of Endocrinology and an article on primary care assessment of male infertility (Wall & Jayasena. BMJ 2018).

The psychosexual and sexual medicine subspecialty is led by Dr David Goldmeier. Again an international expert in his field, he leads a large multi-disciplinary team including nurses, physiotherapists and psychotherapists. He has published extensively and has been an invited speaker both nationally and internationally as an expert in Sexual Medicine.