EAA Andrology Training Centre

Centre Report

2025

Unità Operativa Complessa di Andrologia Medica
Ospedale Civile San Salvatore
Università di L'Aquila
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CENTRE REPORT

History of Centre

Andrology in L'Aquila is a more than 30 years' experience. Among the scientific events organized in L'Aquila in this area, is worth mentioning the International Congress "Oligozoospermia: Recent progress in Andrology", held in 1980; this was a key event in promoting Andrology as new basic and clinical medical science. Twenty years later L'Aquila hosted the European Academy of Andrology (EAA) "1st European Congress of Andrology".

The "Complex Unit of Medical Andrology" of the University Hospital of L'Aquila was instituted in 2000. A bank for male gamete cryopreservation is operative since 2003. In the past two years, the biobank premises have been expanded and completely renovated in space and equipment in line with Italian regulations of the National Transplant Center. The Unit was certified as EAA training centre in 2005 (see report in Int J Androl 2006 vol.29, supplement 1, pag. 154-159), and since 2008 it was certified as Abruzzo reference centre for Andrology and Male Gametes Cryopreservation. In 2016 it was certified "Centre of Excellence" in Andrology and Sexual Medicine by the Italian Society of Andrology and Sexual Medicine. Since 2022, the L'Aquila Andrology Unit is the only public center in Abruzzo recognized by the Istituto Superiore di Sanità for the management of people with gender incongruence.

Organization of Centre

The L'Aquila EAA centre consists of the Complex Unit of Medical Andrology within the University Hospital of L'Aquila. The Unit includes medical clinic for outpatients with andrological and endocrinological disordfers, a seminology laboratory and the bank for male gamete cryopreservation. Within the Andrology Unit, there is also an outpatient service for diabetes and metabolism dedicated to the management of patients with diabetes mellitus, dyslipidemia, obesity, and cardiovascular diseases. The presence of this service allows for an integrated and multidisciplinary approach to the management of outpatients with vasculopathic erectile dysfunction and functional hypogonadism secondary to obesity. Furthermore, the Unit is the only public center in Abruzzo recognized by the Istituto Superiore di Sanità for the management of people with gender incongruence.

Close cooperation exists within the L'Aquila University Hospital with the Clinical Pathology Service (for hormonal determinations and bacterial colture of semen, including search for Clamydia and Ureaplasma in uretral swab and molecular genetic tests), the Medical Genetics Unit (for cytogenetic tests, including Y deletions analysis), the Urology Unit (for Micro-TESE and Surgical Andrology), the Unit of Operative Radiology (for scleroembolization of spermatic vein), the ART centre of Obstetrics and Gynaecology Unit, the Paediatric Unit (for handling young boys with defects of hypothalamus-pituitary-gonadal axis) and psychiatric service (for the management of sexual dysfunction and diagnosis of gender incongruence). Thus, patients have access to all medical requirements within short distance.

The Andrology Unit also cooperates with the Spinal Unit of San Raffaele Sulmona Institute for the management of sexual and reproductive dysfunctions of men with spinal cord injuries.

Educational activities

Current activities

Post-graduate School of Endocrinology. In 1981 a Postgraduate School of Andrology was instituted at the University of L'Aquila. In 1986 it was replaced by the Postgraduate School of Endocrinology. Postgraduate students spend at least 2 years of the course in the Andrology Unit.

Pre-graduate course of Andrology for medical students at the University of L'Aquila.

Pre-graduate course of Andrology for students in Reproductive Biotechnologies at the University of Teramo (professional training in andrology at the Andrology Unit of L'Aquila).

Previous activities

Course on Management of Male Infertility (2013, February). A 2 days Course reserved to 80 doctors from different area of Russia Federation, actively involved in Andrology clinics, and selected by FARMAMED, a pharmaceutical institution of Russia.

MASTER in Quality Management and Safety in Handling and Storage of Human Cells and Tissues (2012-2013 and 2013-2014).

Postgraduate course in Quality Management and Safety in Handling and Storage of Human Cells and Tissues (2014).

Master's degree in adolescent medicine (2022-2023).

Research activities

In the field of **erectile dysfunction (ED)** and its relationship with cardiovascular risk, we explored the molecular mechanisms involved in the inhibition of circulating angiogenic cells (CACs) in subjects with ED and explored the role of PDE5i on CACs and endothelial function (Int J Androl 2012,35:645; Asian J Androl 2014,16:290; J Sex Med 2016,13:1063). The correlates of ED have been assessed in spinal cord injured men (J Sex Med 2012,9:830; J Sex Med. 2020 May;17(5):911-918; J Clin Med. 2021 May 13;10(10):2090). In this population we carried out a network meta-analysis to identify the best medical treatment for ED (Andrology. 2025 Feb;13(2):314-322) and quantified the overall infection rate of penile prosthesis implants (Int J Impot Res. 2024 May;36(3):206-213). The network meta-analysis approach was also applied to assess the effectiveness of nutraceutical treatments in the clinical management of erectile dysfunction (J Sex Med. 2024 Oct 31;21(11):1054-1063). The prevalence of ED and other sexual dysfunction was investigated in Klinefelter syndrome (J Sex Med. 2021 Jun;18(6):1053-1064), in men with homosexual orientation (J Sex Med. 2019 May;16(5):624-632) and in men with hyperuricemia (Andrology. 2022 Jan;10(1):72-81). The relationship between cannabis consumption and sexuality was also investigated in large study involving ≈5000 men (Andrology. 2024 Jan;12(1):9-19). Finally, we reviewed all medical treatment strategies for Peyronie's disease in light of the available evidence and current guidelines (Sex Med Rev. 2024 Sep 25;12(4):747-753).

In the field of **male infertility**, interest has been focused on the relationship of seminal leucocytes with sperm pathophysiology (oxidative stress, DNA damage, apoptosis) (Fertil Steril 2011,95:2676; Andrology 2016,4:808), seminal levels of endocannabinoids (Andrology 2017,5:87), semen quality and ART outcomes (Andrology, 2020;8:125-135.). Studies have been also carried out on the relevance of both morphological and functional mitochondrial modifications in spermatozoa of subjects with asthenozoospermia (Fertil Steril 2011, 95:641; Fertil Steril 2011, 95: 2315). Expertise in the field of immunological infertility is documented by the publication of various reviews by invitation (MALE AUTOIMMUNE INFERTILITY In:

WKH Krause & RK Naz: IMMUNE INFERTILITY, Ed. Springer-Werlag, Berlin pp.145-153, 2009, and an updated 2nd Edition in 2017; INFERTILITY: IMMUNLOGICAL ASPECTS In: eLS, John Wiley & Sons, Ltd: Chichester, 2012) and by a large retrospective analysis of over 10,000 men (the largest published so far) assessing the prevalence of anti-sperm antibodies and the relationship of degree of sperm auto-immunization to semen parameters and post-coital test outcome (Hum Reprod 2019,34:834) as well as the relationship between natural and intrauterine insemination-assisted live births and the degree of sperm autoimmunization (Hum Reprod. 2020 Jun 1;35(6):1288-1295). Attention has been also focused on the effect of varicocele repair on male reproductive outcomes (J Endocrinol Invest. 2019 Oct;42(10):1215-1221; Andrologia 2018,50:e13118; J Endocrinol Invest 2017,40:1145), as well as on the clinical significance of epididymal ultrasound in the diagnosis of excretory and secretory azoospermia, and in oligozoospermia (Andrology 2013,1:133; Hum Reprod 2014,7:1368). Moreover, we also carried out a comprehensive evaluation of the risk of testicular cancer (Front Endocrinol 2019,10:164), as well as clinical and seminal features (Hum Reprod. 2021 Mar 18;36(4):891-898) in men with testicular microlithiasis. As far as the treatment of male infertility is concerned, we coordinated the guidelines on the FSH use from the Italian Society of Andrology and Sexual Medicine (SIAMS) (J Endocrinol Invest. 2018 Sep;41(9):1107-1122) and carried out the largest network meta-analysis on the efficacy of nutraceutical interventions (Andrology. 2024 Mar;12(3):538-552). The impact of advancing age on semen quality was also investigated in a large cohort of over 2500 men (Arch Gynecol Obstet. 2024 Jun;309(6):2843-2852). Finally, we took part in the multicenter study promoted by the EAA aimed at standardizing ultrasound examinations in the field of andrology (Andrology. 2021 Mar;9(2):559-576; Andrology. 2022 Sep;10(6):1150-1171; Andrology. 2022 Oct;10 Suppl 2(Suppl 2):118-132).

In the field of **physiology and physiopathology of human spermatozoon** we explored the role of endocannabinoid system (Endocrinology 2010,151:5882; Andrology 2014,2:502; Nat Rev Urol. 2021 Jan;18(1):19-32) and arachidonic acid pathways (Int J Mol Sci. 2023 May 3;24(9):8207). We also demonstrated the involvement of mitochondrial dysfunction in the inhibitory effect on sperm motility exerted by the seminal plasma from men with spinal cord injury (Andrology 2013,1: 456-63; Antioxidants (Basel). 2021 Apr 28;10(5):695) and the protective role of lactobacilli on sperm oxidative damage (Fertil Steril 2011, 95:2485; PLoS One 2013,8:e83136). We carried out the first studies assessing the effects *in vitro* of the plasticizer molecules bisphenol A (Reprod Toxicol 2016,66:61; Front Endocrinol (Lausanne). 2020 Jun 12;11:353; Front Endocrinol (Lausanne). 2020 Oct 8;11:597609; Biochem Pharmacol. 2022 Mar;197:114896), and bisphenol S and F (Reprod Toxicol. 2021 Aug;103:58-63) on human spermatozoa. We also demonstrated the expression of ACE2 receptor and its isoform short-ACE2 in human spermatozoa (Int J Mol Sci. 2022 Mar 28;23(7):3694).

Hypogonadism and its correlates have been addressed in men with spinal cord injury, who exhibit a high prevalence of biochemical androgen deficiency (Andrology 2014,2:721; J Spinal Cord Med 2016,25:1; J Spinal Cord Med 2016,39:246; Arch Phys Med Rehabil 2016,97:726; Spinal Cord 2018,56:494; Arch Phys Med Rehabil 2017;98:940; J Endocrinol Invest 2019;42:167; J Endocrinol Invest. 2020 Nov;43(11):1599-1606; Spinal Cord. 2025 Feb;63(2):80-85), as well as in men with vitamin D deficiency (Endocrine. 2021 Apr;72(1):49-61). We also assessed the intervention strategies for androgen deficiency (Andrology. 2020 Nov;8(6):1551-1566; Expert Rev Clin Pharmacol. 2021 Sep;14(9):1091-1103; Andrology. 2023

Sep;11(6):1067-1076). More recently we first identified a negative association between iodine exposure and testosterone levels in a large cohort from the NHANES (JAMA Netw Open. 2023 Dec 1;6(12):e2348573). Finally, we reviewed the effectiveness of medical strategies in preventing bicalutamide-induced breast events in patients with prostate cancer (J Endocrinol Invest. 2025 Jul;48(7):1659-1668).
In recent years, our area of clinical and research interest has included **gender incongruence** with neurobiology analyses (J Sex Med. 2020 Mar;17(3):543-550) and studies on the effects of gender affirming hormone therapy on coagulation (Front Endocrinol (Lausanne). 2021 Nov 9;12:741866; Thromb Res. 2024 Mar 4;236:170-178), bone metabolism (Calcif Tissue Int. 2024 Nov;115(5):624-635), renal function (Front Endocrinol (Lausanne). 2025 Jun 12;16:1537838), liver function (J Endocrinol Invest. 2025 Jan;48(1):161-171), heart activity (Eur J Endocrinol. 2025 Oct 1:lvaf201. doi: 10.1093/ejendo/lvaf201) and anthropometric-cardiovascular profile (Transgend Health. 2024 Dec 16;9(6):466-483).

Clinical activities

1. *Andrology Clinic:* The Medical Andrology Unit is mainly active in the evaluation and management of infertile patients and those with sexual dysfunctions. Patients with primary or secondary hypogonadism, boys with delayed puberty and patients with other endocrine diseases are also seen. The Andrology Unit also includes an outpatient diabetes and metabolism service, enabling integrated, multidisciplinary care for patients with metabolic disorders, vasculopathic erectile dysfunction, and obesity-related hypogonadism. In the 2023 the Andrology Unit has been recognized regional reference centre for the management of congenital hypogonadotropic hypogonadism.

2. *Seminology laboratory:* **Conventional semen analysis** is performed according to the World Health Organization recommended procedures (2021). Nevertheless, IgG-MAR-test continue to be performed as screening test for immunological infertility on all ejaculates in the contest of the standard semen analysis. In the presence of a positive IgG-MAR-test, IgA-MAR test is also performed in the same ejaculate, and sperm-agglutinating activity is titrated in serum and seminal plasma. Laboratory participates to external quality assessment for semen analysis UK NEQAS (Birmingham).
Sperm **DNA fragmentation** (TUNEL assay) is assessed using flow cytofluorimetry in cases of ART failure and recurrent pregnancy loss. DNA fragmentation testing is also offered to patients with idiopathic male infertility in order to identify those most likely to respond to FSH treatment (specifically, those with more than 15% of spermatozoa showing DNA fragmentation).
Moreover, flow cytometry is employed for quantifying and phenotyping seminal leukocytes by using monoclonal antibodies (anti-CD45, anti-CD14 and anti-HDL-DR) and the Flow-Count™ Fluorospheres kit.
Computer-Assisted Semen Analysis (CASA) is performed for an objective assessment of sperm motility in selected cases (i.e., on evaluating effectiveness of treatments).
For research purpose, CASA and flow cytometry analyses are carried out to assess mitochondrial membrane potential, mitochondrial ROS generation, membrane lipid peroxidation, DNA 8OHdG, caspase activation, sperm tyrosine phosphorylation during capacitation and anti-sperm antibody load on sperm surface.
Transmission electron microscopy (TEM) can be offered to ascertain genetic conditions of total sperm immotility with preserved sperm vitality.

3. *Centre for male gamete cryopreservation:* A bank for male gamete cryopreservation is operative since 2003. Sperm cryopreservation is offered mainly to patients with malignant diseases before chemotherapy or radiotherapy but also to patients with severe oligozoospermia or intermittent presence of motile spermatozoa in the semen (as backup for ICSI), to patients with hypothalamo-pituitary hypogonadism after gonadotrophin treatment and to patients undergoing pelvic surgery and to AMAB transgender subjects before starting gender affirming hormone treatment.
Cryopreservation of testicular sperm is also routinely performed after TESE/Micro-TESE.

4. *Testicular sperm extraction:* Up to December 2018, TESE has been performed by Andrology Unit staff in azoospermic patients. Starting from January 2019, micro-TESE is performed in cooperation with the Urology Unit of the Hospital. Specimens are immediately transferred to Andrology laboratory for sperm extraction and histology.

5. *Medically assisted ejaculation procedures:* Penile vibratory stimulation (PVS) is offered to spinal cord injured men for semen evaluation and/or cryopreservation.

6. *Ultrasonography:* Ultrasonographic examinations are performed with a duplex scanner equipped with colour flow imaging (General Electric, Healthcare, WI, USA). Scrotal color-Doppler ultrasound (CDU) as diagnostic tool in patients with poor semen quality, in those with an increased risk of malignancy and in those with evidence of varicocele at physical examination. Penile CDU, both at the baseline and 10 and 30 minutes following intracavernous injection of 10 μg of the vasoactive drug prostaglandin E1, is offered to men with erectile dysfunction associated to vascular diseases or vascular risk factors. This is also offered in men with Peyronie's disease. Penile examination is associated to ultrasound determination of common carotid arteries intima-media thickness as an objective evaluation of preclinical atherosclerosis of large arteries. Trans-rectal CDU is performed as a diagnostic tool in patients with azoospermia or severe oligozoospermia to screen possible obstructions of the distal seminal tract. This is also offered to men with persistent leucocytospermia or possible prostate-vesciculitis after general and physical examination. Transvaginal sonography is performed by the ART staff to monitor follicular development.

7. The *activity of the ART centre of Obstetrics and Gynaecology Unit*, discontinued after the 2009 earthquake (intrauterine inseminations continued to be offered at the Andrology Unit), restarted from 2019. A strict co-operation exists with the Andrology Unit. Female outpatients are visited by gynecologist within the Andrology Unit.

8. Since 2022, the L'Aquila Andrology Unit is the only public center in Abruzzo recognized by the Istituto Superiore di Sanità (ISS) for the management of people with *gender incongruence*. The center works in close cooperation with the hospital's mental health service, and after the diagnosis of gender incongruence, gender affirming hormone therapy can be prescribed to AFAB and AMAB transgender people free of charge at the endocrinology outpatient office of our Andrology center based on Italian legislation (Law #164/82).

Name and address of Centre

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Università di L'Aquila
67100 Coppito, L'Aquila, Italy
Tel: +39 862 368338
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Type of Centre

University	
University Hospital	X
Private Centre	

Other (please specify) _____

1. Director Arcangelo Barbonetti

Academician		Affiliated Member		Clinical Andrologist	X

3. Present Staff *(Senior Scientists)*

1)	Name	Arcangelo Barbonetti
	Degree	Associate professor
	Speciality	Endocrinology, Andrology

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

2)	Name	Marco Giorgio Baroni
	Degree	Full professor
	Speciality	Endocrinology, Diabetology

Insert any additional staff below *(if required)*

Biologists

1)	Name	Giuliana Cordeschi
	Degree	Dr.
	Speciality	Biologist, funzionario tecnico University of L'Aquila
	Full time	
2)	Name	Camilla Tonni
	Degree	Dr.
	Speciality	Reproductive biotechnologist

Insert any additional staff below *(if required)*

PhD Students

1) Name	Daniele Tienforti, M.D., PhD, FECSM
2) Name	Luca Spagnolo, M.D., PhD
3) Name	Maria Totaro, M.D., PhD

Nurses

1) Name	Anna Spaziani
2) Name	Rita Nannicola

4. Clinical Activity

A. Outpatients: Consultations per year in the last 4 years

	2021	2022	2023	2024
New patients	1290	1276	1018	1215
Follow-up patients	1171	1659	1460	1512

Type of patients in the last years (%)	2021	2022	2023	2024
Infertility	≈ 30%	≈ 30%	≈ 30%	≈ 30%
Erectile dysfunction	≈ 25%	≈ 25%	≈ 25%	≈ 25%
Hypogonadism	≈ 25%	≈ 25%	≈ 25%	≈ 25%
Klinefelter	≈ 1%	≈ 1%	≈ 1%	≈ 1%
Gynaecomastia	<1%	<1%	<1%	<1%
Varicocele	Included in "infertility"	Included in "infertility"	Included in "infertility"	Included in "infertility"
Testicular tumours	<1%	<1%	<1%	<1%
Disorders of gender identity	<1%	<1%	<1%	<1%
Other	≈ 15-20%	≈ 15-20%	≈ 15-20%	≈ 15-20%

B1. Male ultrasound (testis, penile, prostate)

	2021	2022	2023	2024
Total	276	196	191	269

B2. Female ultrasound (transvaginal ultrasonography)

	2021	2022	2023	2024
Total	484	272	152	100

C. Andrological surgery procedures

	2021	2022	2023	2024
mTESE	13	4*	3*	9
Varicocele scleroembolization *(Performed at the Interventional Radiology Unit)*	35	32	38	28
Prostate biopsies				
BPH				
Prostate cancer				
Vasectomy				
Vaso-vasostomy				

**The numbers refers to the months: January-April 2022 and May-December 2023 only. This is due to the suspension of the activities to carry out earthquake-resistant consolidation construction work. On average, 1-2 mTESE are performed per month.*

5. A. Andrology laboratory activity

	2021	**2022**	**2023**	**2024**
Semen analyses	779	763	613	674
Sperm antibodies: in our lab MAR test is an integral part of standard semen analysis				

5. B. Andrology laboratory activity

Sperm banking donors	Yes		No	X
Sperm banking cancer patients	Yes	X	No	

If yes:				
	2021	**2022**	**2023**	**2024**
Number of samples	180	55*	62*	101

**Low numbers due to the suspension of the activities to carry out earthquake-resistant consolidation construction work.*

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

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

** Reproductive hormones assays are performed in the campus*

If yes please specify type of assays and number of samples in the last year:

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

** Reproductive hormones assays are performed in the campus*

If yes number of tests in the past year _____

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

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

Blood karyotyping Yes [X] No [ ]

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

Other genetic tests (please specify)

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

IVF Unit	Yes	X	No	

If yes please specify: Children, Endocrinology, IVF, Urology, Genetics, Pathology, Psychiatry

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		No	X

If yes please specify:

7. Clinical teaching activity

Duration of training (years): 2 years of Reproductive Medicine and Andrology out of 5 years of Postgraduate School of Endocrinology

	Number
A: Trainees in the last five years	5
B: Trainees who passed EAA-ESAU\exam for Clinical Andrologist in the last 5 yrs	2
C: Trainees working in the centre preparing to pass the EAA-ESAU examination	2
D: PhD Students	3
E: Medical Students	80/yr
F: Other students (MSc): Students of Biotechnologies of Reproduction	25/yr

8. Formal Andrology teaching program Yes X No

If yes: specify duration (years/months): Years 2 Months 0

	Hours of formal teaching per year	**Professional training (weeks/months)**
Medical Students	20	1 week
PhD Students		
Post Graduate students	30	11 months
Trainees		
Students of Biotechnologies of Reproduction	25	1 week

9. Research Activity (main topics of the last 5 years)

Sexual dysfunction

Continuing our traditional research on erectile dysfunction (ED), in the last 5 years, correlates of ED have been assessed in spinal cord injured men (J Sex Med. 2020;17:911; J Clin Med. 2021;10:2090). In this population we carried out a network meta-analysis to identify the best medical treatment for ED (Andrology. 2025 Feb;13(2):314-322) and quantified the overall infection rate of penile prosthesis implants (Int J Impot Res. 2024 May;36(3):206-213). The network meta-analysis approach was also applied to assess the effectiveness of nutraceutical treatments in the clinical management of erectile dysfunction (J Sex Med. 2024 Oct 31;21(11):1054-1063). The prevalence of ED and other sexual dysfunction was investigated in Klinefelter syndrome (J Sex Med. 2021;18:1053), in men with homosexual orientation (J Sex Med. 2019;16:624) and in men with hyperuricemia (Andrology. 2022;10:72). The relationship between cannabis consumption and sexuality was also investigated in large study involving ≈5000 men (Andrology. 2024;12:9). Finally, we reviewed all medical treatment strategies for Peyronie's disease in light of the available evidence and current guidelines (Sex Med Rev. 2024 Sep 25;12(4):747-753).

Male infertility

Our interest has been focused on the relationship of seminal leukocytes with semen quality and ART outcomes (Andrology. 2020;8:125). Continuing our traditional research on the field of immunological infertility, in a recent retrospective analysis of over 10,000 men (the largest published so far), we assessed the relationship between natural and intrauterine insemination-assisted live births and the degree of sperm autoimmunization (Hum Reprod. 2020;35:1288). Moreover, we carried out a comprehensive evaluation of clinical and seminal features of men with testicular microlithiasis (Hum Reprod. 2021;36:891). Recently, our interest has been focused on the treatment of male infertility: we carried out the largest network meta-analysis on the efficacy of nutraceutical interventions (Andrology. 2024;12:538). In a large cohort of over 2500 men, we demonstrated that advancing male age exhibits an independent association with a decrease in the percentage of motile and morphologically normal spermatozoa, with greater evidence from the age of > 40 years (Arch Gynecol Obstet. 2024 Jun;309(6):2843-2852). Finally, we took part in the multicenter study promoted by the EAA aimed at standardizing ultrasound examinations in the field of andrology (Andrology. 2021 Mar;9(2):559-576; Andrology. 2022 Sep;10(6):1150-1171; Andrology. 2022 Oct;10 Suppl 2(Suppl 2):118-132).

Physiology and physiopathology of human spermatozoon

Over the past five years we have continued to deal with 1) the role of mitochondrial dysfunction (Antioxidants. 2021;10:695) and endocannabinoid system (Nat Rev Urol. 2021;18:19) in sperm biology and function; 2) the effects of the plasticizer bisphenols on human spermatozoa (Front Endocrinol. 2020;11:353; Front Endocrinol. 2020;11:597609; Reprod Toxicol. 2021;103:58; Biochem Pharmacol. 2022;197:114896). We also reviewed the role of arachidonic acid pathways (Int J Mol Sci. 2023 May 3;24(9):8207) and demonstrated the expression of ACE2 receptor and its isoform short-ACE2 in human spermatozoa (Int J Mol Sci. 2022;23:3694).

Hypogonadism and other endocrine disorders in men with spinal cord injury (SCI)

Continuing our clinical research on androgen deficiency in men with spinal cord injury, we demonstrated significant and independent associations of testosterone, level of the lesion and age with prostate volume (J Endocrinol Invest. 2020;43:1599). In this population, we recently explored the involvement of irisin in the pathophysiology linking androgen deficiency to metabolic syndrome (Spinal Cord. 2025 Feb;63(2):80-85). We contributed to clarify the clinical significance of the association between

hypovitaminosis D and androgen deficiency through a large systematic literature review with meta-analysis (Endocrine. 2021;72:49). As for the treatment of hypogonadism, we produced a critical comparative analysis of available guidelines on testosterone replacement therapy (Andrology. 2020;8:1551), with special reference to the patient with metabolic disorders (Expert Rev Clin Pharmacol. 2021;14:1091), and evaluated the therapeutic efficacy of selective estrogen receptor modulators, especially in the obese hypogonadal patient (Andrology. 2023;11:1067). More recently we first identified a negative association between iodine exposure (as assessed by urinary iodine concentration) and both total and calculated free testosterone levels in a large cohort from the NHANES (JAMA Netw Open. 2023;6:e2348573). Finally, we reviewed the effectiveness of medical strategies in preventing bicalutamide-induced breast events in patients with prostate cancer (J Endocrinol Invest. 2025 Jul;48(7):1659-1668).
In recent years, our area of clinical and research interest has included **gender incongruence.** In this field we revealed a significant association between longer CAG repeats in the androgen receptor and transgender identity of AMAB people (J Sex Med. 2020;17:543). We also assessed the effects of gender affirming hormone therapy (GAHT) on bone metabolism (Calcif Tissue Int. 2024 Nov;115(5):624-635) renal function (Front Endocrinol (Lausanne). 2025 Jun 12;16:1537838), liver function (J Endocrinol Invest. 2025 Jan;48(1):161-171) and heart activity (Eur J Endocrinol. 2025 Oct 1:lvaf201. doi: 10.1093/ejendo/lvaf201) in AFAB people and on coagulation parameters in both AMAB (Front Endocrinol. 2021;12:741866) and AFAB people (Thromb Res. 2024;236:170-178). The changes in anthropometric-cardiovascular profile under testosterone-based GAHT was also evaluated (Transgend Health. 2024 Dec 16;9(6):466-483).

10. Research Funding

- Funding from University of L'Aquila to support annual projects in the last 3 years: Euro 20000.
- 2019 "From chronic inflammation to metabolic disorders: study of the gut-liver axis in the pathophysiology of adipose tissue dysfunction". Euro 34527.
- 2020-2021. Research funding from the Department of MeSVA, University of L'Aquila, for the project entitled "Understanding and combating the risk of death in diabetic patients: use of the ENFORCE prediction model with the implementation of inflammatory biomarkers." Euro 5700.
- 2022. Research funding from the Department of MeSVA, University of L'Aquila, for the project entitled "Regulation of body fat accumulation and glucose metabolism: study of genetic, molecular, nutritional, and therapeutic mechanisms in relation to cardiometabolic risk." Euro 2700.
- 2022. Research funding from the Italian Ministry of Health – PNRR: M6/C2_CALL 2022, for the project entitled "Tryptophan-related metabolic pathways and mortality rate in people with diabetes." Euro 1000000.
- 2023. Research funding FFO–PSD-MESVA Call, Department of MeSVA, University of L'Aquila, Italy, for the project entitled "Pathogenesis of NAFLD: assessing the role of angiopoietin-like protein 3 (ANGPTL3) as a new vitamin D receptor (VDR) target gene in the molecular signaling involved in liver steatosis." Euro 12000.
- 2023. PRIN-PNRR 2022 grant no. P20222CB2B, entitled "Elucidating molecular mechanisms underlying the protection against fatty liver disease." Euro 60000.

- 2023. EU4Health Programme (EU4H) Call: EU4H-2022-PJ-3 Project: 101128983 — PROVIDE. Grant entitled: Prediction and pReventiOn of cardioVascular disease In DiabEtes (PROVIDE). PI (524.00 Euro)

ORGANIZATION CHARTS

Organization charts legend: Department / Unit Structure

Name of the Centre
Complex Unit of Medical Andrology

Director of the Unit:
Prof. Marco Giorgio Baroni
Director of the EAA training center:
Prof. Arcangelo Barbonetti

Staff members: Please, see pages 8-10

Clinical activities:
Andrological outpatient clinics
Endocrinological outpatients clinics
Infertility outpatient clinic (couples)
Gender incongruence outpatient clinics
Diabetes and metabolic disorders outpatient clinic
Seminology
Ultrasound
Cryopreservation of sperm
mTESE*

Contribution to EAA training:
Infertility investigation, infertility management and fertility preservation
Management of andrological disorders
Andrological ultrasound

FULL LIST OF PUBLICATIONS of staff members from the last 5 years

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