

# Évaluation Ejaculation

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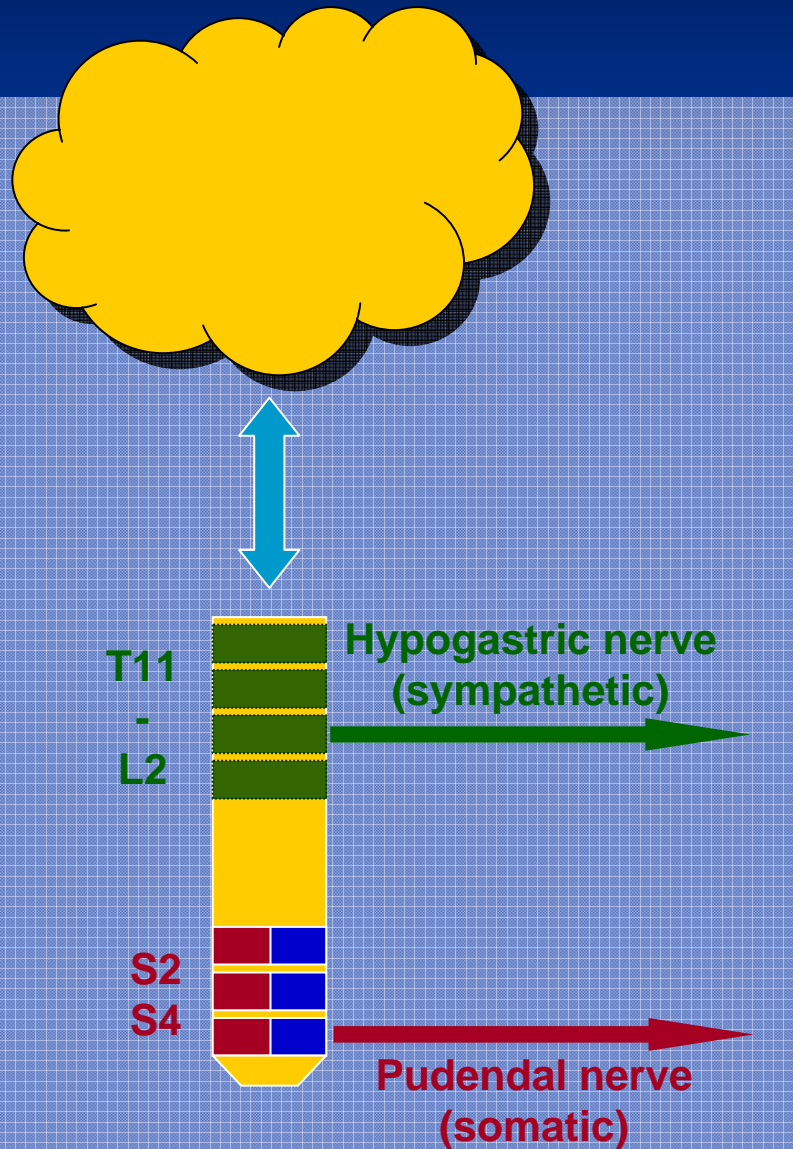
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# Ejaculation in SCI patients



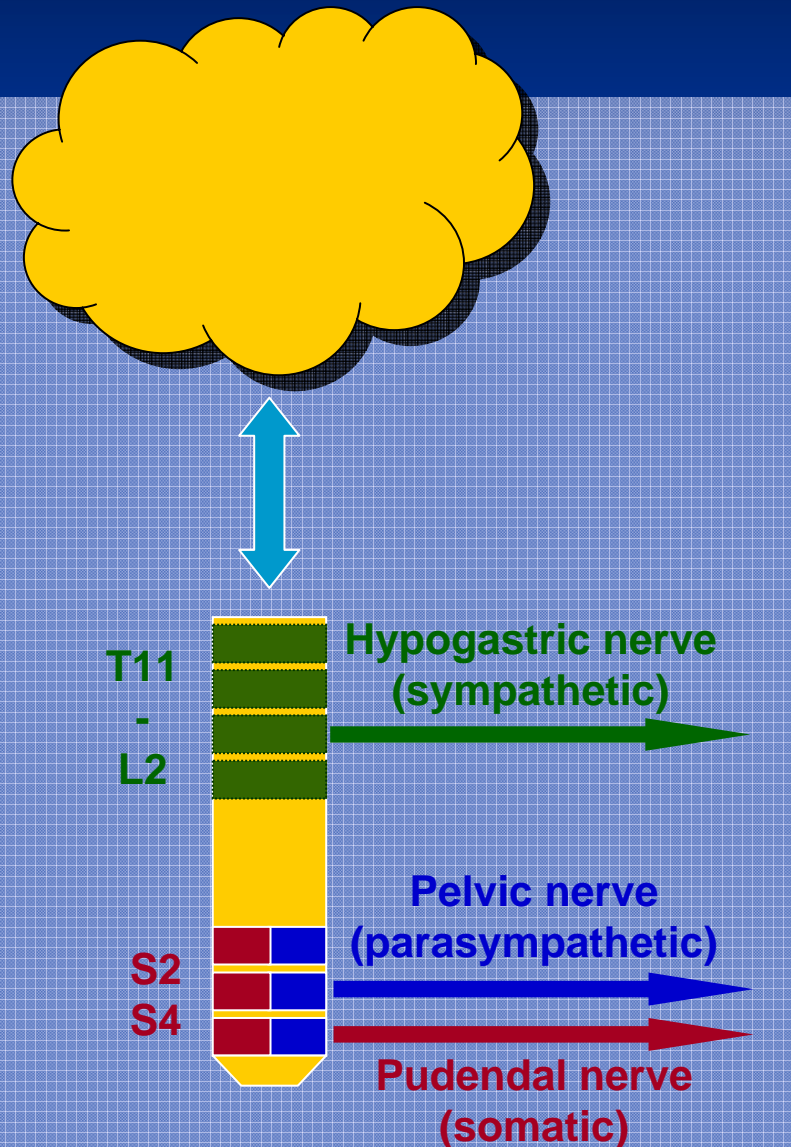
## T11-L2 centre

- Seminal emission

## S2-S4 centre

- Expulsion (projectile ejaculation)

# Ejaculation in SCI patients



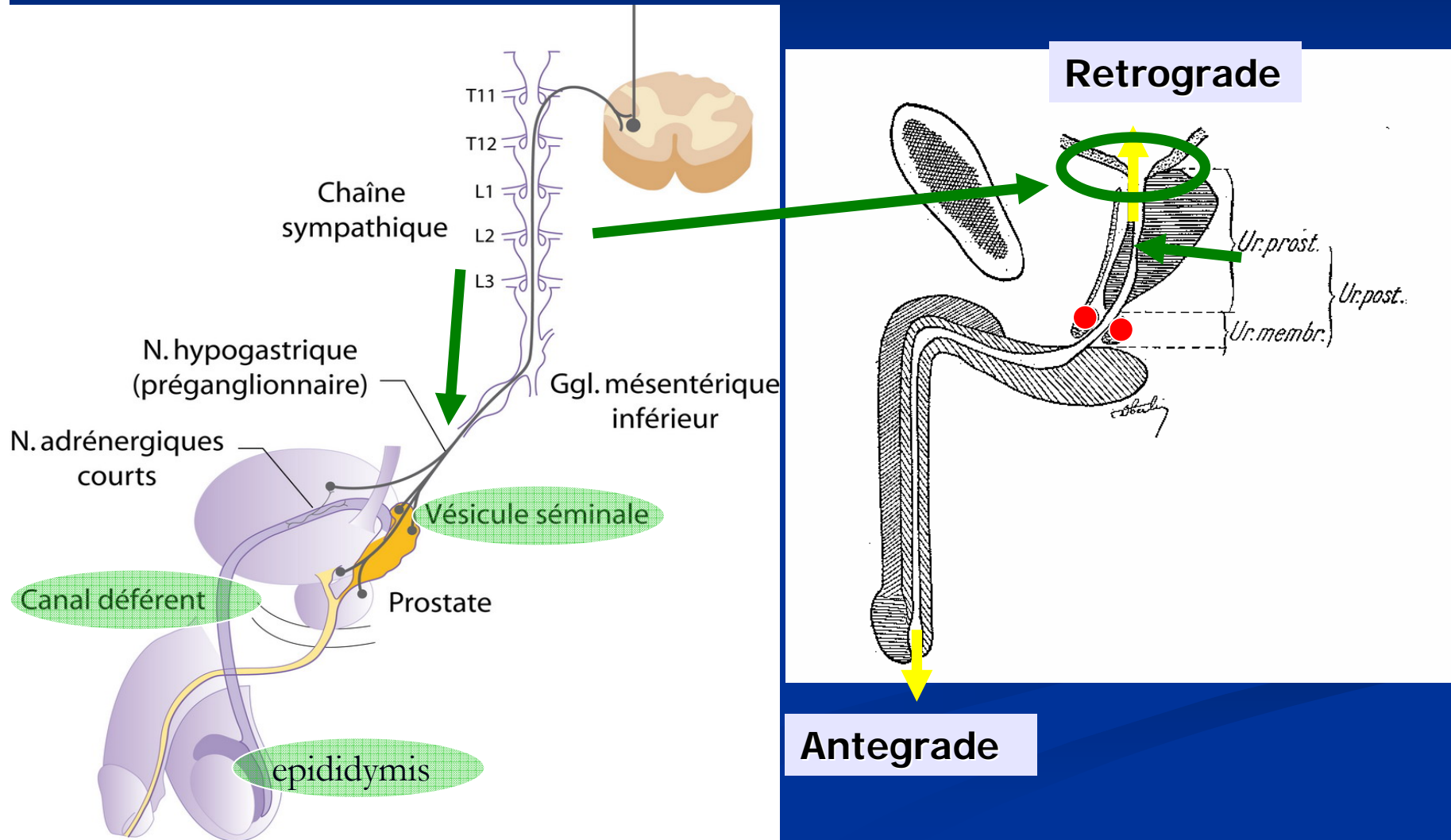
## T11-L2 centre

- Seminal emission
- Psychogenic erection

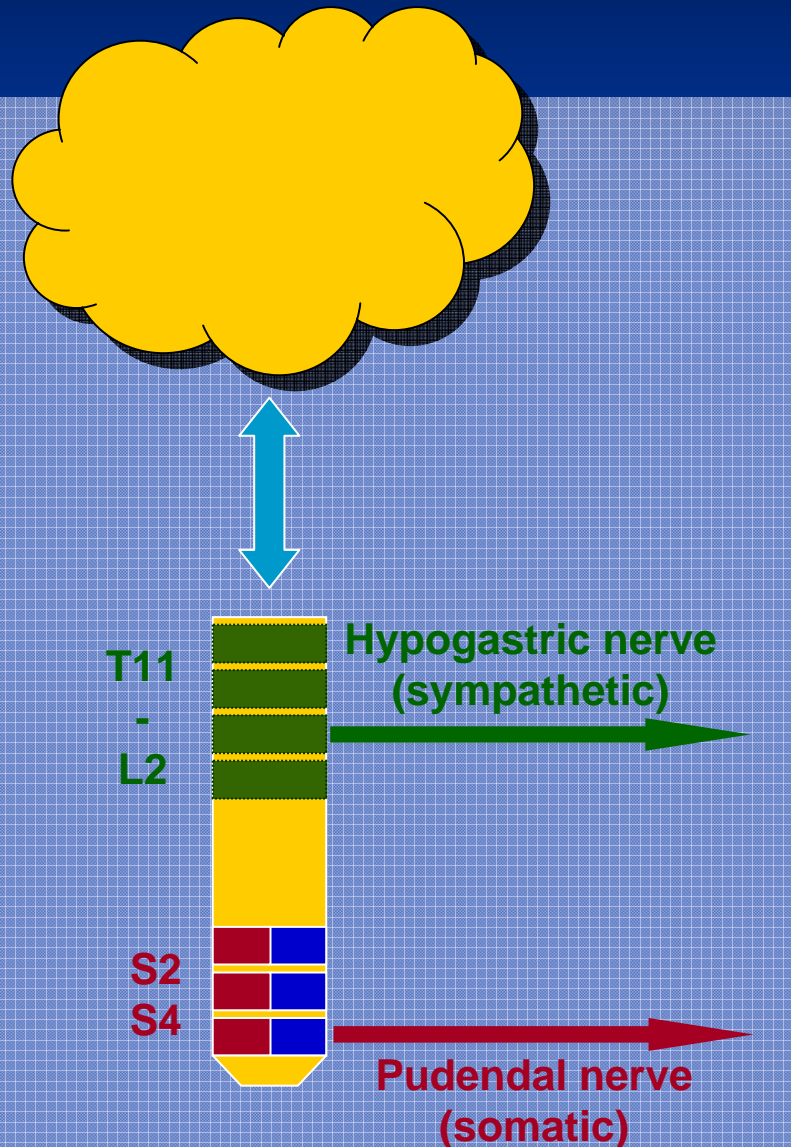
## S2-S4 centres

- Expulsion (projectile ejaculation)
- Reflex erection

# Ejaculation in SCI patients

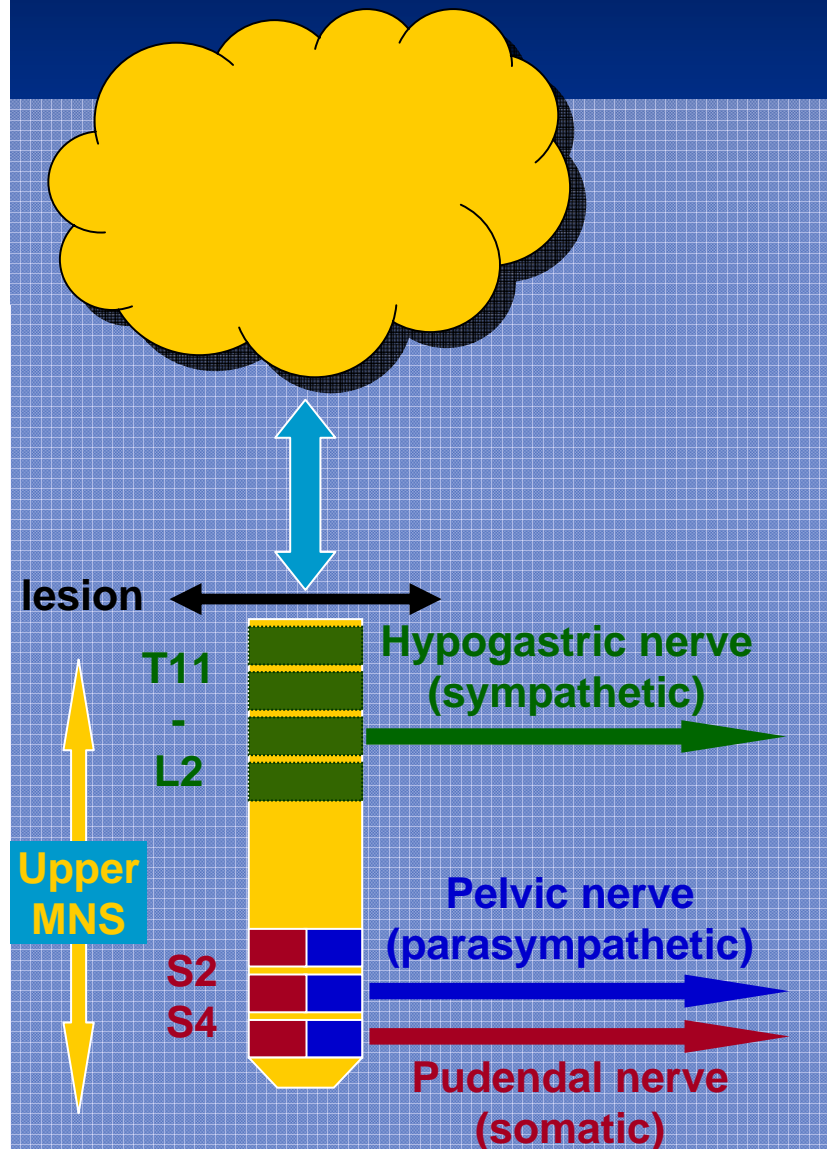


# Ejaculation in SCI patients



- Spinal coordination?
  - Truit 2002, Xu Giuliano 2005
  - Chehensse, Denys, Giuliano 2013
- 1<sup>st</sup> phase: seminal emission
- 2d phase: expulsion (projectile ejaculation)

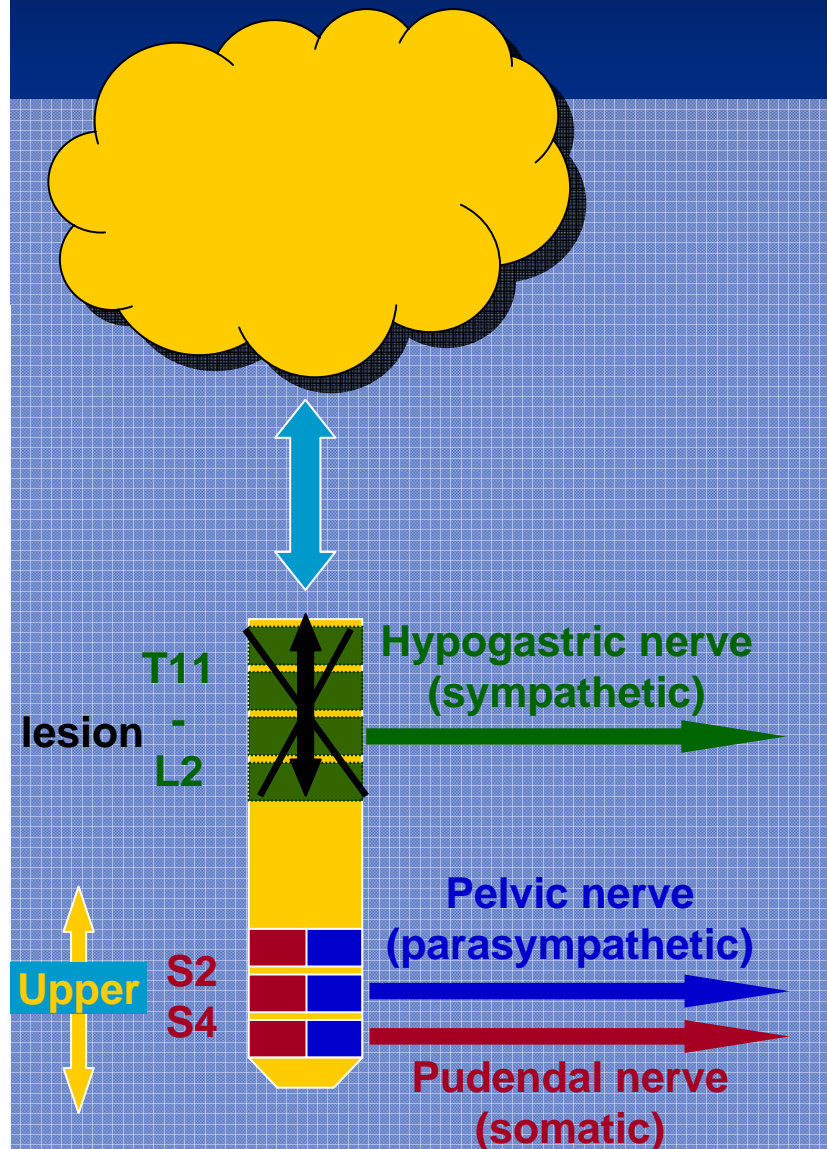
# Ejaculation in SCI patients



## Complete SCI above T10

- Upper Motor Neuron syndrome
- *Psychogenic erection*
- *Reflex erection*
  
- Emission & expulsion

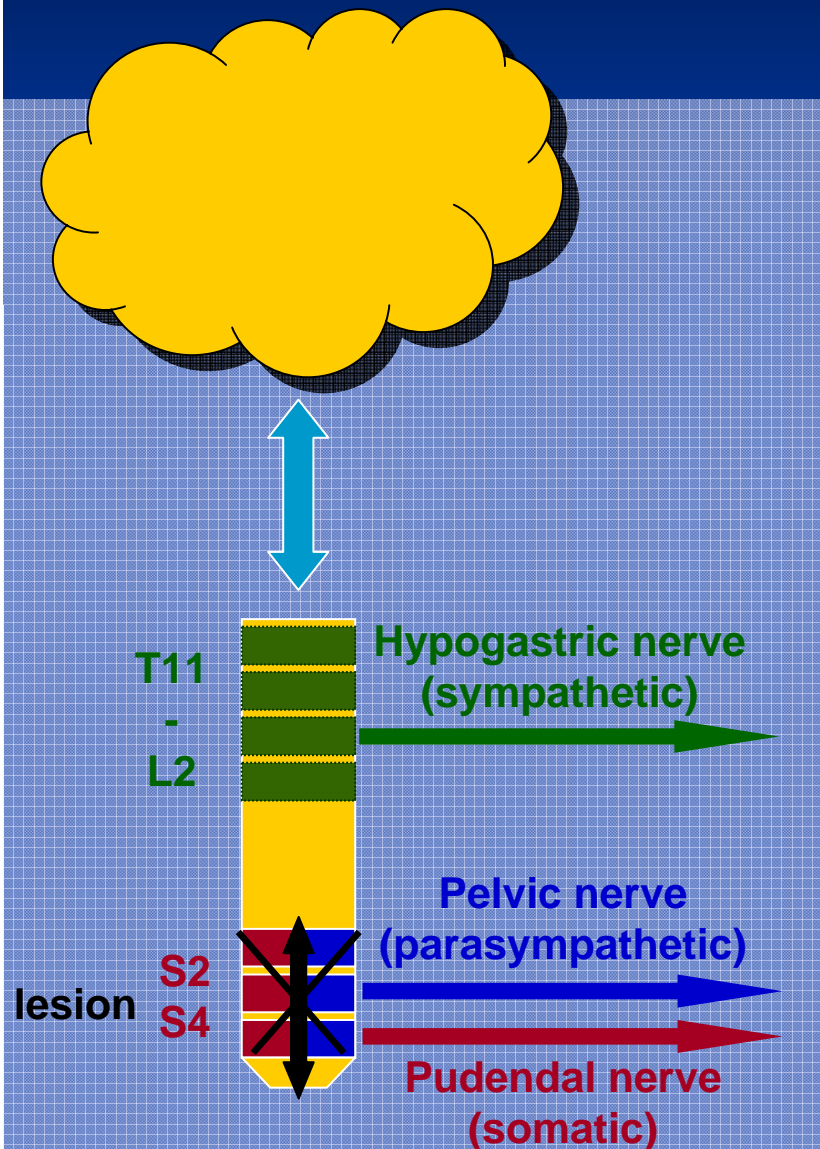
# Ejaculation in SCI patients



## Lesion at T11-L2 segments

- Upper Motor Neuron syndrome
- **Ejaculation**
- *Psychogenic erection*
- *Reflex erection*

# Ejaculation in SCI patients



## Lesion sacral segments

- Lower Motor Neuron syndrome
- *Psychogenic erection*
- **Emission** (dribbling ejaculation)
- ~~*Reflex erection*~~



# Ejaculation in SCI patients

- Ejaculation during intercourse or masturbation
  - 12% patients with a complete SCI
  - 33% patients with a incomplete SCI

*(Chéhensse, Denys, Giuliano 2013)*
- Stronger stimulations
  - Erection
  - PVS, alone or on midodrine

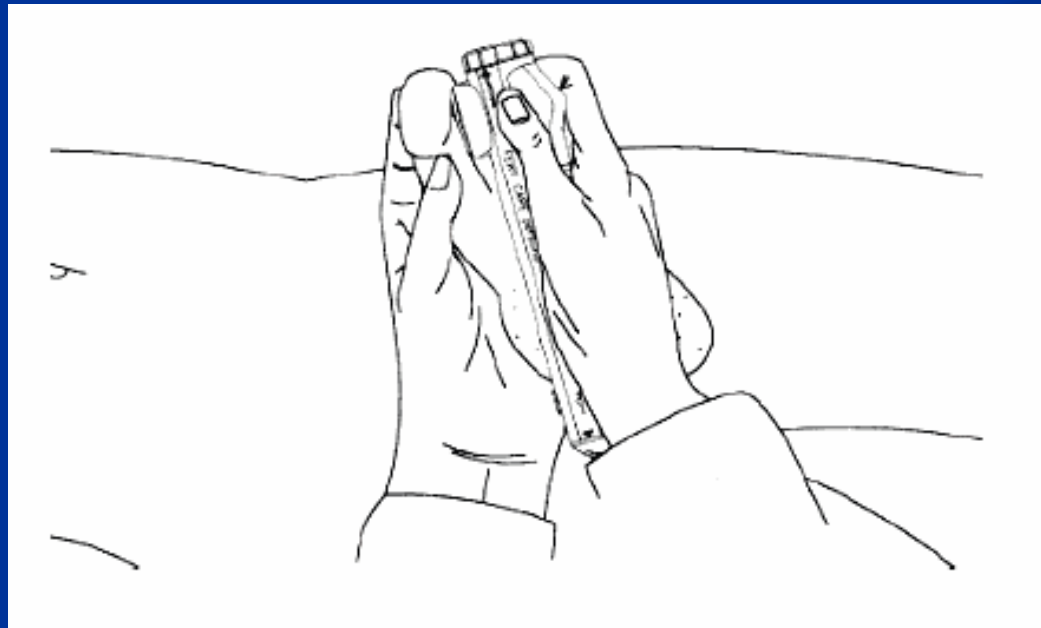
# Ejaculation in SCI patients

- Better erection improves ejaculation
  - Oral phosphodiesterase type-5 inhibitors
    - Sildenafil (*Soler 2007*), Vardenafil (*Giuliano 2008*)
  - Alphablockers
    - Alfuzosin + Sildenafil (*Kaplan 2007*)
- Baclofen decreases erection & ejaculation
  - Chronic intrathecal baclofen therapy (*Denys 1998, Jones 2008*)
  - Reversible with withdrawal or reduction of administration

# PVS in SCI patients

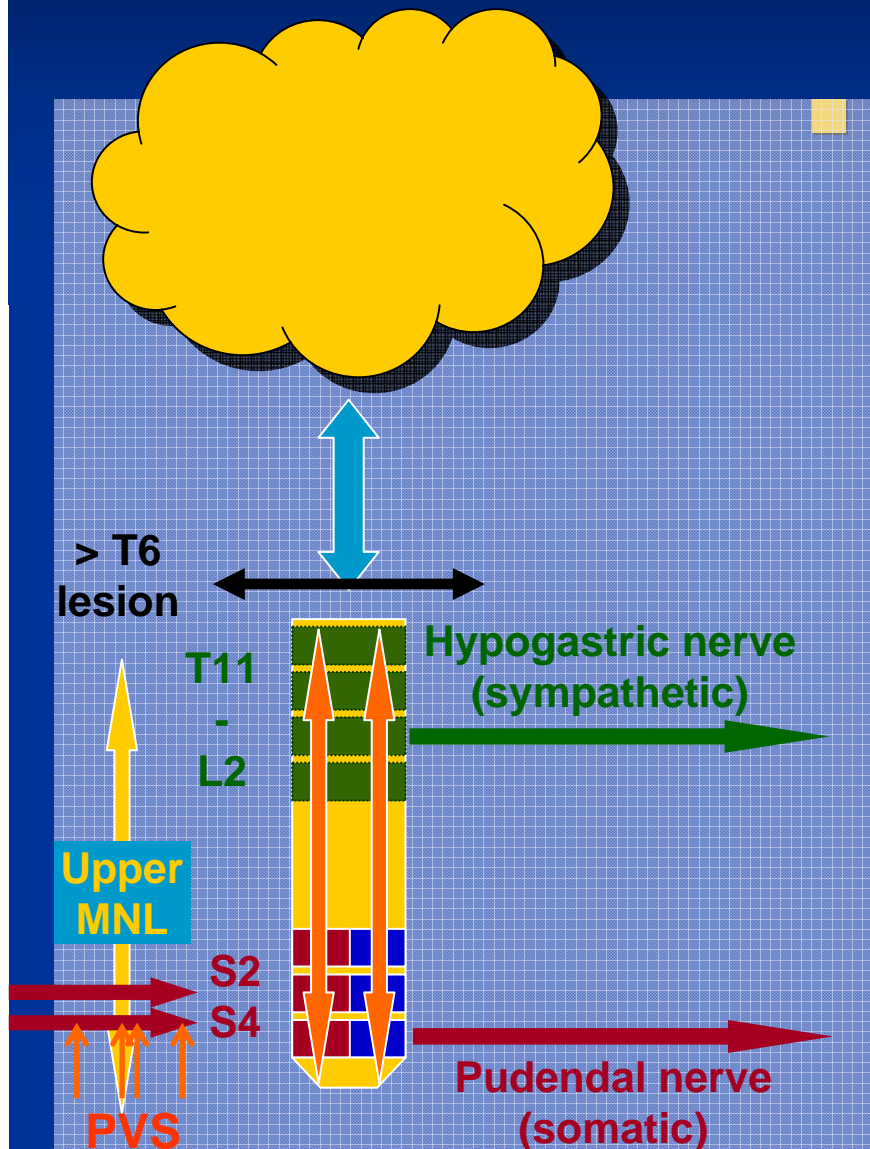
- Penile Vibratory Stimulation (PVS)
  - Amplitude: 2,5 mm
  - Frequency: 100 Hz

*Brindley 1984, Sonksen 1994*



# PVS in SCI patients

## Mechanism of action



- Stimulation of the afferents
- Strong sympathetic activation
  - T11-L2 segment: ejaculation
  - T6-T12 segment: vasoconstriction vascular splanchnic bed
  - **Autonomic dysreflexia** (*Comarr 1985, Claydon Krassioukov 2006*)

# PVS in SCI patients

	Patients	Ejacul <sup>o</sup>	Antegrade	Ante & Retrograde	Retrograde
Siosteen 1990	n = 32	<b>91 %</b>	76 %	-	24 %
Sonksen 1991	n = 36	<b>75 %</b>	59 %	41 %	-
Sonksen 1994	n = 66	<b>88 %</b>	71 %	-	29 %
Ohl 1996	n = 34	<b>82 %</b>	79 %	21 %	-
Brackett 1998–9	n = 211	<b>54 %</b>	65 %	35 %	-
Soler 2007	n = 449	<b>65 %</b>	50 %	33 %	17 %

# PVS in SCI patients

- Spastic patients (Upper MNL) above T10
  - Ejaculation is frequent (>80%), mostly antegrade but frequently associated with retrograde ejaculation
- Flaccid patients (Lower MNL)
  - 12% (*Ohl 1996, Soler 2007*) 27% (*Sonksen 1994*) 35% (*Brackett 1999*)
  - Ejaculation is rare and mostly retrograde

# PVS in SCI patients

- PVS
  - Sandwich technique (*Brackett 2007*)



# PVS in SCI patients

- PVS
  - Abdominal ES (*Kafetsoulis 2006*)





## ■ Stimulation mécanique

### ■ Viberect:

- Fréquence: 75-100 Hz
- Amplitude: 4 mm

### ■ Succès

- Patients médullaires > T10
- 23/30 patients (77%)

*Tajkarimi, SC 2014*



Figure 1. The Viberect handheld penile vibratory stimulatory device.



# PVS + midodrine in SCI patients

- Pharmacological enhancement: Midodrine
  - Alpha1-adrenergic agonist
    - treatment of symptomatic orthostatic hypotension: 10mg x 3
  - Direct stimulation of internal genital organs
  - Cardiovascular effects
    - Rise in Systolic and Diastolic BP
    - Cardiovascular monitoring mandatory

# PVS + midodrine in SCI patients

449 patients with anejaculation during sexual activity

W0

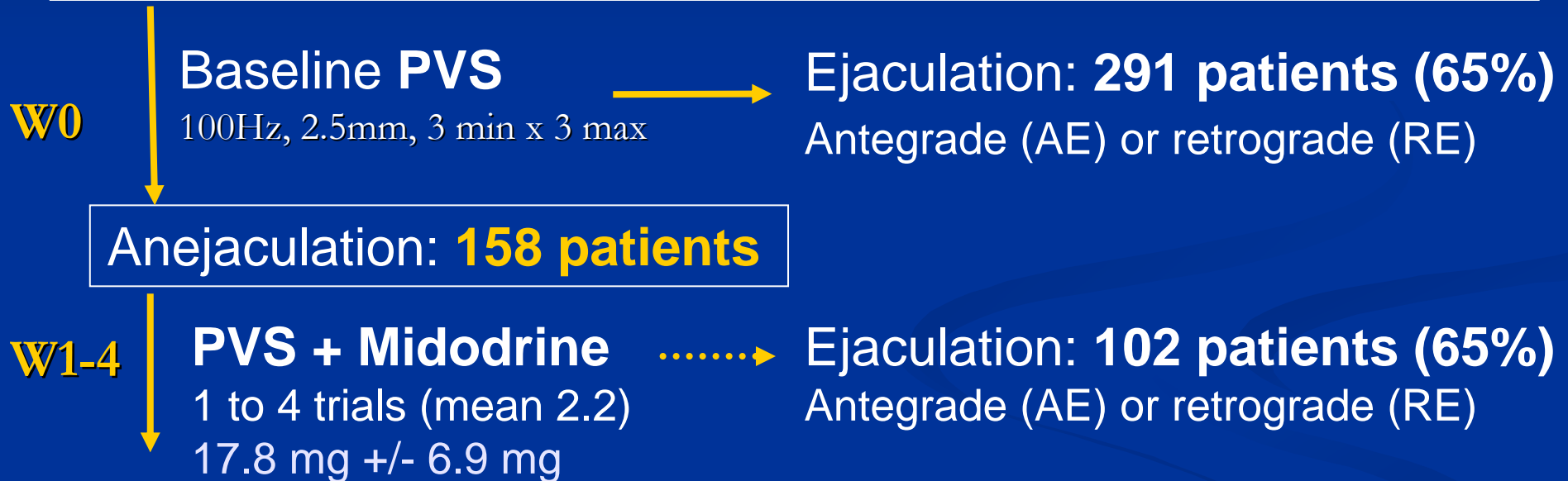
Baseline PVS

100Hz, 2.5mm, 3 min x 3 max

Ejaculation: 291 patients (65%)  
Antegrade (AE) or retrograde (RE)

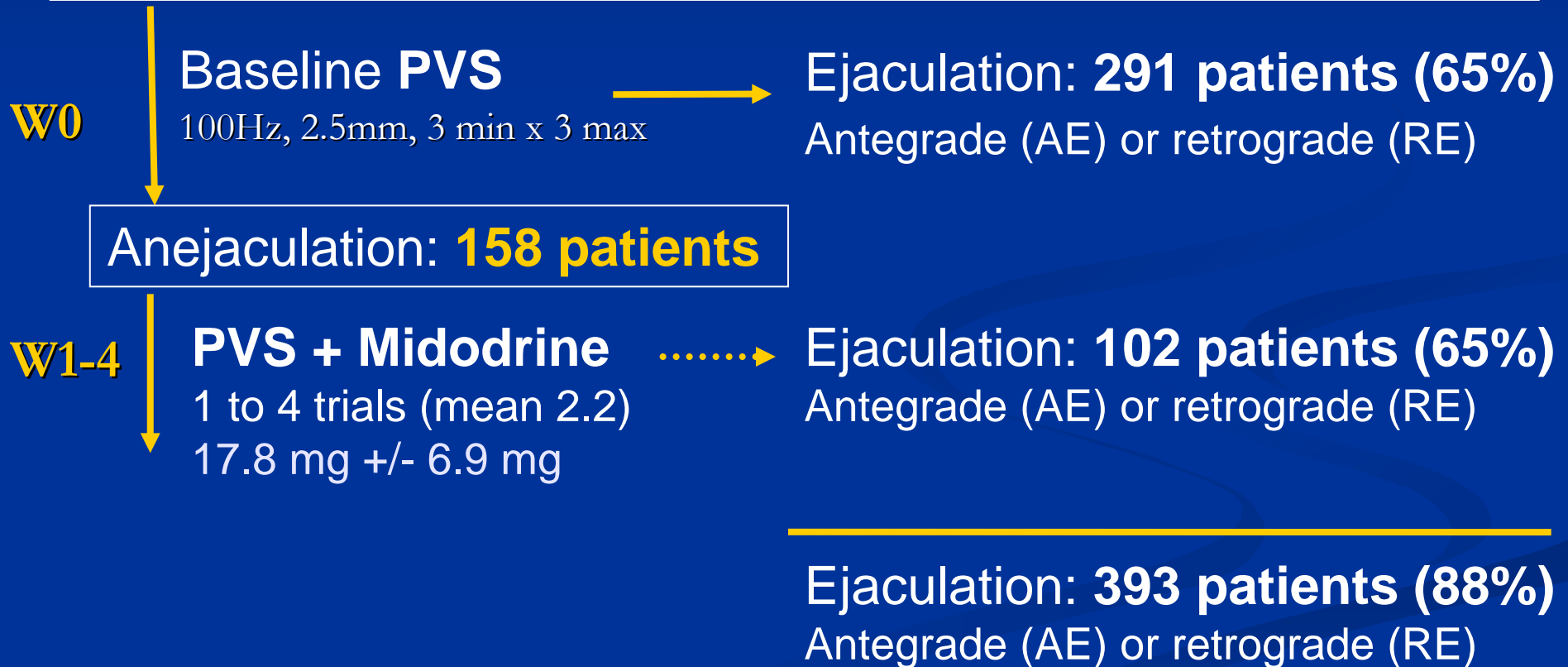
# PVS + midodrine in SCI patients

449 patients with anejaculation during sexual activity



# PVS + midodrine in SCI patients

449 patients with anejaculation during sexual activity



# PVS + midodrine in SCI patients

	Patients	Ejacul <sup>o</sup>	PVS	PVS + midodrine	Total
Soler 2007	n = 449	0 %	65 %	33 %	88 %
Courtois 2008	n = 81	30 %	49 %	12 %	91 %

# PVS + midodrine in SCI patients

	Patients	Ejacul <sup>o</sup>	PVS	PVS + midodrine	Total
Soler 2007	n = 449	0 %	65 %	33 %	88 %
Courtois 2008	n = 81	30 %	49 %	12 %	91 %

	Patients	Ejacul <sup>o</sup>	Antegrade	Ante & Retrograde	Retrograde
Spastic	n = 130	62 %	61 %	16 %	23 %
Flaccid	n = 28	79 %	36 %	0 %	64 %

# PVS + midodrine in SCI patients

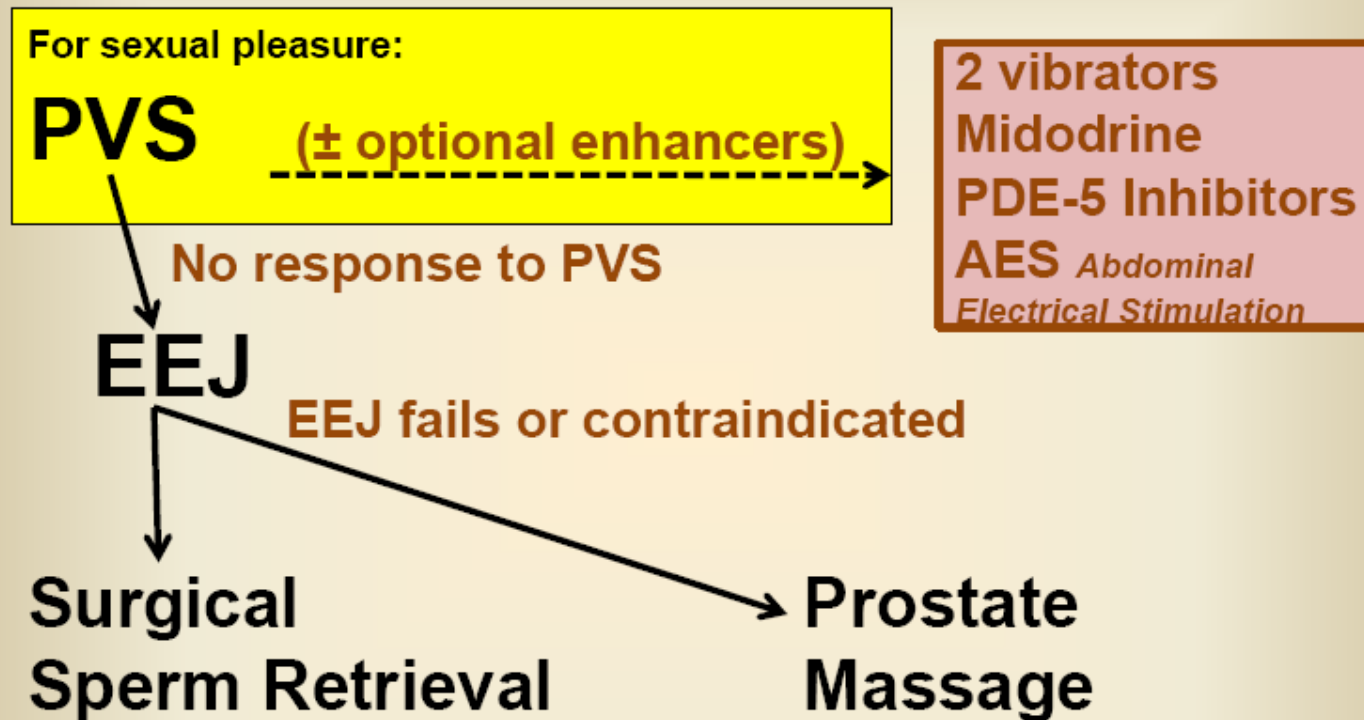
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- Can midodrine be used at home?
  - Cardiovascular risks
  - Midodrine decreases the quality of erection



# Ejaculation in SCI patients

## ALGORITHM



Brackett et al., J Urol 2010; 183: 2304-2308

# Ejaculation in SCI patients

- Influence of drugs?
  - Pain (tramadol), detrusor overactivity, spasticity, depression (serotonin reuptake inhibitors),...
- Influence of repetition?
  - Can this reflex be trained?
- Influence of the psyche?
  - Does psychogenic anejaculation exist?

# Retrograde Ejaculation

- Bladder neck incompetence...
  - Sympathectomy
    - 46% patients T10-L2 lesion (*Rodic 2000*)
    - Alphablockers (Tamsulosin) (*Hellstrom 2006*)
  - Diminished tonus
    - Intradetrusor botulinum toxin increases retrograde ejaculation on PVS (*Caremel Courtois 2011*)

# Retrograde Ejaculation

- ...Bladder neck competent!
  - Synergy of ejaculation
- Doppler during masturbation (*Nagai 2005*)
  - Antegrade: opening of the ESS, closure of the BN
  - Retrograde: bad opening of both ESS and BN
- Sphincter pressures during PVS (*Sonksen 2001*)

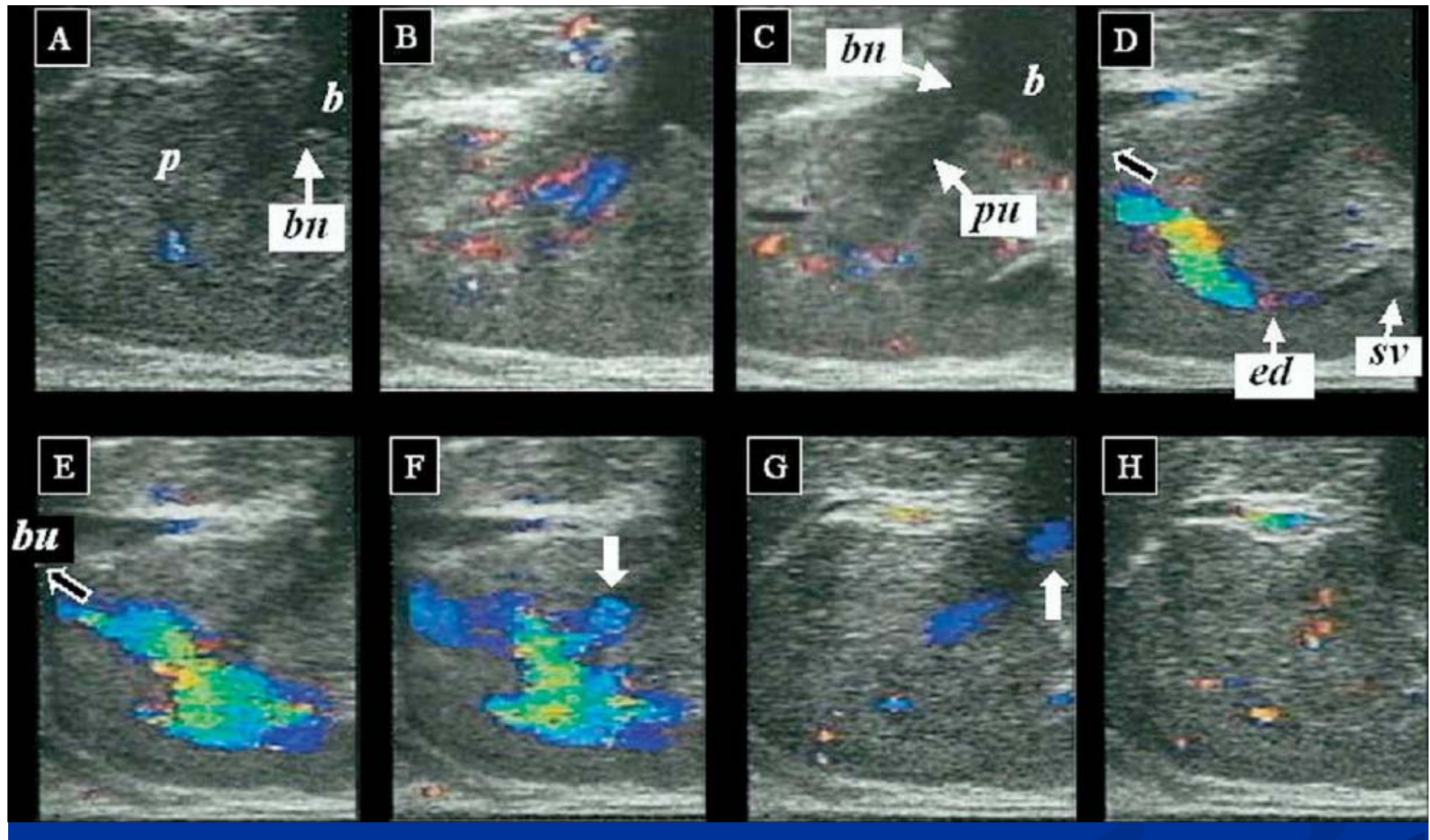


FIGURE 1. Color Doppler ultrasound images of ejaculation in healthy male: (A) Prostate (*p*), bladder neck (*bn*), and bladder (*b*). (B) Blood flows in prostate and prostatic venous plexus increase during penile stimulation. (C) Distension of prostatic urethra (*pu*) and flattening of bladder neck (*bn*) with contraction of prostate. (D,E) Ejaculatory stream (black arrow) from seminal vesicles (*sv*) spurting toward bulbous urethra (*bu*) through ejaculatory duct (*ed*). (F) Flow toward supramontanal portion (white arrow) without any flow into bladder. (G) Bladder neck opens after expulsion, and semen remaining in prostatic urethra flows into bladder (white arrow). (H) Prostatic urethra and bladder neck return to normal.

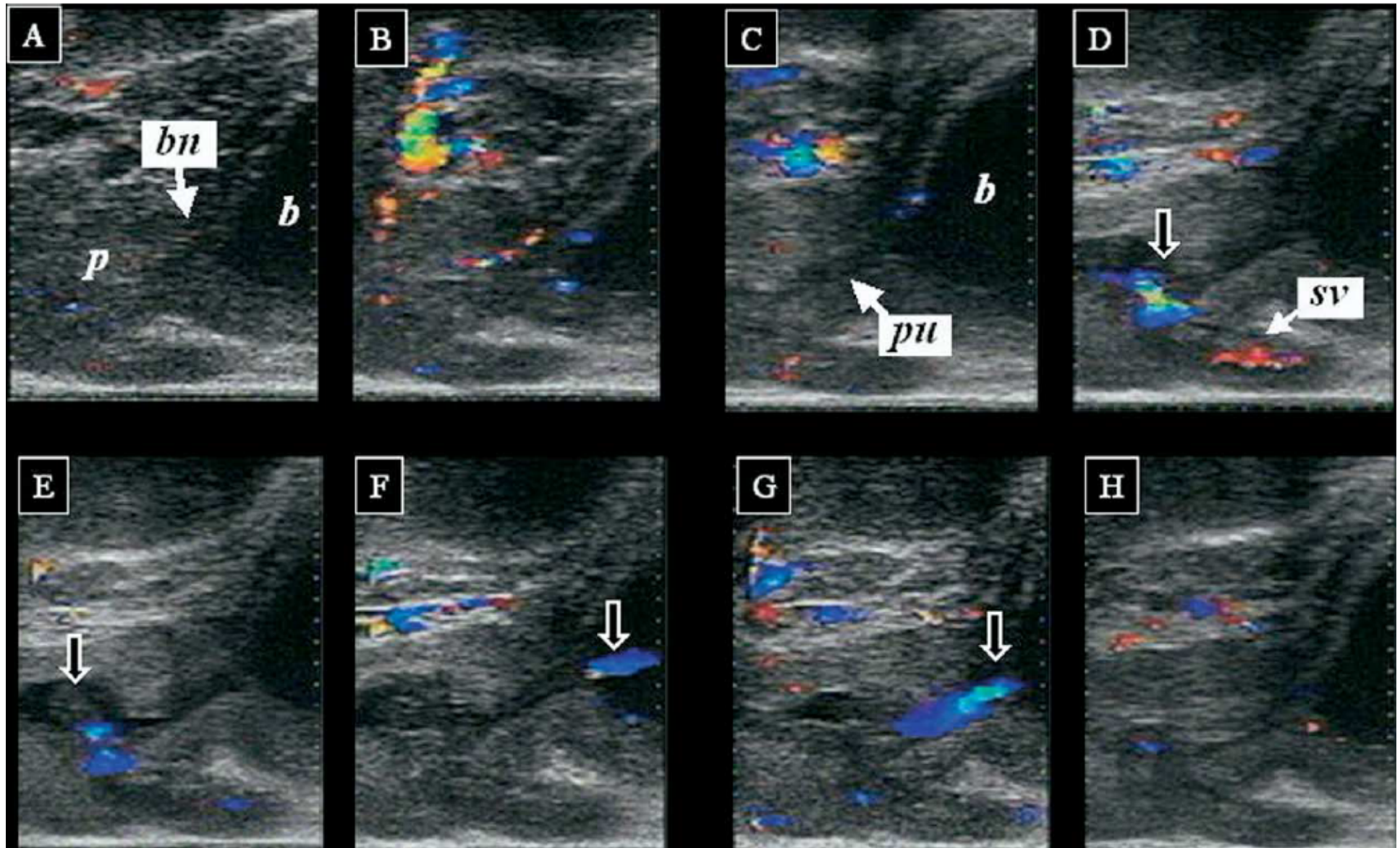
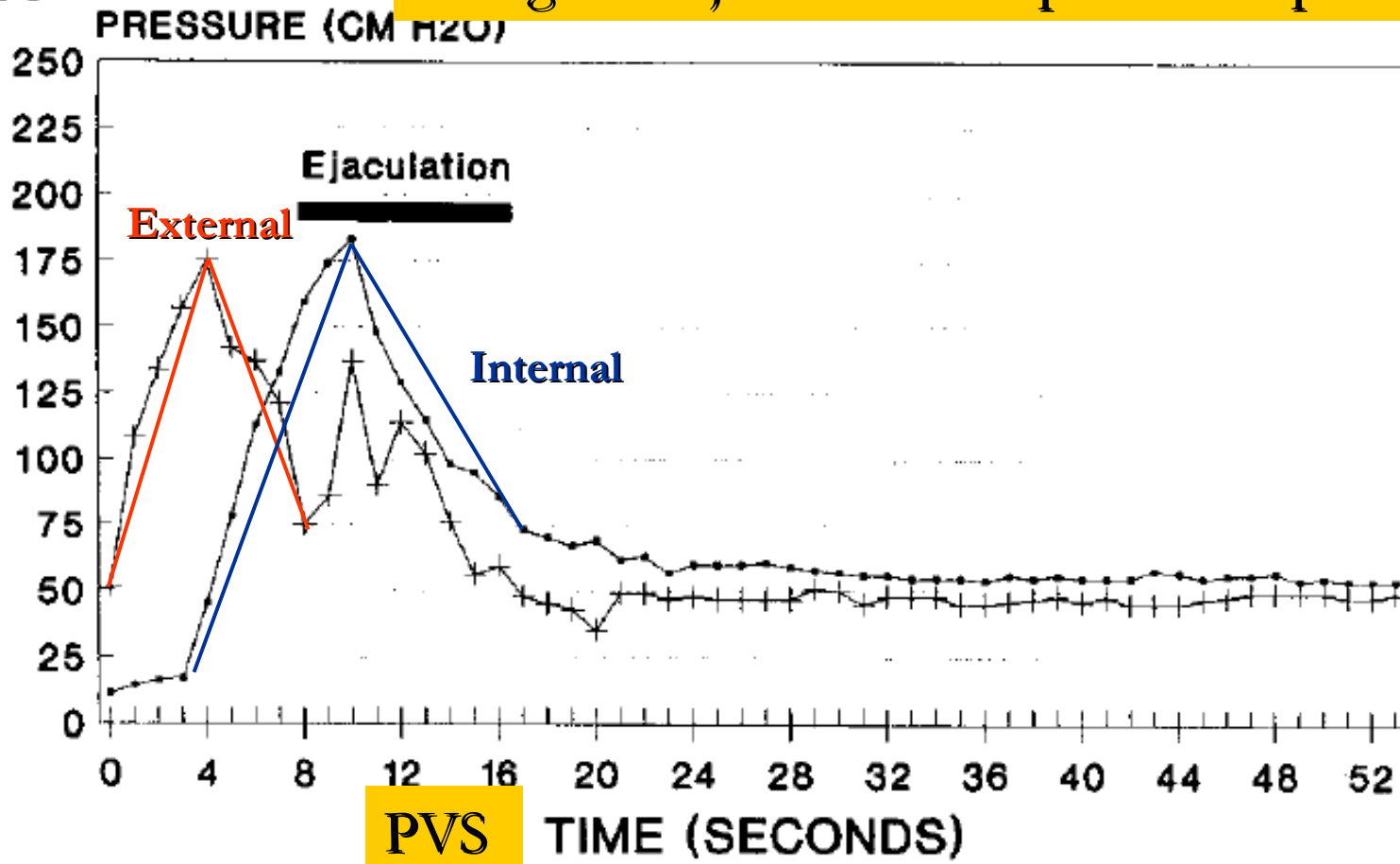


FIGURE 2. Color Doppler images of retrograde ejaculation. (A) Prostate (*p*), bladder neck (*bn*), and bladder (*b*). (B) Blood flow in prostate and prostatic venous plexus increases. (C) Prostatic urethra (*pu*) is distended at beginning of expulsion. (D) Ejaculatory stream (arrow) from seminal vesicles (*sv*) to inframontanal urethra. (E) Inframontanal urethra is filled with semen (arrow), creating a globular-shaped sac during expulsion. (F,G) Semen remaining in prostatic urethra begins flowing into bladder (arrow). (H) Prostatic urethra and bladder neck return to normal.

# Dyssynergic Ejaculation

**A**

Antegrade Ejaculation in Spastic SCI patient

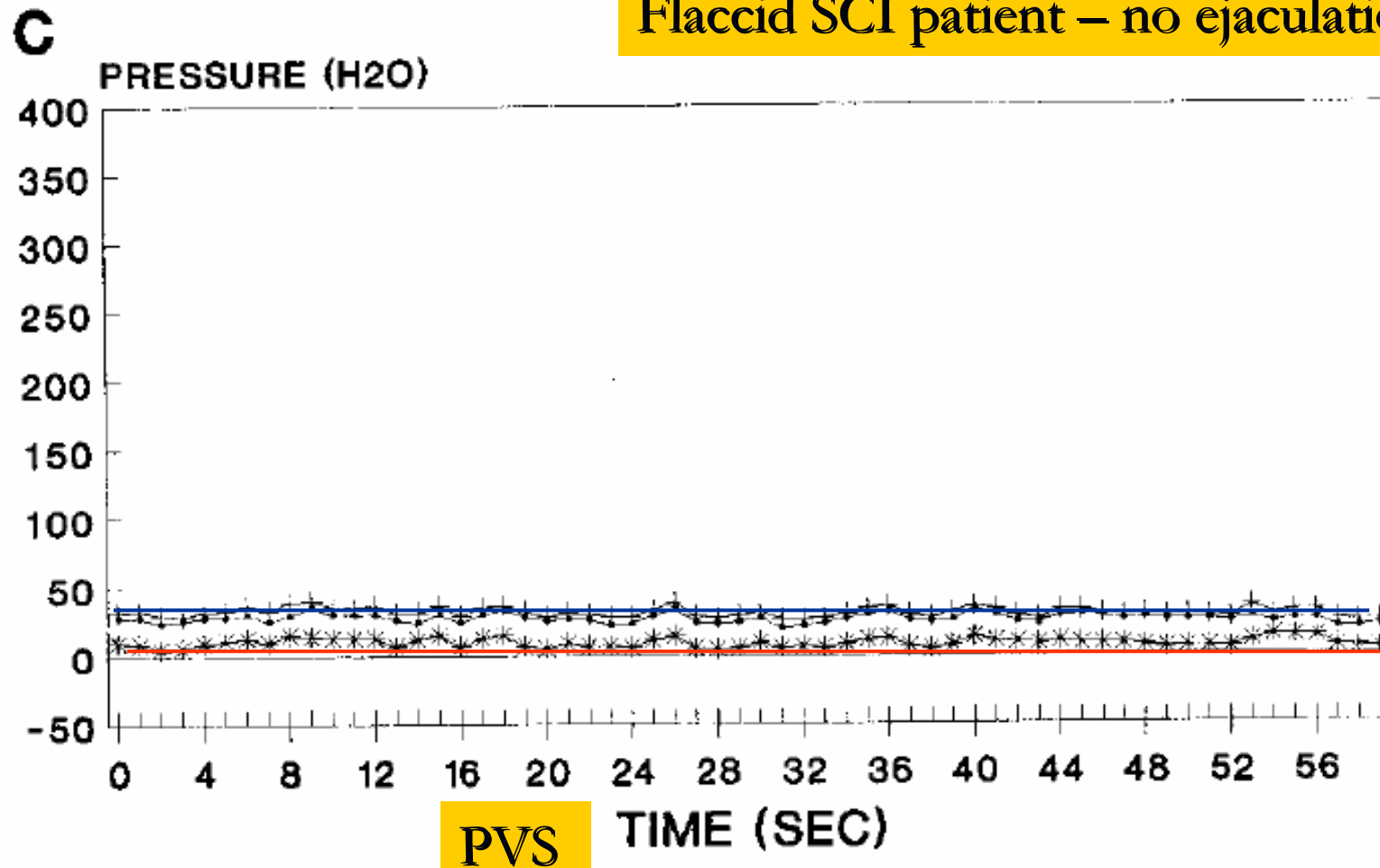


—●— INT. SPHINCTER    —+— EXT. SPHINCTER

Sonksen 2001

# Dyssynergic Ejaculation

Flaccid SCI patient – no ejaculation



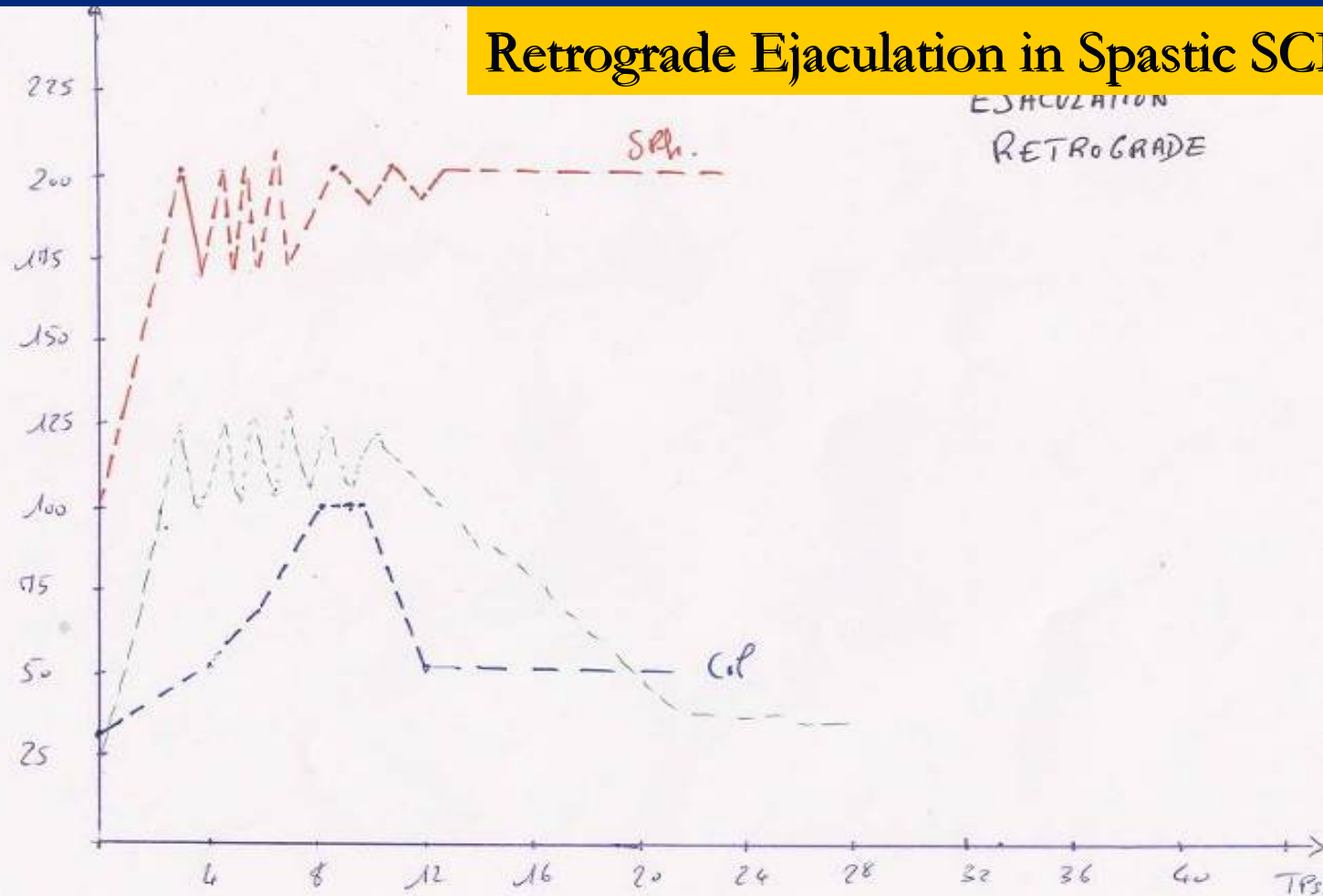
—●— INT. SPHINCTER    —+— EXT. SPHINCTER    —\*— BL

Sonksen 2001



# Dyssynergic Ejaculation

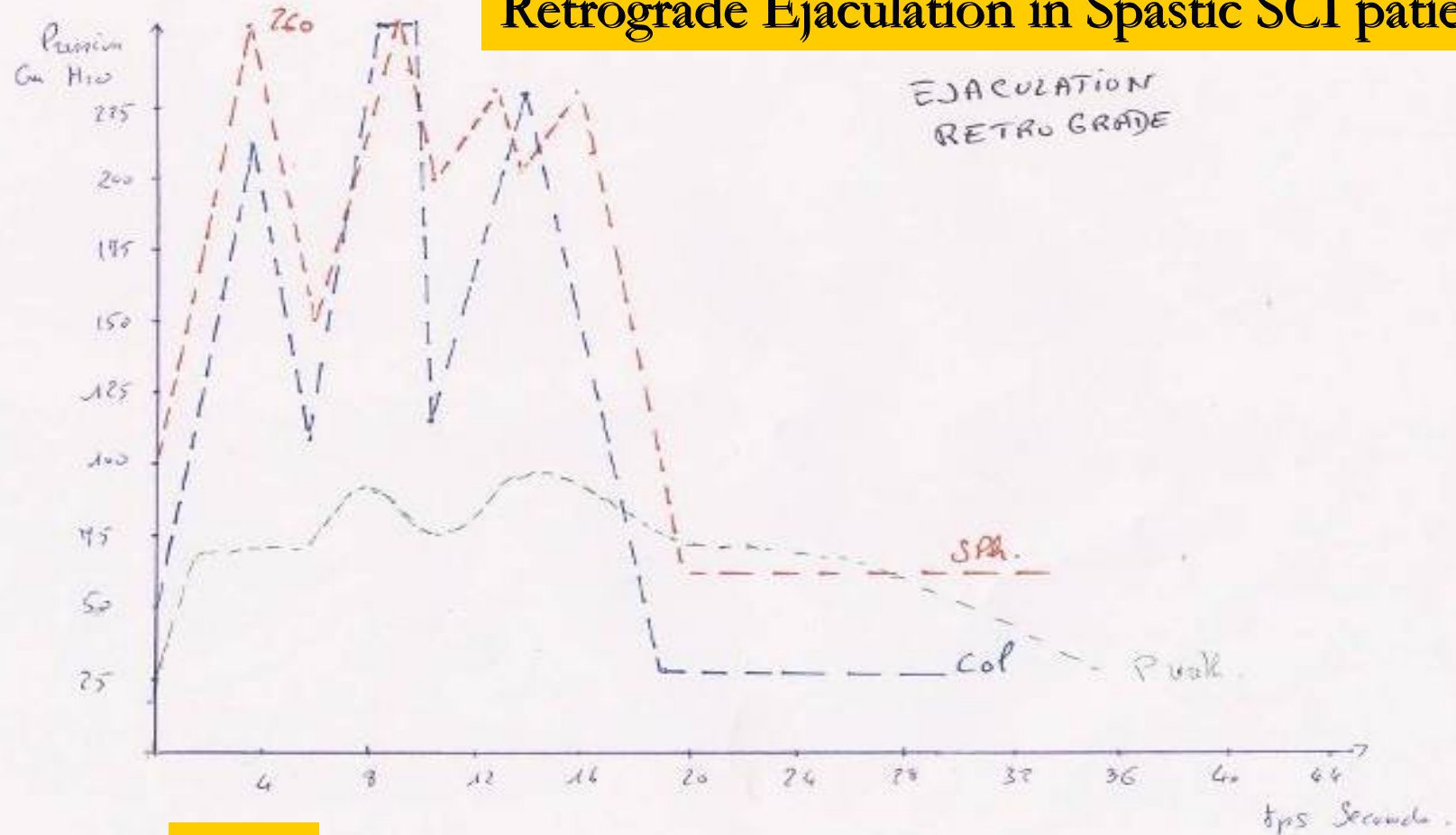
Retrograde Ejaculation in Spastic SCI patient



PVS

# Dyssynergic Ejaculation

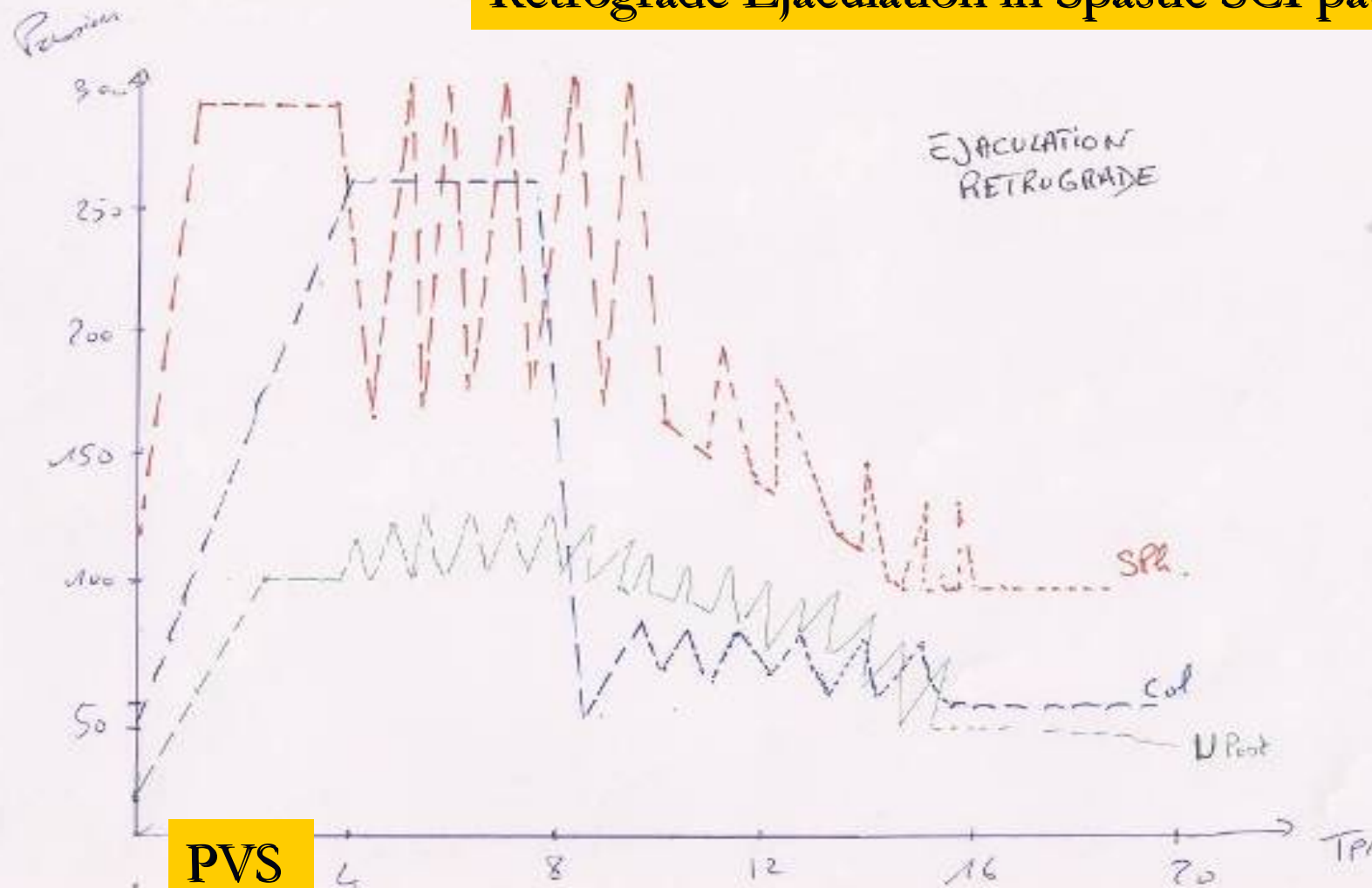
## Retrograde Ejaculation in Spastic SCI patient



PVS

# Dyssynergic Ejaculation

Retrograde Ejaculation in Spastic SCI patient



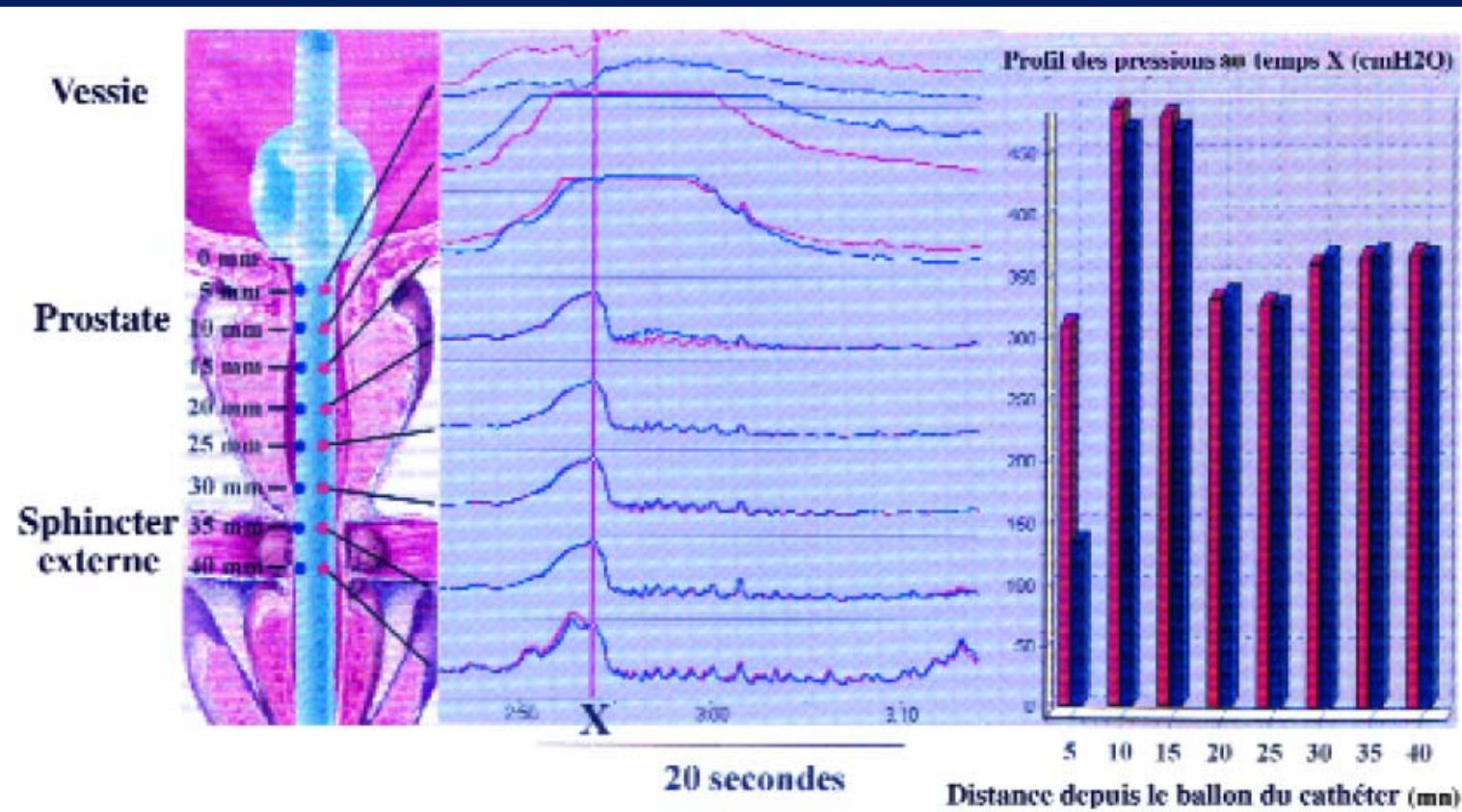
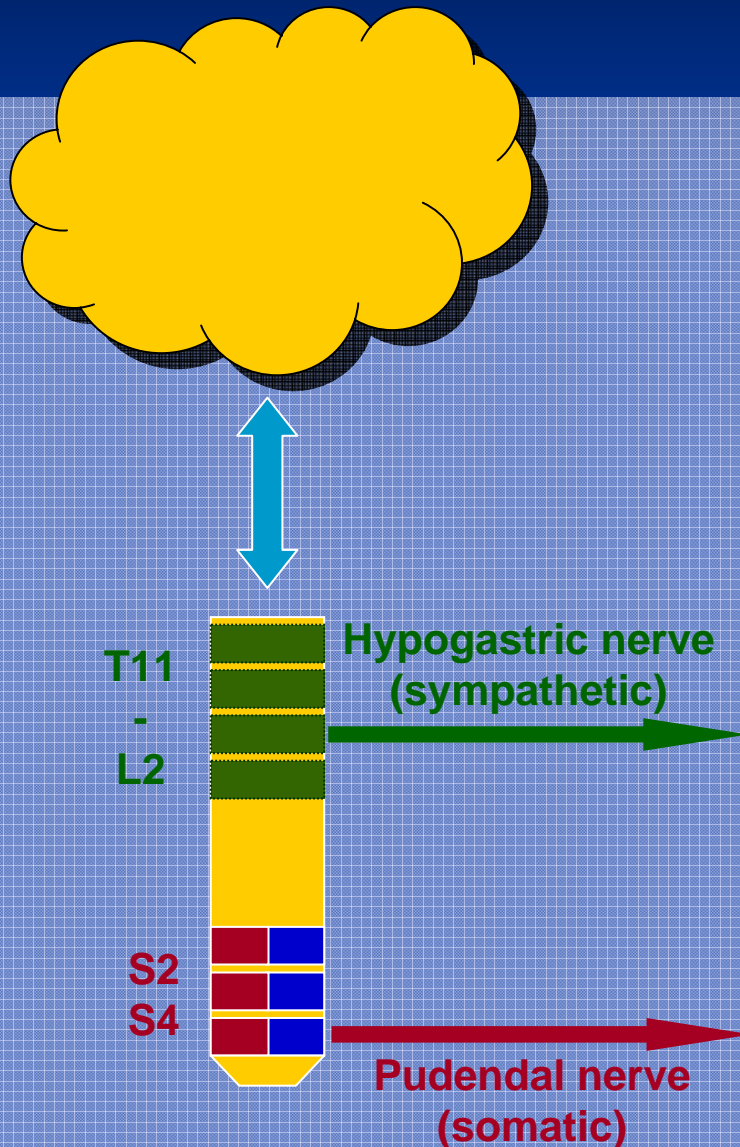


Figure 2. A gauche : coupe simplifiée de l'urètre avec cathéter transurétral et son ballon gonflé. Les canaux (bleu et rouge) sont placés tous les 5 mm entre le col vésical et le sphincter urétral externe à différents niveaux. Au milieu : Profil éjaculatoire enregistré 2 fois (par les canaux opposés : courbes bleu et rouge) tous les 5 mm chez un homme durant 20 sec. Le profil des 4 autres hommes était similaire. A droite : Ce diagramme montre les pressions à chaque niveau au moment X, où les pressions étaient les plus élevées. Les pressions sont significativement plus élevées au niveau des 10-15 premiers mm de l'urètre proximal.

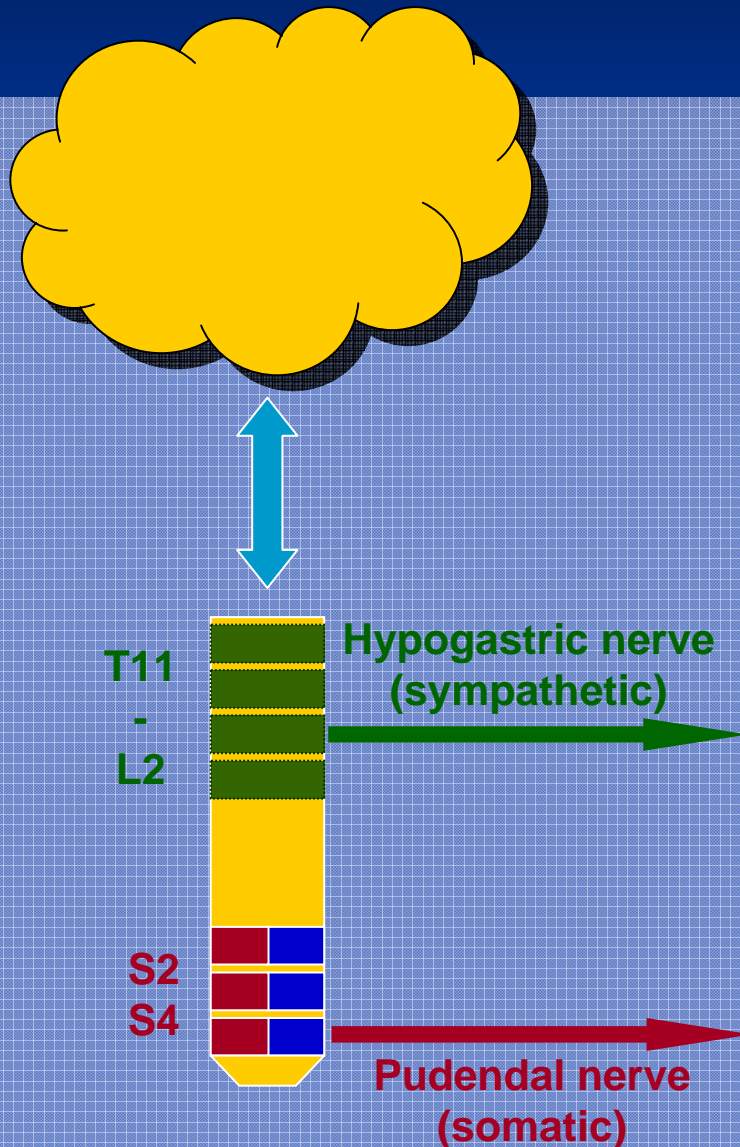
# Ejaculation in SCI patients



- Is there a **supraspinal** control of ejaculation?
  - Bladder sphincter dyssynergia
  - Dyssynergic ejaculation

*Soler 2011*

# Ejaculation in SCI patients



- Is there a **spinal generator** for ejaculation?

## Rats

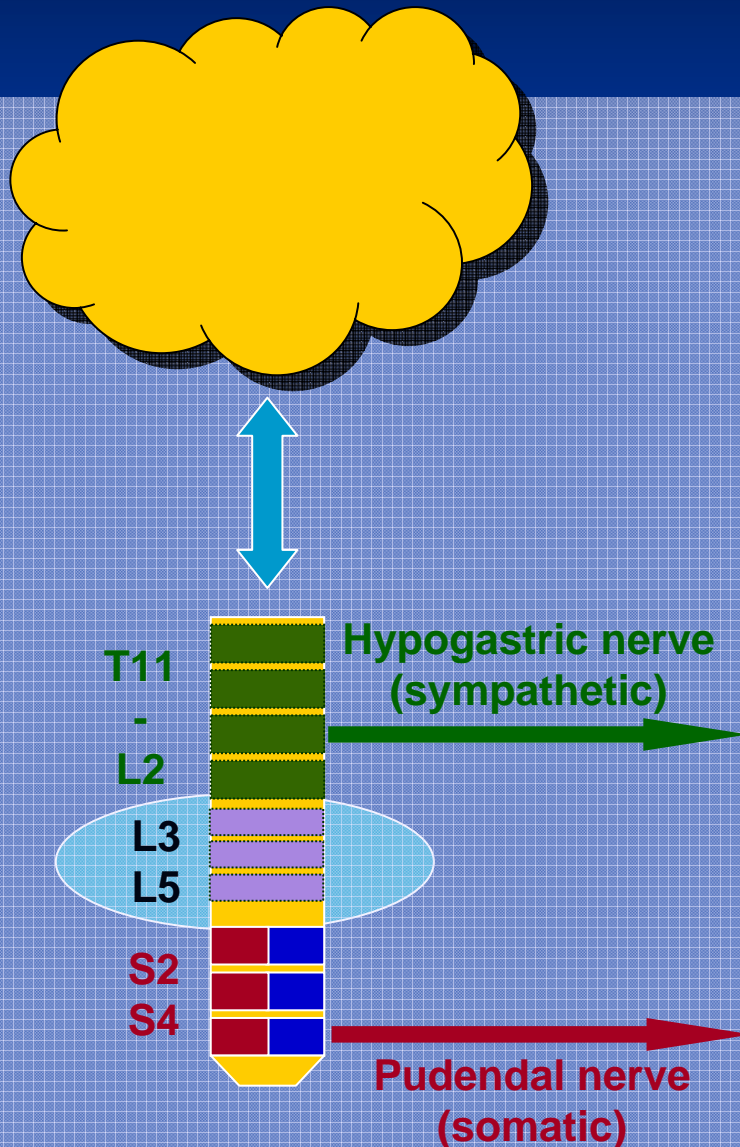
*Truit 2002, Xu Giuliano 2005*

## Humans?

- Review 45 out of 513 studies
- **3795** patients

*Chebense, Denys, Giuliano 2013*

# Ejaculation in SCI patients



- Is there a **spinal generator** for ejaculation?

## Rats

*Truit 2002, Xu Giuliano 2005*

## Humans?

- Review 45 out of 513 studies
- **3795** patients
- Spinal generator at L3-L5

*Chebense, Denys, Giuliano 2013*

## ■ Évaluation éjaculation

- Imagerie: EchoDoppler, IRM fonctionnelle, PET Scan
- NeuroPhysiologique: Capteurs de pression
- Electrophysiologique: Système nerveux autonome



# Ejaculation in SCI patients

## ■ Conclusion

- Ejaculation during intercourse is rare
  - Depends on the type, level and severity of lesion
- Stronger stimulation needed for ejaculation
  - Better erection
  - PVS very effective
- Retrograde ejaculation is frequent
  - Suggestive of dyssynergic ejaculation
- Is there spinal generator for ejaculation in men?