

# **GTO PHARMACEUTICAL, LLC**

---

**Resolving Sexual Pain and Enhancing Sexual Arousal**

**A Novel Use of Sinecatechins for Female Sexual Needs**

# Table of Contents

- **1. Lack of Effective Treatments for Female Sexual Disorders**
- **2. Commercial Market for Treatment of Women with Female Sexual Disorders**
- **3. Problems with Currently Available Therapeutics**
- **4. Novel Use of Sinecatechins for Treatment of Female Sexual Disorders**
- **5. Preliminary Clinical Data**
- **6. Patent Portfolio**
- **7. Wendy Epstein CEO & Founder**
- **8. Conclusions**

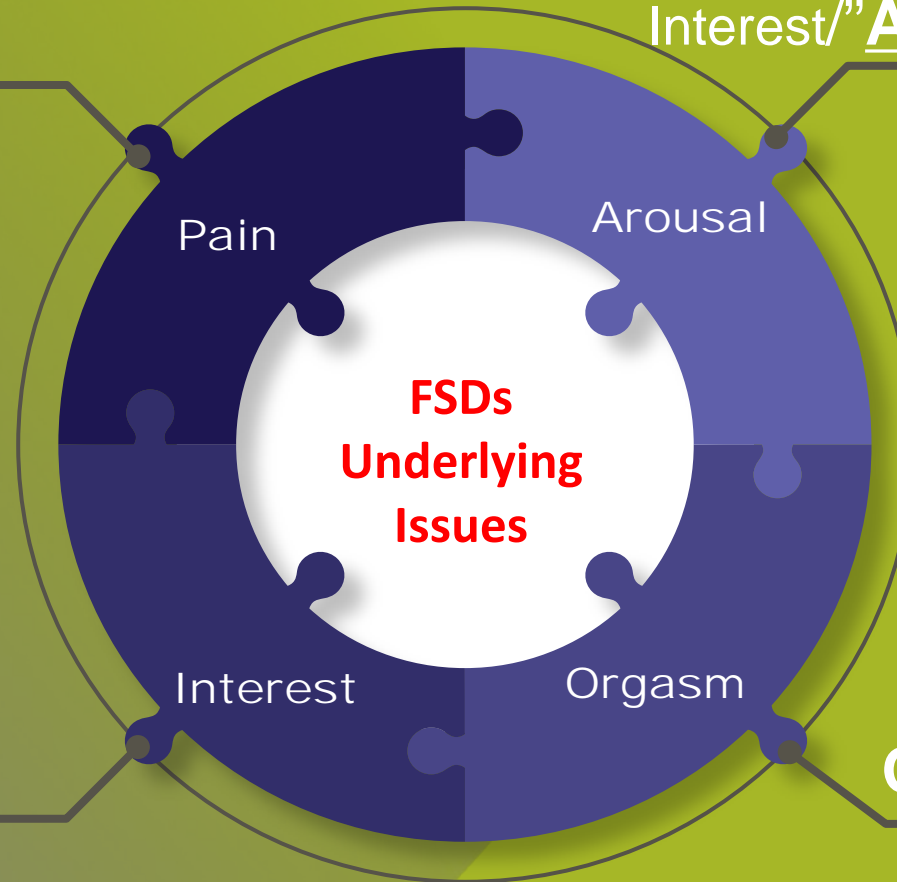
# LACK OF EFFECTIVE TREATMENTS FOR FEMALE SEXUAL DISORDERS

---

# Female Sexual Disorders (FSDs)

**Genito-Pelvic Pain-  
Penetration Disorder:**

**Interest/“AROUSAL” Disorder**



**“INTEREST”/Arousal  
Disorder:**

**Orgasmic Disorder**

# Female Sexual Disorders (FSDs) are common and often untreated

In a ~1,500-woman study of routine gynecology patients more than 90% of respondents reported one or more sexual concerns:

- 71.7% reported **sexual pain including dyspareunia** (Genitopelvic Pain Penetration Disorder)
- 74.7% reported decreased **sexual arousal and difficulty in lubrication** (Interest/Arousal Disorder)
- 83.3% reported **orgasmic disorders** (Orgasmic Disorder)
- 87.2% reported **hypoactive sexual desire** (Interest/Arousal Disorder)

Source: Nusbaum MR, Gamble G, Skinner B, Heiman J. The high prevalence of sexual concerns among women seeking routine gynecological care. *J Fam Pract.* 2000;49:229-232.

# COMMERCIAL MARKET FOR TREATMENT OF WOMEN EXPERIENCING SEXUAL DISORDERS

---

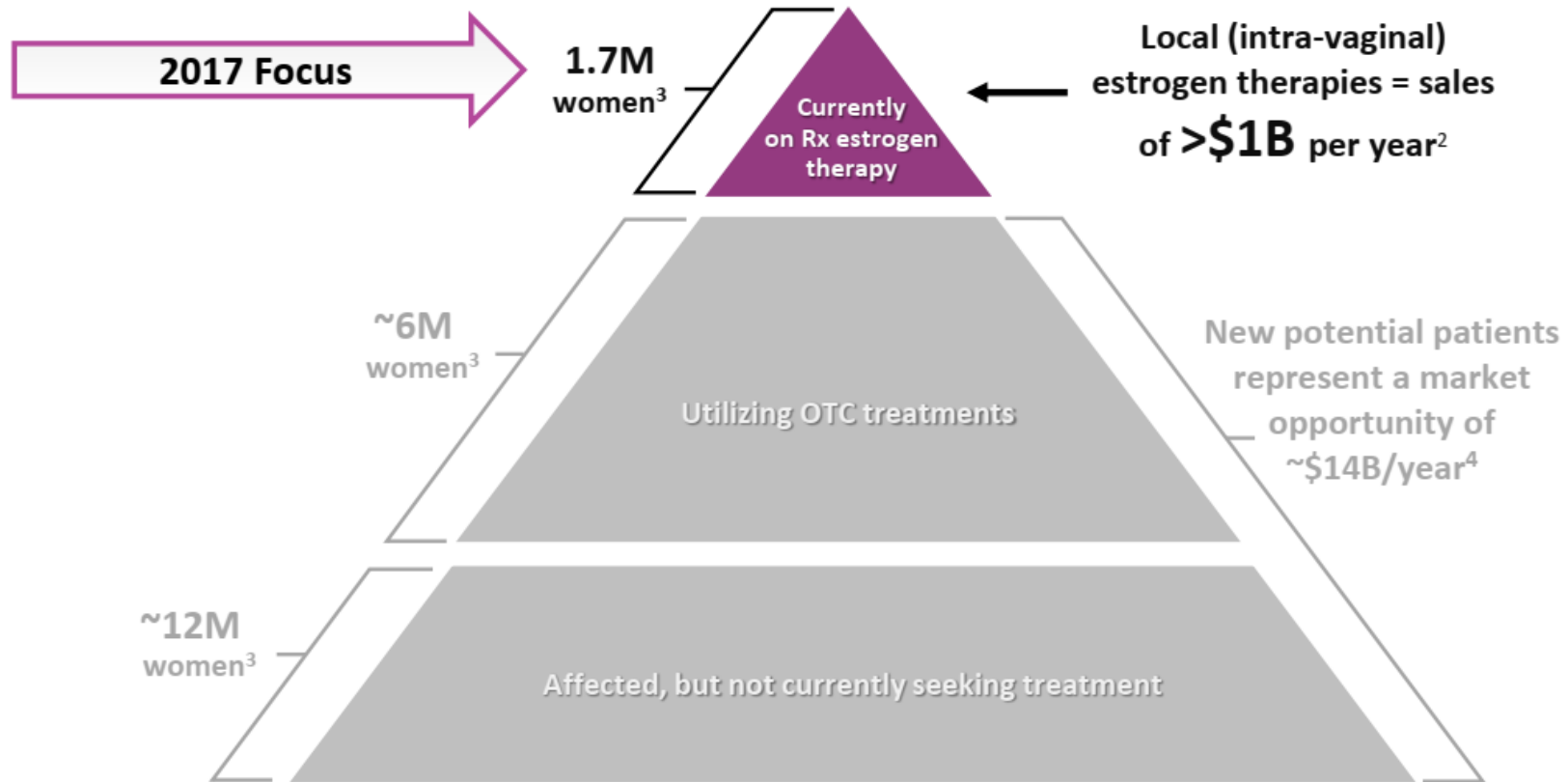
Sales and Market Size

# Vast US Market for Treatment of Female Sexual Pain

- 80-200 million women in the US suffer from sexual pain
- 46-130 million women suffer from vulvodynia (sexual pain in the vulvar vestibule) at a treatment cost of \$31-\$72 billion USD annually
- 20 million postmenopausal women in the US suffer from dyspareunia (painful sex, primarily vestibulodynia) with a potential treatment market of \$15 billion USD

# Dyspareunia: Sizable Untapped Treatment Market

~20M women in U.S. suffer from dyspareunia, a symptom of VVA<sup>1</sup> Postmenopausal Vulvovaginal Atrophy



<sup>1</sup> Intrarosa is a steroid indicated for the treatment of moderate to severe dyspareunia, a symptom of vulvar and vaginal atrophy, due to menopause.

<sup>2</sup> Based on IMS SMART Tool NSP and NPA data for total VVA prescriptions.

<sup>3</sup> AMAG estimates based on: a) Wysocki et al. Management of Vaginal Atrophy: Implications from the REVIVE Survey. Clinical Medicine Insights: Reproductive Health 2014;8 23-30; b) Kingsberg et al. Vulvar and Vaginal Atrophy in Postmenopausal Women: Findings from the REVIVE Survey. J Sex Med 2013;10:1790-17994 Company estimated based on IMS SMART Tool NSP and NPA data.

<sup>4</sup> Company estimated based on IMS SMART Tool NSP and NPA data.



**OVER 1 BILLION WOMEN WORLDWIDE WILL  
BE EXPERIENCING MENOPAUSE BY 2025**

---

**Menopause Unveils Itself As The Next Big Opportunity In Femtech**

**Forbes: July 24, 2019**

# PROBLEMS WITH CURRENTLY AVAILABLE THERAPEUTICS

---

Ineffectiveness  
Safety Issues

# Current therapies are ineffective and/ or have side effects and regulatory restrictions

## Vestibulodynia Pain

- Biofeedback, Pelvic floor muscle physical therapy
- Topical anesthetic (Lidocaine)
- Topical Capsaicin from hot pepper (initially very painful)
- Injections (Botox, cortisones)
- Oral medications (Gabapentin, tricyclic antidepressants, SNRIs, Anticonvulsants, short term Opioids)
- Topical or transdermal estrogen especially when oral contraceptives suspected etiology- often ineffective for postmenopausal women
- Discontinuation of oral contraceptives
- Surgery (laser, vestibulectomy with vaginal advancement)
- AT<sub>2</sub> Type 2 receptor blocker (never developed) requires injection, but consistent with one mechanism of action (MOA) of sinecatechins

## Interest/Desire and Arousal

- **Interest/Desire:**
- Addyi: Filbanserin ineffective and significant side effects-- premenopausal only
- Vyleesi: Bremelanotide injection: limited use by significant side effects; only about 20% tested benefited, premenopausal use only
- **Arousal:**
- Testosterone: not approved in U.S. significant side effects; also converts to estrogen
- No solution for increasing sexual sensations other than OTC warming gels,
- Cannabis THC/CBD

# NOVEL USE OF SINECATECHINS

---

Providing Effective Non-hormonal Topical Treatments  
for Women with Vestibulodynia Sexual Pain and  
Postmenopausal Sexual Arousal Disorder

# GTO Pharmaceuticals

## 5-10% Sinecatechins Ointments

### Decreases Sexual Pain

- **Decreases Dyspareunia** (painful intercourse)
  - Decreases or eliminates vulvar vestibular sexual pain and increases lubrication
- Note: 90% of dyspareunia is due to pain in the vulvar vestibule, not in the vagina for both pre- and post-menopausal women.

### Increases Sexual Arousal

- **Increases Genital Sexual Arousal Sensations**
  - Increases sexual arousal, pleasurable sexual sensations in genitalia
  - Decreases the latency to orgasm and increases the intensity of orgasm.

# Independent Evidence of Green Tea Catechins Significantly Reducing Pain in Vulvar Vestibule

In a 2017 study involving 99 primiparous women to determine the effects of Green Tea ointment on episiotomy pain and wound-healing found that:

*“Green tea ointment appears to be effective in relieving episiotomy pain and improving wound-healing in this study. Further studies are recommended to be conducted on the effectiveness and safety of the different doses of green tea ointment.”*

This would appear to be the first study of its kind demonstrating analgesic effect of green tea ointment in this area of application and a literature search uncovered no additional studies in this area.

Source: Shafrahmani et al. The effect of green tea ointment on episiotomy pain and wound healing in primiparous women: A randomized, double-blind, placebo-controlled clinical trial. *Phytotherapy Research* 2018; 32:522-530.

# CLINICAL TRIAL

---

Placebo Controlled Double Blind Clinical Trial of 5 % and 10%  
Sinecatechins Ointment to Alleviate Vestibulodynia in  
Sexually Active Post-Menopausal Women



**GTO Pharmaceutical, LLC | Clinical Trial Sponsor**

[gtopharmaceutical.com](http://gtopharmaceutical.com)

Placebo controlled double blind clinical trial of 5 % and 10% sin catechins ointment, a topical botanical (FDA approved drug at 15%) derived from Green Tea Leaves *Camellia sinensis*, for the Treatment of Significant to Severe Vulvar Pain from Secondary Provoked Vestibulodynia in Sexually Active Post-Menopausal Women

**Lila Nachtigall, MD, NCMP | Principal Investigator**

Professor of Obstetrics and Gynecology

Director of The Interdisciplinary Menopause Study Group

NYU School of Medicine

[doctorlila@gmail.com](mailto:doctorlila@gmail.com)

GTO  
Pharmaceutical, LLC



## Conclusions from clinical trial data:

- Topical 5% sinecatechins ointment applied once daily or 10% sinecatechins ointment applied three times a week significantly reduced provoked secondary vestibulodynia. Daily use of 5% sinecatechins ointment was not irritating but daily use of 10% sinecatechins can be.
- Unmyelinated afferent C-fibers innervating the vulvar vestibule transmit both sensations of pain and sexual pleasure. The novel finding that topical sinecatechins both significantly reduces vestibulodynia and increases sexual sensations of arousal has a neurological basis.
- Topical sinecatechins may be used adjunctively to alleviate persistent vulvar vestibular pain in women using estrogens to treat vaginal atrophy.
- Women who are unwilling to use estrogenic compounds or for whom estrogens are contraindicated because of estrogen sensitive malignancies may safely use topical sinecatechins ointment alone to significantly reduce their vestibulodynia because topical sinecatechins do not cause proliferation of the vaginal mucosa.
- Post-menopausal women with or without provoked vestibulodynia may elect to use topical sinecatechins ointment to increase overall sexual function, including sexual arousal.
- Based on this clinical trial data, larger clinical trials in both pre-and post-menopausal women with provoked vestibulodynia should be undertaken.

# GTO PHARMACEUTICAL PATENT PORTFOLIO

---

Novel Use of Sinecatechins for  
Treating Female Sexual Disorders

Country	Title	Application No.	Filing Date	Intl. Filing Date	Publication No.	Publication Date	Patent No.	Issue Date
China	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	201680028573.2	11/17/2017	3/18/2016	107530321	1/2/2018		
European	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	16765869.9	9/29/2017	3/18/2016	3270914	1/24/2018		
Hong Kong	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	18107928.2	6/20/2018	3/18/2016	1249008A	10/26/2018		
Israel	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	254568	9/18/2017	3/18/2016				
United States	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	15/074,984	3/18/2016		2016-0271102	9/22/2016	9,750,716	9/5/2017
United States	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	15/680,181	8/17/2017		2017-0340602	11/30/2017	10,624,873	4/21/2020
United States	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS (CIP)	16/488,936	2/23/2018			1/16/2020		
United States	COMPOUNDS AND FORMS OF TREATMENT FOR FEMALE SEXUAL DISORDERS	16/848,824	4/14/2020					

**WENDY EPSTEIN, M.D.  
CEO AND FOUNDER**

---

**GTO Pharmaceutical, LLC**

## **Brief C.V. of Wendy Epstein, M.D., F.A.A.D. relevant to Female Sexual Health**

### **CEO and Founder of GTO Pharmaceutical, LLC and Sponsor of the Clinical Trial:**

Study of Dilute Veregen®, 10% sinecatechins ointment, a botanical FDA approved drug derived from Green Tea Leaves *Camellia sinensis*, for the Treatment of Significant to Severe Vulvar Pain from Secondary Provoked Vestibulodynia in Sexually Active, Postmenopausal Women with Vulvovaginal Atrophy (Lila Nachtigall, M.D. Principal Investigator)

**Consulted as Dermatologist for Avon Products, Inc. for over two decades.**

**Adjunct Clinical Assistant Professor, Department of Dermatology, New York University School of Medicine 2014-present**

**Clinical Assistant Professor, Department of Dermatology, New York University School of Medicine 1987-2014**

voluntary teaching faculty alongside vulvar dermatologist

**Clinical Assistant Professor Department of Dermatology Yale School of Medicine 2008-2010**

**Practicing Board Certified Dermatologist for 34 years.**

**New York University Department of Dermatology Residency 1984-1987.**

**Columbia University, College of Physicians and Surgeons Medical Doctor degree: 1983**

Vulvar Dermatology: Vulvar vestibulodynia

**Princeton University Department of Biology, Master's Degree 1978.**

Research: The Inverse Relationship of Copulatory Stimulation on the Duration of Sexual Receptivity

**Barnard College, Columbia University, Bachelor of Arts Degree 1975**

Research: **Primate Behavior:** the Maternal and Group Behavior of Lemurs and Galagos Honors in Anthropology, Phi Beta Kappa, studied with Professor Margaret Mead

# CONCLUSIONS

---

GTO Pharmaceutical, LLC  
Topical Sinecatechins Ointment

## Sinecatechins ointment



1. **Topical, safe effective treatment for postmenopausal women with estrogen sensitive cancers including those taking aromatase inhibitors.**
2. ***Adjunctive* treatment for postmenopausal women still having pain in the vulvar vestibule despite using topical estrogens.**
3. ***Adjunctive* treatment for women who want to reduce the amount or frequency of their estrogen use.**
4. **Treatment that may be used 'as needed'.**
5. **Treatment that increases sexual arousal, which further decreases sexual pain.**
6. **Rapid onset of action**

# GTO Pharmaceutical, LLC Assets

- Robust Patent Protection for use of Sinecatechins Ointment for Female Sexual Disorders
  - U.S. and International Patent Portfolio
- Trade secrets regarding Mechanism of Operation (MOA)
- Clinical Trial.gov registered placebo-controlled double blinded trial completed
- Other efficacy indicia
- Trade secrets and relationships regarding formulation
- Proprietary business and sourcing relationships



Wendy A. Epstein, M.D., F.A.A.D.  
CEO and Founder of GTO Pharmaceutical, LLC  
[wendymd@gmail.com](mailto:wendymd@gmail.com)  
845-641-8661

# GTO Pharmaceutical, LLC