

# Fisiopatologia femminile

Università di Roma

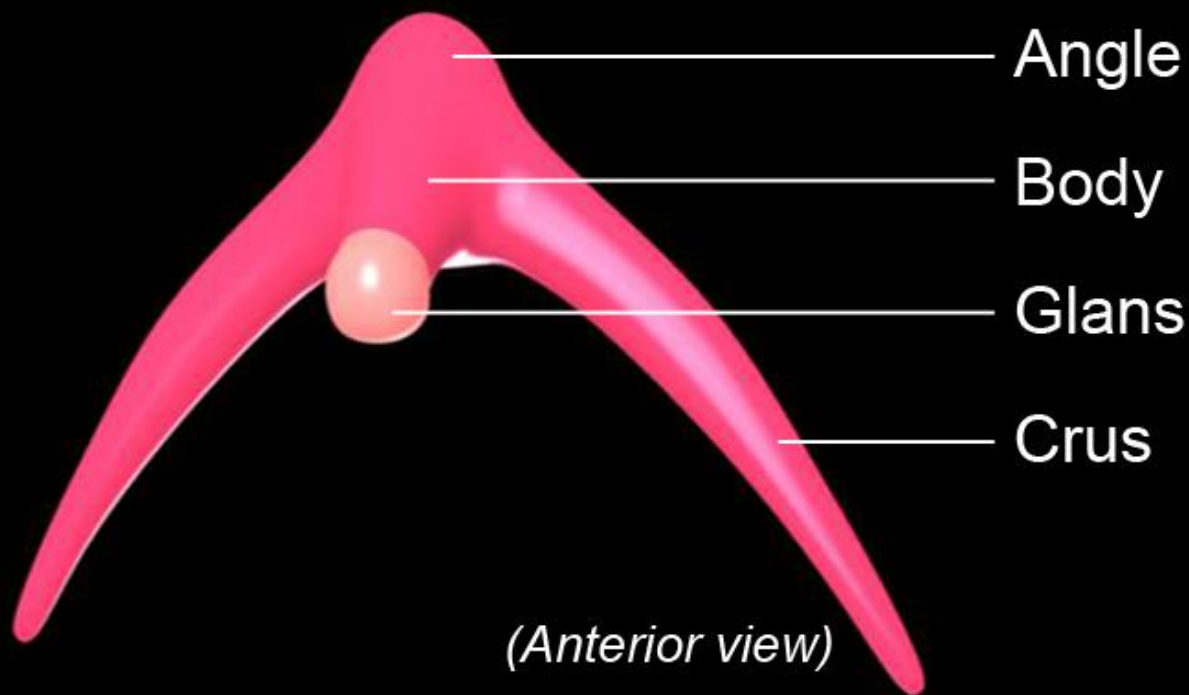


Emmanuele A. Jannini

*ENDOSEX*

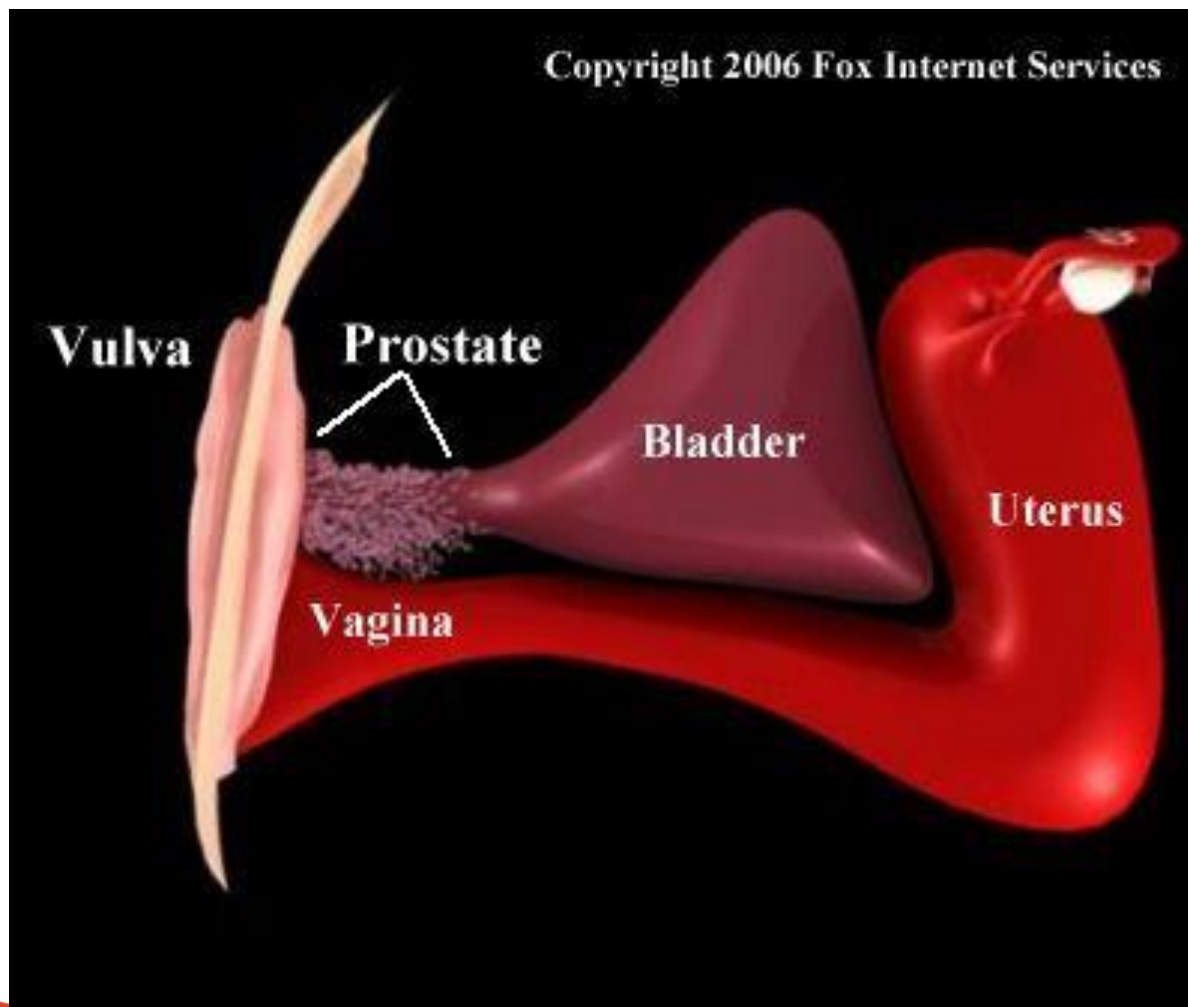
# La porta anteriore

## THE CLITORIS



*(Anterior view)*

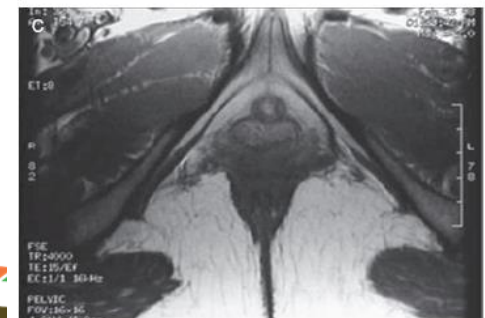
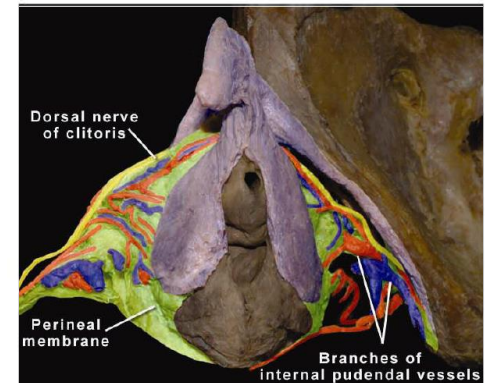
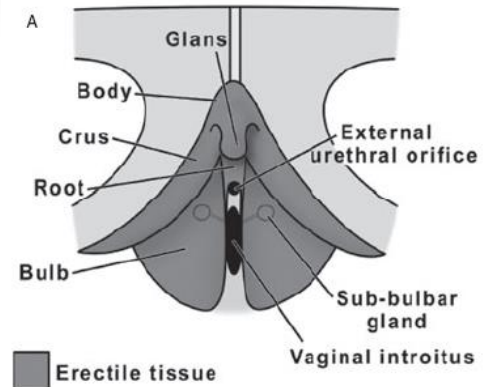
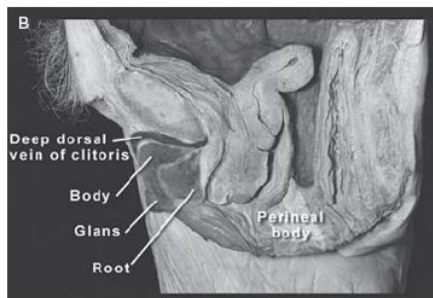
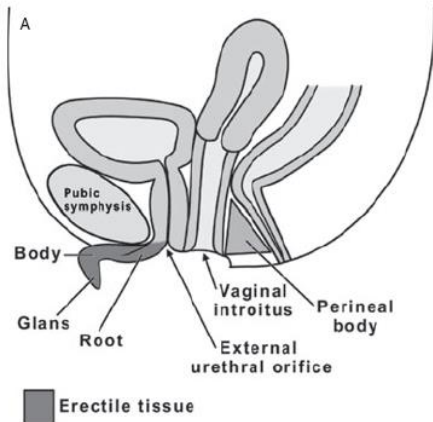
# La porta posteriore



# 7 The Anatomy of the Distal Vagina: Towards Unity

Helen E. O'Connell, MD, MMed, MBBS, FRACS (Urol),\* Norm Eizenberg, MBBS,†  
Marzia Rahman, Medical Student,\* and Joan Cleeve, RN, BA(Hons), Grad Dip Lib and IS\*

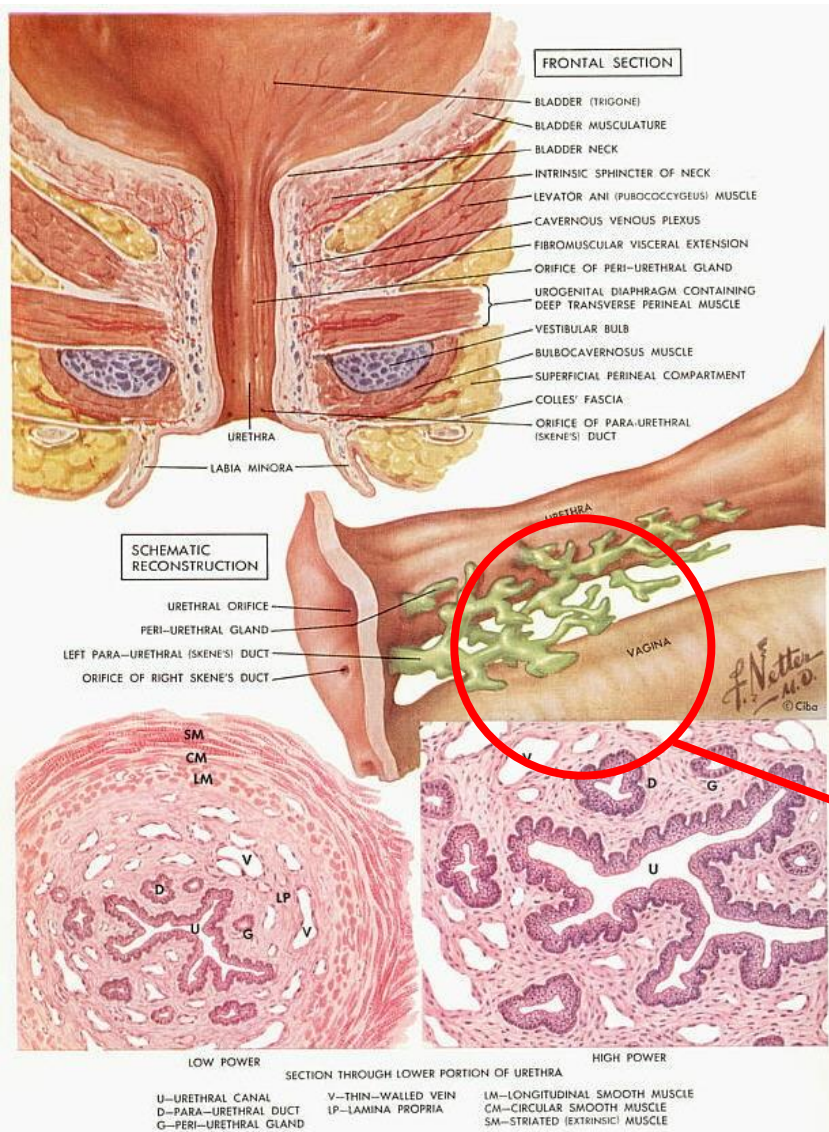
## The clitoral complex



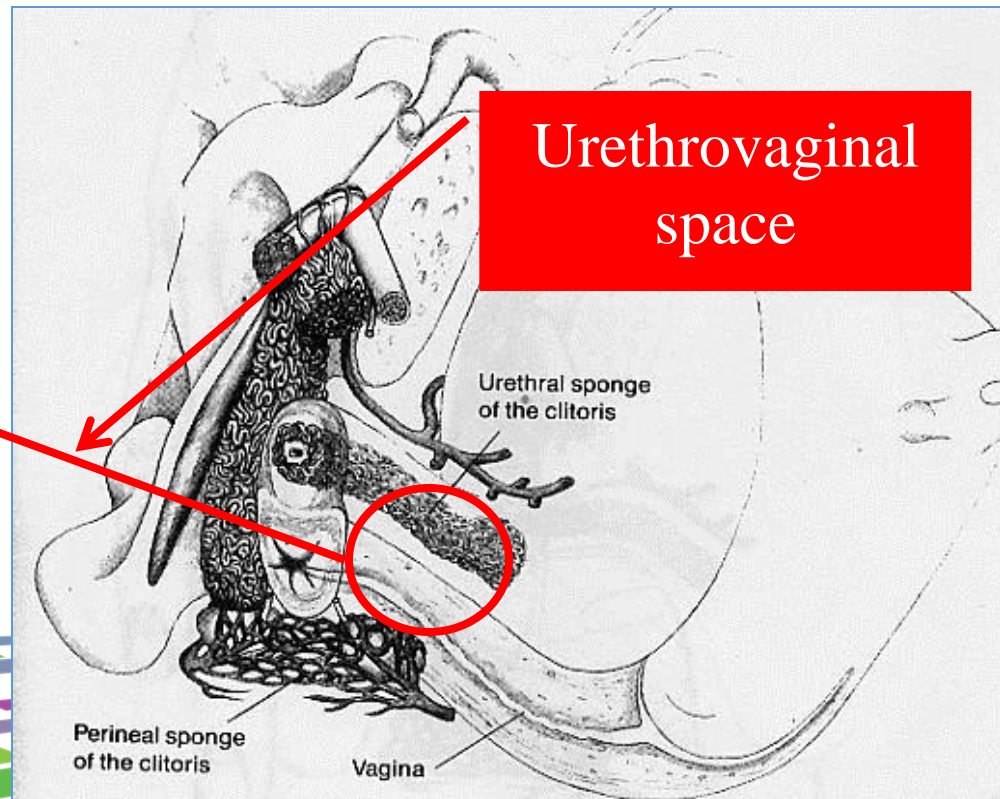
*The clitoris, urethra, and distal vagina form a **united complex**, the erectile tissue surrounding the distal urethra and forming the distal vagina wall*

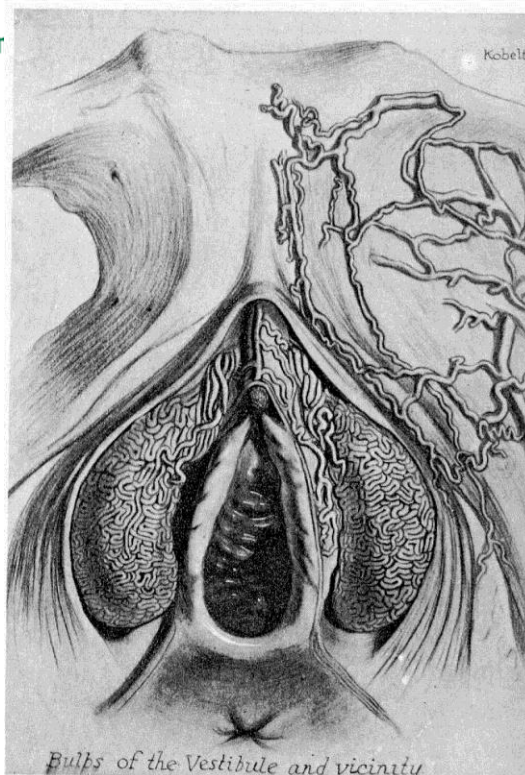
# Anterior vaginal wall or urethrovaginal space

## space



*This short paper will, I hope, show that the anterior wall of the vagina along the urethra is the seat of a distinct erotogenic zone and has to be taken into account more in the treatment of female sexual deficiency. (E. Grafenberg, 1950)*

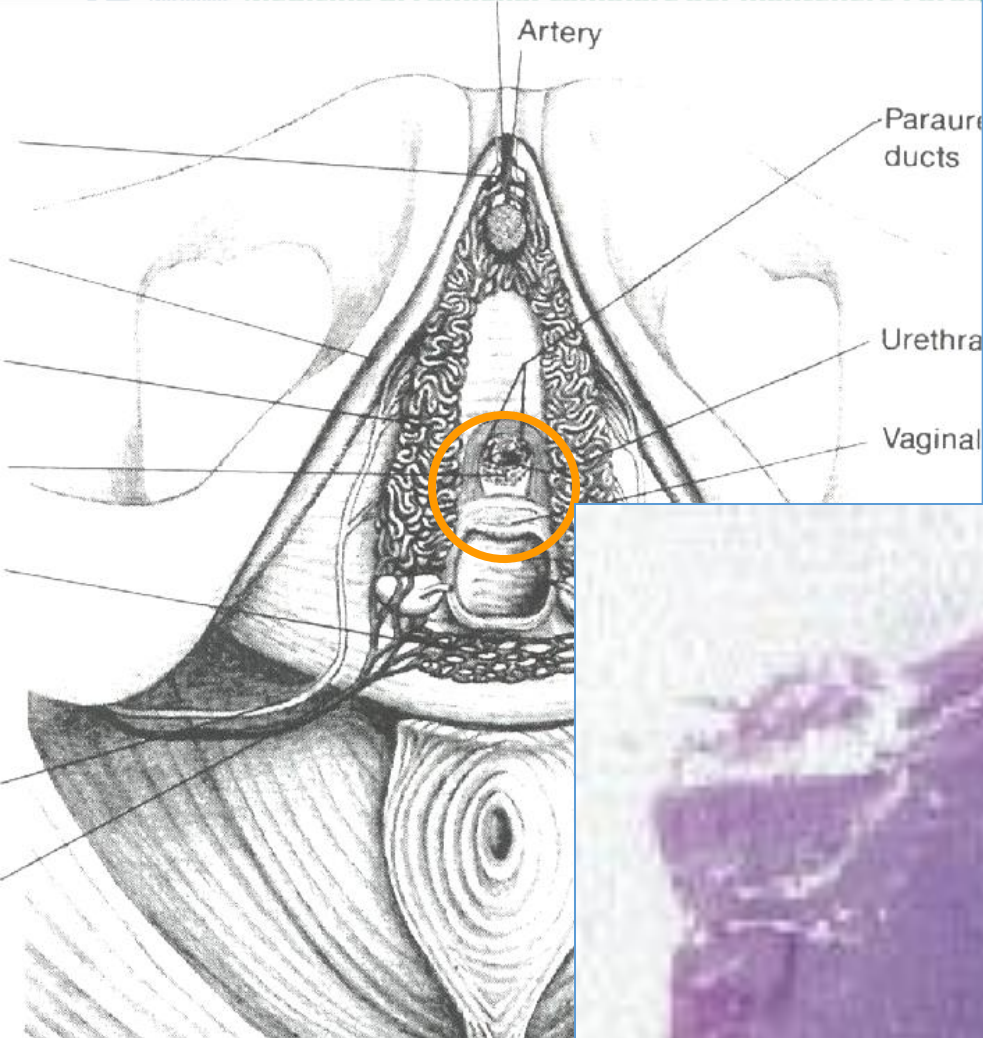




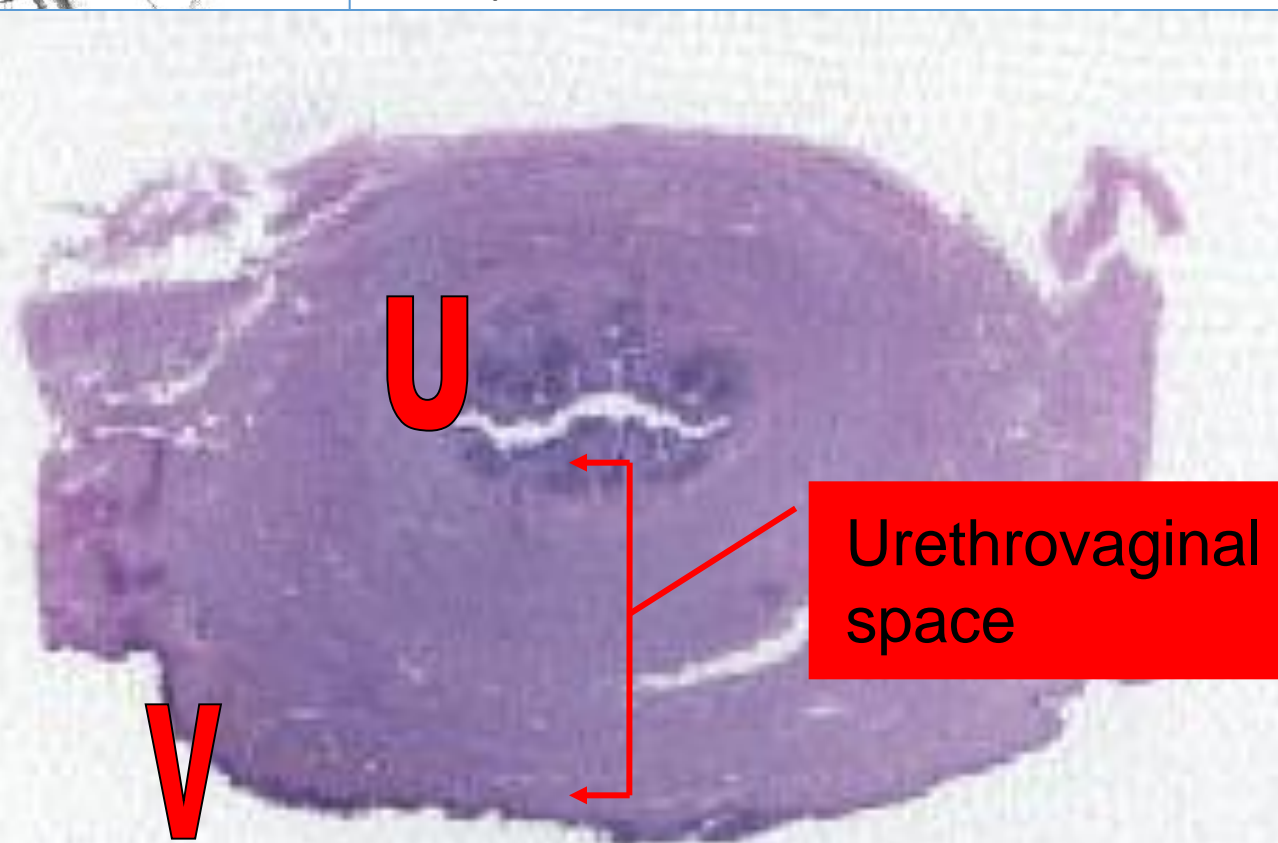
## Functional anatomy of the human vagina

G. D'Amati\*, C.R.T. di Gioia\*, L. Proietti Pannunzi\*, D. Pistilli\*, E. Carosa\*\*\*,  
A. Lenzi\*\*, and E.A. Jannini\*\*\*

*J. Endocrinol. Invest.* 26 (Suppl. to no.3): 92-96, 2003



**Jannini et al:** Histology and Immunohistochemical Studies of Female Genital Tissue. In Goldstein, C. Meston, Davis, Traish (eds.): **Women's Sexual Function and Dysfunction: Study, Diagnosis and Treatment**, London, Taylor and Francis, 2006.



## TYPE 5 PHOSPHODIESTERASE EXPRESSION IN THE HUMAN VAGINA

GIULIA D'AMATI, CIRA R. T. DI GIOIA, MAURO BOLOGNA, DANIELA GIORDANO,  
MAURO GIORGI, SUSANNA DOLCI, AND EMMANUELE A. JANNINI

UROLOGY 60: 191-195, 2002. © 2002.

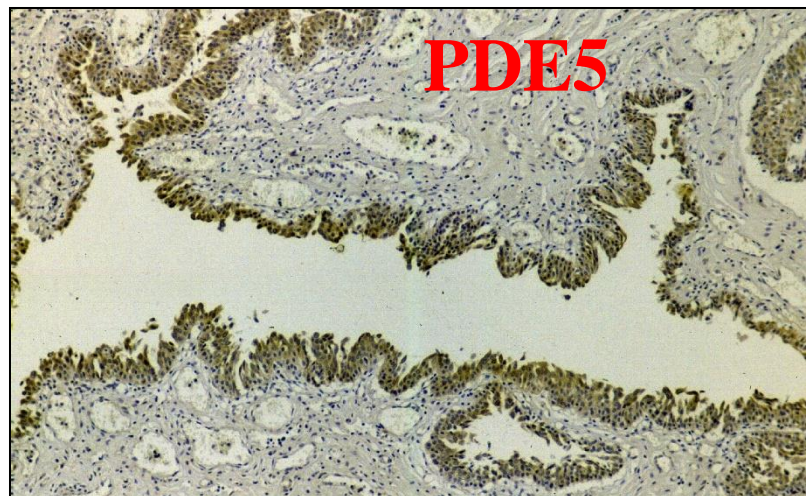
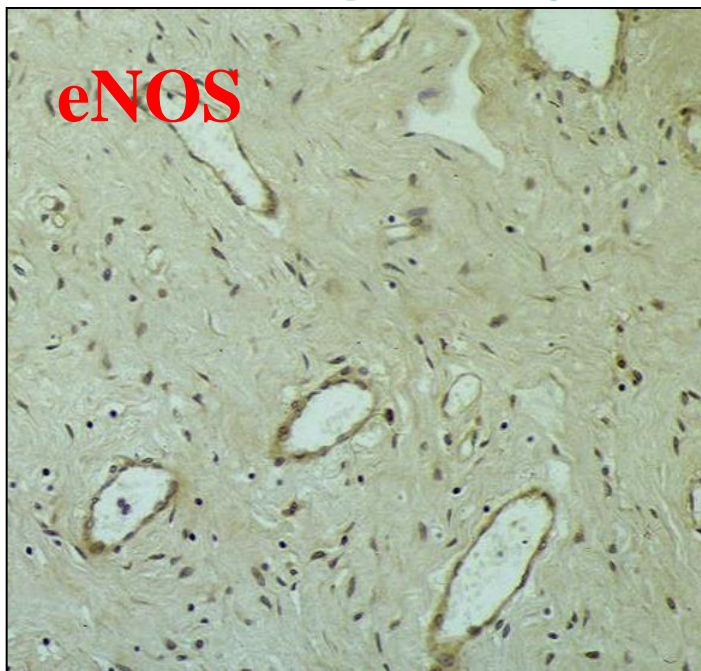
## Subcellular localization and regulation of type-1C and type-5 phosphodiesterases <sup>☆</sup>

Susanna Dolci <sup>a</sup>, Alessia Belmonte <sup>a,b</sup>, Rocco Santone <sup>d</sup>, Mauro Giorgi <sup>d</sup>,  
Manuela Pellegrini <sup>a</sup>, Eleonora Carosa <sup>e</sup>, Emilio Piccione <sup>b</sup>, Andrea Lenzi <sup>c</sup>,  
Emmanuele A. Jannini <sup>e,\*</sup>

Biochemical and Biophysical Research Communications 341 (2006) 837-846



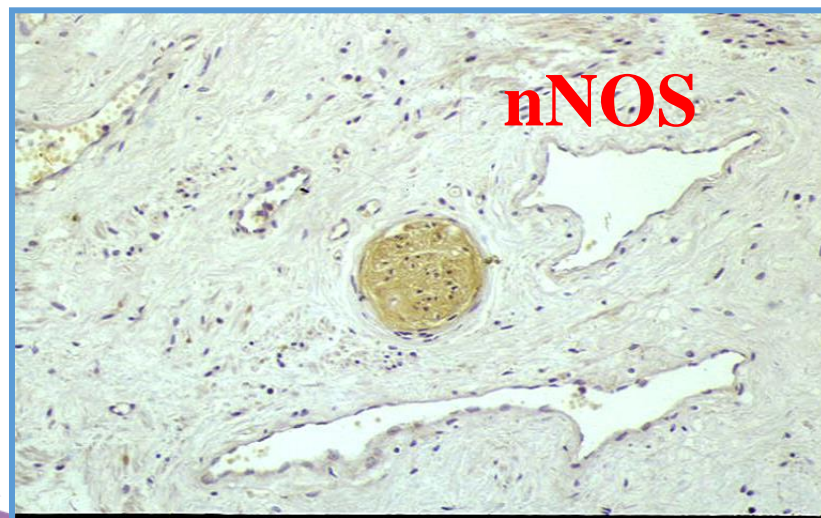




175 Kd



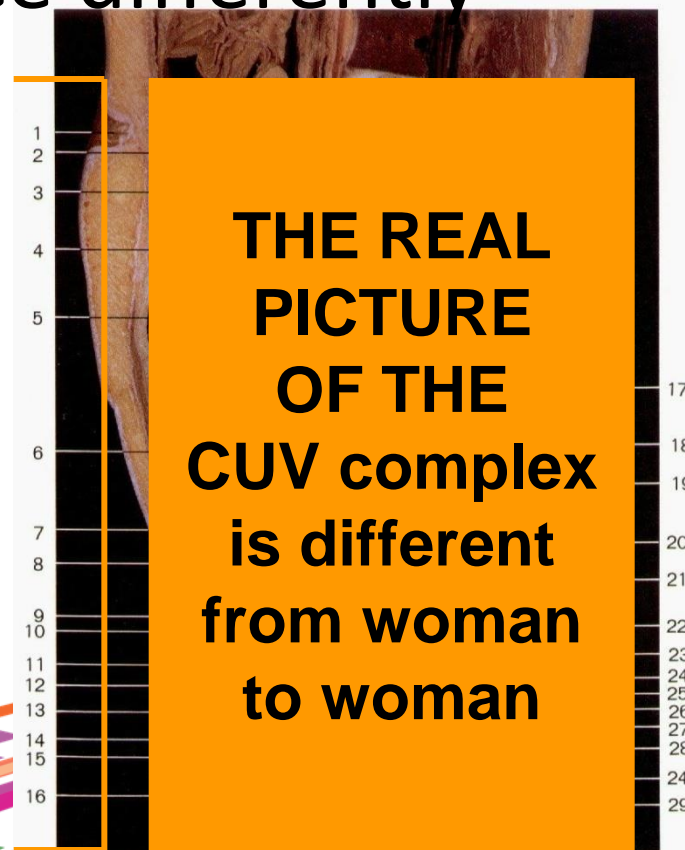
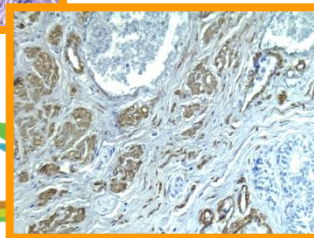
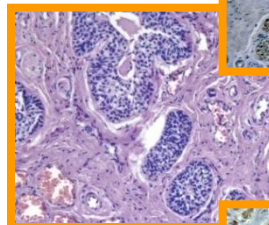
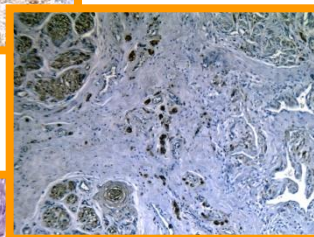
83Kd



# Autopsies demonstrated that

- Women may have in the anterior vaginal wall / urethrovaginal space differently expressed:

- Vessels
- Nerves
- Glands
- Muscles



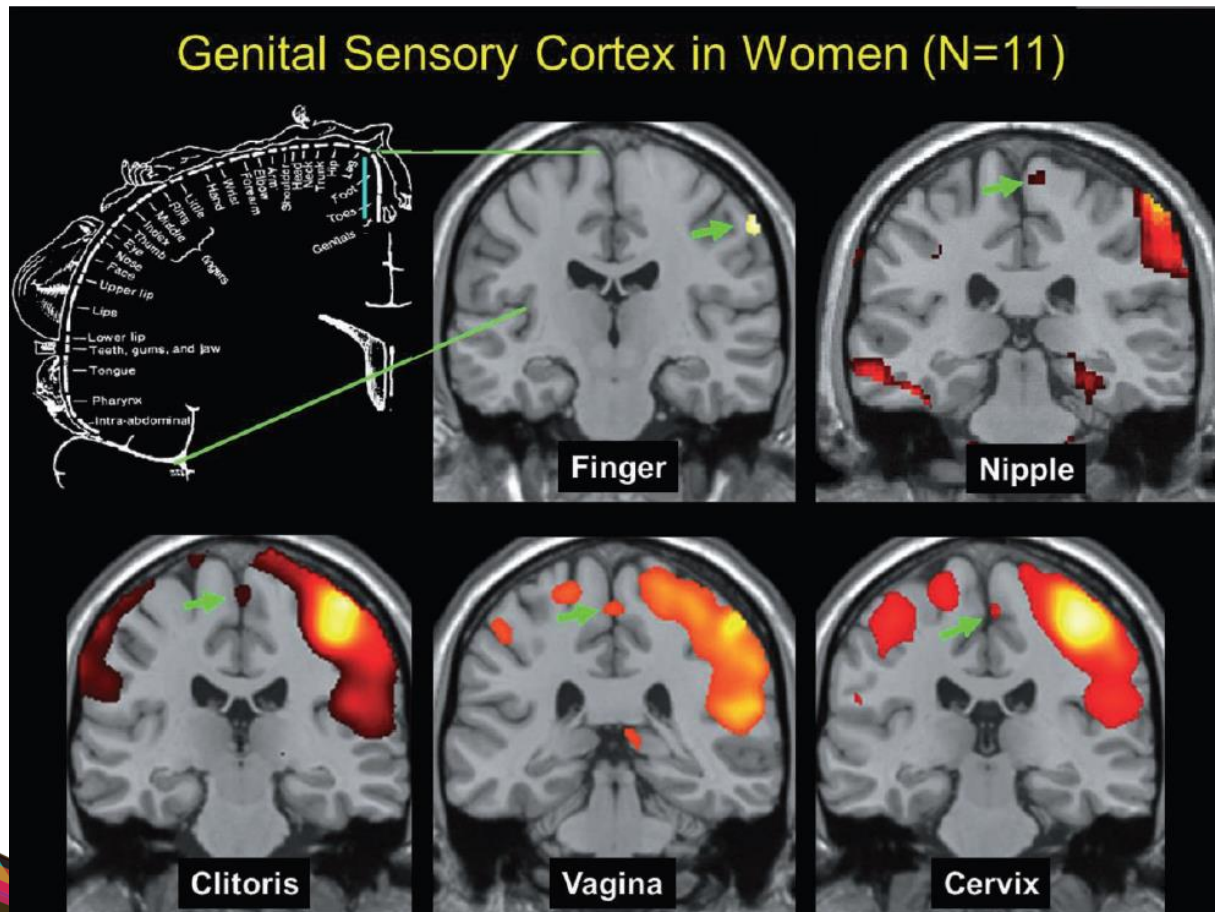
**THE REAL  
PICTURE  
OF THE  
CUV complex  
is different  
from woman  
to woman**

7.17 Midsagittal section through the female trunk. The urinary bladder is empty, the position and shape of the uterus are normal.

# Female Orgasm(s): One, Two, Several

Emmanuele A. Jannini, MD,\* Alberto Rubio-Casillas, Biologist,<sup>†</sup> Beverly Whipple, PhD, RN, FAAN,<sup>‡</sup> Odile Buisson, MD,<sup>§</sup> Barry R. Komisaruk, PhD,<sup>¶</sup> and Stuart Brody, PhD\*\*

J Sex Med 2012;9:956–965.



## Measurement of the Thickness of the Urethrovaginal Space in Women with or without Vaginal Orgasm

Giovanni Luca Gravina, MD, PhD,\* Fulvia Brandetti, MD,\* Paolo Martini, MD, PhD,\* Eleonora Carosa, MD, PhD,\* Savino M. Di Stasi, MD,† Susanna Morano, MD,‡ Andrea Lenzi, MD,§ and Emmanuele A. Jannini, MD\*

**J Sex Med 2008;5:610–618.**

ri valori



## Menstrual Cycle-Related Morphometric and Vascular Modifications of the Clitoris

Cesare Battaglia, MD, PhD,\* Rossella Elena Nappi, MD,† Fulvia Mancini, MD, PhD,\* Arianna Cianciosi, MD,\* Nicola Persico, MD,\* Paolo Busacchi, MD,\* Fabio Facchinetti, MD,‡ and Domenico de Aloysio, MD\*

**J Sex Med 2008;5:2853–**

## 3-D Volumetric and Vascular Analysis of the Urethrovaginal Space in Young Women With or Without Vaginal Orgasm

Cesare Battaglia, MD, PhD,\* Rossella Elena Nappi, MD,† Fulvia Mancini, MD, PhD,‡ Stefania Alvisi, MS,\* Simona Del Forno, MS,\* Bruno Battaglia, MS,\* and Stefano Venturoli, MD\*

2010 International Society for Sexual Medicine

## PCOS and Urethrovaginal Space: 3-D Volumetric and Vascular Analysis

Cesare Battaglia, MD, PhD,\* Rossella Elena Nappi, MD,† Fulvia Mancini, MD, PhD,‡ Stefania Alvisi, MS,\* Simona Del Forno, MS,\* Bruno Battaglia, MS,\* and Stefano Venturoli, MD\*

**J Sex Med 2010;7:2755–2764.**

## 3-D Ultrasonographic Appearance of Two Intermittent Paraurethral Cysts: A Case Report

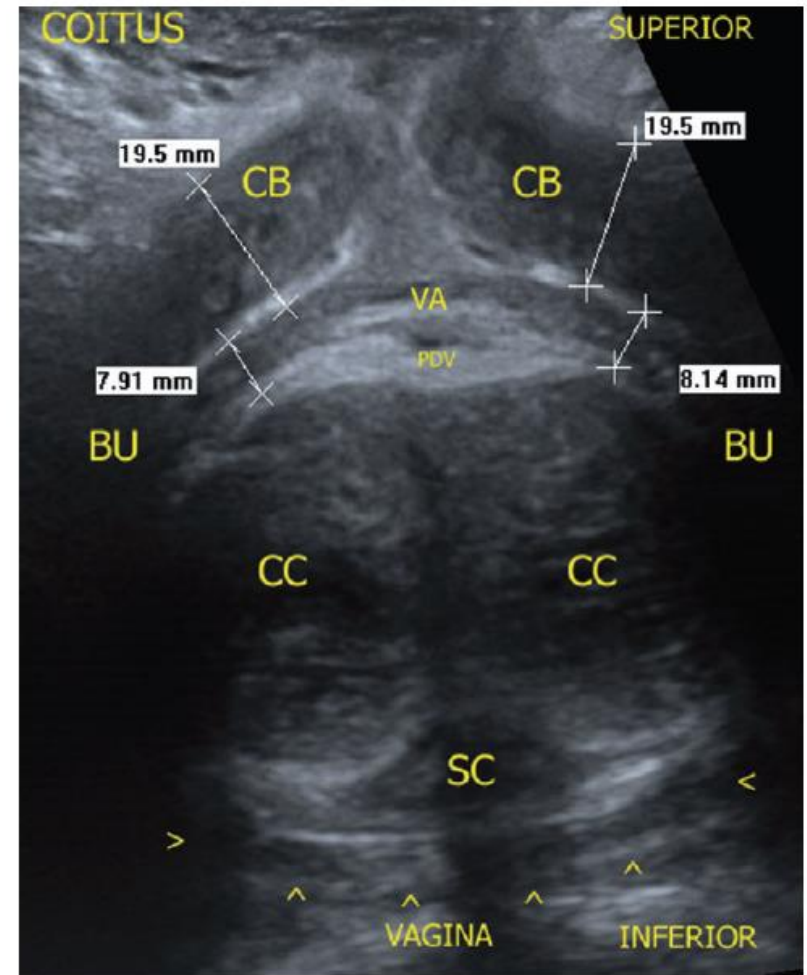
Cesare Battaglia, MD, PhD, and Stefano Venturoli, MD

**J Sex Med 2010;7:2903–2906.**

## AROUSAL, CONGESTIONE E

**LUBRIFICAZIONE VAGINALE:** modificazioni della componente pubo-coccigea del **muscolo elevatore dell'ano**, dell'ischio-cavernoso e del muscolo bulbo-cavernoso (8).

**PENETRAZIONE:** la distensione delle pareti vaginali evoca la contrazione riflessa dei fasci pubo-rettali del muscolo elevatore dell'ano producendo il **riflesso vagino-puborettale**, che favorisce una maggior apertura dell'introito vaginale e un più elevato grado di distensione delle pareti vaginali determinando conseguentemente un miglioramento della stimolazione erotica e della percezione orgasmica.



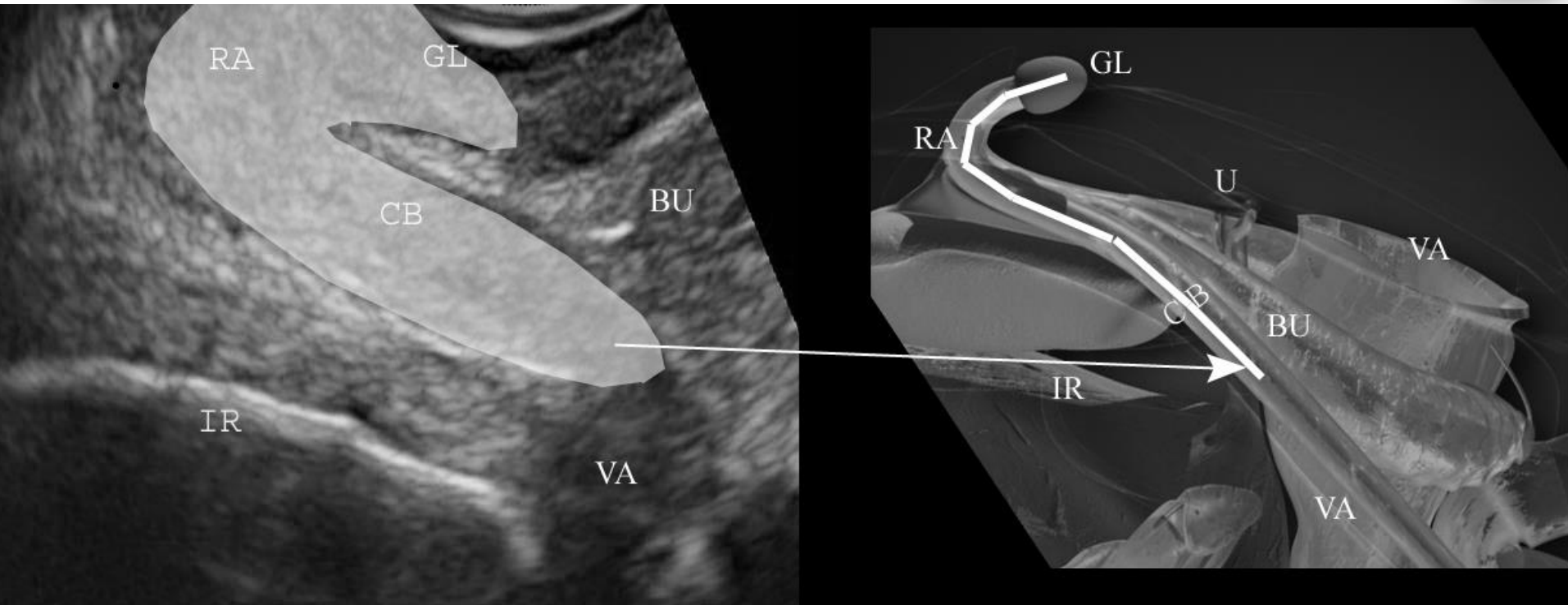
### Coitus as Revealed by Ultrasound in One Volunteer Couple

## Pilot Echographic Study of the Differences in Clitoral Involvement following Clitoral or Vaginal Sexual Stimulation

Odile Buisson, MD\* and Emmanuele A. Jannini, MD†

J Sex Med

Resting



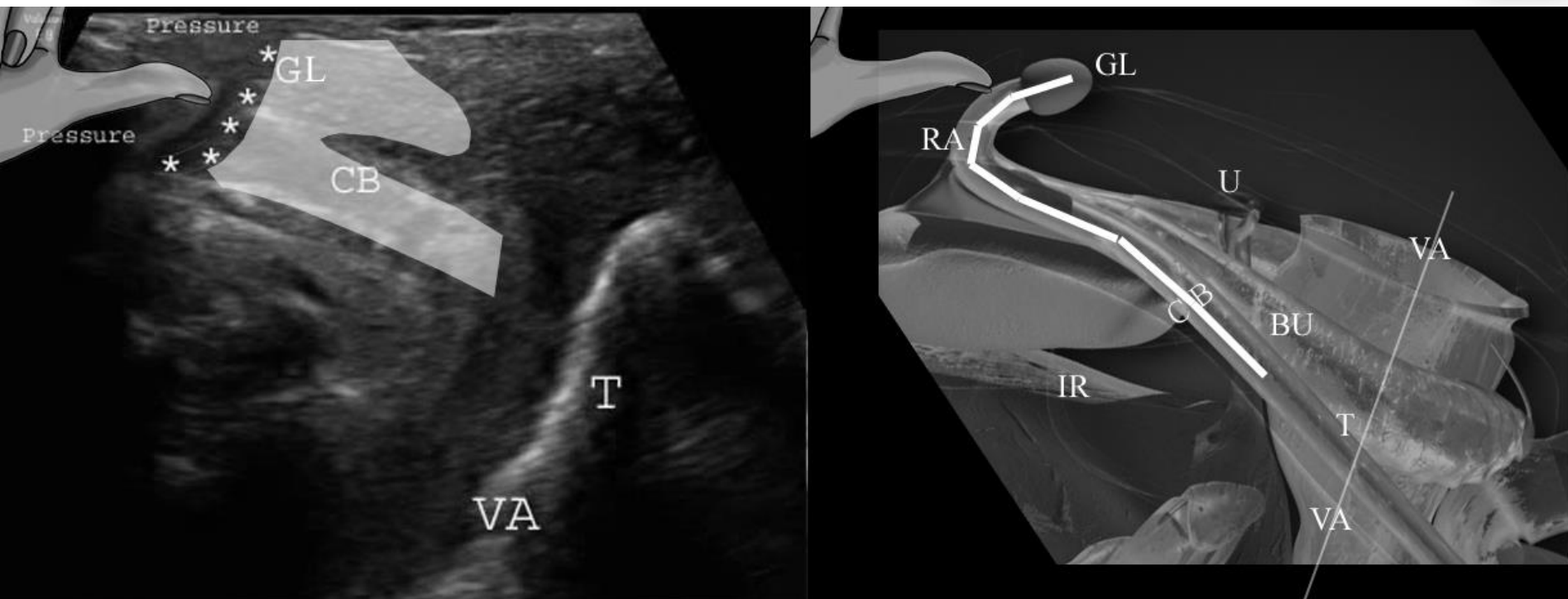
**Figure 1** Representative bidimensional echogram and the corresponding tridimensional reconstruction in a healthy volunteer (Subject 1) of the resting anatomy of the female genitalia in the sagittal plane. The cavernous body showed a long and well-defined hypoechoic structure following the ischiopubic ramus. BU = bulb, CB = clitoral body, GL = glans, RA = raphe, IR = ischiopubic ramus, VA = vagina. Note that supporting information is available on the website highlighting the anatomical relationships.

## Clitoral stimulation

### Pilot Echographic Study of the Differences in Clitoral Involvement following Clitoral or Vaginal Sexual Stimulation

Odile Buisson, MD\* and Emmanuele A. Jannini, MD†

J Sex Med



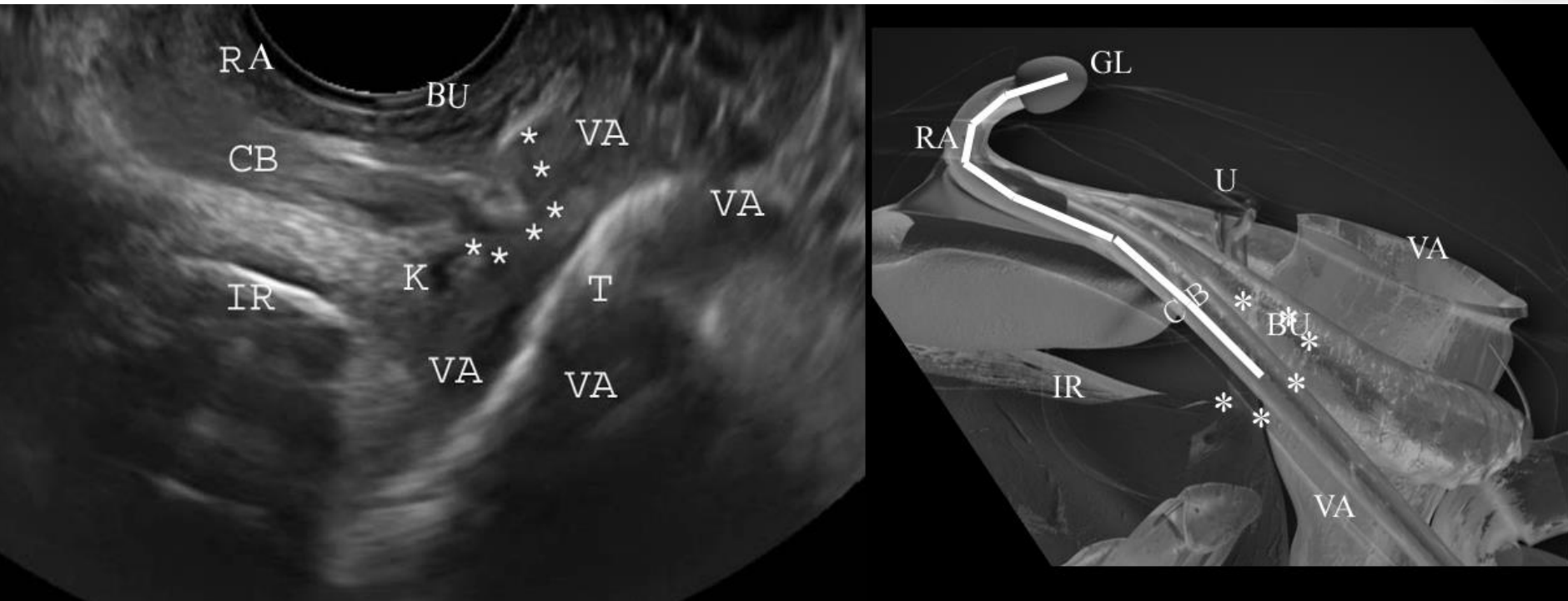
**Figure 2** Representative bidimensional echogram and the corresponding tridimensional reconstruction in a healthy volunteer (Subject 1) of the functional changes during external clitoral stimulation. The glans of the clitoris is moved and crushed, and the area of pressure on the glans and the raphe is highlighted by the asterisks. BU = bulb, CB = clitoral body, GL = glans, RA = raphe, IR = ischiopubic ramus, VA = vagina, U = urethra, T = tampon. Note that supporting information is available on the website highlighting the anatomical relationships.

**Pilot Echographic Study of the Differences in Clitoral Involvement following Clitoral or Vaginal Sexual Stimulation**

Odile Buisson, MD\* and Emmanuele A. Jannini, MD†

J Sex Med

**CUV stimulation**



**Figure 3** Representative bidimensional echogram and the corresponding tri-dimensional reconstruction in a healthy volunteer (Subject 1) of the functional changes during internal vaginal stimulation. While the tampon is pushed upward, the clitoral body slides down. The circular object at the top of the left figure is the convex probe, with the handle at the top of the vulva. Asterisks indicate the close contact between the anterior vaginal wall and the cavernous body. BU = bulb, CB = clitoral body, GL = glans, RA = raphe, IR = ischiopubic ramus, VA = vagina, U = urethra, T = tampon, K = Kobelt plexus. Note that supporting information is available on the website highlighting the anatomical relationships.



## Pilot Echographic Study of the Differences in Clitoral Involvement following Clitoral or Vaginal Sexual Stimulation

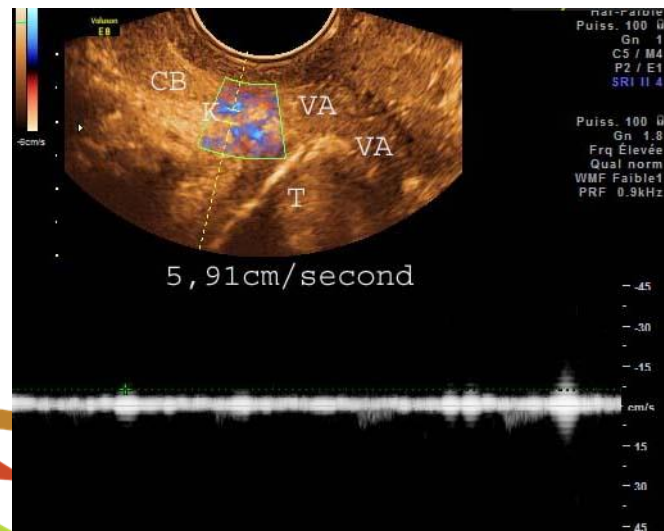
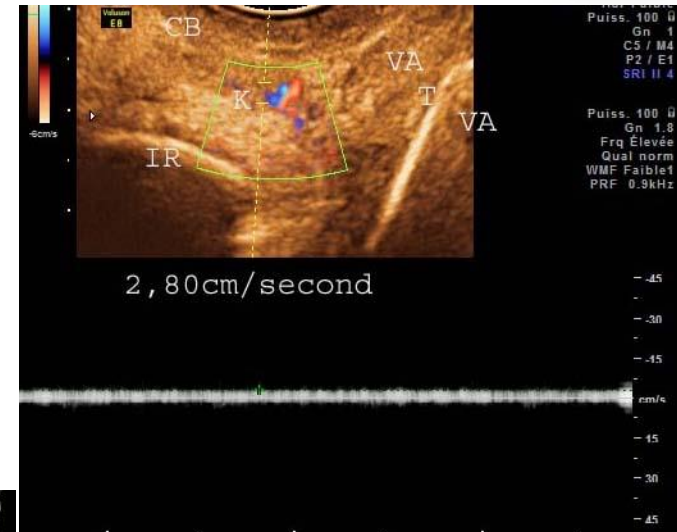
Odile Buisson, MD\* and Emmanuele A. Jannini, MD†

J Sex Med

**Table 1** Differences in speed of blood flow in the veins located at the junction of the cavernous bodies and the vagina during external (clitoral) and internal (vaginal) stimulation (cm/second) (N = 3)

	Clitoral stimulation		Vaginal stimulation	
	Rest	Stimulation	Rest	Stimulation
Subject 1	2.7	2.7	2.8	5.9
	2.5	2.4	2.6	6.4
Subject 2	2.8	2.9	2.6	3.9
	2.9	2.9	3.0	6.6
Subject 3	2.0	3.1	2.1	4.2
	2.6	3.2	2.9	5.8

Each measurement was repeated twice.



**Figure 4** Representative echo-color Doppler of the clitorourethrovaginal complex in a healthy volunteer (Subject 1). The gray-white line represents the venous flow over time (cm/second). The circular object is the convex probe, with the handle at the top of the vulva. (A) Resting, before stimulation. (B) After 3 minutes of thrusting, the flow speed of veins located in the junction of the cavernous bodies and the vagina is enhanced. CB = clitoral body, IR = ischiopubic ramus, VA = vagina, T = tampon, K = Kobelt plexus. Note that supporting information is available on the website highlighting the anatomical relationships.

COITUS

Anterior



Penile corpus cavernosum

Penile corpus cavernosum

Corpus spongiosum

Vagina

Vagina

Posterior

Voluson Research, Gspot 15.02.1980

11L-D/PÉD

MI 1.2



VP15839

6.8cm / 1.2 / 48Hz

09.03.2008

10:36:20

COMP

Abdomen  
13.00 - 4.50  
Puiss. 100 W  
Gn -2  
C6 / M8  
P2 / E0  
SRI II 3

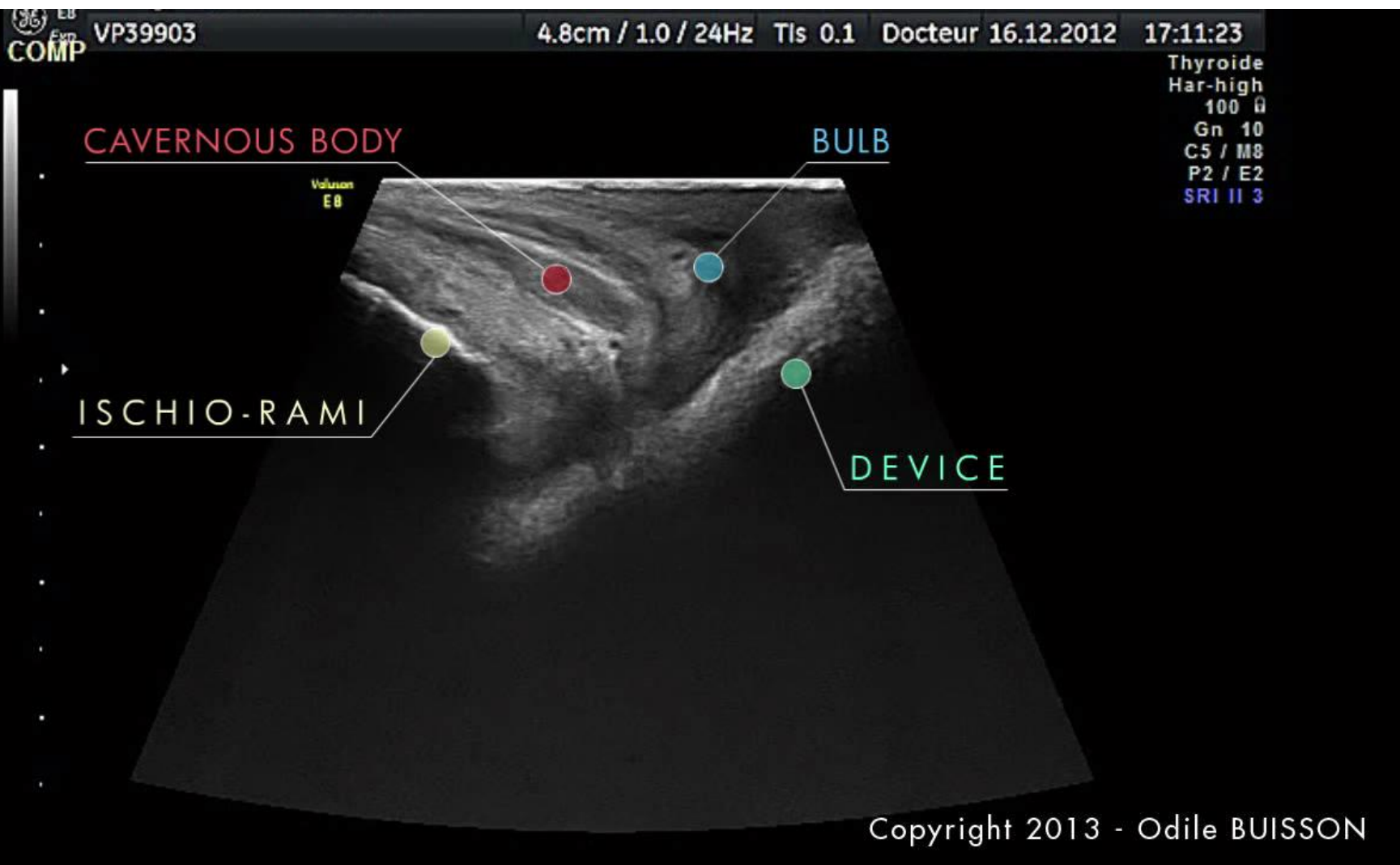




4.2cm  
0.20-0.25cm  
Fetal: 1.00%  
0.00-0.05  
1.7-1.8  
1.9-2.1  
2.2-2.3



4.2cm  
0.20-0.25cm  
Fetal: 1.00%  
0.00-0.05  
1.7-1.8  
1.9-2.1  
2.2-2.3

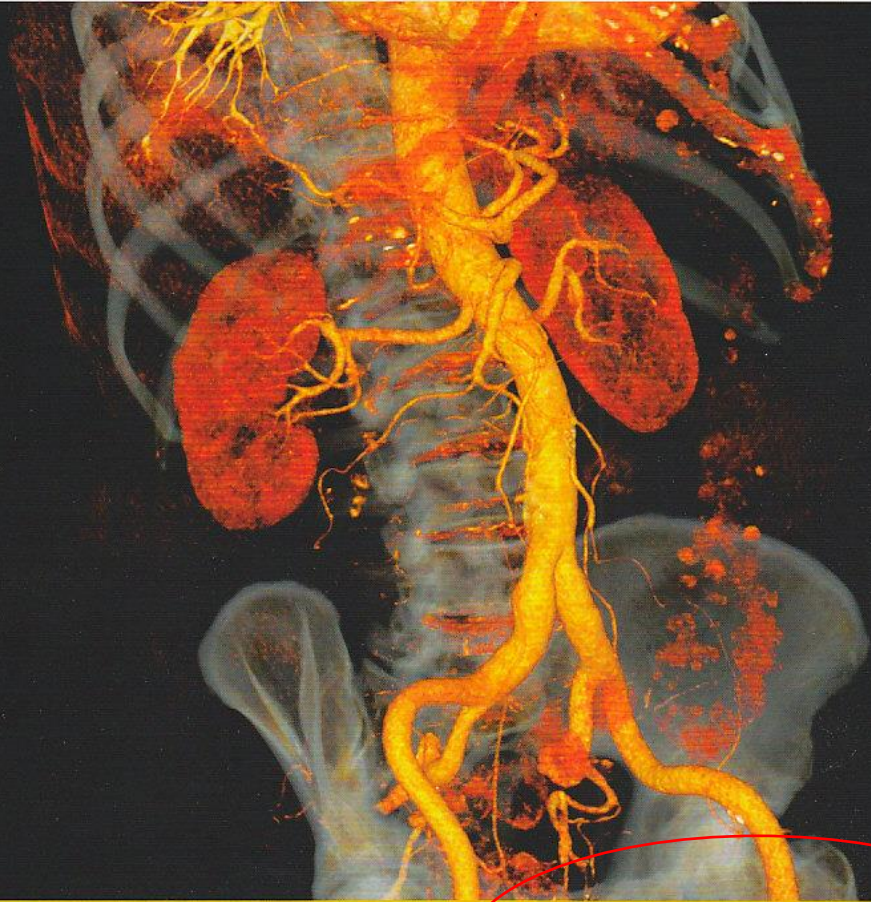


# Beyond the G-spot: clitourethrovaginal complex anatomy in female orgasm

*Emmanuele A. Jannini, Odile Buisson and Alberto Rubio-Casillas*

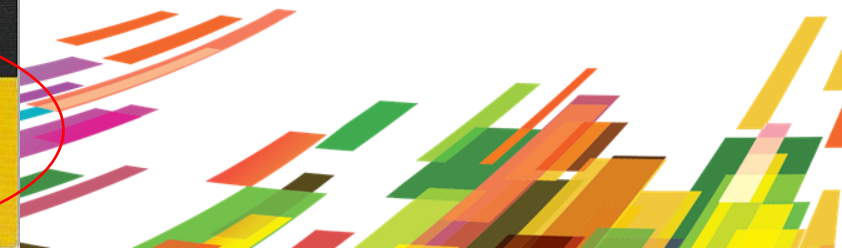
## UROLOGY

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**AUTOPHAGY AND PROSTATE  
CANCER**  
Targeting autophagy as a treatment option

**Anatomy of the female orgasm**  
Role of a postulated clitourethrovaginal  
complex in female sexual function

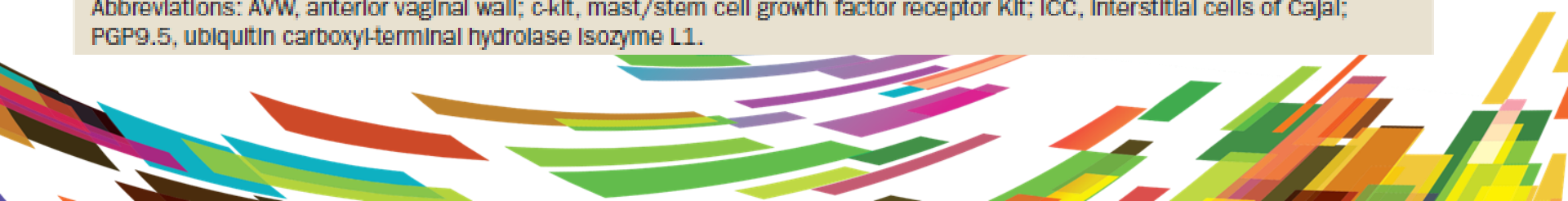


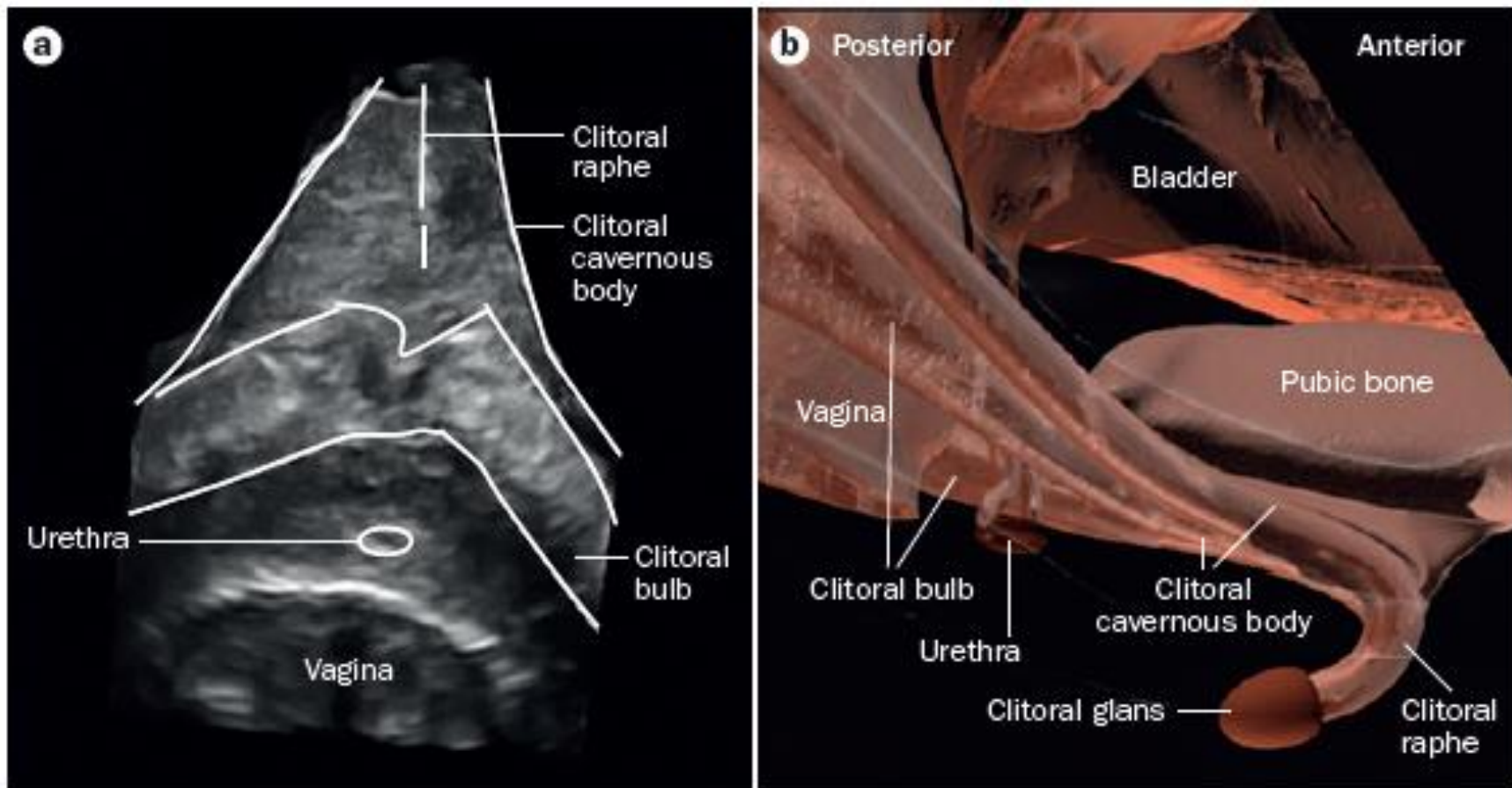
# Locoregional differences

**Table 1** | Evidence for and against locoregional differences in innervation of the human vagina

Finding	Method	Study
<i>Evidence in favour</i>		
More nerves are present in the distal than in the proximal vagina	Immunohistochemistry with an antiserum against the general neuronal marker PGP9.5	Hilliges <i>et al.</i> (1995) <sup>6</sup>
More nerves are present in the distal than in the proximal vagina, and the distal AVW is significantly thicker than the proximal AVW	Microdissection and immunohistochemical study of the human vagina	Song <i>et al.</i> (2009) <sup>7</sup>
ICC are present in the smooth muscle of the vagina	Immunohistochemical investigation using the specific ICC marker c-kit	Shafik <i>et al.</i> (2007) <sup>15</sup>
<i>Evidence against</i>		
No differences in the nerve density in the distal with respect to the proximal vagina. All women from this study had prolapse	Immunohistochemistry with the antibody against the general neuronal marker protein S100	Pauls <i>et al.</i> (2006) <sup>8</sup>

Abbreviations: AVW, anterior vaginal wall; c-kit, mast/stem cell growth factor receptor Kit; ICC, Interstitial cells of Cajal; PGP9.5, ubiquitin carboxyl-terminal hydrolase Isozyme L1.





**Figure 1** | Clitourethrovaginal (CUV) complex and its relationship to female anatomy. **a** | Representative echographic image of the CUV complex in a healthy nulliparous woman, showing the double arch made of the two cavernous bodies and two bulbs. Between the vagina and the double arch, the urethra is visualized. **b** | Ultrasonographic 3D reconstruction of the CUV complex, revealing the close relationship between the vagina and clitoris. Permission obtained from John Wiley and Sons © Buisson, O. & Jannini, E. A. *J. Sex. Med.* **10**, 2734–2740 (2013).





Il complesso CUV è una realtà anatomofunzionale, responsabile fisico, col clitoride esterno, dei tempi della donna.



Riconosco e  
tratto una  
anorgasmica



## Female Orgasm(s): One, Two, Several

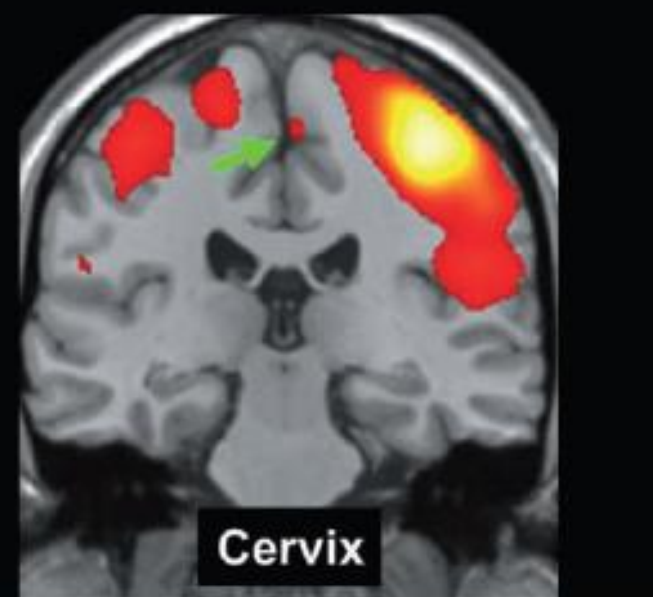
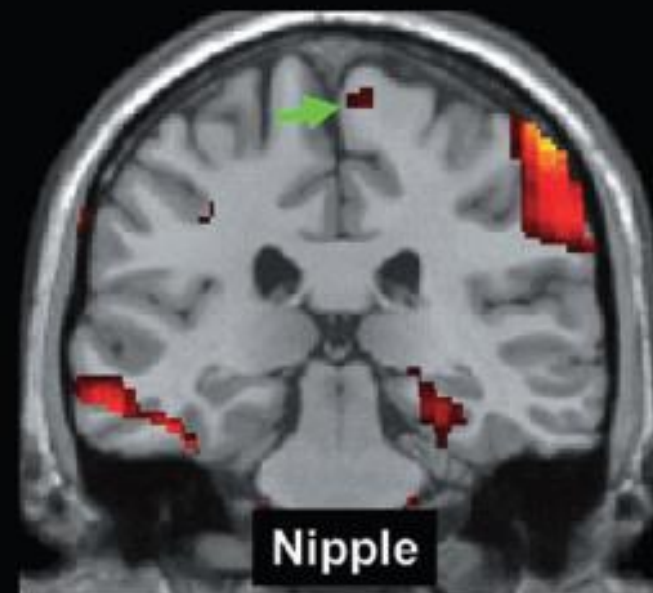
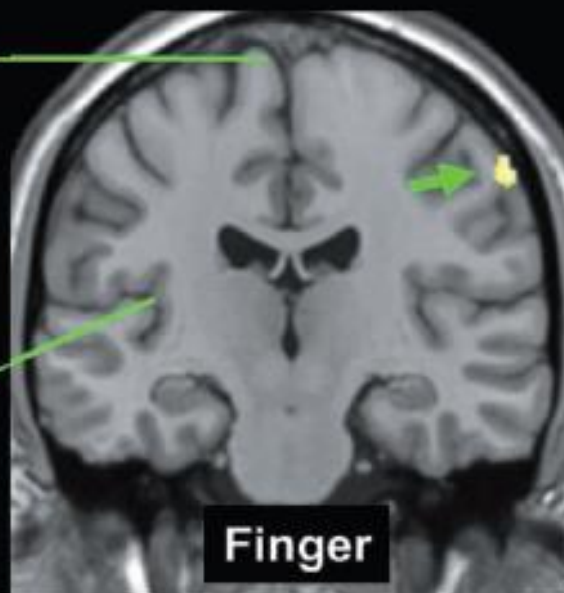
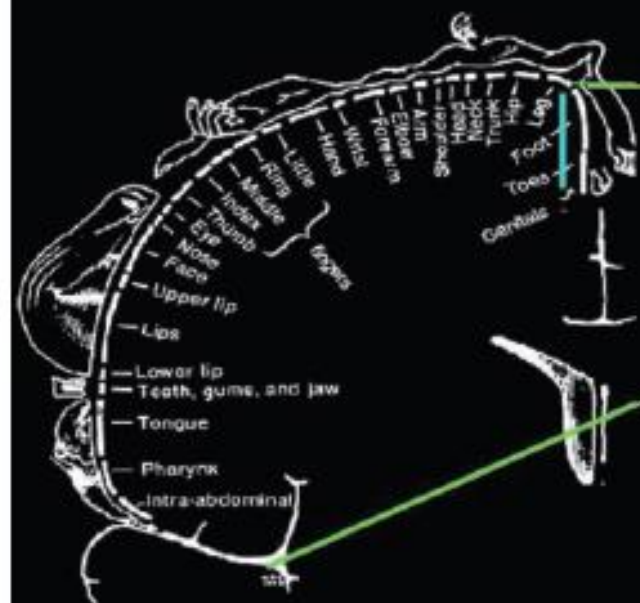
Emmanuele A. Jannini, MD,\* Alberto Rubio-Casillas, Biologist,† Beverly Whipple, PhD, RN, FAAN,‡  
Odile Buisson, MD,§ Barry R. Komisaruk, PhD,¶ and Stuart Brody, PhD\*\*

J Sex Med 2012;9:956–965



# Quanti orgasmi?

# Genital Sensory Cortex in Women (N=11)





# L'orgasmo nascosto

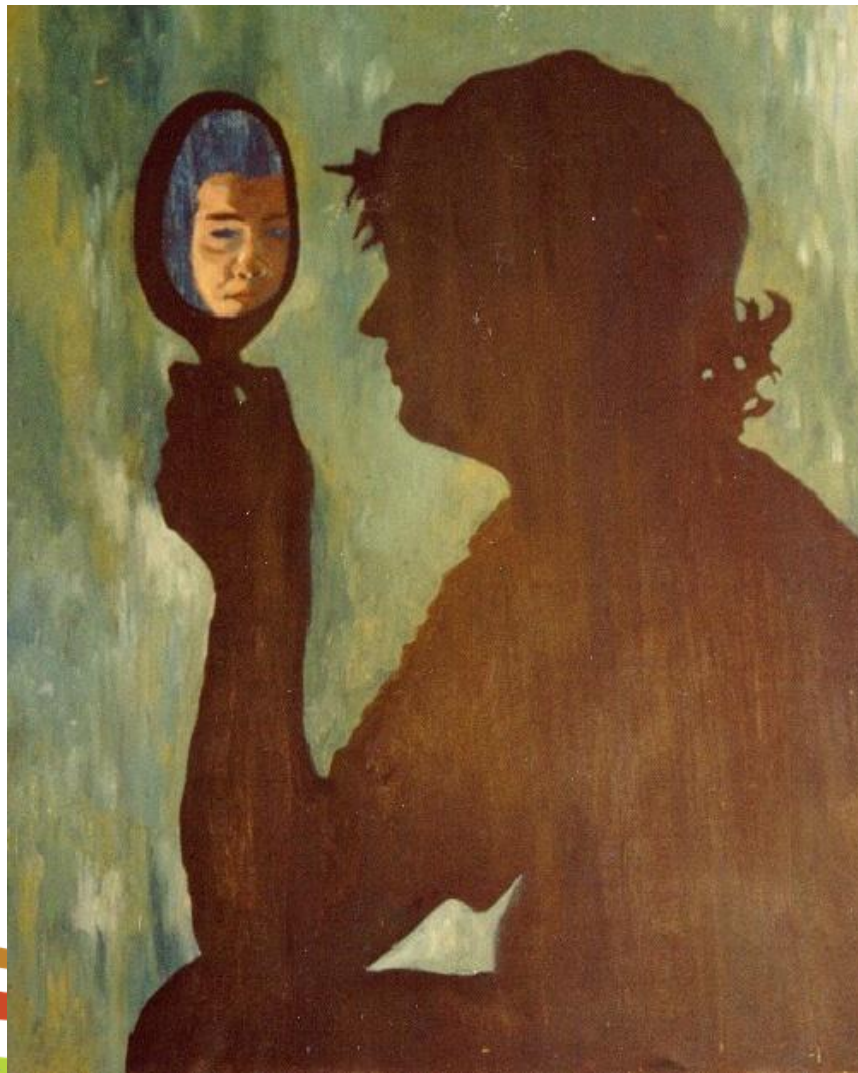


# L'anorgasmia

È una malattia?



# Terapia



Riconosco e  
tratto una  
vaginista



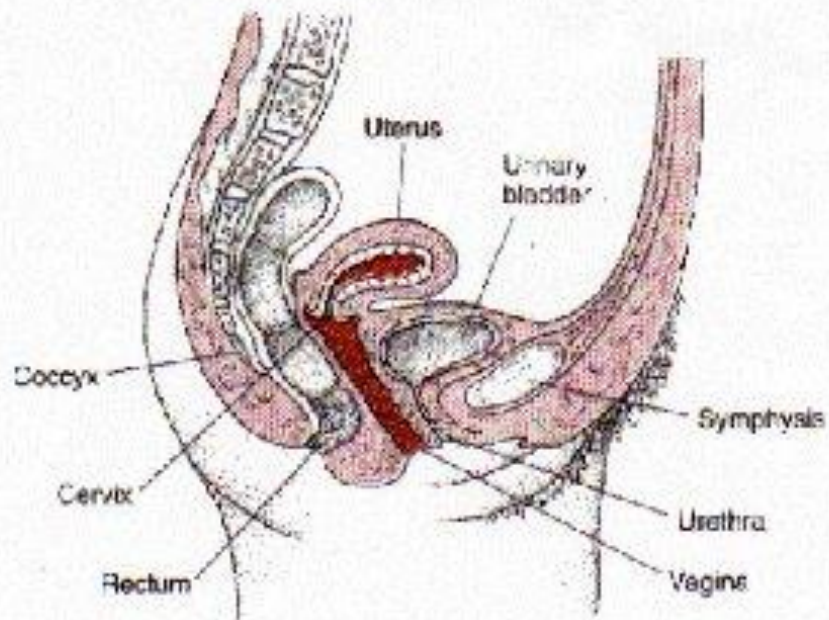
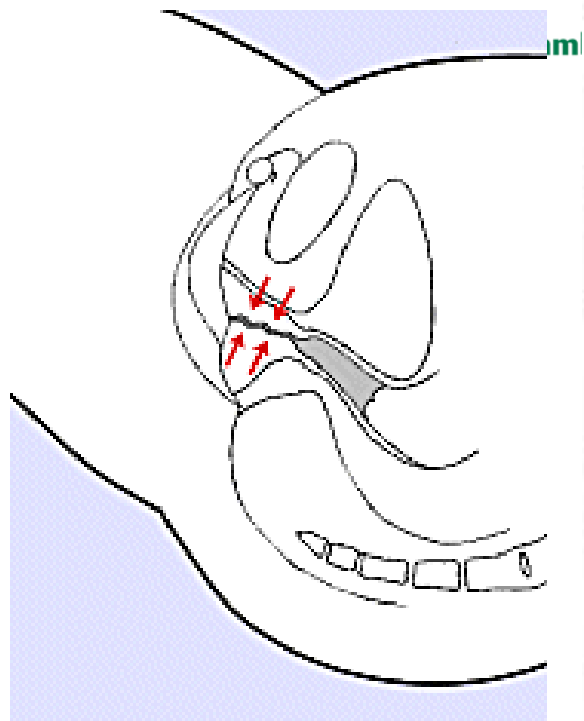


## TABELLA 68.1 Definizioni di vaginismo.

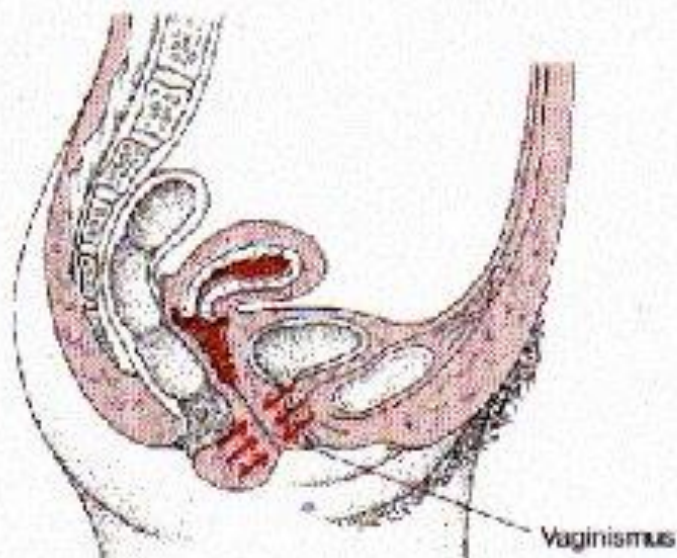
«Ricorrente o persistente spasmo involontario della muscolatura del terzo esterno della vagina che interferisce con la penetrazione» (American Psychiatric Association<sup>8</sup>)

«Spasmo involontario ricorrente o persistente della muscolatura del terzo vaginale inferiore, che interferisce con la penetrazione vaginale, associato o meno a un variabile grado di fobia della penetrazione» (Basson et al.<sup>1</sup>)

«Persistente o ricorrente difficoltà della donna ad accettare la penetrazione vaginale del pene, di un dito o di un oggetto, nonostante l'espresso desiderio della donna di farlo. Ci sono spesso un evitamento fobico e una paura anticipatoria del dolore. Anomalie anatomiche o altre anomalie fisiche devono essere escluse o trattate» (Basson et al.<sup>2</sup>)



(a)



# Cause e fattori di rischio di vaginismo

## ■ NON- ORGANICHE

- Educazione sessuale repressiva
- Abusi sessuali nell'infanzia
- Conflitti psicologici profondi

## ■ ORGANICHE

- Endocrinopatie
- Diabete mellito
- Dispareunia
- Sclerosi multipla



## Principali fattori che modulano la prognosi del vaginismo. (Modificata da Graziottin<sup>17</sup>.)

Gravità del vaginismo, dal I al IV grado, in base all'intensità della contrazione dei muscoli perivaginali

Grado di fobia: lieve, medio, grave

Anni intercorsi dalla scoperta del problema alla richiesta di aiuto

Eventuale presenza di altre patologie associate

- Fisiche (stipsi, cistiti) e/o
- Psicoseessuali (disturbi del desiderio e dell'eccitazione, in particolare)

Grado di stress associato al problema

Motivazione *personale* alla soluzione

Conflitti inconsci della donna sull'identità o l'orientamento sessuali

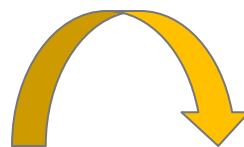
Situazione relazionale della donna (single o in coppia)

Qualità di tale relazione

Presenza di eventuali problemi maschili associati

- Disturbi del desiderio, dell'eccitazione, con deficit erettivo, e/o dell'eiaculazione
- Orientamento omosessuale, cui il matrimonio non consumato faccia da copertura

- Richiesta d'intervento per problemi di fertilità



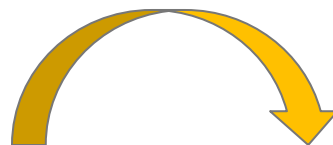
**MOTIVAZIONE ALLA CURA DEL PROBLEMA SESSUALE**



**MOTIVAZIONE DESIDERIO MATERNITA'**

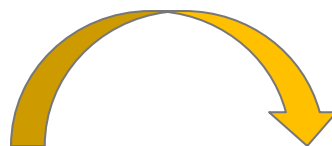
**EMBLEMA DI UN PARADOSSO**

- Il disturbo si manifesta a partire dai primi tentativi di rapporti sessuali
- Vincolo di verginità fino al matrimonio



- **EDUCAZIONE DI TIPO RELIGIOSO RIGIDA**
- **FALSI MITI/CREDENZE SUL MATRIMONIO/SESSUALITA'**

- Aspetto mascolino della donna



- **CONFLITTI RELATIVI ALL'IDENTITA' SESSUALE?**
- **ASPETTO MASCOLINO COME DIFESA DELLA**
- **SESSUALITA'?**



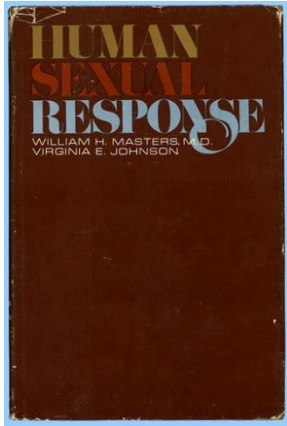
# Opzioni terapeutiche per la cura del vaginismo: quali scegliere?

- **Trattamento farmacologico**
- **Terapia con tossina botulinica**
- **Sedute di fisioterapia**
- **Psicoterapia cognitivo-comportamentale**
- **Sex therapy**





# Sex therapy: il gold standard



Obiettivo principale:

riduzione dell'ansia

associata al rapporto sessuale



# Dilatatori di Hagar



# Terapie del vaginismo

Usare lo specchio

Proibire la penetrazione

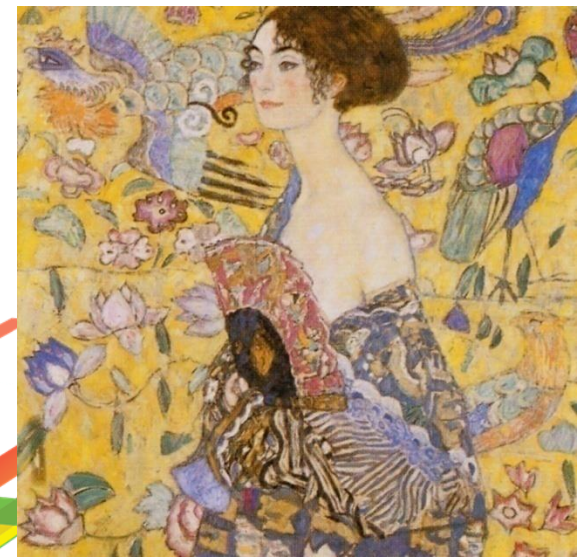
Usare i dilatatori di Hagar

- Non coitale (manuale/orale)
- Dito (da soli, quindi col partner)

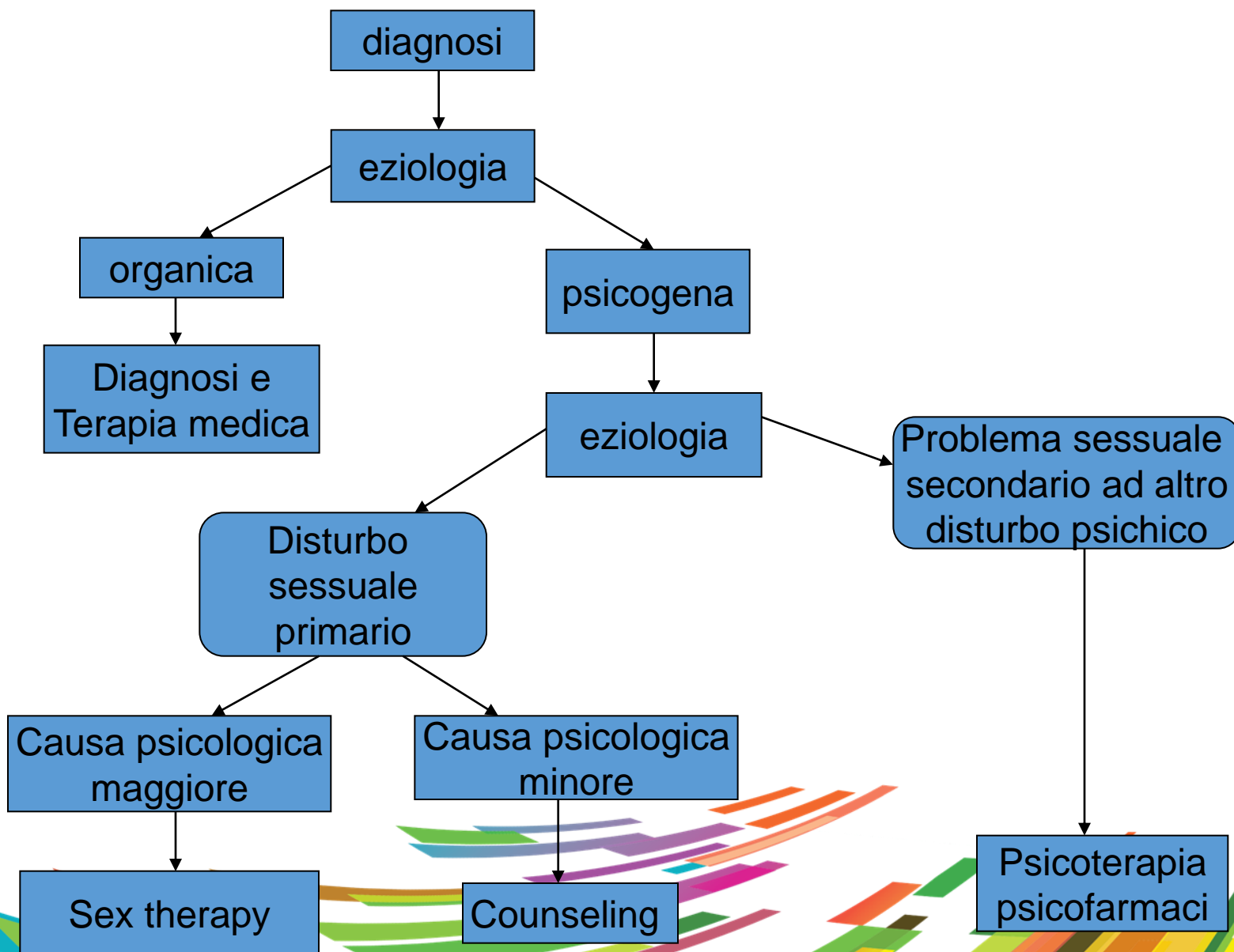
Tecniche di rilassamento

Ipnosi

Farmaci (benzodiazepine)



# Flow chart riassuntiva



# Emanuele: Giugno 2014



